



☎ 06753 - 252234(O)
252235(R)
Fax- 06753 - 253480

OFFICE OF THE PRINCIPAL
NAYAGARH (AUTONOMOUS) COLLEGE
NAYAGARH-752069
Website-www.ngrautocol.ac.in
E-mail – ngrautcol@yahoo.co.in

NAAC 2022/ Extended Profile Deviations/Cr0-1

Date:- 24/01/2022

Criteria 1.1:	Number of programs offered year-wise for last five years
DVV Finding	Please provide 1. Tabulated list of programs showing sl. no., program code, name of program, commencement year, for each year for all the 5 assessment years in the letter head of College, attested by Principal. 2. Please provide the above details in excel sheet matching with the certified data. 3. brochure, prospectus, and handbook/ syllabus book highlighting programs offered for each year for all the 5 assessemnt years, attested by Principal. 4 . highlighted section of program approval orders from affiliating University certified by the Competent authority from affiliating University. 5. certificate from competent authority of affiliating University showing number of programs offered year wise for all the 5 assessment years, attested by Principal. 6. Please provide the link to the College website so as to land on the relevant page on selection of the link and not on any other drives like Google Drive. 7. highlighted section of program approval orders from AICTE/University certified by the Principal .
Response/ Clarification	1) List of Number of programs offered by the institution year wise along program code, program name, year of offering attested by principal is attached (Appendix-I) 2) syllabus book highlighting programs offered for each year for all the 5 assessment years, attested by Principal is attached (Appendix-II) 3) Highlighted section of program approval orders from affiliating University certified by the Competent authority from affiliating University is attached. (Appendix-III) 4) Web link leading to the information in the College website is available on following link: https://ngrautocol.ac.in/dvv.php and Direct link is also posted in the DVV Portal

IQAC Coordinator

PRINCIPAL
NAYAGARH AUTONOMOUS COLLEGE
NAYAGARH

Appendix I



☎ 06753 - 252234(O)

252235(R)

Fax- 06753 - 253480

**OFFICE OF THE PRINCIPAL
NAYAGARH (AUTONOMOUS) COLLEGE**

NAYAGARH-752069

Website-www.ngrautocol.ac.in

E-mail – ngrautcol@yahoo.co.in

Number of programs offered year wise during last five years

Program Code	Program Name	Year of offering
BA	BA	1963-64
BSc	BSc	1966-67
Bcom	Bcom	1981-82
MSW	MSW	2012-13
MCom	Commerce	2018-19
MA	Odia	2019-20

Year wise number of programme list

Year	Number of Programmes
2019-20	6
2018-19	5
2017-18	4
2016-17	4
2015-16	4

S. U. D.
PRINCIPAL
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NAYAGARH

Appendix II

To

NAAC Coordinator,

NAAC Bangalore.

Subject: - Responses to the clarifications asked post submission of IIQA.

Respected Sir,

We have analysed all the clarifications asked and putting responses in seriatim for your kind consideration.

Clarification No. 1:

Kindly clarify whether provided PG and UG programmes have permanent affiliation and valid for current year or not.

Response No. 1:

All U.G. (B.A., B.Sc., B.Com.) Programs are permanently affiliated, once permanent affiliation is received, from that year onwards university do not send any committee and any type of letter to the institute. Also Institution does not require to submit fee for affiliation to the university for the continuation of such programs.

Where in all the P.G. (MSW,MA(Odia) & M.Com) programs are Temporary Affiliated.

Letter from the College Development Council (CDC), The Highest Body of Utkal University stating ALL the U.G. and P.G. Programs with their Current Affiliation Status.
(2020-21)



UTKAL UNIVERSITY
Vani Vihar, Bhubaneswar-751004

Prof. Nigamananda Das,
Director,
College Development Council

Date: 21.05.2021

TO WHOM SO EVER IT MAY CONCERN

This is to certify that, Nayagarh Autonomous College, Nayagarh, Odisha is affiliated to Utkal University since 1961 and recognized by University Grants Commission under 2(f) and 12(B) and the following courses/subjects are taught in the said college as per approval.

Sl.No	Name of the Course(s) and Duration	Affiliation	
		Permanent	Temporary
1	Three years Degree Arts Honours in English, Odia, Education, Economics, Sociology, Psychology, Sanskrit, Philosophy, History, Political Science	Permanent	
2	Three years Degree Honours course in Science Subjects: Physics, Chemistry, Mathematics, Botany, Zoology, Electronics, Computer Science, ITM	Permanent	
3	Three years Degree in Commerce Honours	Permanent	
4	Two years Master Degree Course M.S.W.	Temporary	
5	Two years Master Degree Course M.Com.	Temporary	
6	Two years Master Degree Course M.A. (Odia)	Temporary	

[Signature]
21/5/21
DIRECTOR,

COLLEGE DEVELOPMENT COUNCIL

DIRECTOR
College Development Council
Utkal University
Vani Vihar, Bhubaneswar

Student Academic Management System (SAMS), is a portal by Government of Odisha which clearly shows College Name, Stream, Sanctioned Strength, Subject wise Admission & Vacancy, Program wise & Subject wise as a proof that we are currently affiliated for all of our Under Graduate (U.G.) Programs i.e. B.A., B.Sc., B.Com For the Academic Year (2020-21)

(B.A.)

SL#	SAMS Code	College Name	Stream Name	Stream Strength	Hons. Subject Name	Hons. Subject Name Strength	Admission	Vacancy
1	24102904	Nayagarh (Autonomous) College, Nayagarh	Arts	256	Economics	32	30	2
2	24102904	Nayagarh (Autonomous) College, Nayagarh	Arts	256	Education	16	16	0
3	24102904	Nayagarh (Autonomous) College, Nayagarh	Arts	256	English	8	8	0
4	24102904	Nayagarh (Autonomous) College, Nayagarh	Arts	256	History	32	26	6
5	24102904	Nayagarh (Autonomous) College, Nayagarh	Arts	256	Odia	32	31	1
6	24102904	Nayagarh (Autonomous) College, Nayagarh	Arts	256	Philosophy	8	8	0
7	24102904	Nayagarh (Autonomous) College, Nayagarh	Arts	256	Political Science	32	31	1
8	24102904	Nayagarh (Autonomous) College, Nayagarh	Arts	256	Psychology	32	31	1
9	24102904	Nayagarh (Autonomous) College, Nayagarh	Arts	256	Sanskrit	32	30	2
10	24102904	Nayagarh (Autonomous) College, Nayagarh	Arts	256	Sociology	32	30	2

*For Better Viewing of the SAMS Screen Shots - Please Enlarge the PDF.

(B.Sc.)

SL#	SAMS Code	College Name	Stream Name	Stream Strength	Hons. Subject Name	Hons. Subject Name Strength	Admission	Vacancy
1	24102904	Nayagarh (Autonomous) College, Nayagarh	Biological Science	96	Botany	48	41	7
2	24102904	Nayagarh (Autonomous) College, Nayagarh	Biological Science	96	Zoology	48	42	6

*For Better Viewing of the SAMS Screen Shots - Please Enlarge the PDF.

Admission » Hons. Subject Wise Vacancy

Session : 2020-21 College Type : Degree Stream : Physical Science

Show

Results 1 - 4 Of 4

SL#	SAMS Code	College Name	Stream Name	Stream Strength	Hons. Subject Name	Hons. Subject Name Strength	Admission	Vacancy
1	24102904	Nayagarh (Autonomous) College, Nayagarh	Physical Science	208	Chemistry	80	70	10
2	24102904	Nayagarh (Autonomous) College, Nayagarh	Physical Science	208	Electronics	16	12	4
3	24102904	Nayagarh (Autonomous) College, Nayagarh	Physical Science	208	Mathematics	32	25	7
4	24102904	Nayagarh (Autonomous) College, Nayagarh	Physical Science	208	Physics	80	71	9

*For Better Viewing of the SAMS Screen Shots - Please Enlarge the PDF.

Admission » Hons. Subject Wise Vacancy

Session : 2020-21 College Type : Degree Stream : -Select-

Show

Results 1 - 2 Of 2

SL#	SAMS Code	College Name	Stream Name	Stream Strength	Hons. Subject Name	Hons. Subject Name Strength	Admission	Vacancy
1	24102904	Nayagarh (Autonomous) College, Nayagarh	Oth. Science	64	Computer Science	32	32	0
2	24102904	Nayagarh (Autonomous) College, Nayagarh	Oth. Science	64	ITM	32	19	13

*For Better Viewing of the SAMS Screen Shots - Please Enlarge the PDF.

(B.Com.)

Admission » Hons. Subject Wise Vacancy

Session : 2020-21 College Type : Degree Stream : Commerce

Show

Results 1 - 1 Of 1

SL#	SAMS Code	College Name	Stream Name	Stream Strength	Hons. Subject Name	Hons. Subject Name Strength	Admission	Vacancy
1	24102904	Nayagarh (Autonomous) College, Nayagarh	Commerce	192	Commerce	192	145	47

*For Better Viewing of the SAMS Screen Shots - Please Enlarge the PDF.

List of admitted students for the year 2020-21 under Student Academic Management System (SAMS), by Government of Odisha as a proof that we are currently affiliated for all of our Post Graduate (P.G.) programs i.e. MSW, M.A.(Odia) & M.Com for the Academic Year (2020-21) (MSW)

SI.#	Barcode No.	Hall Ticket No.	Applicant Name	Father Name	DOB	Course	Admission Date	Mobile No	Gender	Social Category	Graduation Board	Graduation YOP	Mark	Mark with weightage
1	20P1506323		BARSHA PRIYADARSHINI	MANDJ KUMAR DALABEHERA	20-04-2000	MSW (Master of Social Work)	21-01-2021	6372847138	Female	OBC	Utkal University, Bhubaneswar	2020	31.25	31.25
2	20P1201333		ITISHREE MAHARANA	SANTOSH KUMAR MAHARANA	15-02-2000	MSW (Master of Social Work)	11-12-2020	9861632677	Female	SEBC	Utkal University, Bhubaneswar	2020	36.32	36.32
3	20P1523334		JHUNI SAHOO	NABAKISHORE SAHOO	02-06-1992	MSW (Master of Social Work)	11-12-2020	7735150612	Female	OBC	Utkal University, Bhubaneswar	2012	32.26	32.53
4	20P1528742		LAXMI PRIYA SAHOO	BANAMALI SAHOO	03-07-1996	MSW (Master of Social Work)	11-12-2020	6371360076	Female	OBC	Utkal University, Bhubaneswar	2017	31.23	31.23
5	20P1757343		PRASANTA KUMAR SWAIN	PANU CHARAN SWAIN	10-07-1999	MSW (Master of Social Work)	11-12-2020	7978591373	Male	OBC	Utkal University, Bhubaneswar	2020	32.82	32.82
6	20P1345389		ROJINA Das	Laxman Das	01-04-1995	MSW (Master of Social Work)	11-12-2020	6370072947	Female	OBC	Utkal University, Bhubaneswar	2016	27.53	27.53
7	20P1650326		SEFALI SATHUA	BIRANCHI NARAYAN SATHUA	13-06-2000	MSW (Master of Social Work)	11-12-2020	6371197774	Female	SEBC	Utkal University, Bhubaneswar	2020	31.23	31.23
8	20P0503470		SUKANTI NAYAK	SARAT CHANDRA NAYAK	25-06-1999	MSW (Master of Social Work)	11-12-2020	8144381857	Female	General	Utkal University, Bhubaneswar	2020	35.16	35.16

*For Better Viewing of the SAMS Screen Shots - Please Enlarge the PDF.

M.A. (Odia)

SI.#	Barcode No.	Hall Ticket No.	Applicant Name	Father Name	DOB	Course	Admission Date	Mobile No	Gender	Social Category	Graduation Board	Graduation YOP	Mark	Mark with weightage
1	20P0472738		AKASH KUMAR SETHI	SANTOSH KUMAR SETHI	24-05-1999	Odia	20-12-2020	9337746968	Male	SC	Berhampur University, Bhanjabihar, Ganjam	2020	38.91	38.91
2	20P0863678		ASANTI SAHOO	JOGENDRA SAHOO	04-07-2000	Odia	30-01-2021	9861871745	Female	General	Utkal University, Bhubaneswar	2020	41.25	41.25
3	20P1218779		BHAGIRATHI PRADHAN	KANGURA PRADHAN	17-04-1997	Odia	29-12-2020	8327777053	Male	ST	Berhampur University, Bhanjabihar, Ganjam	2019	31.10	31.10
4	20P1010113		GAYATRI RAUTARAY	PRAMOD KUMAR RAUTARAY	16-04-2000	Odia	11-12-2020	9078726708	Female	General	Utkal University, Bhubaneswar	2020	47.74	47.74
5	20P8537210		KAMALINI DALAI	AKHILA DALAI	29-03-2000	Odia	22-01-2021	9556211792	Female	General	Ramadevi Womens University, Bhubaneswar	2020	44.55	44.55
6	20P2266149		LIZARANI SETHI	ANGADA SETHI	03-05-1995	Odia	11-12-2020	9437641614	Female	SC	Berhampur University, Bhanjabihar, Ganjam	2016	39.85	39.85
7	20P9989210		MITHUN BADIA	KAILASH BADIA	10-06-1999	Odia	11-12-2020	7077359427	Male	OBC	Utkal University, Bhubaneswar	2019	49.65	49.65
8	20P0282370		PINTU SAHOO	SHARAT SAHOO	07-04-1997	Odia	21-01-2021	7008188873	Male	SEBC	Utkal University, Bhubaneswar	2018	46.23	46.23
9	20P1639656		PRAGATIKA RANI PATRA	NARAYAN PATRA	24-11-1999	Odia	31-01-2021	8144700834	Female	OBC	Utkal University, Bhubaneswar	2020	38.35	38.35
10	20P0932662		PUJARANI NAYAK	AKRURA NAYAK	23-05-1999	Odia	29-01-2021	7978209841	Female	OBC	Utkal University, Bhubaneswar	2019	38.67	39.18

*For Better Viewing of the SAMS Screen Shots - Please Enlarge the PDF.

(M. Com)

The screenshot displays the SAMS interface for Niyagah (Autonomous) College, Raigarh. The main content area is titled "List of Applicants Admitted in College". It features a search filter with fields for Session (2020-2021), PG Subject (Commerce), Barcode No., and Hall Ticket No. Below the filter is a table with 10 rows of applicant data. The table columns include Sl.#, Barcode No., Hall Ticket No., Applicant Name, Father Name, DOB, Course, Admission Date, Mobile No., Gender, Social Category, Graduation Board, Graduation YOP, Mark, and Mark with weightage. The table shows details for 10 applicants, including their names, dates of birth, and marks.

Sl.#	Barcode No.	Hall Ticket No.	Applicant Name	Father Name	DOB	Course	Admission Date	Mobile No.	Gender	Social Category	Graduation Board	Graduation YOP	Mark	Mark with weightage
1	20F0103400		ANSUMAN NAYAK	BAIKUNTHANATH NAYAK	07-04-2000	Commerce	20-12-2020	7978776489	Male	OBC	Utkal University, Bhubaneswar	2020	46.19	46.19
2	20F0601122		DEBASHEETA SARANGI	SANTOSH KUMAR SARANGI	22-05-1999	Commerce	11-12-2020	9348181860	Female	General	Utkal University, Bhubaneswar	2020	51.20	51.20
3	20F157057		JASHIN CHAUDHURY	BIJAYA CHANDRA CHAUDHURY	21-12-1998	Commerce	19-12-2020	9668692070	Female	OBC	Utkal University, Bhubaneswar	2019	44.39	44.39
4	20F0791196		KANHU CHARAN SAHOO	NARAYAN SAHOO	10-05-1999	Commerce	11-12-2020	7377432814	Male	OBC	Utkal University, Bhubaneswar	2019	56.58	56.58
5	20F1892456		MAMATA SAHOO	GADADHAR SAHOO	09-05-1995	Commerce	19-12-2020	9090879959	Female	OBC	Utkal University, Bhubaneswar	2015	47.26	47.26
6	20F1629959		NOMALISHA PRAZHAN	PRAYAGAR PRAZHAN	29-04-2000	Commerce	18-12-2020	8328920508	Female	General	Utkal University, Bhubaneswar	2020	47.05	47.05
7	20F1905239		PENKRYOTT DASH	BISWANATH DASH	03-04-1999	Commerce	21-05-2021	9090982489	Male	General	Fakir Mohan University, Balasore	2020	45.60	45.60
8	20F272310		POOJA NANDA	RAJENDRA PRASAD NANDA	21-10-1997	Commerce	22-05-2021	8917655895	Female	General	Utkal University, Bhubaneswar	2020	40.10	40.10
9	20F1546073		PRITIPRASANNA BEHERA	PURUSOTTAM BEHERA	25-03-2000	Commerce	11-12-2020	9429946440	Male	SEBC	Utkal University, Bhubaneswar	2020	59.94	59.94
10	20F0980688		RAMESH SAHOO	SAURJA SAHOO	15-04-1998	Commerce	11-12-2020	8327786682	Male	General	Utkal University, Bhubaneswar	2018	54.48	54.48

*For Better Viewing of the SAMS Screen Shots - Please Enlarge the PDF.

Latest university affiliation letters with Application for continuation of Affiliation along with proof of payment of requisite fee to the university are attached under Response 2: for your kind consideration.

Clarification No. 2:

You are requested to provide the university affiliation letter for all the programs mentioned in IIQA for the current academic year 2020-21. In the absence of the same, institution is required to submit latest university affiliation letter and a copy of the letter submitted to the University requesting for extension/continuation of the affiliation for the current academic session and proof of payment of requisite fee (if applicable) to the university.

Response No. 2:

latest university affiliation letter and a copy of the letter submitted to the University requesting for extension/continuation of the affiliation for the current academic session and proof of payment of requisite fee to the university Attached.

Programs with affiliation Status are tabulated below: -

Program	Affiliation Status	Remark
B.A. (Economics, Education, English, History, Odia, Philosophy, Political Science, Psychology, Sanskrit, Sociology)	Permanent	Once Permanent Affiliation is received, Institution does not require to submit fee for affiliation to the university for the continuation of such programs. Latest Letter of Affiliation attached for your perusal please.
B.Sc. (Physics, Chemistry, Mathematics, Botany, Zoology, Computer Science, ITM, Electronics)	Permanent	Once Permanent Affiliation is received, Institution does not require to submit fee for affiliation to the university for the continuation of such programs. Latest Letter of Affiliation attached for your perusal please.
B. Com	Permanent	Once Permanent Affiliation is received, Institution does not require to submit fee for affiliation to the university for the continuation of such programs. Latest Letter of Affiliation attached for your perusal please.

B.A., B.SC., B.Com.
(Permanent Affiliation)

UTKAL UNIVERSITY
VANI VIHAR : DHUBANESWAR-751004

NOTIFICATION NO. APP./120(P)/23270 /2004, Dated 20.4.04

It is notified for information of all concerned that the Administrator in exercising powers as Syndicate has been pleased to grant permanent affiliation at 3 years Bachelor's Degree in Arts/ Science/Commerce stage with number of seats and subjects mentioned below to Nayagarh College, Nayagarh in the district of Nayagarh from the session 2002-03 subject to fulfilment of the following conditions besides the conditions as laid down in the statutes and Government concurrence.

a) The College should endeavour for enhanced student enrolment in +3 Science.

The compliance report regarding fulfilment of the conditions should be made available in the office of the undersigned within two months failing which the college shall stand de-affiliated as per statutes 198 without further intimation.

<u>Subjects</u>	<u>Compulsory</u>
+3 Arts = 120 to 256 seats	
Sanskrit, Education, Sociology = 64 seats each	
Psychology = 16 to 96	
Honours in Sanskrit & Psychology = 16 to 32 seats each,	
Education = 16 seats, sociology = 32 seats	
+3 Science = 120 to 192 seats	
PCM=80 to 120 seats, CBZ= 40 to 64 seats	
Vocational-Seed Technology = 30 seats	
Honours in physics, Chemistry, Math, Botany & Zoology = 16 to 32 seats each	
+3 Commerce = 64 to 96 seats	
Honours in B & Accounting = 16 to 32 seats.	

By Order,

Alanka
20/4/04
REGISTRAR.

Memo No. APP./120(P)/23271 /2004, Dated 20.4.04

Copy to:-

1. The principal, Nayagarh College, At/PO./Dist. Nayagarh for information and necessary action, (By Regd. post);
2. The Joint Secretary to Government of Orissa, H.E., Education Department, Bhubaneswar;
3. The Director, Higher Education, Orissa, Bhubaneswar;
4. The Controller of Examinations, U.U for information.

Alanka
20/4/04
REGISTRAR.

Memo No. APP./120(P)/23272 /2004, Dated 20.4.04

Copy to:-

1. The section Officers of all the Examination Sections/ Dev.I/Public Compliance and Syndicate Unit, U.U. ;

S. N. Das

PRINCIPAL
NAYAGARH AUTONOMOUS COLLEGE
NAYAGARH

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(1)

Sri G. Sundara

30/12/19

Draft
1101

UTKAL UNIVERSITY
VANI VIHAR, BHUBANESWAR-751004

No. AFF- AFF- 120(P)/

33153

NOTIFICATION

2019.

Dated 03.12.2019

It is notified for information of all concerned that the Vice-Chancellor in exercising the power under Clause 6 (15) of Odisha Universities Act, 1989 on 22.08.2019 (which is subsequently ratified by the Syndicate dt. 25.10.2019) has been pleased to grant of Permanent affiliation in B. Sc Computer Science and B. Sc ITM Hons course with 32 seats each from the session 2015-16, to Nayagarh (Auto) College, Nayagarh, Pin- 7520691, subject to fulfillment of the following conditions besides the conditions as laid down in the Statutes and Government Concurrence.

1. The "Satwa" mentioned in the Record of Rights as "Rayata", which is to be converted to Sitiban.

The compliance report regarding fulfillment of the conditions should be made available in the Office of the undersigned within six months from the date of issue of this notification, failing which the College shall stand disaffiliated as per Statutes 198 of G.U.F. Statute, 1990 without further information.

SUBJECT(S)

B. Sc. Computer Science and B. Sc. ITM Hons Course with 32 seats each from the Session 2015-16.

BY ORDER

S. K. ...
DIRECTOR, CDC, U.U.

Memo No. - AFF- 120(P)/

33154

2019

Date: 03.12.2019

Copy to:-

1. The Principal, Nayagarh (Auto) College, Nayagarh, Pin- 7520691, for information and necessary action (By Regd. Post);
2. The Joint Secretary to Govt., Govt. of Odisha, Education Department, Bhubaneswar;
3. The Director, Higher Education, Odisha, Bhubaneswar;
4. The Controller of Examinations, Utkal University;
5. The Regional Director, Education, Unit-II, Ashok Nagar, Bhubaneswar-751009; for information and necessary action;

S. K. ...
DIRECTOR, CDC, U.U.

Date: 03.12.2019

Memo No. AFF- 120(P)/

33155

2019

Copy to:

1. The Section Officer of all the Examination Sections/C.D.C Unit Public Compliance and Syndicate Section, Utkal University;
2. The Secretary, Sports council, Utkal University;
3. The System Manager, Computer Cell, Utkal University, is requested to web host this notification for information;

S. K. ...

(15)

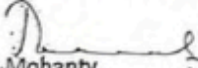
S. K. ...

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NAYAGARH AUTONOMOUS COLLEGE
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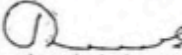
OFFICE OF THE REGIONAL DIRECTOR OF EDUCATION, UNIT-II, BHUBANESWAR-09
OFFICE ORDER No. 11631 / RDE, Dated the 9/8/16

In exercise of power conferred under sub-section 6 of section 6 of the O.E. Act, 1959, the Committee constituted in the Govt. Notification No.15041 / HE Dated 01.05.2004 in the H.P.C. held on 16.07.2016 after careful consideration has been pleased to grant Permanent Recognition from the academic session 2014-15 (Degree classes) to the under named institution with the details mentioned therein.


1. Name of the Institution :- Nayagarh (Auto) College
 2. Address :- Nayagarh
 3. Name of the Block :- Nayagarh NAC
 4. Dist. :- Nayagarh
- | | | |
|---------------|---|------------------------------------|
| <u>Stream</u> | <u>Comp. Subject with seat</u> | <u>Optional Subject with seats</u> |
| +3. Comm. | Marketing, Finance, Mgmt & Banking Insurance Hons - 16 seats each | |
| +3 Sc. | <u>Electronics Hons - 16 seats</u> | |


Sd/- Dr. D. Mahanty,
Regional Director of Education
Bhubaneswar & Prescribed Authority.

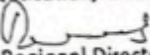
Memo No. 11632 / Dated the 9/8/16
Copy forwarded to the Secretary, Governing Body, Nayagarh (Auto) College, Nayagarh,
Dist - Nayagarh for information and necessary action.


Regional Director

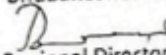
Memo No. 11633 / Dated the 9/8/16
Copy forwarded to the Registrar, Utkal University, Vanivihar, Bhubaneswar for
information and necessary action.


Regional Director

Memo No. 11634 / Dated the 9/8/16
Copy submitted to the Joint Secretary to Govt., Deptt. of Higher Education, Odisha,
Bhubaneswar for information and necessary action.

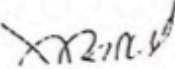

Regional Director

Memo No. 11635 / Dated the 9/8/16
Copy submitted to the Director of Higher Education, Odisha, Bhubaneswar for
information and necessary action.


Regional Director


S. V. Das

PRINCIPAL
NAYAGARH AUTONOMOUS COLLEGE
NAYAGARH





Post Graduate (P.G.) Programs with affiliation Status are tabulated below: -

Program	Year of Inception	Affiliation Status	Remark
MSW	2012-13	Temporary	Latest university affiliation letter along with Application for continuation of Affiliation /Recognition & proof of payment of requisite fee to the university is attached.
M.A. (Odia)	2019-20	Temporary	Latest university affiliation letter along with Application for continuation of Affiliation /Recognition & proof of payment of requisite fee to the university is attached.
M. Com.	2018-19	Temporary	Latest university affiliation letter along with Application for continuation of Affiliation /Recognition & proof of payment of requisite fee to the university is attached.

**MSW
(Temporary Affiliation)**

14/02/20
11/11/20
15/2/20

17/2-2020

**GOVERNMENT OF ODISHA
DEPARTMENT OF HIGHER EDUCATION**

No. HE-NGCE-(T)-II-SM-32-16 4527/HC

Dtd. 15-02-2020

In exercise of power conferred under Sub-section 6 of Section 6 of the O.E. Act, 1969 the Committee constituted in the Govt. notification No.1564/HE., dt.01.05.04 & No.9927/HE, dt.29.4.16 and power delegated in the HPC meeting held on 27.04.2016 and sub-committee meeting dt.07.02.2020 after careful consideration the under signed has been pleased to grant of 7th T.R. to MSW course with 32 seats for the Academic session (s) 2019-20 & (Academic batch) to the under named institution (s) under Sub- Section 9 of Section 6 of the O.E. Act. 1969 with the stipulation that the prescribed Authorities shall re-inspect the college within six months regarding the fulfillment of the conditions / deficiencies.

1.	Name of the College	Nayagarh (Auto.) College
2.	The location of the college with detailed Address and phone No.	Nayagarh
3.	The period of which the recognition is valid	(1 st June 2019 to 31 st May 2020).
4.	The course under which students may be Enrolled along with the permitted student's Strength	7 th T.R. to MSW course with 32 seats
5.	Name of the University	Utkal University

CONDITIONS:

This temporary recognition is subject to fulfillment of conditions as prescribed under Section 6-A (1) of the O.E. Act. 1969, the Universities first status, 1990 and the rules framed there under. The college is to run this course strictly as per this UGC guideline and University norms.

Application for extension of temporary recognition for the Session 2020-21 for grant of recognition shall be submitted by the Institution in the prescribed format-along with requisite fees in the Directorate of Higher Education, Odisha, Bhubaneswar online by the end of August.

By the order of the D.H.E.(O)
Mamata Panda
Assistant Director

Memo No. 7528 //HE Dt. 15-02-2020 //

Copy forwarded to the Principal, Nayagarh (Auto.) College, Nayagarh for information.

Assistant Director

Memo No. 7529 //HE Dt. 15-02-2020 //

Copy forwarded to the Registrar, Utkal University for information & necessary action. He is requested to check laboratory facility, Library facility and quality of teaching faculty along with other parameters required by them before giving affiliation.

Assistant Director

Typed by: S K R /dt.14.02.20
Compared by:

S.K. Panda

PRINCIPAL
NAYAGARH AUTONOMOUS COLLEGE

(L7)

MSW

(Application for Continuation of Affiliation /Recognition)

2020-21



Common Application Form for Opening Permission/Recognition
(See Rules 4(2) & 19 (1))
Higher Education Department, Government of Odisha

Application No.
PE3009202000683

1. Permission Type * : Permanent Recognition
2. College Type * : Degree
- a) District* : Nayagarh
- b) Block* : Nayagarh (NAC)
- c) College Name* : Nayagarh (Autonomous) College, Nayagarh
3. Whether Governing Body formed. : No

a) President Details

b) Secretary Details

Secretary Name	Mobile	Aadhaar Number
	+91	

4. Whether Education Agency has been registered under the Society Reg. Act. 1860 / Trust : Yes
- a) Name of the Educational Agency* : NAYAGARH AUTONOMOUS COLLEGE,NAYAGARH
- b) The Registration No. and Date * : 19938,19-May-1983
5. Postal Address at which correspondence may be made * : District:- Nayagarh Block:- Nayagarh (NAC) Location:- Nayagarh
6. Name of the block/Notified Area/Municipality in which the collage is proposed to be located * : Nayagarh (NAC)
7. Whether there is any Government College and / or any Other recognized private college offering Degree/Professional Courses existing in the Block/Notified Area/Municipality. : No
8. Name of the feeder Institution *

Sl#	Name of the feeder Institution
1	N P M MAHAVIDYALAYA NAYAGARH
2	BANSHIDHAR DEGREE COLLEGE ITAMATI
3	B S DEGREE COLLEGE DASPALLA
4	PS DEGREE COLLEGE KHANDAPARA
5	R S MAHAVIDYALAYA ODAGAON
6	N M MAHAVIDYALAYA KANTILO

9. Challan Details. *

Sl#	Challan No.	Challan Date.	Bank Name	Amount
1	46	28-Sep-2020	S B I MAIN BRANCH NAYAGARH	25000.00

10. Whether the college has its own Land : Yes

Sl#	Tahasil Name	Mouza Name	Khata No.	Plot No.	Plot Area (in sq. ft.)	Build_up Carpet Area (In sq. ft.)	Remark
1	NAYAGARH	NAYAGARH	1157	2374-2388	16.64	150000	

11. Whether the college has its own Building : Yes

- a) What is the area of the site on which the college Building has been constructed / is proposed to be Constructed : 150000
- b) Particulars of classrooms and other rooms if Building has been constructed : 70

12. Opening Permission*

Sl#	Course/Facility	Year	Date of HPC	Date of Appellate	No.	Date of Orders
1	MSW	2020-21	15-Feb-2020		7527	15-Feb-2020

13. Room Details*

Sl#	Room Description	Type of Big. (Asbestor/RCC/Tile)	Length (in mt.)	Breadth (in mt.)
1	102	RCC	8	10

MSW
(Proof of Payment of Requisite Fee to Utkal University)
2020-21

Under Rs.25001 /- (Rupees Twenty-five Thousand one) only

Schedule LIII- Form No. 186
 (See S.R's 52)
 (O. T.C. 6)

CHALAN No. 420

ORIGINAL

Chalan of cash paid into the Treasury/Sub-treasury at Nayagarh
 State/Reserve Bank of India

To be filed in by the remitter				To be filed in by the Departmental Officer or the Treasury	
By whom tendered	Name (or designation) and address of the person on whose behalf money is paid	Full particulars of the remittance and of authority (if any)	Amount	Head of account	Order to the Bank
Name- Signature- <u>B. K. Mishra</u>	<u>Principal, Nayagarh Autonomous College, Nayagarh</u>	<u>8th Permanent Recognition of MSW Course (Sub-section B(A) of the O.E Act. 1969.</u>	25000	<u>38-8229-Development & Welfare funds-Development funds for education purpose- (A)-Orissa Loan stipend fund (Receipts)</u>	<u>Sh. Kumar Pradhan</u> <u>PRINCIPAL 24.09.2020</u> <u>Signature and designation of the Officer ordering the money to be paid in</u>
			25000		

OGP (Forms) DTP-213-10.000Bks-10-12-2009

*To be used only in the case of remittances to Bank through an officer of the Government
 Rs.25000 /- (Rupees Twenty-five Thousand) only*

Received payment

28 SEP 2020

Initial

Treasurer

Accountant

Date

Treasury Officer

(See instructions on overleaf)



**M.A. (Odia) & M.Com.
(Temporary Affiliation)**

OFFICE OF THE REGIONAL DIRECTOR OF EDUCATION, UNIT-II, BHUBANESWAR-09.

Tele Fax-0674-2533284, Email-rdebbbsa@rediffmail.com

OFFICE ORDER No. 4724 / RDE, Dated, 17.7.20

In exercise of powers conferred under sub-section 6 of section 6 of the O.E. Act, 1969, and as per the delegation of powers made by the Committee, constituted in the Govt. Notification No.15641 / III, Dated 01.05.2004, in their meeting held on 27.04.2016, the Temporary Recognition to P.G Courses as details mentioned below in favour of the under named Institution is hereby granted for the academic session 2019-20 subject to the following conditions.

- a. Name of the Institution : - Nayagarh (Auto.) College
- b. Name of the agency : - G.B of Nayagarh (Auto.) College,
- c. Address : - Nayagarh,
- d. Name of the Block/ULB : - Nayagarh, Dist- Nayagarh

Stream	Comp. Subject with seats	Optional subject with seats
	P.G. in Odia with 16 seats (1 st TR)	
	M.Com- 32 seats (2 nd TR)	

This temporary recognition is subject to fulfillment of conditions prescribed under section 6 A (1) of the O.E. Act, 1969, the Orissa Higher Secondary Act and Regulations, 1982, the Universities First Statutes, 1990 and the Rules framed there under and the conditions stipulated in the opening permission order of the college.

Application for extension of temporary recognition for the academic session 2019-20 shall be submitted by the institution in the prescribed format along with requisite fees in shape of challan in the office of the Regional Directorate of Education, Bhubaneswar by end of August.

While applying the applicant shall file an affidavit to the effect (i) that the conditions in which they were deficient have been fulfilled in the meantime, so as to comply the requirement under the Act and relevant Rules for grant of recognition for the session 2020-21.

(ii) The Institution has to fulfill the conditions of recognition in all respect as per O.E. Act & Rules within 7th year of its permission/Temporary Recognition, failing which no further application for renewal of temporary recognition shall be entertained and action as deemed fit shall be taken against institution for closure/ derecognition of the institution.

(Mihir Ranjan Sethi)
Regional Director of Education
Bhubaneswar & Prescribed Authority

Memo No. 4725 / Dated 17.7.20

Copy forwarded to the Secretary, Governing Body/Principal, Nayagarh (Auto.) College, Madanpur, Nayagarh, Dist- Nayagarh for information and necessary action. You are required to submit Annual Enrolment Return (AER) of every Academic Session latest by 31st August.

[Signature]
Regional Director

Memo No. 4726 / Dated 17.7.20

Copy forwarded to the Registrar, Utkal University, Van. .har, Bhubaneswar for information and necessary action.

[Signature]
Regional Director

Memo No. 4727 / Dated 17.7.20

Copy submitted to the Joint Secretary to Government, Department of Higher Education, Odisha, Bhubaneswar for information and necessary action.

[Signature]
Regional Director

Memo No. 4728 / Dated 17.7.20

Copy submitted to the Director, Integrated of Higher Education Department, Odisha, Bhubaneswar for information and necessary action.

[Signature]
Regional Director

[Signature]

PRINCIPAL
NAYAGARH AUTONOMOUS COLLEGE
NAYAGARH

(L6)

M.A. (Odia) & M.Com. (Application for Continuation of Affiliation /Recognition) 2020-21



Common Application Form for Opening Permission/Recognition
(See Rules 4(2) & 19 (1))
Higher Education Department, Government of Odisha

Application No.
TE2809202000480

1. Permission Type * : Temporary Recognition

2. College Type * : Degree

a) District* : Nayagarh

b) Block* : Nayagarh (NAC)

c) College Name* : Nayagarh (Autonomous) College, Nayagarh

3. Whether Governing Body formed : No

a) President Details

b) Secretary Details

Secretary Name	Mobile	Aadhaar Number
	+91	

4. Whether Education Agency has been registered under the Society Reg. Act. 1860 / Trust : Yes

a) Name of the Educational Agency* : NAYAGARH AUTONOMOUS COLLEGE, NAYAGARH

b) The Registration No. and Date * : 19938, 11-May-1983

5. Postal Address at which correspondence may be made * : District:- Nayagarh Block:- Nayagarh (NAC) Location:- Nayagarh

6. Name of the block/Notified Area/Municipality in which the college is proposed to be located * : Nayagarh (NAC)

7. Whether there is any Government College and / or any Other recognized private college offering Degree/Professional Courses existing in the Block/Notified Area/Municipality. : No

8. Name of the feeder Institution *

Sl#	Name of the feeder Institution
1	N P M MAHAVIDYALAYA NAYAGARH
2	BANSHIDHAR DEGREE COLLEGE ITAMATI
3	SARANKUL DEGREE COLLEGE SARANKUL
4	P S DEGREE COLLEGE KHANDAPADA
5	N M DEGREE COLLEGE KANTILO
6	RANPUR DEGREE COLLEGE RANPUR
7	B S DEGREE COLLEGE DASPALLA

9. Challan Details. *

Sl#	Challan No.	Challan Date.	Bank Name	Amount
1	44	28-Sep-2020	S B I MAIN BRANCH NAYAGARH	25000.00
2	45	28-Sep-2020	S B I MAIN BRANCH NAYAGARH	25000.00

10. Whether the college has its own Land : Yes

Sl#	Tahasil Name	Mouza Name	Khata No.	Plot No.	Plot Area (In sq. ft.)	Build_up Carpet Area (In sq. ft.)	Remark
1	NAYAGARH	NAYAGARH	1157	2374-2388	16.64	150000	

11. Whether the college has its own Building : Yes

a) What is the area of the site on which the college Building has been constructed / is proposed to be Constructed : 150000

b) Particulars of classrooms and other rooms if Building has been constructed : 70 ROOMS AND OTHER 20 ROOMS ARE UNDER CONSTRUCTION

12. Opening Permission*

Sl#	Course/Facility	Year	Date of HPC	Date of Appellate	No.	Date of Orders
1	MA IN ODIA M.COM	2020-21			4724	17-Jul-2020

13. Room Details*

13/07/2020

Welcome :: Department of Higher Education, Govt. of Odisha

Sl#	Room Description	Type of Big. (Asbestor/RCC/Tile)	Length (In mt.)	Breadth (In mt.)
1	99	RCC	10	8
2	102	RCC	7	6
3	GEN COMP LAB	RCC	38	24

14. Lab Details*

Sl#	Name of the laboratory	Area (In sq. ft.)	Equipments & Consumables sufficient for Lab (Y/N)	No. of Computers in working condition
1	SC COMP LAB	920	Yes	40

15. Pastor

M.A. (Odia) & M.Com. (Proof of Payment of Requisite Fee to Utkal University) 2020-21

Under Rs.25001 /- (Rupees Twenty-five Thousand one) only

Schedule LIII- Form No. 186
(See.S.R's 52)
(O. T.C. 6)

CHALAN No. 44 ORIGINAL

Chalan of cash paid into the Treasury/Sub-treasury at Nayagarh
State/Reserve Bank of India

To be filed in by the remitter				To be filed in by the Departmental Officer or the Treasury	
By whom tendered	Name [or designation] and address of the person on whose behalf money is paid	Full particulars of the remittance and of authority [if any]	Amount	Head of account	Order to the Bank
Name- <u>B.K. Mallick</u> Signature-	Principal, Nayagarh Autonomous College, Nayagarh	2nd Temporary Recognition of M.A in Odia (S.F) under section 6(A) of the O.E Act.1969.	25000	*38-8229-Development & Welfare funds-101-Development funds for educational purpose- (A)-Orissa Loan stipend fund (Receipts)*	<u>Suresh Kumar Panigrahy</u> Full Signature and designation Principal, Nayagarh Autonomous College, Nayagarh money to be paid in. Orissa Bank
To be used only in the case of remittances to Bank through officer of the Government			25000		
Rs.25000 /- (Rupees Twenty-five Thousand) only					
Received payment			S. B. I NAYAGARH PLEASE ACCEPT		
Treasurer	Accountant	Date	Treasury Officer		
Check ID No. _____			(See instructions on overleaf)		

OGP (Forms) DTP-213-10.000Bks-10-12-2009

Under Rs.25001 /- (Rupees Twenty-five Thousand one) only

Schedule LIII- Form No. 186
(See.S.R's 52)
(O. T.C. 6)

CHALAN No. 43 ORIGINAL

Chalan of cash paid into the Treasury/Sub-treasury at Nayagarh
State/Reserve Bank of India

To be filed in by the remitter				To be filed in by the Departmental Officer or the Treasury	
By whom tendered	Name [or designation] and address of the person on whose behalf money is paid	Full particulars of the remittance and of authority [if any]	Amount	Head of account	Order to the Bank
Name- <u>B.K. Mallick</u> Signature-	Principal, Nayagarh Autonomous College, Nayagarh	3rd Temporary Recognition of M.COM (S.F) under section 6(A) of the O.E Act.1969.	25000	*38-8229-Development & Welfare funds-101-Development funds for educational purpose- (A)-Orissa Loan stipend fund (Receipts)*	<u>Suresh Kumar Panigrahy</u> Full Signature and designation Principal, Nayagarh Autonomous College, Nayagarh money to be paid in. Orissa Bank
To be used only in the case of remittances to Bank through officer of the Government			25000		
Rs.25000 /- (Rupees Twenty-five Thousand) only					
Received payment			S. B. I NAYAGARH PLEASE ACCEPT		
Treasurer	Accountant	Date	Treasury Officer		
Check ID No. _____			(See instructions on overleaf)		

OGP (Forms) DTP-213-10.000Bks-10-12-2009

Clarification No. 3: The programs mentioned in IIQA, Self declaration and affiliation letter to be same.

Response No. 3: The programs have been updated in IIQA as per self-declaration and affiliation Letters for your kind consideration please.

Yours Sincerely,



PRINCIPAL
NAYAGARH AUTONOMOUS COLLEGE
NAYAGARH








Appendix III

Academic Year
2015-16

UTKAL UNIVERSITY

REGULATIONS & SYLLABUS UNDER GRADUATE PROGRAMME IN BACHELOR OF ARTS

(HONOURS & PASS)- CBCS PATTERN Effective from Admission Batch: 2015 - 2016
(Applicable to Autonomous Colleges)

 Skill Development
 Employability
 Entrepreneurship
 All the three
 Skill Development and Employability
 Skill Development and Entrepreneurship
 Employability and Entrepreneurship

SYLLABUS FOR B.A. (HONORS) ECONOMICS UNDER CHOICE BASED CREDIT SYSTEM OF UTKAL UNIVERSITY, BHUBANESWAR

Course Structure for B.A. (Honours) Economics

There are a total of fourteen economics core courses that students are required to take across six semesters. All the core courses are compulsory. In addition to core courses in economics, a student of B.A. (Honours) Economics will choose four Discipline Specific Elective (DSE) Courses. The DSE Courses are offered in the fifth and sixth semesters and two such courses will be selected by a student from a set of courses specified for each of these semesters (Groups

I and II in the attached table). It is recommended that each college should offer at least three DSE Courses in the fifth and sixth semesters to allow the students some minimal element of choice.

Contact Hours: Each course has 5 lectures and 1 tutorial (per group) per week. The size of a tutorial group is 8-10 students.

Note on Course Readings: The nature of several of the courses is such that only selected readings can be specified in advance. Reading lists will be updated and topic-wise readings will be specified at regular intervals, ideally on an annual basis.

Course Structure for B.A. (Honours) Economics

Skill Enhancement Courses (SEC II)

1. Data Analysis and Computer Application
2. Financial Economics

Core Economics Course 1: INTRODUCTORY MICROECONOMICS

Course Description

This course is designed to expose the students to the basic principles of microeconomic theory. The emphasis will be on thinking like an economist and the course will illustrate how microeconomic concepts can be applied to analyze real-life situations.

Module 1: Exploring the subject matter of Economics

The Ten Principles of Economics: How people make decisions; Working of the economy as a whole; Thinking Like an Economist: The economist as Scientist – The scientific method: Observation, Theory and more observation; Role of assumptions; Economic Models; The economist as a policy advisor; Why economists disagree; Graphs in Economics

Module 2: Supply and Demand: How Markets Work, Markets and Welfare

The market forces of demand and supply – Markets and competition; The demand curve – Market vs individual demand curve; Shifts in demand curve; The supply curve – Market vs individual supply curve; Shifts in supply curve; Equilibrium between supply and demand and changes there in; Price elasticity of demand and its determinants; Computing price elasticity of demand; Income and cross elasticity of demand; The price elasticity of supply and its determinants; Computing price elasticity of supply; Consumer Surplus and Producer Surplus; Market efficiency and market failure.

Module 3: The Households

The Budget Constraint; Preferences – representing preferences with indifference curves; Properties of indifference curves; Two extreme examples of indifference curves; Optimisation – Equilibrium; Change in equilibrium due to changes in income, changes in price; Income and substitution effect; Derivation of demand curve; Three applications – Demand for giffen goods, wages and labour supply, Interest rate and household saving.

Module 4: The Firm and Market Structures

Cost concepts; Production and costs; The various measures of cost – Fixed and variable cost, average and marginal cost; Cost curves and their shapes; Costs in the short run and in the long run; Economies and diseconomies of scale. Firms in competitive markets – What is a competitive market; Profit maximisation and the competitive firm's supply curve; The marginal cost curve and the firm's supply decision; Firm's short-run decision to shut down; Firm's long-run decision to exit or enter a market; The supply curve in a competitive market – short run and long run; Monopoly - Why monopolies arise and public policy towards monopolies

Module 5: The Input Markets

The demand for labour – The production function and the marginal product of labour; Value of the marginal product of labour and demand for labour; Shifts in labour demand curve; The supply of labour – the trade-off between work and leisure; Shifts in the labour supply curve; Equilibrium in the labour market; Other factors of production: Land and capital; Linkages among factors of production.

Readings:

1. Principles of Economics, Gregory N Mankiw, 6e Cengage Learning India Private Limited,

New Delhi

2. William A McEachern and Simrit Kaur (2012): *Micro Econ: A South-Asian Perspective*, Cengage Learning India Private Limited, New Delhi.
3. Karl E. Case and Ray C. Fair (2007): *Principles of Economics*, 8th Edition, Pearson Education Inc.

Core Economics Course 2: MATHEMATICAL METHODS FOR ECONOMICS I

Course Description

This is the first of a compulsory two-course sequence. The objective of this sequence is to transmit the body of basic mathematics that enables the study of economic theory at the undergraduate level, specifically the courses on microeconomic theory, macroeconomic theory, statistics and econometrics set out in this syllabus. In this course, particular economic models are not the ends, but the means for illustrating the method of applying mathematical techniques to economic theory in general. The level of sophistication at which the material is to be taught is indicated by the contents of the prescribed textbook.

Module I: Preliminaries

Sets and set operations; relations; functions and their properties; Number systems

Module II: Functions of one real variable

Types of functions- constant, polynomial, rational, exponential, logarithmic; Graphs and graphs of functions; Limit and continuity of functions; Limit theorems

Module III: Derivative of a function

Rate of change and derivative; Derivative and slope of a curve; Continuity and differentiability of a function; Rules of differentiation for a function of one variable; Application- Relationship between total, average and marginal functions

Module IV: Functions of two or more independent variables

Partial differentiation techniques; Geometric interpretation of partial derivatives; Partial derivatives in Economics; Elasticity of a function – demand and cost elasticity, cross and partial elasticity

Module V: Matrices and Determinants

Matrices: concept, types, matrix algebra, transpose, inverse, rank; Determinants: concept, properties, solving problems using properties of determinants, solution to a system of equations - Cramer's rule and matrix inversion method.

Readings:

1. K. Sydsaeter and P. J. Hammond (2002): *Mathematics for Economic Analysis*. Pearson Educational Asia
2. A. C. Chiang and K. Wainwright (2005): *Fundamental Methods of Mathematical Economics*, McGraw Hill International Edition.
3. T. Yamane (2012): *Mathematics for Economists*, Prentice-Hall of India

Generic Elective I: Indian Economy

Course Description: This paper introduces the students to the essentials of Indian economy with an intention of understanding the basic feature of the Indian economy and its planning process. It also aids in developing an insight into the agricultural and industrial development of India. The students will understand the problems and policies relating to the agricultural and industrial sectors of India and current challenges of Indian economy.

Module I: Introduction to Indian Economy

Colonialism & British Rule: Exploitation and under-development in India; Basic features of India Economy; Indian Economy as a developing economy; Demographic trends in India - Size and growth of population, Occupational structure, Sex composition, Age structure and demographic dividend; Causes of population growth and population policy

Module II: Indian Agriculture

Role of agriculture in Indian Economy; Cause of low productivity, Green Revolution and Land Reforms, Agricultural Finance-Sources and Problems; Agricultural Marketing in India

Module III: Industrial Development in India

Role of Industrialisation in Indian Economy; Small Scale & Cottage Industries: Meaning, Role, Problems and Remedies; Industrial Policies of 1948, 1956, 1977 and 1991; Problems of Industrial Development in India; Industrial Sickness

Module IV: Service Sector in India

Growth & Contribution to GDP; Composition and relative importance of service sector; Factors determining growth of the sector; ICT and IT – Spread and Policy; Sustainability of services led growth

Module V: Current Challenges facing Indian Economy

Unemployment – Meaning; important employment Generation programmes, MGNREGS; Inequality in income distribution-Causes thereof; Government policy to check its growth

Basic Readings:

1. Kapila U. *Indian economy since Independence*. Academic Foundation, New Delhi
2. Misra, S. K. and Puri V. K. *Indian Economy — Its Development Experience*. Himalaya Publishing House, Mumbai
3. Dutt R. and Sundharam K. P. M. *Indian Economy*. S. Chand & Company Ltd., New Delhi.
4. Agarawala, A. N. *Indian Economy*, New Age Publications, New Delhi
5. Panagariya, Arvind (2008): *India: the Emerging Giant*, Oxford University Press, New York
6. Acharya, S. and Mohan, R. (Eds.) (2010): *India's Economy: Performance and Challenges*, Oxford University Press, New Delhi.
7. Ahluwalia, I. J. and Little, I. M. D. (Eds.) (1998): *India's Economic Reforms and Development: Essays for Manmohan Singh*, Oxford University Press, New Delhi.

Core Economics Course 3: INTRODUCTORY MACROECONOMICS

Course Description

This course aims to introduce the students to the basic concepts of Macroeconomics. Macroeconomics deals with the aggregate economy. This course discusses the preliminary concepts associated with the determination and measurement of aggregate macroeconomic variable like savings, investment, GDP, money, inflation, and the balance of payments.

Module I: Basic Concepts

Macro vs. Micro Economics; Why Study Macroeconomics? Limitations of Macroeconomics ; Stock and Flow variables, Equilibrium and Disequilibrium, Partial and General Equilibrium Statics – Comparative Statics and Dynamics ; National Income Concepts – GDP, GNP, NDP and NNP at market price and factor cost; Personal Income and Disposable personal Income; Real and Nominal GDP

Module II: Measurement of Macroeconomic Variables

Output, Income and Expenditure Approaches; Difficulties of Estimating National Income; National Income Identities in a simple 2- sector economy and with government and foreign trade sectors; Circular Flows of Income in 2, 3 and 4-sector economies; National Income and Economic Welfare ; Green Accounting.

Module III: Money

Evolution and Functions of Money, Quantity Theory of Money – Cash Transactions, Cash Balances and Keynesian Approaches, Value of Money and Index Number of Prices

Module IV: Inflation, Deflation, Depression and Stagflation

Inflation – Meaning, Causes, Costs and Anti-Inflationary Measures; Classical, Keynesian, Monetarist and Modern Theories of Inflation, Deflation- Meaning, Causes, Costs and Anti-Deflationary Measurers, Depression and Stagflation; Inflation vs. Deflation

Module V: Determination of National Income

The Classical Approach - Say's Law, Theory of Determination of Income and Employment with and without saving and Investment; Basics of Aggregate Demand and Aggregate Supply and Consumption- Saving – Investment Functions, The Keynesian Approach – Basics of Aggregate Demand and Aggregate Supply and Consumption, Saving, Investment Functions; The Principle of Effective Demand; Income Determination in a Simple 2-Sector Model; Changes in Aggregate Demand and Income- The Simple Investment Multiplier; Income Determination in a 3-Sector Model with the Government Sector and Fiscal Multipliers

Readings:

1. N. Gregory Mankiw (2010): *Macroeconomics*, 7th edition, Cengage Learning India Private Limited, New Delhi
2. Richard T. Froyen (2005): *Macroeconomics*, 2nd Edition, Pearson Education Asia, New Delhi.
3. Errol D'Souza (2009): *Macroeconomics*, Pearson Education Asia, New Delhi.

Core Economics Course 4: MATHEMATICAL METHODS FOR ECONOMICS II

Course Description

This course is the second part of a compulsory two-course sequence. This part is to be taught in Semester II following the first part in Semester I. The objective of this sequence is to transmit the body of basic mathematics that enables the study of economic theory at the undergraduate level, specifically the courses on microeconomic theory, macroeconomic theory, statistics and econometrics set out in this Syllabus. In this course, particular economic models are not the ends, but the means for illustrating the method of applying mathematical techniques to economic theory in general. The level of sophistication at which the material is to be taught is indicated by the contents of the prescribed textbook.

Module I: Linear models:

Input- Output Model: Basic concepts and structure of Leontief's open and static Input-Output model; solution for equilibrium output in a three industry model; The closed model

Module II: Second and higher order derivatives:

Technique of higher order differentiation; Interpretation of second derivative; Second order derivative and curvature of a function; Concavity and convexity of functions; Points of inflection

Module III: Differentials and total derivatives:

Differentials and derivatives; Total differentials; Rules of differentials; Total derivatives; Derivatives of implicit functions

Module IV: Single and multivariable optimisation:

Optimum values and extreme values; Relative maximum and minimum; Necessary versus sufficient conditions - First and Second derivative tests; Economic applications thereof, First and second order condition for extremum of multivariable functions; Convex functions and convex sets

Module V: Optimisation with Equality Constraints:

Effects of a constraint; Finding stationary value – Lagrange-Multiplier method (Two variable single constraint case only): First and second order condition; The Bordered Hessian determinant.

Readings:

1. K. Sydsaeter and P. J. Hammond (2002): *Mathematics for Economic Analysis*. Pearson Educational Asia
2. A. C. Chiang and K. Wainwright (2005): *Fundamental Methods of Mathematical Economics*, McGraw Hill International Edition.
3. T. Yamane (2012): *Mathematics for Economists*, Prentice-Hall of India

Generic Elective II: Indian Economy II

Course Description: This paper is the part II of Indian economy deals with the external sector, financial markets in India, Indian Public Finances and Economic Reforms. This paper also troughs some light on current challenges of Indian Economy.

Module I: External Sector in India

Trends, Composition & Direction in exports from and imports of India; Problems of Balance of Payment: Causes of deficit in BoP & measures to correct it; Trade Policy- Export Promotion Vs Import Substitution; Foreign Trade Policy of India; WTO and India

Module II: Financial Markets in India

Commercial Banking in India- Nationalisation of Banks; Lead bank scheme and branch expansion; RBI - Functions, Monetary Policy; Development Banking- IFCI, IDBI, SIDBI and NABARD

Module III: Indian Public Finance

Public Expenditure-Growth and Composition, Causes of Growth of Public Expenditure in India: Tax Revenue of Central and State Governments; Concept of VAT; Deficit Financing in India- Revenue, Budget, Fiscal and Primary Deficits; Purpose and Effects of Deficit Financing; India's Fiscal Policy-Objectives

Module IV: Economic Reforms, Globalisation in India, Foreign Capital and MNCs

Genesis of Reforms, Macroeconomic Stabilisation, Structural Reforms, Appraisal
Globalisation and its impact on the Indian Economy; Foreign Capital-Need, Components; MNCs – Reasons for Growth and Appraisal

Module V: Current Challenges Facing Indian Economy

Inflation – Causes, Consequences and Anti-inflationary Policy; Poverty – Poverty line and Estimates, Major Poverty Alleviation Programmes; Environmental Degradation – Growth and Environment; Population Growth and Environment; Environment Policy

Basic Readings:

1. Kapila U. *Indian economy since Independence*. Academic Foundation, New Delhi
2. Misra, S. K. and Puri V. K. *Indian Economy — Its Development Experience*. Himalaya Publishing House, Mumbai
3. Dutt R. and Sundharam K. P. M. *Indian Economy*. S. Chand & Company Ltd., New Delhi.
4. Agarawala, A. N. *Indian Economy*, New Age Publications, New Delhi
5. Panagariya, Arvind (2008): **India: the Emerging Giant**, Oxford University Press, New York
6. Acharya, S. and Mohan, R. (Eds.) (2010): **India's Economy: Performance and Challenges**, Oxford University Press, New Delhi.
7. Ahluwalia, I. J. and Little, I. M. D. (Eds.) (1998): **India's Economic Reforms and Development: Essays for Manmohan Singh**, Oxford University Press, New Delhi.

Core Economics Course 5: MICROECONOMICS I

Course Description

The course is designed to provide a sound training in microeconomic theory to formally analyze the behaviour of individual agents. Since students are already familiar with the quantitative techniques in the previous semesters, mathematical tools are used to facilitate understanding of the basic concepts; this course looks at the behaviour of the consumer and the producer and also covers the behaviour of a competitive firm.

Module I: Consumer Theory I

The market – Constructing a model; Optimisation and equilibrium; The demand curve and the supply curve; Market Equilibrium; The budget constraint and budget set; Changes in budget line; Effect of taxes, subsidy and rationing on budget set; Consumer Preferences – Indifference curves; Case of perfect substitutes, complements, neutrals, satiation, discrete goods; The marginal rate of substitution; Utility – Cardinal utility; Constructing a utility function; Marginal utility and MRS; Optimal choice and consumer demand; Estimating Utility Functions; Implications of the MRS condition; Choosing taxes; Demand – Normal and inferior goods; Income Offer Curve and Engel Curve; Ordinary goods and Giffen goods; The Offer Curve and the demand Curve; The inverse demand function.

Module II: Consumer Theory II

Slutsky Equation – The Substitution and Income Effects; Sign of Substitution Effect; The Total Change in Demand; Rates of Change; The Law of Demand; Another Substitution Effect; Compensated Demand Curves; Consumer's Surplus – Demand for a discrete good; Constructing utility from demand; Other interpretations of consumer's surplus; Approximating continuous demand; Interpreting the change in consumer's surplus; Producer's surplus; Calculating gains and losses

Module III: Production Theory

Marginal Productivity, Isoquant Maps and the Rate of Technical Substitution, Production with One Variable Input (labour) and with Two-Variable Inputs, Returns to Scale, Four Simple Production Function (Linear, Fixed Proportions, Cobb-Duglas, CES), Technical Progress

Module IV: Cost Functions

Definition of Costs, Cost Functions and its Properties, Shift in Cost Curves, Cost in the Short-Run and Long-Run, Long-Run versus Short-Run Cost Curves, Production with Two Outputs – Economies of Scope

Module V: Profit Maximisation

The Nature and Behaviour of Firms, Profit Maximization, Marginal Revenue, Short-Run Supply by Price-Taking Firm, Profit Functions and its Properties

Readings:

1. C. Snyder and W. Nicholson (2012): Microeconomic Theory: Basic Principles and Extensions, 11th Edition, Cengage Learning, Delhi, India.
2. R. S. Pindyck, D. N. Rubinfeld and P. L. Meheta (2009): Microeconomics, 7th Edition, Pearson, New Delhi.

3. H. R. Varian (2010): *Intermediate Microeconomics: A Modern Approach*, 8th Edition, W.W. Norton and Company/Affiliated East-West Press (India). The workbook by Varian and Bergstrom may be used for problems

Core Economics Course 6: MACROECONOMICS I

Course Description

This course introduces the students to formal modelling of a macro-economy in terms of analytical tools. It discusses various alternative theories of output and employment determination in a closed economy in the short run as well as medium run, and the role of policy in this context. It also introduces the students to various theoretical issues related to an open economy.

Module I: Consumption Function

Consumption – Income Relationship, Propensities to Consume and the Fundamental Psychological Law of Consumption; Implications of Keynesian Consumption Function; Factors Influencing Consumption Function; Measures to Raise Consumption Function; Absolute, Relative, Permanent and Life – Cycle Hypotheses

Module II: Investment Function

Autonomous and Induced Investment, Residential Investment and Inventory Investment, Determinants of Business Fixed Investment, Decision to Invest and MEC, Accelerator and MEI Theories of Investment.

Module III: Demand for and Supply of Money

Demand for Money – Classical, Neoclassical and Keynesian Approaches, The Keynesian Liquidity Trap and its Implications, Supply of Money – Classical and Keynesian Approaches, The Theory of Money Supply Determination and Money Multiplier, Measures of Money Supply in India

Module IV: Aggregate Demand and Aggregate Supply

Derivation of Aggregate Demand and Aggregate Supply Curves in the IS-LM Framework; Nature and Shape of IS and LM curves; Interaction of IS and LM curves and Determination of Employment, Output, Prices and Investment; Changes in IS and LM curves and their Implications for Equilibrium

Module V: Inflation, Unemployment and Expectations, and Trade Cycles

Inflation – Unemployment Trade off and the Phillips Curve – Short run and Long run Analysis; Adaptive and Rational Expectations; The Policy Ineffectiveness Debate; Meaning and Characteristics of Trade Cycles; Hawtrey's Monetary Theory, Hayek's Over-investment Theory and Keynes' views on Trade Cycles

Readings:

1. N. Gregory Mankiw (2010): *Macroeconomics*, 7th edition, Cengage Learning India Private Limited, New Delhi
2. Richard T. Froyen (2005): *Macroeconomics*, 2nd Edition, Pearson Education Asia, New Delhi.

3. Errol D'Souza (2009): *Macroeconomics*, Pearson Education Asia, New Delhi.

Core Economics Course 7: STATISTICAL METHODS FOR ECONOMICS

Course Description

This is a course on statistical methods for economics. It begins with some basic concepts and terminology that are fundamental to statistical analysis and inference. It is followed by a study and measure of relationship between variables, which are the core of economic analysis. This is followed by a basic discussion on index numbers and time series. The paper finally develops the notion of probability, followed by probability distributions of discrete and continuous random variables and introduces the most frequently used theoretical distribution, the Normal distribution.

Module I: Data Collection and measures of central tendency and dispersion

Basic concepts: population and sample, parameter and statistic; Data Collection: primary and secondary data, methods of collection of primary data; Presentation of Data: frequency distribution; cumulative frequency; graphic and diagrammatic representation of data; Measures of Central Tendency: mean, median, mode, geometric mean, harmonic mean, their relative merits and demerits; Measures of Dispersion: absolute and relative - range, mean deviation, standard deviation, coefficient of variation, quartile deviation, their merits and demerits; Measures of skewness and kurtosis.

Module II: Correlation Analysis

Correlation: scatter diagram, sample correlation coefficient - Karl Pearson's correlation coefficient and its properties, probable error of correlation coefficient, Spearman's rank correlation coefficient, partial and multiple correlation.

Module III: Regression Analysis

Two variable linear regression analysis - estimation of regression lines (Least square method) and regression coefficients - their interpretation and properties, standard error of estimate

Module IV: Time Series and Index Number

Time Series: definition and components, measurement of trend- free hand method, methods of semi-average, moving average and method of least squares (equations of first and second degree only), measurement of seasonal component; Index Numbers: Concept, price relative, quantity relative and value relative; Laspeyer's and Fisher's index, family budget method, problems in construction and limitations of index numbers, test for ideal index number.

Module V: Probability theory

Probability: Basic concepts, addition and multiplication rules, conditional probability; Random variables and their probability distribution; Mathematical expectations; Theoretical Distribution: normal distribution - Properties and uses, problems using area under standard normal curve

Recommended books:

- 1 Jay L. Devore (2010): *Probability and Statistics for Engineering and the Sciences*, Cengage learning, 2010.

2. S. C. Gupta (): *Fundamentals of Statistics*, Himalaya Publishing House, Delhi
3. Murray R. Spiegel (): *Theory & Problems of Statistics*, Schaum's publishing Series.

Core Economics Course 8: MICROECONOMICS II

Course Description

This course is a sequel to Microeconomics I. The emphasis will be on giving conceptual clarity to the student coupled with the use of mathematical tools and reasoning. It covers Market, general equilibrium and welfare, imperfect markets and topics under information economics.

Module I: Firm Supply and Equilibrium

Market Environments; Pure competition ; Supply decision of a competitive firm and Exceptions; Inverse Supply Function; Profits and Producer's Surplus; Long Run Supply Curve of a Firm; Long Run Average Costs; Short Run and Long Run Industry Supply; Industry Equilibrium in Short and Long Run; Meaning of Zero Profits; Economic Rent.

Module II: General equilibrium, efficiency and welfare

The Edgeworth Box; Trade; Pareto Efficient Allocations; Existence of equilibrium and efficiency; The Welfare Theorems and their implications; The Firm; Production and the Welfare Theorems ; Production possibilities, comparative advantage and Pareto efficiency

Module III: Monopoly

Barriers to Entry, Profit Maximization and Output Choice, Monopoly and resource Allocation, Monopoly, Product Quality and Durability, Price Discrimination, Second Degree Price Discrimination through Price Schedules, Regulation of Monopoly, Dynamic Vies of Monopoly

Module IV: Oligopoly

Oligopoly – Choosing a strategy; Quantity leadership – Problems of the follower and the leader; Price leadership; Comparing quantity leadership and price leadership; Simultaneous Quantity Setting; Example of Cournot Equilibrium; Simultaneous Price Setting; Collusion

Module V: Game Theory

The Payoff Matrix of a Game; Nash Equilibrium; Mixed Strategies ;The Prisoner's Dilemma; Repeated Games; Enforcing a cartel; Sequential Games; A Game of entry deterrence.

Readings:

1. C. Snyder and W. Nicholson (2012): *Microeconomic Theory: Basic Principles and Extensions*, 11th Edition, Cengage Learning, Delhi, India.
2. R. S. Pindyck, D. N. Rubinfeld and P. L. Meheta (2009): *Microeconomics*, 7th Edition, Pearson, New Delhi.
3. H. R. Varian (2010): *Intermediate Microeconomics: A Modern Approach*, 8th Edition, W.W. Norton and Company/Affiliated East-West Press (India). The workbook by Varian and Bergstrom may be used for problems.

Core Economics Course 9: MACROECONOMICS II

Course Description

This course is a sequel to Macroeconomics I. In this course, the students are introduced to the long run dynamic issues like growth and technical progress. It also provides the micro-foundations to the various aggregative concepts used in the previous course.

Module I: Financial Markets and Reforms

Features of Financial Markets, Functions of Financial Markets, Banks and Financial Markets, Adverse Selection and Moral Hazard, Risk and Supply of Credit, The Determination of Banks Asset Portfolio, Financial Repression and Major Financial Sector Reforms in India, Lessons from the Global Financial Crisis and the Policy Response in India

Module II: Open Economy Macroeconomics

Balance of payments- Concept, Equilibrium and Disequilibrium, Measures to Correct Disequilibrium, Determination of Foreign Exchange Rate- the PPP Theory and its Implications, Fixed vs. Flexible Exchange Rates, The Short-run open economy Model, the basic Mundell-Fleming Model. International Financial Markets

Module III: Modelling Economic Growth

The Basic Harrod- Domar Model, Joan Robinson and the Golden Rule of Capital Accumulation, The Basic Solow Model, Theory of Endogenous Growth – the Rudimentary A-K Model

Module IV: Macroeconomic Policy

The Goals of Macroeconomic Policy and of Policy Makers, The Budget and Automatic Fiscal Stabilisers, The Doctrine of Balanced Budget and Keynesian Objections; Concepts of Budget, Revenue and Fiscal Deficits, Fiscal Policy: Objectives and Limits to Discretionary Policy, The Crowding –Out Hypothesis and the Crowding – in Controversy Meaning, Scope and Objectives of Monetary Policy, Instruments of Monetary Policy, the Transmission Mechanism of Monetary Policy, Rules vs. Discretion in Monetary Policy, Implications of Targeting the Interest Rate, Limits to Monetary Policy

Module V: Schools of Macroeconomic Thought and the Fundamentals of Macroeconomic Theory and Policy

Classics, Keynes, Monetarists, New Classicals and New Keynesians: (i) Keynes vs. the Classics – Aggregate Demand and Aggregate Supply, Underemployment Equilibrium and Wage Price Flexibility, (ii) Monetarists and Friedman's Reformulation of Quantity Theory, Fiscal and Monetary Policy: Monetarists vs. Keynesians, (iii) The New Classical View of Macroeconomics and the Keynesian Counter critique, (iv) The New Keynesian Economics with reference to the Basic Features of Real Business Cycle Models, the Sticky Price Model.

Readings:

1. N. Gregory Mankiw (2010): *Macroeconomics*, 7th edition, Cengage Learning India Private Limited, New Delhi
2. Richard T. Froyen (2005): *Macroeconomics*, 2nd Edition, Pearson Education Asia, New Delhi.
3. Errol D'Souza (2009): *Macroeconomics*, Pearson Education Asia, New Delhi.

Core Economics Course 10: Public Economics

Course Description

Public economics is the study of government policy from the points of view of economic efficiency and equity. The paper deals with the nature of government intervention and its implications for allocation, distribution and stabilization. Inherently, this study involves a formal analysis of government taxation and expenditures. The subject encompasses a host of topics including public goods, market failures and externalities.

Module I: Introduction to public finance

Public Finance: meaning and scope, distinction between public and private finance; public good versus private good; Principle of maximum social advantage; Market failure and role of government;

Module II: Public Expenditure

Meaning, classification, principles, cannons and effects, causes of growth of public expenditure, Wagner's law of increasing state activities, Peacock-Wiseman hypotheses

Module III: Public Revenue

Sources of Public Revenue; Taxation - meaning, cannons and classification of taxes, impact and incidence of taxes, division of tax burden, the benefit and ability to pay approaches, taxable capacity, effects of taxation, characteristics of a good tax system, major trends in tax revenue of central and state governments in India

Module III: Public Budget

Public Budget: kinds of budget, economic and functional classification of the budget; Balanced and unbalanced budget; Balanced budget multiplier; Budget as an instrument of economic policy.

Module V: Public Debt

Sources, effects, debt burden – Classical, Ricardian and other views, shifting - intergenerational equity, methods of debt redemption, debt management, tax versus debt;

Readings:

1. J. Hindriks and G. Myles (2006): *Intermediate Public Economics*, MIT Press.
2. R. A. Musgrave and P. B. Musgrave (1989): *Public Finance in Theory and Practices*. McGraw Hill
3. B. P. Herber (1975): *Modern Public Finance*.
4. B. Mishra (1978): *Public Finance*, Macmillan India limited.

Core Economics Course 11: INDIAN ECONOMY I

Course Description

Using appropriate analytical frameworks, this course reviews major trends in economic indicators and policy debates in India in the post-Independence period, with particular emphasis on paradigm shifts and turning points. Given the rapid changes taking place in India, the reading list will have to be updated annually.

Module I: Basic Characteristics of Indian Economy as a Developing Economy

Indian Economy in the Pre-British Period; The Structure and Organisation of Villages and Towns; Industries and Handicrafts in Pre-British India; Colonialism; Economic Consequences of British Rule; Decline of Handicrafts and Progressive Ruralisation; The Land System and Commercialisation of Agriculture; Industrial Transition; Colonial Exploitation and Impacts – Underdevelopment; Colonisation and Modernisation; State Policies and Economic Underdevelopment; The Current State of Indian Economy

Module II: Population and Human Development

Population Growth and Economic Development – size, growth and future of population; Causes of rapid population growth; Population and economic development; Population policy; Demographic issues – Sex and Age Composition of population; Demographic Dividend; Urbanisation and Migration; Human Resource Development – Indicators and importance of Human Resource Development; Education policy; Health and nutrition.

Module III: National Income in India – The Growth Story and Regional Disparities

Trends in national and per capita income; Changes in sectoral composition of national income; Regional disparities in Growth and Income; Savings and Investment and Economic Growth – The Linkage

Module IV: Economic Planning in India

Rationale, Features, Objectives, Strategies, Achievements and Assessment of Planning in India; Eleventh Five Year Plan – Objectives, Targets and Achievements; Twelfth Five Year Plan – Vision and Strategy; From Planning to NITI – Transforming India's Development Agenda.

Module V: Current Challenges

Poverty – Estimation and Trends, Poverty Alleviation Programs – MGNREGA, NRLM, SJSRY; Inequality – Measures and trends in India; Unemployment – Nature, Estimates, Trends, Causes and Employment Policy

Readings:

1. Indian Economy, VK Puri and SK Misra, Himalaya Publishing House, 31st Revised Edition
2. Indian Economy Datt and Sundharam, Gaurav Datt and Ashwani Mahajan, S Chand Publications, 7th Revised Edition
3. Indian Economy Since Independence, ed by Uma Kapila, Academic Foundation, Revised Nineteenth Edition 2008-09
4. The New Oxford Economics Companion to India, ed by K Basu and A Maertens, Oxford University Press, 2012
5. Economic Survey of India 2015-16, Ministry of Finance, GoI

6. NITI Ayog document- (Feb 8, 2015)

Core Economics Course 12: DEVELOPMENT ECONOMICS I

Course Description

This is the first part of a two-part course on economic development. The course begins with a discussion of alternative conceptions of development and their justification. It then proceeds to aggregate models of growth and cross-national comparisons of the growth experience that can help evaluate these models. The axiomatic basis for inequality measurement is used to develop measures of inequality and connections between growth and inequality are explored. The course ends by linking political institutions to growth and inequality by discussing the role of the state in economic development and the informational and incentive problems that affect state governance.

Module 1: Study of economic development:

Development Economics as a subject; economic growth and economic development; characteristics of underdeveloped countries – vicious cycle of poverty and cumulative causation; obstacles to economic development; measures of economic development – national and per capita income, basic needs approach, capabilities approach, three core values of development, PQLI, HDI, HPI, MDPI, GDI; capital formation and economic development

Module 2: Theories of Economic Growth and Development

Classical theory, Marxian theory; Schumpeterian theory; Rostow's stages of economic growth; Solow model and convergence with population growth and technical progress

Module 3: Poverty, Inequality and Development:

Concepts of poverty and inequality; Measuring poverty; Measuring Inequality – Lorenz curve and Kuznets' inverted U hypothesis; Growth, poverty and inequality; Economic characteristics of poverty groups (rural poverty, women and poverty, indigenous population and poverty); Policy options – some basic considerations

Module 4: Institutions and economic development:

Role of institutions in economic development; Characteristics of good institutions and quality of institutions; The pre-requisites of a sound institutional structure; Different measures of institutions – aggregate governance index, property rights and risk of expropriation; The role of democracy in economic development; Role of state; Role of markets and market failure; Institutional and cultural requirements for operation of effective private markets; Market facilitating conditions; Limitations of markets in LDCs; Corruption and economic development – tackling the problem of corruption

Module 5: Agriculture, Industry and Economic Development:

Role of agriculture; Transforming traditional agriculture; Barriers to agricultural development; Role of industrialization; Interdependence between agriculture and industries – A model of complementarities between agriculture and industry; terms of trade between agriculture and industry; functioning of markets in agrarian societies; interlinked agrarian markets

Readings:

1. Debraj Ray (2009): *Development Economics*, Oxford University Press.
2. Partha Dasgupta (2007): *Economics, A Very Short Introduction*, Oxford University Press.
3. Abhijit Banerjee, Roland Benabou and Dilip Mookerjee (2006): *Understanding Poverty*, Oxford University Press.
4. Amartya Sen (2000): *Development as Freedom*, OUP.
5. Daron Acemoglu and James Robinson (2006): *Economic Origins of Dictatorship and Democracy*, Cambridge University Press.
6. Robert Putnam (1994): *Making Democracy Work: Civic Traditions in Modern Italy*, Princeton University Press.
7. Todaro, Michael P and Stephen C Smith (2006): *Economic Development*, 8th Edition, Pearson
8. Thirlwall, A P (2011): *Economics of Development*, 9th Edition, Palgrave Macmillan

Core Economics Course 13: INDIAN ECONOMY II

Course Description

This course examines sector-specific policies and their impact in shaping trends in key economic indicators in India. It highlights major policy debates and evaluates the Indian empirical evidence. Given the rapid changes taking place in the country, the reading list will have to be updated annually.

Model I: Agricultural Development in India

Indian Agriculture: nature, importance, trends in agricultural production and productivity, factors determining production, land reforms, new agricultural strategies and green revolution, rural credit; Agricultural marketing and warehousing.

Module II: Industrial Development in India

Trends in industrial output and productivities; Industrial Policies of 1948, 1956, 1977 and 1991; Industrial Licensing Policies – MRTP Act, FERA and FEMA; Growth and problems of SSIs, Industrial sickness; Industrial finance; Industrial labour

Module III: Tertiary Sector and HRD

Tertiary Sector: growth and contribution of service sector to GDP of India, share of services in employment; Human development – concept, evolution, measurement; HRD: indication, importance, education in India, Indian educational policy; Health and Nutrition.

Module IV: External Sector

Foreign Trade: role, composition and direction of India's foreign trade, trends of export and import in India, export promotion versus import substitution; Balance of Payments of India; India's Trade Policies; Foreign Capital – FDI, Aid and MNCs.

Module IV: Indian Economy and Environment

Environmental Policies in India: The Environment (Protection) Act 1986, The Environment (Protection) Rules 1986, The National Forest Policy 1988, Policy statement for Abatement of Pollution 1992, National Conservation Strategy and Policy Statement on Environment and Development 1992, The National Environment Appellate Authority Act 1997, National Environmental Policy 2006; Global deal with Climate Change: Introduction, Intergovernmental Panel for Climate Change (IPCC), Impact of Climate Change on India, Global Response on Climate Change, Possible Role of India

Readings:

1. U. Kapila (2010): *Indian economy since Independence*. Academic Foundation, New Delhi
2. S. K. Misra and V. K. Puri (Latest Year): *Indian Economy — Its Development Experience*, Himalaya Publishing House, Mumbai
3. S. Chakraborty (): *Development Planning: The Indian Experience*. Clarendon Press.
4. R. Dutt and K. P. M, Sundharam (Latest Year): *Indian Economy*, S. Chand & Company Ltd., New Delhi.
5. A. Panagariya (2008): *India: the Emerging Giant*, Oxford University Press, New York
6. S. Acharya and R. Mohan (Eds.) (2010): *India's Economy: Performance and Challenges*, Oxford University Press, New Delhi.
7. I. J. Ahluwalia and I. M. D. Little (Eds.) (1998): *India's Economic Reforms and Development: Essays for Manmohan Singh*, Oxford University Press, New Delhi.

Core Economics Course 14: DEVELOPMENT ECONOMICS II**Course Description**

This is the second module of the economic development sequence. It begins with basic demographic concepts and their evolution during the process of development. The structure of markets and contracts is linked to the particular problems of enforcement experienced in poor countries. The governance of communities and organizations is studied and this is then linked to questions of sustainable growth. The course ends with reflections on the role of globalization and increased international dependence on the process of development.

Module 1: Population and Development

Demographic concepts : birth and death rates, age structure, fertility and its determinants, the Malthusian population trap and the microeconomic household theory of fertility; costs and benefits of population growth and the model of low level equilibrium trap; the seven negative consequences of population growth; the concept of optimum population; rural-urban migration – the Harris Todaro migration model and policy implications

Module 2: Dualism and economic development

Dualism – geographic, social and technological; the theory of cumulative causation; the regional inequalities in the context of economic development; the inverted U relationship; international inequality and the centre periphery thesis; dependency, exploitation and unequal exchange; the dualistic development thesis and its implications

Module 3: Environment and Development

Basic issues of environment and development – population, resources and the environment; poverty, economic growth, rural development, urban development and the environment; simple model of environment and economic activity; environmental degradation and externalities; common property resources, public goods and the free-rider problem; renewable and non-renewable resources; environmental values and their measurement; concept of sustainable development; basics of climate change

Module 4: Financing Economic Development

Saving, capital formation and economic development; rural financial intermediaries, micro credit and economic development; financial liberalisation, financial inclusion and economic

development; taxation, public borrowing and economic development; inflation, saving and growth – the Keynesian approach; foreign finance, investment and aid – controversies and opportunities; private foreign investment and private portfolio investment; growing role of non-governmental organisations

Module 5: Globalisation, international trade and economic development:

Trade and economic development; export led growth; trade liberalisation and growth of exports; terms of trade and economic growth – the Prebisch Singer Hypothesis; trade strategies for development – import substitution vs export promotion; international commodity agreements; trade vs aid.

Readings

1. Debraj Ray (2009): *Development Economics*, Oxford University Press.
2. Partha Dasgupta (2007): *Economics, A Very Short Introduction*, Oxford University Press.
3. Abhijit Banerjee, Roland Benabou and Dilip Mookerjee (2006): *Understanding Poverty*, Oxford University Press.
4. Thomas Schelling (1978): *Micromotives and Macrobehavior*, W. W. Norton.
5. Albert O. Hirschman (1970): *Exit, Voice and Loyalty: Responses to Decline in Firms, Organizations and States*, Harvard University Press.
6. Elinor Ostrom (1990): *Governing the Commons: The Evolution of Institutions for Collective Action*, Cambridge University Press.
7. Dani Rodrik (2011): *The Globalization Paradox: Why Global Markets, States and Democracy Can't Coexist*, Oxford University Press.
8. Michael D. Bordo, Alan M. Taylor and Jeffrey G. Williamson (ed.) (2003): *Globalization in Historical Perspective*, University of Chicago Press.
9. Todaro, Michael P and Stephen C Smith (2006): *Economic Development*, 8th Edition, Pearson
10. Thirlwall, A P (2011): *Economics of Development*, 9th Edition, Palgrave Macmillan

DSE Group I
DSEG 1.1: Economic History of India 1857-1947

Course Description

This course analyses key aspects of Indian economic development during the second half of British colonial rule. In doing so, it investigates the place of the Indian economy in the wider colonial context, and the mechanisms that linked economic development in India to the compulsions of colonial rule. This course links directly to the course on India's economic development after independence in 1947.

Module I: Introduction: Colonial India: Background and Introduction

Overview of colonial economy

Module II: Macro Trends

National Income; population; occupational structure

Module III: Agriculture

Agrarian structure and land relations; agricultural markets and institutions – credit, commerce and technology; trends in performance and productivity; famines

Module IV: Railways and Industry

Railways; the de-industrialisation debate; evolution of entrepreneurial and industrial structure; nature of industrialisation in the interwar period; constraints to industrial breakthrough; labor relations

Module V: Economy and State in the Imperial Context

The imperial priorities and the Indian economy; drain of wealth; international trade, capital flows and the colonial economy – changes and continuities; government and fiscal policy

Readings:

1. Lakshmi Subramanian, *"History of India 1707-1857"*, Orient Blackswan, 2010, Chapter 4.
2. Sumit Guha, 1991, Mortality decline in early 20th century India', *Indian Economic and Social History Review (IESHR)*, pp 371-74 and 385-87.
3. Tirthankar Roy, *The Economic History of India 1857-1947*, Oxford University Press, 3rd edition, 2011.
4. J. Krishnamurty, *Occupational Structure*, Dharma Kumar (editor), The Cambridge Economic History of India, Vol. II, (henceforth referred to as CEHI), 2005, Chapter 5.
5. Irfan Habib, *Indian Economy 1858-1914*, A People's History of India, Vol.28, Tulika, 2006.
6. Ira Klein, 1984, —When Rains Fail: Famine relief and mortality in British India||, *IESHR* 21.
7. Jean Dreze, *Famine Prevention in India in Dreze and Sen (eds.) Political Economy of Hunger*, WIDER Studies in Development Economics, 1990, pp.13-35
8. John Hurd, *Railways*, CEHI, Chapter 8, pp.737-761.
9. Rajat Ray (ed.), *Entrepreneurship and Industry in India*, 1994.
10. AK Bagchi, —Deindustrialization in India in the nineteenth century: Some theoretical implications, *Journal of Development Studies*, 1976.
11. MD Morris, *Emergence of an Industrial Labour Force in India*, OUP 1965, Chapter 11,

Summary and Conclusions.

12. K.N. Chaudhuri, *Foreign Trade and Balance of Payments*, CEHI, Chapter 10.
13. B.R. Tomlison, 1975, *India and the British Empire 1880-1935*, IESHR, Vol.XII.
14. Dharma Kumar, *The Fiscal System*, CEHI, Chapter 12.
15. Basudev Chatterjee, *Trade, Tariffs and Empire*, OUP 1992, Epilogue.

DSEG 1.2 INTRODUCTORY ECONOMETRICS

Course Description

This course provides a comprehensive introduction to basic econometric concepts and techniques. It covers statistical concepts of hypothesis testing, estimation and diagnostic testing of simple and multiple regression models. The course also covers the consequences of and tests for misspecification of regression models.

Module I: Introduction

Definition, Nature and scope of econometrics; Theoretical Probability Distributions: Normal distribution; chi-square, t- and F-distributions and their uses

Module II: Sampling

Basic concepts of sampling: Probability and non-probability sampling; Types of sampling. Theory of Estimation: Estimation of parameters; properties of estimators – small sample and asymptotic properties; point and interval estimation

Module III: Hypothesis Testing

Testing of hypotheses: defining statistical hypotheses; Simple and composite hypotheses; Null and alternative hypothesis; Type I and Type II errors, Critical region; Neyman-Pearson lemma; Power of a test.

Module IV: Linear Regression Analysis

Two variable linear regression model – Assumptions; Least square estimates, Variance and co- variance between Least square estimates; BLUE properties; Standard errors of estimates; Co- efficient of determination; Inference in a two variable linear regression model; ANOVA; Forecasting.

Module V: Violation of Classical Assumptions

Heteroscedasticity, multicollinearity and auto-correlation: Meaning, consequences, tests and remedies.

Reading List:

1. Johnston (1991), "Econometric Methods", Mc Graw Hill Book Co
2. Koutsoyiannis, A, (1992) "Introduction to Econometrics" OUP
3. Dougherty, C. (1992) "Introduction to Econometrics" OUP.
4. Kmenta, J (1997); "Elements of Econometrics", University of Michigan Press
5. Gujarati, D & Sangeetha (2007); "Basic Econometrics", Mc Graw Hill Book Co.

DSEG 1.3: Odisha Economy

Course Description

Using appropriate analytical frameworks, this course reviews major trends in economic indicators and policy debates in Odisha in pre- and post-Independence period, with particular emphasis on paradigm shifts and turning points. Given the rapid changes taking place in Odisha, the reading list will have to be updated annually.

Module I: Odisha Economy before 1947

Orissa's Economy in the Nineteenth Century: Benevolence or Exploitation, Forces of Nature, Animal Power, The Company Steps in, Public Works and Public Health, Education, Disintegration of Village Economy, New Social Environment, Changing Position of Social Classes, The Moneylenders, The Borrowers, Money-flows from Village to Metropolis, Pauperization of Peasantry, The Wage Earners, Demographic Changes, Profiting from Rural Adversity; Diarchy in 1919 and Separation of Provincial Finances from Central Government in 1937; Emergence of Federal Finance (Ref.: Das 1976a and 1976b, GoO 2016).

Module II: Macro Economy of Odisha

A macro glance of Odisha economy: aggregate income, broad sectoral decomposition, performance of districts, employment, child labour and bonded labour, employment programmes, consumption expenditure, cost of living; Odisha State public finances (Chapter 14 and 15 of Ref 1; & Chapter 2 and 9 of Ref 2)

Module III: Agriculture Sector Development in Odisha

Agriculture: land ownership and land tenure, agricultural wages and rural unemployment, production and productivity of major crops, agricultural inputs, agricultural policy; Animal Husbandry; Fisheries (Chapter 1 to 3 of Ref 1; & Chapter 3 of Ref 2)

Module IV: Industry, Infrastructure and Environment

Industry: Investment, industrial policy, and the growth of large industries, mining and quarrying; Construction; tertiary sector: tourism, transport and power; Water Resources, Forest Resources (Chapter 4 to 8 of Ref 1; & Chapter 4 & 5 of Ref 2)

Module V: Social Sector in Odisha

Poverty: income poverty and inequality; health sector: outcomes, infrastructure, finance, public health, NRHM; education: Literacy, Primary education, secondary education, higher education, SSA; human development (Chapter 9 to 13 of Ref 1; & Chapter 7 & 8 of Ref 2)

Reading List:

1. Nayak, P., Panda, S. C., Pattanaik, P. K. (2016): **The Economy of Odisha: A Profile**, Oxford University Press, New Delhi
2. GoO (2012): **Odisha Economic Survey 2015-16**, Planning and Convergence Department, Directorate of Economics and Statistics, Government of Odisha, Bhubaneswar
3. GoO (2004): *Human Development Report 2004 Orissa*, Planning and Coordination Department, Government of Odisha, Bhubaneswar
4. Mahapatro, S. B. (1980): Inter-Industry Wage Differentials in Orissa: An Empirical

- Analysis, *Indian Journal of Industrial Relations*, 15(4): 525-536.
5. Vyasulu, V. and Arun, A. V. (1997): Industrialisation in Orissa: Trends and Structure, *Economic and Political Weekly*, 32(22): M46-M53.
 6. Das, Binod S. (1976a): Orissa's Economy in the Nineteenth Century, *Social Scientist*, 4(11): 32-46.
 7. Das, Binod S. (1976b): Orissa's Economy in the Nineteenth Century: Part Two, *Social Scientist*, 4(12): 38-50.
 8. GoO (2016): Commemorative Volume on 80 Years Odisha Budget: Since 1936-37, CEFT-XIMB and Department of Finance, Government of Odisha
 9. Mohanti, K. K. and Padhi, S. (1995): Employment Situation of Tribal Population in Orissa: 1981 Census Data, *Economic and Political Weekly*, 30(29): 1879-1882.
 10. Nair, K. R. G. (1993): New Economic Policy and Development of Backward Regions: A Note on Orissa, *Economic and Political Weekly*, 28(19): 939-941.
 11. Mohanty, B. (1993): Orissa Famine of 1866: Demographic and Economic Consequences, *Economic and Political Weekly*, 28(1/2): 55-66.
 12. Haan, A. de and Dubey, A. (2005): Poverty, Disparities, or the Development of Underdevelopment in Orissa, *Economic and Political Weekly*, 40(22/23): 2321-2329.
 13. Samal, K. C. (1998): Poverty Alleviation after Post-Liberalisation: Study of a Tribal Block in Orissa, *Economic and Political Weekly*, 33(28): 1846-1851
 14. Nayak, P. and Chatterjee, B. (1986): Disguised Unemployment in Agriculture: A Case Study of Rural Orissa, *Indian Journal of Industrial Relations*, 21(3): 310-334.

DSEG 1.4: Research Methodology

Course Description

The course is to develop a research orientation among the students and to acquaint them with fundamentals of research methods. Specifically, the course aims at introducing them to the basic concepts used in research and to scientific social research methods and their approach. It includes discussions on sampling techniques, research designs and techniques of analysis.

Module I: Basics of Research

Introduction to Research: Meaning, Objectives, Motivation, Types, Approaches, Significance, Research Process, Criteria of Good Research; Qualities of a Good Researcher, Research as a Career

Module II: Research Problem

Defining the Research Problem: What is a Research Problem? Selecting the Problem, Necessity of Defining the Problem, Technique Involved in Defining a Problem; Research Design: Meaning, Need, Features of a Good Design, Important Concepts Relating to Research Design, Different Research Designs, Basic Principles of Experimental Designs

Module III: Measurement and Scaling Technique

Measurement in Research, Measurement Scales, Sources of Error in Measurement, Tests of Sound Measurement, Techniques of Measurement Tools, Scaling and Important Scaling Technique

Module IV: Problems in Research

Research Ethics: codes and ethics, permissions to research, responsibilities, confidentiality, feedback, participatory research; Research Proposal and literature review: research proposal, review of literature, levels of analysis, using the library and internet, abstracting, word processing, plagiarism

Module V: Actions in Research

English in report writing: words, sentences, paragraph, writing style; The Report: improving quality, sections, drawing conclusions, evaluation checklists, persistence; Common Citation Styles

Basic Readings

1. Kothari, C. R. (2004): **Research Methodology: Methods and Techniques**, New Age International Private Limited Publishers, New Delhi.
2. Guthrie, G. (2010): **Basic Research Methods**, Sage Publications India Private Limited, New Delhi.
3. Monippally, M. M. (2010): **Academic Writing: A Guide for Management Students and Researchers**, Response Books (Sage), New Delhi, Pp. 196-217

Additional Readings

1. Young, P. V. (1996): **Scientific Social Survey and Research**, PHI Learning Private Limited, New Delhi
2. Dooley, D. (2008): **Social Research Methods**, Prentice-Hall of India Private Limited, New Delhi

DSE Group II

DSEG 2.1: Environmental Economics

Course Description

This course introduces the students to the basics of environmental economics to understand the fundamentals of environmental concerns and develop insights into valuation of environment.

Module I: Economy and Environment

Nature and Scope of Environmental Economics- historical development, early economic paradigms, post- war economics and environmentalism; Environment and Economy interaction; Environment as a public good- National versus global public goods, Market failure, Externalities and the environment; The nexus involving environment, development and poverty.

Module II: The Economics of Pollution and Climate change

The optimal level of pollution, Pollution as externality, alternative definitions of pollution; The market Approach to optimal pollution, Property rights and market bargain theorems, Coase theorem; Taxation, Subsidies and optimal pollution; Pollution permit trading; Climate change – concept, causes, effects and management; Climate change and Agriculture

Module III: Valuation of Environmental damage

Methods and difficulties of environmental valuation, Economic value, Total economic value, Option value, Existence value; Direct and Indirect Valuation of Environmental Goods: The hedonic price approach, Contingent valuation, Travel cost approach; Willingness to pay vs. Willingness to accept.

Module IV: Environmental Pollution and Regulation in India

Causes and effects of water pollution, air pollution, noise pollution, soil pollution, Prevention and control of environmental degradation, Mechanism for environmental regulation in India- Environmental policy and legislations

Module V: Natural Resources and Sustainable Development

Environment and sustainable development, Concept and indicators of sustainable development, Resource scarcity, Renewable and exhaustible resources, Optimal use of renewable resources – fishery and forest, Tragedy of commons, People's Participation in the management of common property resources

Reading List:

1. Bhattacharya, R. N. (2002): Environmental Economics: An Indian Perspectives, OUP, New Delhi
2. Shankar, U. (Ed.) (2001): Environmental Economics, OUP, New Delhi.
3. Dayal, V. and Chopra, K. (2009): Handbook of Environmental Economics in India, OUP, New Delhi
4. Bromley, D.W (Ed)(1995); Handbook of Environmental Economics, Blackwell, London
5. Fisher, A.C(1981); Resource and Environmental Economics, Cambridge University Press
6. Helfand, G and P. Berck (2011); The Economics of the Environment, PHI Learning Private Limited, New Delhi
7. Hemple Lamont, C (1998); Environmental Economics – the Global Challenge First East West Press
8. Hussen, A.M (1999); Principles of Environmental Economics, Routledge, London
9. Kolstad, C.D (1999); Environmental Economics Oxford University Press, New Delhi
10. Pearce, D.W and R.K Turner (1948); Economics of Natural Resources and the Environment, Harvester Wheatsheaf
11. Perman R.M. and J. McGilvary (1996); Natural Resources and Environmental Economics, Longman, London
12. Tietenberg. T (1994); Environmental Economics Policy, Harper Collings, New York
13. The Economics of Climate Change: The Stern Review by Great Britain Treasury, Cambridge University Press

DSEG 2.2: International Economics

Course Description

This course introduces the students to international trade and finance to understand the theories of international trade and develop insights into trade policy and balance of payments. The course also develops insight into international financial system and the trade policy of India.

Module I: Importance of Trade and Trade Theories

Importance of the study of International Economics; Inter-regional and international trade; Need for a separate theory of international trade; Theories of Trade- absolute advantage, comparative advantage and opportunity cost; Heckscher-Ohlin theory of trade — its main features, assumptions and limitations

Module II: Trade and Economic Growth

Concepts of terms of trade and their importance; Doctrine reciprocal demand – Offer curve techniques; Gains from trade— their measurement and distribution; International Trade and Growth: Small and Open country cases; Tariffs and quotas – their impact in partial equilibrium analysis; Free trade and policy of tariffs in relation to economic growth with special reference to India

Module III: Exchange Rate

Concept and Types of Exchange Rate (bilateral vs trade-weighted exchange rate, cross exchange rate, spot, forward, futures), Demand for and Supply of foreign exchange, Exchange Rate Determination: Purchasing-Power Parity Theory, The Monetary Model of Exchange Rates, Asset or Portfolio Model of Exchange Rates. Fixed versus Flexible exchange rate

Module IV: Balance of Trade and Payments

Concepts and components of balance of trade and balance of payments; Equilibrium and disequilibrium in balance of payments; Consequences of disequilibrium in balance of payments; Various measures to correct deficit in BoPs; Foreign trade multiplier- Concept and implications; Present balance of payment position of India – Need for and rationale of trade reforms in India including partial and full convertibility of rupee; recent export and import policies in India

Module V: International Economic Institutions

Functions of IMF, World Bank, WTO and Asian Development Bank — Their achievements and failures; Their Role from the point of view of India; Forms of economic cooperation; Reforms for the emergence of international monetary system and trading blocs at the global level

Reading List:

1. Krugman Paul R. and Obstfeld Maurice. *International Economics*, Pearson Education
2. Salvatore Dominick. *International Economics*, Wile India.
3. Sodersten Bo and Reed J. *International Economics*, McMillan Publisher
4. Carbaugh Robert. *International Economics*, South-Western College Publication.
5. Gandolfo Giancarlo. *International Trade Theory and Policy*, Springer Publication
6. Gandolfo Giancarlo. *International Finance and Open-Economy Macro Economics*, Springer Publication
7. Copeland Laurence. *Exchange Rates and International Finance*, Addison Wesley, Publication.
8. Kanan, P. B. (1994): *The International Economy*, Cambridge University Press, London.
9. Kindleberger, C. P. (1973): *International Economics*, R.D. Irwin, Homewood.

DSEG 2.3: Economics of Agriculture

Course description

This course introduces the students to significance of agriculture in the Indian economy and helps to understand the role agriculture in economic development. It is designed to develop insights into changing agricultural practices in India and assess the significance of agriculture in the era of liberalisation.

Module I

Role of Agriculture in Economic Development, Economic growth – sectoral changes and agriculture, agriculture in rural development, farm and non-farm employment issues, inter-linkages between agriculture and industry; empirical evidence of inter-dependence between agriculture and industry

Module II

Traditional Agriculture: characteristics; Schultz's hypothesis – its criticisms; Mechanization of Indian Agriculture; Case for and against farm mechanization; Green revolution and trends of mechanization in India

Module III

Agricultural price policy for a developing economy – objectives and effectiveness of agricultural price policy, elements of agricultural price policy, features of an ideal agricultural price policy, agricultural price policy in India and public distribution system

Agricultural marketing – need and criteria for assessing efficiency, agricultural marketing system in India, development of a national agricultural marketing platform

Module IV

Risk and uncertainty in agriculture – difference between risk and uncertainty, types of uncertainty in agriculture, measures for mitigating risk and uncertainty in agriculture, new agricultural insurance scheme of India

Rural credit in India, importance and estimates, agencies for rural credit, review of progress of institutional finance in rural India since independence

Module V

Agriculture in Indian Planning, Globalization and Indian agriculture, Case for and against privatization of agriculture, WTO and India's trade in agricultural commodities

Reading List:

1. Ghatak, S and K. Ingerscent (1984), Agricultural and Economic Development, Select Books, New Delhi.
2. Rudra, A (1982), Indian Agricultural Economics: Myths and Realities, Allied Publishers, New Delhi.
3. Sony, R. N. (2006), Leading Issues in Agricultural Economics, Vishal Publishing, Jalandhar.
4. Tyagi, B. P. (1998), Agricultural Economics and Rural Development, J. P. Nath Publishing, Meerut.
5. Sadhu, A N and A Singh (2008), Fundamentals of Agricultural Economics, Himalaya Publishing House, Mumbai.
6. Lekhi, R K and Joginder Singh (2008), Agricultural Economics, Kalyani Publishers, Ludhiana.

SEC II: Data Analysis and Computer Application (Option I)

Course Description:

The purpose of this course is to introduce basic computer skills to students at UG level in non technical subjects. After completion of this course, the students are expected to acquire some basic knowledge about computers and to develop some basic skills in using computers for data storage, compilation, analysis and presentation.

Module I: Introduction to computer and Basic data types

Introduction to computer- Characteristics and Basic Applications of Computer, Components of Computer System, Central Processing Unit (CPU), VDU, Keyboard and Mouse, Other input/output Devices, Memory, concepts of Hardware and Software, Classifications of computers; Representation of data/Information concepts of data processing, Basic data types, Storage of data/Information as files, operating system and The User Interface (windows, Linux), Windows Setting- Control Panels, Accessories (windows)

Module II: Basic Word Processing

Introduction to Word Processing, Opening Word Processing Package, Opening and closing documents, Using a Document/Help Wizard, Text Creation and Manipulation, Formatting the Text, Handling Multiple Documents, Table Manipulation, Printing, saving documents in different formats

Module III: Spreadsheets and Basic Data Analysis

Spread Sheet, Elements of Electronics Spread Sheet, Application/usage of Electronic Spread Sheet, Manipulation of cells, Formulas and functions; Spread sheets for Small accountings- maintaining invoices/budgets, basic practical data analysis works (Maintaining daily and monthly sales reports)

Module IV: Basic Computer Communication and Internet

Basic of Computer networks- LAN and WAN, Internet, Service on Internet; WWW and Web Browsers, Web Browsing software, Surfing the Internet, Chatting on Internet, Email-Basic of electronic mail, Using Emails, Document handling in Email.

Module V: Basic Presentations

Basics- Difference between presentation and document, Using Power Point, Creation of Presentation, Preparation of Slides, Selection of type of Slides, Importing text from word documents, Providing aesthetics- Slide Designs, Slide Manipulation and Slide Show, Presentation of the Slides

Reading List:

1. C.S. French "Data Processing and Information Technology", BPB Publications 1998
2. P.K Sinha, Computer Fundamentals, BPB Publications, 1992
3. Guy Hart-Davis "The ABCs of Microsoft Office 97 Professional edition", BPB Publications, 1998
4. Karl Schwartz, "Microsoft Windows 98 Training Guide", 1998

Course Description

This course intends to explain the ideas on financial system in India. It will help the students to enhance their knowledge on concepts like financial institutions, instruments and markets, their functioning and usage in real world.

Module I: Financial system

The structure of the financial system- Functions of the financial sector-Indicators of financial development; Financial System and Economic Development; financial inclusion: concept and its evolution; policy initiatives on financial inclusion.

Module II: Interest rate policy

Theories of interest rate determination-Level of interest rates-Long period and short period rates- Administered interest rates; Deregulation of interest rates; financial sector reforms in India.

Module III: Money market

Money Market: features; objectives; features of a developed and under developed money market; importance of money market; composition of money market: organized and unorganized; money market institutions and instruments; features and problems of Indian money market.

Module IV: Capital Market

Capital market: composition; Primary and secondary market for securities. Functions of new issue and secondary market; organizations of stock exchanges in India; defects in Indian stock exchange; SEBI; its objectives and functions

Module V: Non-Banking Financial Companies

Non-Banking Financial Companies: Hire purchase Companies-Venture Capital Companies. Insurance Sector: objectives, functions, life insurance and general insurance; IRDA and its role and functions in financial markets.

Basic Reading List

1. M.Y.Khan-Indian Financial System, Tata McGraw Hill, New Delhi.
2. L.M.Bhole: Financial institutions and Market, Tata McGraw hill, New Delhi.
3. Gorden & Natrajan: Financial Market and institutions, Himalaya Publishing house.

SYLLABUS FOR B.A. (HONORS) EDUCATION UNDER CHOICE BASED CREDIT SYSTEM OF UTKAL UNIVERSITY, BHUBANESWAR

CORE - 1

BASICS IN EDUCATION

INTRODUCTION:

The Philosophical foundation is a unique educational charity whose aim is to bring philosophy to schools and the wider community. Through doing philosophy in the classroom the primary concern is to improve the educational practices and provide opportunities for the disadvantaged. Philosophical enquiry develops speaking and listening skills vital for literacy and emotional development, helps children who find it difficult to access other classes, and encourages critical and creative thinking essential in the 21st Century. And it will prepare students to apply knowledge, sensibility, skills and dispositions of philosophical inquiry, analysis, and interpretation to educational practices.

Course Objectives

- after completion of the paper, students shall be able to:
- explain the concept of education and its relationship with philosophy
- list areas of philosophy and narrate their educational implications.
- describe the contribution of Philosophy to the field of education.
- appreciate the contribution of various Indian Schools of Philosophy to the field of education.
- evaluate the impact of Western Philosophies on Indian Education.
- narrate the contribution of the Great Indian Thinkers.

Unit – 1 Bases of Education

- Meaning, Nature and purpose of Education
- Aims of Education: Education for individual development and education for social efficiency
- Functions of education

Unit – 2 Philosophical foundations of education

- Concept of Philosophy

- Inter dependence of philosophy and education
- Branches of philosophy and their educational implications –
Metaphysics, Epistemology and Axiology.

Unit – 3 Reflections of Indian schools of Philosophy on education

- Common characteristics of Indian Philosophy
- Sankhya and Vedanta as Philosophical systems
- Educational implications of Sankhya and Vedanta.

Unit – 4 Western Schools of Philosophy and their educational implication.

- Idealism
- Naturalism
- Pragmatism

Unit – 5 Doctrines of Great Educators of East and West and their influence on the practices of school education with special reference to Aims and ideals of Education, Curriculum, method of teaching and the role of teacher.

- Gandhi
- Sri Aurobindo
- Rousseau
- Dewey

REFERENCES

- Agarwal, J.c. (2010), *Teacher and Education in a Developing society*, Delhi; Vikash Publishing house.
- Arulsarmy, S (2011), *Philosophical and sociological perspectives on Education*, New Delhi; Neelkamal Publications Pvt. Ltd.
- Bhatia K.K., (2011), *Philosophical and sociological foundations of Education*, New Delhi; Kalyani Publishers.
- Bigge, Morris, L. *Educational Philosophies for Teachers*. Columbus, USA: Charies
Boston, USA: Allyn & Bacon.
- Brubacher, John. S. *Modern Philosophies of Education*. New York, USA: McGraw
- Butler J. Donald, *Four Philosophies and their practices in Education and Religion*.

- Chauhe, S.P. & Chaube, A (2009), *Foundation of education* , New Delhi; Vikash, Publishing house Pvt. Ltd.
- Dash, B.N. (2011) *Foundation of Education*, New Delhi; Kalyani Publishers.
- E. Merrill Publishing Co.
- Gutek, Gerald L. (2009). *New Perspectives on Philosophy and Education*. New
- Hill Book Company Inc.
- Janeja, V.R. (2012) *Educational Thought and Practice*, New Delhi, Sterling Publishers, Private Limited.
- Jersey, USA: Pearson
- Kneller, George F. *Introduction to Philosophy of Education*. New York, USA: John
- Mishra, Bhawna (2004), *Education Evolution Development and Philosophy*, New Delhi; Akanhsa Publishing House.
- Mohanty, Jagannatha (1991), *Foundation of Education*, Cuttack – 2, Takshashila.
- Nayak, B.K *Text Book of Foundation of Education*. Cuttack, Odisha: Kitab Mhal.
- New York, USA: Harper & Row.
- Ozman, Howard A., & Craver, Samuel M., *Philosophical Foundations of Education*.
- Premnath, *Bases of Educations*. Delhi, India: S. Chand and Co.
- Publishers.
- Ross, James S., *Ground Work of Educational Theory*. London, U.K: Oxford
- Rusk, Robert R., *Philosophical Bases of Education*, London, U.K: Oxford University of London Press Ltd.
- Safaya, R.N. & Shaida, B.D. (2010), *Modern Theory and Principles of Education*, New Delhi : Dhanpatrai Publishing Company Pvt. Ltd.
- Saiyadain, K.G. *Education and social order*. Bombay: Asia Publishing House.
- Taneja, V. R. (2000). *Educational Thought and Practice*. New Delhi: Sterling University of London Press Ltd.
- Wiley and Sons, Inc.
- Wingo, G. Max. *Philosophies of Education*. New Delhi: Sterling Publishers.

C1 Practical

Book Review

Each Student is required to review a Book / Journal / Educational Article and Write a report.

CORE – 2

EDUCATION AND SOCIETY

INTRODUCTION

Education is a sub-system of the society. The aims of education are determined by the aims of the society. The relationships between the two concepts i.e., education and society are so strong that it is not possible to separate them because what happens to one affects the other. It is impossible to think purposefully about many contemporary problems and issues of education without thinking about the society. Educational institutions are micro-societies, which reflect the entire society. The education system in any given society prepares the child for future life and instils in him those skills that will enable him to live a useful life and contribute to the development of the society. Education as a social phenomenon does not take place in a vacuum or isolation; it takes place in the society. This paper will deal with the functioning of education vis-a-vis the society. Education as a sub-system of society and how other sub-systems affect education will be discussed. Various agencies which are involved towards promotion of education will be discussed at length. Special emphasis is placed on issues relating to equality of educational opportunity with specific reference to the Scheduled Castes/Tribes and women. Special attention is also given how education plays an important role towards social change, national integration and international understanding in a diverse social context.

Course Objectives

After completion of this paper, students shall be able to:

- justify education as a social process and explain its function.
- describe the aims of education from sociological perspective.
- list various agencies of education and their function.
- justify education as a sub-system of society and how other sub-systems affect education;
- appreciate the importance of education for social change.

Unit – 1 **Education and society**

- **Society : Meaning and characteristics**

- **Types of society : Agricultural, Industrial, rural and urban**

- **Interrelationship between education and society**

- Views of Indian thinkers on Education and Society :

Radhakrishnan and Sri Aurobindo on Education

- Views of Western Thinkers on Education and Society: Dewey and Illich

Unit – 2 Education and culture

- Meaning and concept of culture

- Characteristics and types of culture

- Cultural lag and acculturation

- Cultural dimensions of Education

- Inter relationship between education, custom and value system.

Unit – 3 Education, Social process and Institution

- Education and socialization

- Education and social change

- Education and social mobility

- Role of Education for the development of the marginalised

- Education and Affirmative action

Unit – 4 Education and Globalisation

- Education, Growth and Development

- Globalisation and liberalization

- Educational system in Europe

- Educational system in SAARC countries

- Education in Global context

Unit – 5 Education and state

- Concept of Democracy

- Education in totalitarian and welfare state

- Interrelationship of state and education

- Role of education in Nation building

- State Control of Education and Autonomy in Education.

REFERENCES

- Abraham, M.F. (2008). *Contemporary Sociology*. New Delhi: Oxford University Press.
- Anand, C.L. et.al. (Ed.) (1983). *Teacher and Education in Emerging in Indian Society*. New Delhi: NCERT.
- Dewey, John (1973). *The School and Society*. Chicago: University of

Chicago Press.

- Mathur, S.S. (1966). *A Sociological Approach to Indian Education*. Vinod PustakMandir, Agra.
- Nayak, B.K. *Text Book of Foundation of Education*. Cuttack: Kitab Mahal.
- NCERT (1983). *Teacher and Education in Emerging Indian Society*. New Delhi.
- Ottaway, A.K.C. (1966). *Education and Society*. London: Routledge and Kegan Paul.

C2 Practical

Field Study

Each student is required to visit a school observe the school functioning and prepare a report

CORE – 3

THE LEARNER AND LEARNING PROCESS

INTRODUCTION:

Educational Psychology plays a pivotal role in understanding Childs' unique character in teaching learning process. No child is alike from physical, psychological, and social point of view. So a classroom teacher must understand unique characteristics of children and the factors affecting children's learning. This course will enable the learners to understand the Childs' innate potentialities and apply educational psychology in teaching learning process.

Course Objectives:

After completion of this paper, students shall be able to:

- establish relationship between education and psychology.
- understand various methods used to study individual behaviour.
- explain the application of educational psychology in teaching learning process.
- understand individual difference from intelligence, creativity, and personality point of view
- explain the concept of learning and factors affecting learning.
- reflect the contribution of various learning theories in teaching learning process.
- Explain different category of people from different Personality type and the type of adjustment.

Unit - 1 **Educational Psychology**

- Relationship between education and psychology

- Meaning, Nature and scope of educational psychology

- Relevance of educational psychology for teacher

- Methods of studying learner behaviour :

Survey, observation case study and experimental

Unit – 2 **Developmental psychology**

• Concept

• Difference between growth and development

- Principles of development
- Areas of development : Physical, social, emotional and intellectual during childhood and adolescence
- Piagetian stages of cognitive development

Unit – 3

Intelligence, creativity and individual difference

- Meaning and nature of intelligence
- Theories: Uni-factor, two-factor, multiple factor, Gardner's theory of Multiple Intelligence.
- Measurement of intelligence : individual and group tests, verbal, non- verbal and performance test.
- Individual difference: concept, nature factors and Role of Education
- Creativity : Meaning, Nature and Stages of creative thinking
Assessing and nurturing creativity.

Unit – 4

Learning and motivation

- Learning : Meaning nature and factor
- Theories of learning with experiment and educational implications: Trial and error with focus on laws of learning classical conditioning, operant conditioning and insightful learning and constructivist approach to learning.
- Motivation: concept, types and technique of motivation.

Unit – 5

Personality and Mental Health

- Personality: Meaning and nature
- Assessment: Subjective, objective and projective techniques.
- Mental Health: Concept, factor affecting mental health and role of teacher.
- Mental Health of teachers
- Adjustment mechanism

REFERNECES

- Aggarwal J.C (2010) Essentials of Educational Psychology, New Delhi, Vikas Publishing House Pvt. Ltd.
- Sharma R.N. (2010) Educational Psychology, Delhi, Surjeet Publications.
- Mangal S.K. (2008) Essentials of Educational Psychology, New Delhi, Prentice Hall of India Private Limited.
- Kuppuswamy B (2013) Advanced Educational Psychology, New Delhi,

Sterling Publishers Private Limited.

- Mathur S.S. (1962) Educational Psychology, Agra, Vinod Pustak Mandir.
- Kulshreshtha S.P. (2013) Educational Psychology, Meerut, R. Lall Book Depot.
- Bhatia & Bhatia (2004) A Text Book of Educational Psychology, Delhi, Doaba House Book Sellers & Publishers.
- Pandey Ram Shakal (2006), Advanced Educational Psychology, Meerut, R. Lall Book Depot.
- Bigge, M.L. *Psychological Foundations of Education*. Harper and Row, New York.
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- Mangal S.K. (1997). *Advanced Educational Psychology*. Presentice Hall of India, New Delhi.
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- Dash, U.N & Mohanty, M.M (1990). Schooling and Cognition. Harper Collins Publisher, New York.
- Maslow, A.H. (1970). Motivation and Personality (2nd edition). New York: Harper & Row.

C3 Practical

Administration of Psychological Test

Each student is to administer a psychological test (Intelligence / creativity / personality test) and interpret the scores and prepare a report.

CORE – 4

PEDAGOGICAL SKILLS

INTRODUCTION

It is important to note that 'education' is not synonymous with 'school'. It has always been the case that a range of activities that are educational in nature can, indeed should, occur outside the school, even from the earliest age given the educative role of the parents. The Delors Commission Report on education for the 21st century proposed 'learning to live together' as one of the four pillars of education. It advocates learning to live together by developing an understanding of other people and an appreciation of interdependence – carrying out joint projects and learning to manage conflicts in a spirit of respect for the values of pluralism, mutual understanding and peace (UNESCO, 1996). The policy context in India and around the globe is moving towards recognition of the educational value of newer form of pedagogy in the 21st Century which will enable the children to develop critical reasoning power, justify their views, independent decision making power, expression of thoughts, and empathy to others' feelings. Recently NCERT (2005) and NCTE (2009) have changed their curriculum framework and accordingly revised their text books and teacher orientation process to empower the prospective teachers to cope up with emerging pedagogies and to promote higher order learning of the learners like, creative expression, authenticity, abstraction of ideas, and multiple thinking, etc. This paper is intended to give insight to the students on importance of pedagogy in education.

Course objectives

After completion of the course, the students shall be able to:

- explain the concept of pedagogy;
- differentiate pedagogy from other allied concepts;
- define different type of task of teaching
- establish relationship between teaching and learning;
- list out different approaches and methods of teaching;

Unit – 1 **Concept of teaching – learning**

- Meaning and definitions of teaching
- Characteristics and importance of teaching
- Meaning and definition of learning.

- Relationship between teaching and learning.

Unit – 2 Task of teaching

- Meaning and definition of teaching task
- Variables involved in a teaching task: Independent Dependent and intervening variable.
- Phases of teaching task : Pre-active, interactive and post – active phase.
- Level of teaching task: Memory Understanding and reflective level.
- Lesson plan design : The Herbartian steps, 5E Model ICON Design Model.

Unit – 3 Theories of teaching

- Meaning and Nature of Theory of teaching
- Types of Teaching Theories.
- Formal : Communication theory,
- Descriptive : Gagne’s hierarchical theory
- Normative: Theories of Mitra and Clarke

Unit – 4 Principles and Maxims of Teaching

- General principles teaching
- Psychological principles of teaching
- Maxims of teaching

Unit – 5 Approaches and Methods of Teaching

Inductive – Deductive, Analytic - synthetic,
Problem Solving and Project
method.

Shift in focus from teaching to learning –

constructivist approach Activity based and child centered

approach – concept and elements.

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C-4 Practical

Preparation of Lesson

Plan

Each student is to required develop five lesson plans in his/her method subject, (which he / she has to opt in 3rd Semester). The plan will be developed following Herbatian approach / 5E Model / Icon Design Model.

CORE - 5

TECHNOLOGY AND INNOVATIONS IN EDUCATION

INTRODUCTION

Educational technology (ET) is the efficient organization of any learning system adapting or adopting methods, processes, and products to serve identified educational goals (NCERT, 2006). This involves systematic identification of the goals of education, recognition of the diversity of learners' needs, the contexts in which learning will take place, and the range of provisions needed for each of these. Our schools should move from a predetermined set of outcomes and skill sets to one that enables students to develop explanatory reasoning and other higher-order skills. Educational technology is a powerful tool towards developing such reasoning and skills. It should enable students to access sources of knowledge, interpret them and create knowledge rather than be passive users. It should enable the teachers to promote flexible models of curriculum transaction. It should encourage to use flexible curriculum content and flexible models of evaluation as well. Present paper will give an exposure to students to understand the meaning, nature and scope of educational technology. They will be sufficiently oriented about nuances of communication and their implications in educational context. They will understand the underlying principles of instructional design. Students will develop the ability to prepare lesson plans based on constructivist approach. They will be oriented about the need and importance distance education in India.

Course Objectives

On completion of this course, the students will be able to:

- understand the meaning, nature and scope of educational technology
- explain with examples various approaches to educational technology
- describe systems approach and its application in educational context
- explain the concepts, principles, modes, process and barriers of communication and their implications in educational context
- explain the instructional design and its underlying principles
- describe different models of teaching and their use in effective classroom teaching

Unit – 1 **Educational Technology**

Meaning, nature and scope

Approaches to Educational Technology : Hardware, software and
system approach

Types of Educational Technology

Importance of Educational Technology for the teacher and the student.

Unit – 2

Communication Process

Meaning and nature

Process, components and

types Barriers of

communication

Study of Classroom Communication through flander's interaction analysis.

Unit – 3

Innovations in Educational Technology

Programmed instruction : Concept Basic principles and

applications Microteaching : Concept assumptions, phases
and applications.

Simulated Teaching : concept, procedure and applications

Personalized system of instruction : Concept, objectives, strategies and
applications

Unit – 4

Teaching Models

Concept attainment

model Advance

organizer model

Synetics model

Inductive model

Memory model

(These teaching models are to be discussed with reference to focus, syntax, social system, support system and application)

Unit – 5 **Classroom instructional Aids**

Projected and non projected

Aids ICT – enabled devices

Organisation of school teaching learning

Materials (TLM) Centre: Objective

Procedure

Planning

Applicatio

n

Types of Materials to be procured for teaching different school subjects.

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C5 Practical

Classroom Interaction Analysis

Each student is to observe one classroom interaction preferably in a school and prepare an observation matrix and write a report.

CORE - 6

PEDAGOGY OF SCHOOL SUBJECTS

(Each student is required to select any one of the following school subjects) **METHODS OF TEACHING ODIA**

Introduction

Mother-tongue plays a significant role in the education of a child. It has a great importance in the field of education. Therefore, mother tongue must be given an important and prominent place in the school curriculum. Method of teaching Odia will enable us to preserve and enrich our language and culture forever by developing Odia language skills among learners. The learners will also be equipped with the skills to prepare Odia lesson plans by using constructivist approach.

Learning Objectives and Expected Outcomes

On completion of the course the students shall be able to:

- describe the concept of Mother Tongue;
- explain the semantic peculiarity of Odia language
- justify the importance and objectives of teaching Mother Tongue (Odia) at Secondary Stage;
- describe various pedagogical approaches of language teaching.
- prepare subject specific lesson plan for improvement of language skills. plan and construct test to assess language skills and content areas.

Unit –1 Conceptual

Importance of mother tongue in the life and education of the child Aims and objectives of teaching mother tongue at school level.

Place of mother tongue in the school curriculum.

Unit – 2 Methods and approaches

Direct Method

Discussion Method

Discussion cum appreciation

method Inductive and deductive

method

Unit – 3 Techniques of Teaching

Teaching of prose and

poetry Teaching of

Grammar Teaching of

composition

Unit – 4 Teaching Learning Materials for teaching Odia

Teaching learning materials : Purpose, Types and

Use Language Text Book : Importance, Purpose

Language Laboratory characteristics application

Unit – 5 Development of Lesson Plan

Preparation of Lesson Plan : Herbartian approach

5E Model

Icon Design Model

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METHOD OF TEACHING ENGLISH

INTRODUCTION

Language is always regarded as the means of communication. Among all the foreign languages English is worldwide accepted as the international language. It has been the window on the world through which we peep into the world to grasp international information on trade, education, health, politics etc. In this connection we need to strengthen our efficiency in English language to present ourselves in the market of education as a skilled person. Basically, in teaching and learning, English language deals with different modes of transaction, language skills. It enables a teacher to follow variety of methods of teaching of prose & poetry, grammar; and enables to prepare the lesson plan and scheme of lessons. As a student of education, one needs to learn role and anatomy of English language, methods of teaching and developing language skills, phonetics etc which are reflected in the course contents of this paper.

Learning Objectives and Expected Outcomes

On completion of course the students shall be able to:

- State the place of English language in India
- describe English as a second language in the multi lingual syllabus India
- List out different techniques of teaching
- Discuss different type of teaching learning materials in teaching English
- Prepare lesson plan in English

Unit – 1 Teaching / Learning English as a second language

- Importance of learning English as a second language
- Aims and objectives of teaching English
- Place of English in school curriculum

Unit – 2 Methods and approaches

- Translation and Direct methods
- Structural approach to teaching English
- Communicative approach to learning English

Unit – 3 Techniques of teaching

- Teaching prose and poetry
- Teaching grammar

- Teaching composition

Unit – 4 Teaching learning materials for teaching English

- Teaching aids : purpose types and use
- The English test book and work book
- The language laboratory
- Application of ICT in teaching English

Unit – 5 Developing a lesson plan for teaching English

- Herbartian approach
- 5 E Model
- ICON Design Model

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METHODS OF TEACHING MATHEMATICS

INTRODUCTION

Mathematics is closely linked not only with the daily life of the human society but also with scientific and technological world. Therefore, teaching of mathematics has formed, since the advent of education in human history, one of the three 'R's of learning. To be effective in teaching and creating a constructive learning situation, the teacher should not only have the content knowledge of mathematics, but also the pedagogical knowledge and its values in daily life of the human being. The pedagogical knowledge of mathematics will help the learner to effectively transact the mathematical concept and apply the effective strategy to assess the learner.

Course Objectives

On completion of the course the students shall be able to:

- explain the nature and scope of mathematics
- identify different types of proof in mathematics and their application to solving mathematical problems
- relate the mathematical concepts with other school subjects
- achieve the mastery over the methods, strategy and approaches for transacting the contents of mathematics
- develop mathematics achievement test and acquire of the scoring procedure
- analyze learners learning difficulties and develop remedial strategies to meet needs of slow learners and to develop enrichment materials for the advanced learners

Unit – 1 Importance and values of teaching mathematics

- Aims and objectives of teaching mathematics
- Relationship of mathematics with other school subjects.

Unit – 2 Mathematics curriculum and its organization at school stage.

- Principles of curriculum construction in Mathematics
- Principles of Arranging / organizing curriculum
- Pedagogical analysis of content in School Mathematics

Unit – 3 Methods of teaching mathematics

- Analytic and synthetic methods

- Inductive and deductive methods
- Project method

Unit – 4 Teaching learning Materials in Mathematics

- Teaching aids in mathematics : Purpose, types and use.
- Mathematics text book and workbook.
- Application of ICT in teaching mathematics.

Unit – 5 Developing lesson plan for teaching mathematics.

- Herbartian approach
- 5 E Model
- ICON Design Model.

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METHOD OF TEACHING HISTORY

INTRODUCTION

History occupies an important place in the school curriculum. Through History students will aware about the past events and developments. History creates linkage between present and past. Through the subject our students will respect our culture, traditions and heritage. History shows path to future.

COURSE OBJECTIVES:

On completion of the course, students shall be able to:

- explain the meaning and scope of History
- relate History with other school subjects
- explain the different approaches to organization of contents in History
- achieve mastery over different methods and approached for curriculum transaction
- List out the different types of teaching learning materials in history and explain their importance.
- Prepare Lesson plan in History

Unit – 1 History: Meaning, nature, scope, and importance

- Aims and objectives of teaching History at school level.
- Relationship of History with other school subject.

Unit – 2 The History curriculum

- Approaches to organization of contents in history curriculum: chronological, concentric, topical, regressive.
- Selection of content of History : Local, national and global perspectives.
- The History curriculum at school level in Odisha.

Unit – 3 Methods of Teaching History

- Lecture, story telling, narration-cum-discussion, dramatization, source method.
- Development of sense of time and space.

Unit – 4 Teaching learning material (TLM) in history

- Purpose, types and use
- Time line.

- ICT-enabled teaching aids in History.

Unit – 5

Preparation of Lesson Plan in History

- Herbartian Approach
- 5E Model
- ICON design model

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METHOD OF TEACHING SCIENCE

Introduction

The paper is meant for the students joining Masters Level with B.S background. The paper intends to develop an insight among the students regarding science as a distinct

discipline with its characteristics and method of inquiry. The MA (Education) students pursuing science would focus both a s physical and biological science and acquaint themselves with different methods and models of teaching. The methods, models and materials would be discussed with reference to the content of course prescribed for H.S.C examination in science. The students, on completion of course, are expected to develop scientific thinking, adapt methods and materials to the needs of students and conduct assignments in line with constructivist perspective.

Learning Objectives and Expected Outcomes

On completion of the course the students shall be able to

- gain insight on the meaning nature, scope and objective of science education.
- appreciate science as a dynamic body of knowledge
- appreciate the fact that every child possesses curiosity about his natural surroundings
- identify and relate everyday experiences with learning science
- appreciate various approaches of teaching learning of science
- employ various techniques for learning science
- use different activities like demonstration ,laboratory experiences, observation, exploration for learning of science
- facilitate development of scientific attitudes in learner
- Construct appropriate assessment tools for evaluating science learning

Unit – 1 Conceptual

- Meaning, nature and scope of General Science
- Aims and objectives of teaching science at school level.
- Correlation of science with other school subjects.
- Importance of science in the school curriculum

- Unit – 2 Methods and approaches**
- Observation method
 - Demonstration-cum-Discussion method
 - Project method
 - Heuristic method
 - Laboratory method
- Unit – 3 Science curriculum**
- Principles of curriculum construction in science
 - Organisation of curriculum in science
 - Pedagogical analysis of contents in science
- Unit – 4 Teaching learning materials (TLM) for teaching science**
- Purpose, type and use
 - Application of ICT in teaching science
 - The science laboratory : Purpose, Importance and utility
- Unit – 5 Development of Lesson plan for teaching Science**
- Herbartian Approach
 - 5 E Model
 - ICON Design model

REFERENCES

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METHOD OF TEACHING GEOGRAPHY

INTRODUCTION

Geography as a subject play a vital role in the school Curriculum for many people, Geography means knowing where places are and something of their characteristics is important for reading or the multiplication of tables for arithmetic, but Geography involves far more. Geography is the study of places on earth and their relationship with each other. Often the study of Geography begins with one's home community and expands as person gains greater experience. Thus Geography provides a conceptual link for children between home, school and the world beyond. Geographers study how people enteract with the environment and with each other from place to place and they classify the earth into regions. It helps us to be better citizen.

Course Objectives:

On completion of the course ,students shall be able to:

- explain the meaning and scope of Geography.
- relate Geography with other school subjects
- explain the different approaches of curriculum transaction in Geography.
- list out the different type of Teaching Learning Material (TLM) in Geography
- explain the principles of curriculum organization in Geography.
- Prepare lesson plan in teaching Geography.

Unit – 1 Conceptual

- Meaning, nature and scope of Geography
- Aims and objectives of teaching Geography at the school level.
- Correlation of Geography with other school subjects.
- Place of Geography in the school curriculum.

Unit – 2 Methods and approaches

- Direct observation and indirect observation
- Discussion method / Demonstration-cum-discussion method
- Project method
- Regional method
- Heuristic method

Unit – 3 Geography curriculum

- Principles of curriculum construction in Geography
- Organisation of curriculum in Geography
- Pedagogical Analysis of contents in Geography

Unit – 4 Teaching Learning Materials (TLM) for teaching

- Teaching Learning Materials : Purpose, type, & use
- Application of ICT in Teaching Geography
- Importance of Geography Room: Purpose, importance, utility
- Geography Text Book: Importance characteristics purpose and application.

Unit – 5 Development of Lesson Plan for teaching Geography

- Herbartian approach
- 5 E Model
- ICON Design Model

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C-6 Practical

School

Internship

Each student will deliver 5 (five) lesson in a school in his / her method subject opted in the 3rd Semester following Herbartian approach / 5E Model / Icon Design Model.

CORE – 7

STATISTICS IN EDUCATION

INTRODUCTION

The fundamental principles and techniques of statistics provide a firm foundation to all those who are pursuing courses in education, psychology and sociology. The role of statistics is essential for collection, analysis, grouping and interpreting the quantitative data. Research and innovations are very essential in the field of education for enrichment, progress and development of the knowledge society. A lot of surveys and research works are carried out in the field of education. Statistical methods help the researchers in carrying out these researches successfully. Therefore, the basic knowledge of statistical method is very vital for conducting any survey, research and project work. Students at undergraduate level must have to develop the basic knowledge of statistical methods used in education.

Course Objectives

After completion of this course students shall be able to:

- Describe the importance of statistics in field of education
- Convey the essential characteristics of a set of data by representing in tabular and graphical forms.
- Compute relevant measures of average and measures of variation
- Spell out the characteristics of normal probability of distribution
- Examine relationship between and among different types of variables of a research study

Unit – 1 **Concept of Statistics**

- Meaning, Definition and characteristics of statistics
- Kinds of statistics
- Types of Data
- Scales of Measurement
- Frequency Distribution

Unit – 2 **Graphical Representation of Data**

- Histogram
- Frequency Polygon
- Pie-Diagram

- Cumulative frequency graph
- Cumulative percentage curve / Ogive

Unit – 3

Measures of Central Tendency and Dispersion:

- Mean
- Median
- Mode
- Range
- Average Deviation
- Quartile Deviation
- Standard Deviation

Unit – 4

Measures of Correlation

- Concept of Correlation
- Linear and Non-linear correlation
- Rank difference method of correlation
- Product moment correlational method

Unit – 5

Inferential Statistics

- Normal Probability curve – Divergence from Normality
- Chi-square test
- t-test

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C-7 Practical

Statistical Analysis of Achievement Scores

Each student is required to collect the achievement scores of the students of a class at least 02(two) schools and make statistical analysis of the collected data and a report.

CORE – 8

CURRICULUM DEVELOPMENT & EDUCATIONAL GUIDANCE

INTRODUCTION

The organization of schooling and further education has long been associated with the idea of a curriculum. But what actually is curriculum, and how might it be conceptualized? We explore theory and practice of curriculum design and its relation to informal education. Curriculum theory and practice to some must sound like a dull but required course activity. Curriculum theory at its best is a challenging and exciting intellectual puzzle. It is a vibrant field full of contradictions, challenges, uncertainties and directions. Yet it is a critical field, the outcome of which does matter. When we teach, whether from preschool to high school; from children to adult, whether educating or training, what we do must make a difference. We cannot waste our audiences time with training that doesn't help, with educating that doesn't educate, or teaching that which may be irrelevant or even wrong. If a surgeon makes a mistake, his patient dies. If teachers, educators, professors, trainers make a mistake, we do not readily see the consequences, and indeed may never see the consequences. Ask yourself: Have you hurt anyone lately by giving misinformation? Did you really make a difference in your teaching, say yesterday? How do you know? Does the curriculum that you help design and deliver really do the job it is supposed to? This course deals with the theory and practice of curriculum design. Participants will want to ask "How do I do curriculum design?" "What are the theoretic underpinnings which inform the practical problems of making curriculum?" For this course, however, the underlying theoretical foundations which inform how and what one does will bias our discussions into particular directions. Students need Guidance in different ways and in various forms to solve their problem. Educational guidance is helpful for all categories of learner There are different services available to provide guidance to students . The present paper emphasizes the study of various concepts of guidance and counseling and its importance in teaching learning process.

Course Objectives:

On completion of this course, the students shall be able to:

- define and explain the concept of curriculum.
- list different types of curriculum with examples.
- suggest bases of curriculum such as, philosophical,

psychological and sociological.

- describe different considerations for curriculum planning;
- elucidate different process of curriculum development;
- explain the role of teacher in curriculum development.
- identify major issues and trends in curriculum;
- Explain National curricular Framework (2005)
- Explain different type of Guidance & Counselling
- List out different type of counseling services and the role of teacher in organizing those services

Unit – 1 Curriculum

- Meaning and importance
- Types of Curriculum: subject centered, learner centered, experience centered curriculum, Core curriculum, Local specific curriculum.
- Components of curriculum: Objectives, Content, Learning experience & Evaluation

Unit – 2 Bases of curriculum

- Philosophical, Sociological & Psychological bases of curriculum, Principles of curriculum construction:
 - Principles of Activity centredness, Community centeredness
 - Integration, Relevance, Balance, Flexibility, Variety & Plurality, Forward looking, contextuality, ICT – enabled

Unit – 3 National Curricular Framework (NCF) 2005

- Guiding Principles
- Learning & knowledge
- Curricular areas, School Stages & Assessment

Unit – 4 Guidance and counseling

- Guidance: Meaning, Nature and scope
- Types of guidance : Educational, Vocational, & Personal
- Counseling : Meaning, nature & Scope
- Different types of counseling
- Techniques of counseling

Unit – 5 Organisation of Guidance services in school

- Placement service
- Occupational information service

- Pupil inventory service
- Follow up service
- Role of teacher in organizing guidance services in school

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C-8 Practical

Text Book

Review

Each student will review a school text book and write a detailed report.

CORE - 9

EDUCATIONAL ASSESSMENT & EVALUATION

INTRODUCTION

Assessment is considered to be one of the most crucial aspects of any teaching learning process, as it helps the teacher to record the growth of their students, planning for instructional strategy and most importantly helps to assess their own growth over the years. An effective method of assessment in the classroom helps to create conducive learning environment and a teacher must have to know different techniques of assessment which may improve students' learning. The key issues that involve in assessment are how to assess, when to assess, and what will be its implication on students learning. The paper outlines the above mentioned questions and different issues that involves in assessment.

Course Objectives

After completion of the course ,students shall be able to:

- describe the role of assessment in education.
- differentiate measurement, assessment and evaluation.
- establish the relationship among measurement, assessment and evaluation.
- explain different forms of assessment that aid student learning.
- use wide range of assessment tools and techniques and construct these appropriately.
- classify educational objectives in terms of specific behavioral form
- prepare a good achievement test on any school subject
- explain the characteristics of good measuring instruments.
- list out different type of assessment techniques

Unit – 1 **Assessment & Evaluation in Education**

- Understanding the meaning of Test, Measurement Evaluation and Assessment
- Scales of Measurement
- Types of measurement, Norm Referenced and Criterion Referenced
- Procedure of Evaluation: Placement, Formative, Diagnostic and Summative

- Concept of continuous and comprehensive evaluation (CCE).
- Unit – 2 Instructional Objectives**
- Taxonomy of Educational objectives with special reference to cognitive domain
 - Methods of stating instructional objectives: General instructional objectives and specific learning outcomes.
 - Relationship of Evaluation procedure with objectives.
 - Construction of objective based and objective type test items: Essay type, Objective type: principles of construction, Advantages and limitations.

Unit – 3 Techniques of Assessment

- Observation
- Interview
- Rating scale
- Checklist
- Project
- Concept Mapping

(Above techniques are to be discussed with reference to purpose, type, procedure of administration and application)

Unit – 4 Test construction

- Teacher made test vs. standardization
- General Principles of Test construction and standardization : Planning, Preparing, Tryingout & Evaluating.

Unit – 5 Characteristics of a Good Test

- Reliability - Concept and method
- Validity - Concept, type and methods of validation
- Objectivity - Concept, type and factors
- Usability - Concept and factors

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C-9 Practical

Construction of an achievement test

Each student will construct 50 objective based objective type test items along with a blue print

CORE – 10

INTRODUCTION TO EDUCATIONAL RESEARCH

INTRODUCTION

Research is a creative work undertaken systematically to increase the stock of knowledge, including knowledge of humanity, culture and society, and the use of this stock of knowledge to devise new applications. It is used to establish or confirm facts, reaffirm the results of previous work, solve new or existing problems, support theorems, or develop new theories. A research project may also be an expansion on past work in the field. The primary purposes of research are documentation, discovery, interpretation, or the research and development of methods and systems for the advancement of human knowledge. Approaches to research depend on epistemologies, which vary considerably both within and between humanities and sciences. In the present paper, students will be given an orientation about the nature, purpose, scope of research in education. A brief overview of different types of research in education will be given to the students. Students will be exposed to different methodology of research in education. Students can use appropriate tools and techniques for the collection of data and understand concept of sampling.

Course Objectives

On completion of this course the students shall be able to:

- Describe the nature, purpose, scope of research in education
- Identify types of research in education
- Explain the characteristic of qualitative, quantitative and mixed research
- Select and explain an appropriate method for a research study
- Select appropriate tools and techniques for the collection of data
- Describe the procedure of preparation of Research Report

Unit – 1 Introduction to Research

- Methods of Acquiring knowledge
- The Nature of science
- Meaning and characteristics of research
- Basic, Applied and action research
- The nature of educational research

Unit – 2 Types of studies in Educational Research

- Descriptive Research
- Experimental Research
- Qualitative Research
- Philosophical and Historical studies

Unit – 3 Research Design

- Identification of problem and formulation of Research question
- Hypothesis : Meaning and types
- Sampling : Concept and purpose
- Tools of data collection : Questionnaire, Rating scale, Attitude scale and checklist
- Techniques of data collection : Interview and observation

Unit – 4 Data Analysis and Interpretation

- Analysis of Quantitative Data (Descriptive statistical Measure)
- Analysis of Quantitative Data (inferential statistics based on parametric tests)
- Analysis of Quantitative Data (inferential statistics based on non-parametric tests)
- Analysis of Qualitative Data

Unit – 5 Research reports and application

- Writing proposal / synopsis
- Method of literature survey / Review
- Research Reports various components or structure
- Scheme of chapterization and Referencing

REFERENCES

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C-10 Practical

Preparation of Project

proposal

Each student will prepare a project proposal.

CORE – 11

HISTORY OF EDUCATION IN INDIA

INTRODUCTION

In heritage of Indian education, you need to know the key words, *Heritage* and *Education*. The Indian heritage witnesses the most fabulous contributions in the field of education. It is believed that in the ancient days, education was imparted orally by the sages and the scholars and the information was passed on from one generation to the other. The Gurukuls were the traditional Hindu residential schools of learning which were typically in the teacher's house or a monastery. At the Gurukuls, the teacher imparted knowledge on various aspects of the religion, the scriptures, the philosophy, the literature, the warfare, the statecraft, the medicine astrology and the history. As the students of Education, you all need to learn the system of education starting from the ancient India till the today's globalised knowledge society through the hierarchy of time. The paper will develop a sense of appreciation and pride about the Indian Cultural and Educational heritage.

Course objectives

On completion of this course ,students shall be able to:

- narrate the concept of education in the context of Indian heritage.
- describe education in ancient India, particularly, Vedic Education, panishadic Education, and the Buddhist Education.
- critically examine the education system in Medieval India
- elaborate the role of teacher, school and community in preservation of Indian heritage and achievement of national goals.
- Evaluate the education system during British period with special emphasison the commissions and committees.
- Elaborate the status of education during post-independence period with special emphasis on the commissions and committees.

Unit – 1 **Education in Ancient India**

- Education during Vedic & Upanishadic period
- Education during Buddhist period
- Ancient seats of learning: Nalanda, Taxila, & Varanasi
- Achievements of Ancient India in different fields of knowledge

and enlightenment.

Unit – 2 Education in Medieval India

- Islamic Education in India: Aims, structure, curriculum, methods and educational institutions.
- Hindu Education: Aims, structure, curriculum, methods and educational institution.
- Impact of the interaction between the two systems of education.
- Evaluation of state patronage for education during the period.

Unit – 3 Education during early British period (up to 1885)

- Educational endeavours during the early British period (up to 1835)
- Adam's Report
- Macalay's Minute and Bentinck's Resolution. 1835
- Wood's Despatch 1854
- Hunter Commission Report 1882

Unit – 4 Education during later British period (1885-1947)

- National Education Movement
- Curzon's Education Policy
- Calcutta University (Sadler) Commission report 1917
- Basic Education 1937

Unit – 5 Education in Independent India

- Report of the University Education Commission 1948
- Report of the Secondary Education Commission 1952.
- Report of the Indian Education Commission 1966
(Reports of the commissions to be studied with reference to Aims, structure & Curriculum)
- NPE 1986 and the Revised NPE 1992.
 - Essence & the Role of Education
 - National System of Education
 - Reorganisation of Education at different stages.
- Report of NKC with regard to school & higher education

REFERENCES:

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C-11 Practical

Case Study

Each student will make a case study of an educational institution and prepare report.

CORE – 12

COMPARATIVE EDUCATION

INTRODUCTION

This paper is an introduction to a systematic study of comparative education, the analytical survey of foreign educational systems. Comparative education is relatively a young sub field in the very old discipline of pedagogy. Educational reforms are so intimately connected with politics, with problems of race, nationality, language and religious and social ideals that it becomes rather imperative to have a glimpse over the evolution of educational development of nations. This course is an attempt to combine the two purposes : an academic insight and a general introduction into comparative education as a study of contemporary solutions to various countries. It is widely recognized that this intending students of education should have some knowledge of foreign educational systems and their comparative merits. This paper also aims at the analytical study of education in all countries with a view to perfecting national systems with modification and changes, which the circumstances and local conditions would demand.

Course objectives

On completion of this course ,students shall be able to:

- Explain the scope of comparative education
- List out the factors of comparative education
- Compare the structure,curriculum and evaluation system of India with that of China, Japan,U.K and U.S.A

Unit – 1 **Definition and scope of Comparative Education**

- First pioneers of comparative education.
- Other subsequent comparative studies
- Approaches: statistical, psychological and historical
- National traditions and the definition of a nation.

Unit – 2 **Theory and Methods of comparative Education**

- Purpose of comparative education
- Area studies : Description and interpretation
- Comparative studies : Juxtaposition and comparison

Unit – 3 **Factors**

- The Racial factor
- The Linguistic factor
- Geographic and economic factor
- Religious factor

Unit – 4 Systems of Education

(Characteristic, structure, curriculum and evaluation system)

- U.K.
- U.S.A.

Unit – 5 Systems of Education

(Characteristic, Structure, Curriculum & Evaluation system)

- China
- Japan

REFERENCES

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Core-12 Practical

Term Paper

Each student is required to prepare a term paper on any topic of comparative education.

DISCIPLINE SPECIFIC ELECTIVE (DSE) – 1 ICT IN

EDUCATION

INTRODUCTION

Information and Communication Technology (ICT) now hold great potential for increasing the access to information as well as a means of promoting learning. ICT has tremendous potentiality in transforming classrooms into more engaging, collaborative and productive learning environments in which instructions can be customized to students' specific needs, interests and learning styles. It is also redefining the way educators teach as well as the way the students learn. The present paper is based on above assumptions. The paper will orient the learners about the need and importance of ICT in education. It will describe about the importance of open source software in education particularly, in developing country like, India. Students will be given an exposure about the various approaches and stages towards the use of ICT in education. Students are expected to develop reasonably good ICT skills in terms of use of various computer software and ICT tools.

Course Objectives

On completion of this course, the students shall be able to:

- explain the concept, nature and scope of ICT in education
- differentiate Web. 1.0 and Web 2.0
- describe the importance of open source software in education
- list and explain various approaches in adoption and use of ICT in education.
- list and explain various stages of ICT usages in general and pedagogical usages in particular in education.
- describe the needed teacher competencies for ICT usage in the classroom.
- ☐ demonstrate the use of various computer software such as Word-processing , Spreadsheets, and Presentation.

Unit – 1

Information & Communication Technology : Meaning and importance

- The ICT infrastructure : computers, telecommunication network, networking.
- Introduction to internet, the World Wide Web, e-mail, and social media.

- ICT potential for improving access, quality and inclusion in education

Unit – 2

E- learning : meaning and importance

E – learning methods and media :

Virtual learning environment

Virtual universities

Massive Open Online Course(MOOCs)

Webinars

Special internet forum / discussion

groups e-tutorials

Unit – 3

ICT Resources

- Open Educational Resources (OERs) purpose and importance
- e-Libraries, e-books, e-journals, Inflibnet
- Important website for education : NCERT, UGC, NCTE, MHRD, DHE, UNESCO, UNICEF, UIS (UNESCO Institute of Statistics) etc.
- Other learning resources: Encyclopedia, dictionaries, multimedia etc.

Unit – 4 ICT in class room

- Purpose and importance of ICT in class room
- ICT enabled curriculum : enhancing ICT use in the existing curriculum
- Full integration of ICT into curriculum
- Designing / Developing ICT integrated smart classrooms: hardware and software requirements, utilization procedures
- Developing multimedia and ICT based lessons.

Unit – 5

ICT for school improvement

- ICT for competency standards and professional development of teachers
- ICT for school administration
- ICT for student support services : admission libraries, guidance, maintenance of student records etc.
- ICT enabled assessment
- ICT for open and distance learning
- ICT for life long learning

REFERENCES

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- Retrieved from <http://portal.unesco>.

DSE-1 Practical

Internet Search for Study Material

Each student is required to search internet, collect study materials related to any educational topic and write a report.

DISCIPLINE SPECIFIC ELECTIVE (DSE) – 2

SPECIAL EDUCATION

INTRODUCTION

Nature and nurture have a substantial role to play in growth and development of human beings. Nature and nurture apart, human organism is susceptible to damage through disease and injury. Disease, accident, genetic causes or any other reason, which inflicts the persons, causing loss or want of abilities, may not be equal in all cases. Accordingly the degree of abilities or lack of abilities varies. Deviations from average of physical and mental ability of human beings beyond limits resulting in substantial and appreciable difficulties in performing a function or in social adjustment process be perceived as disability. Some of the practitioners understand rehabilitation as a graded acquerntial individualized approach in which charity has given way to right so far as the empowerment of persons with disability is concerned. Education is the means to empower them. It has become a fundamental right of every child. The evolution of education of persons with disability has a history with the starting point in the 10th century in Europe and America. It has been realize that education of the persons with disability is very crucial for the development and independent leaving as far as possible. Education of the persons with disability has evolved as an essential responsibility of the government not only because of constitutional provisions but also with the UN mandates.

Course Objectives

On completion of this course, students shall be able to

- know about the concept, nature, objectives,types and historical perspective of special education
- explain the innovations and issues of special education
- elaborate the policies and programmes of special education
- able to identify different type of special category children
- understand various educational interventions meant for special children
- explain the role of resource teacher and special teacher

- Unit – 1** **Conceptual**
- Exceptional children : Concept and types
 - Inter relationship between impairment, disability and handicap.
 - Historical development of special education in India.
 - Issues and innovations in Education of Exceptional children: Mainstreaming, Labeling and De-institutionalisation.
- Unit – 2** **Policies and programmes in the Education of special children**
- Indian Education Commission (1964-66)
 - National Policy on Education (1986)
 - Report of Rama Murty Committee (1991)
 - Programme of Action (1992)
 - UN Conventions in Human Rights (1994)
- Unit – 3** **Education of the gifted and creative children**
- Concept
 - Characteristics
 - Identification
 - Educational provisions
 - Role of Teacher
- Unit – 4** **Education of the Educable Mentally Retarded**
- Concept
 - Characteristics
 - Methods of identification
 - Educational Provision
 - Role of Teacher
- Unit – 5** **Education of Children with Learning Disability**
- Concept
 - Characteristics
 - Methods of identification
 - Role of Special / Resource Teacher

REFERENCES:

- Blackhurst. A.E. & Berdine, w.H. (Eds) (1981). An introduction to special education, Little Brown & Co. Boston
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DSE-2 Practical

Case study of Special

Child

Each student is required to conduct a case study of a special child and write a report.

CORE – 13

EDUCATIONAL PLANNING, ADMINISTRATION AND MANAGEMENT

INTRODUCTION

Management is a universal phenomenon. Knowledge of management is indispensable for successful accomplishment of goals of an organization. Knowledge of management is required to ensure efficiency and better output of an organization and its functioning. As we know education plays a significant role in the socioeconomic development of the country, proper management of educational institutions requires managerial skills among all the people entrusted with the responsibilities of education. The paper deals with various concepts, principles and functions of educational management. It emphasizes on educational planning, finance and school management and focuses on trends in educational management. The paper will develop an interest towards the educational management.

Course Objectives

On completion of the course the students shall be able to:

- explain the concept, nature and scope of educational management
- describe the functions of educational management and administration
- list down various types of educational administration
- elaborate the principles of educational management
- elaborate the steps in planning
- explain different types of administration
- elaborate functions of state level educational bodies
- describe the sources of financing in education

Unit – 1 Educational Planning

- Meaning, Nature, Objective and scope
- Approaches: Social Demand, Cost benefit analysis and Manpower requirement
- Steps in Educational Planning : Diagnosis of Educational Development, Plan formulation, Plan implementation,

Monitoring and Evaluation.

- School Development Plan : Concept and Process

Unit – 2 Educational Administration

- Concept, Objectives and scope of educational administration
- Types : Totalitarian and Democratic
- Basic Functions of Administration : Planning, Organizing, Directing and Controlling.

Unit – 3 Educational administration in the state

- Administration of Education in Odisha: Structure and Functions.
- Functions of state level educational bodies: SCERT, BSE & OPEPA

Unit – 4 Educational Management

- Meaning, Nature and Scope
- Types: Centralized vs Decentralised Authoritarian vs Democratic
- Functions of Educational Management

Unit – 5 Economics of Education

- Costs in Education: The current cost and capital cost of education
 - The Direct and Indirect cost of education.
 - The private cost, social cost and unit cost of education.
- Educational Expenditure as investment
- Financing of Education :
 - Agencies of financing Education
 - Financing of education by parents
 - Financing of education by Employers.

REFERENCES:

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C-13 Practical

Visit to Administrative Unit

A visit to educational administrative unit such as DHE, SCERT, RDE, CHSE, University OPEPA interaction with administrator(s) and preparation of a report.

CORE – 14

CONTEMPORARY CONCERNS IN INDIAN EDUCATION

INTRODUCTION:

To remain current, to widen understanding levels holistically, and to thoroughly prepare learner for the world in which they will ultimately live and work, they must continually examine current practices in search of better solutions and needed change. The intent of this course is to familiarize learner to historical roots of Universalisation of Elementary education and initiative so far taken by Govt. to materialize this reality. Further, paper generally discusses the effort of Govt. to extend the provision of free and compulsory education at secondary level and developing a sound approach to dealing with the rapid pace of reform and change from the teacher's perspective. Emphasis is placed on examining over various emerging issues, problems and strategies of current trends relating to Peace education, Human Rights education value education, environmental education, Life skills education

Course Objectives

On completion of the course the students shall be able to:

- explain the concept of universalization of elementary education
- describe universalization of elementary education and secondary education implementation strategies
- describe present position of secondary education
- Explain the challenges of secondary education
- explain present scenario of higher education and agencies for improvement
- explain the concept of value education, environmental education and Life skills education

Unit – 1

Elementary Education

- Universalisation of elementary education.
- Right of Children to Free and Compulsory Education (RCFCE) Act 2009.
- Quality concerns in Elementary education.
- Sarva Sikshya Abhiyan (SSA) & District Primary Education Project (DPEP)

Unit – 2 Secondary Education

- Present position of secondary education in India
- Challenges and problems of secondary education.
- Vocationalisation of secondary education
- Rashtriya Madhyamik Sikshya Abhiyan (RMSA)

Unit – 3 Higher Education

- Present position of Higher Education in India
- Challenges in higher education : expansion, quality & inclusiveness.
- RUSA

Unit – 4 Social Commitments in Education

- Gender issues in Indian education
- Equalisation of educational opportunity
- Constitutional provisions for education
- Education for national integration and international understanding.

Unit – 5 Emerging concerns

- Environmental Education
- Value education, Peace Education and Human Rights Education
- Adolescent Education
- Life skills ducation

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C-14 Practical

Educational Programme Review

Each student is required to collect the perception of students / teachers / community members about the relevance and implementation issues in respect of an educational initiative / programme and prepare a report.

DISCIPLINE SPECIFIC ELECTIVE (DSE) – 3

DISTANCE EDUCATION

INTRODUCTION:

Distance education was an educational mode supplementary, Complementary and alternative to conventional/traditional system of education depending on the situation it was practiced. Today it has evolved into an independent system of education, hanks to the growth of communication Technologies and cognitive sciences which are flexible enough to use the technologies for pedagogic purposes. It is an educational innovation to meet the ever increasing and diversified educational needs and demands of the society which are sequal to changing social, economic and other conditions on one hand and technological developments on the other. Distance education is innovative in the sense that it sets up its own norms, approaches and methodology which are different from the face-to-face system of education. It can be non-conformist and non-traditional in nature. It makes adequate provision to impart instruction to learners at a distance by incorporating a variety of means for didactic interaction between its students and the teaches and / or the institution. This paper is an attempt to provide the students of education honours some of the fundamental concepts under the purview of distance education.

Course Objectives

On completion of this course, students shall be able to

- explain the importance of Distance education in the present context
- describe the historical perspective of distance education
- elaborate the curricular process of Distance education
- understand various modes of student support services
- develop clear idea about different type of Distance education institutions

Unit – 1 Concept of Distance Education

- Aims and objectives of Distance Education
- Purposes and functions served by distance education.
- Theories of Distance Education
- Distance education in India : Historical perspective

Unit – 2 Curricular process in Distance Education

- Preparing and supplying study material

- ICT support for distance learning
- Personal contact programme in distance learning
- Assignments and projects in distance learning

Unit – 3 Development of distance learning material /self –

instructional material (SIM)

- Planning for self instructional material: Importance objectives and learning outcomes
- Preparation of the material
- Context, language and formal editing of self – instructional material
- Self –assessment for self – instructional material

Unit – 4 Distance learners

- Profit of distance learners
- Needs of distance learner
- Problems of distance learner
- Steps for facilitating distance learner
- Student support services

Unit – 5 Open and distance learning institutions:

- Open Universities and open schools : Meaning and Nature
- IGNOU and NIOS
- Other forms of distance education – correspondence courses, Radio TV education
- Virtual universities and Massive Open online courses.

References

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DSE-3 Practical

Preparation of Self instructional materials (SIM)

Each student is required to prepare a self instructional material (SIM) on any topic.

OR

Case study of Distance education study centre

Each student is required to conduct case study of distance education study centre (IGNOU, NIOS, SOU, etc.) and write a report.

Distribution of Marks

Record	-	20 marks
Viva voce	-	05 marks
Total	=	25 marks

DSE – 4 PROJECT

Each student is required to prepare a project on educational problem / issue and submit a report. The project shall be evaluated by an external and internal examination.

GENERIC ELECTIVE (G.E.) – 1

VISION OF EDUCATION IN INDIA:

ISSUES AND CONCERNS

INTRODUCTION

Education is essentially a normative endeavour, hence is intentional. It intends, rather deliberately, to socialize children into a value frame or normative structure. That is why history reveals that every education system, at different historical periods, had been guided by certain value concerns. In contemporary times, the education system in India derives its values from the Constitution of India. While socializing children education has to negotiate within the frame of Constitutional values. Indian Constitution envisioned a humane society based on freedom, equality and justice, and this led to evolving many institutions to realize the vision. In this regard, education has been considered as an agency of social transformation and classroom as the shaper of the envisioned destiny. Since teachers ought to play crucial role in realizing the vision, they are to be informed the Constitutional vision so as to develop normative perspectives regarding education and thereby emerging concerns and issues. This normative perspective a teacher holds in turn guides his/her actions and acquires a meaning to action.

Education being an operational area, every citizen perceives several issues related to it through personal experience. The student-teachers need to understand the main issues that touch their functioning as also situate themselves in context. Such an understanding on at least a few issues and concerns will equip student teachers to be ready for dealing with other issues and concerns in the field. This is very relevant as it may not be possible to bring under scrutiny all issues and concerns.

Since, concerns and issues cannot and should not be 'informed' like 'ready to cook facts', the course is designed in such a fashion that prospective teachers would be encouraged to come to terms with concerns and issues that would emerge out of their reasoned engagement with contemporary educational reality in the light of professed humanistic values,

Course Objectives

On completion of the course the students shall be able to:

- explain normative vision of Indian Society

- explain the view points of Indian thinkers on Education
- elaborate the contemporary issues like universalisation of school education, RTE Act -2009 and Rastriya Madhyamika sikshya Abhiyan
- identify importance of common school system

Unit – 1 Normative vision of Indian Education

- Normative orientation of Indian Education: A historical enquiry.
- Constitutional provisions on education that reflect national ideas : Democracy, Equity, Liberty, Secularism and social justice
- India as an evolving nation state : Vision, nature and salient feature – Democratic and secular polity, federal structure : Implications for educational system .
- Aims and purposes of education drawn from the normative vision.

Unit – 2 Vision of Indian Education : Four Indian thinkers

- An overview of salient features of the “Philosophy and Practice” of education advocated by these thinkers.
 - Rabindranath Tagore : Liberationist pedagogy
 - M.K. Gandhi : Basic Education
 - Jiddu Krishnamurty : Education for Individual and social Transformation
 - Sir Aurobindo : integral Education

Unit – 3 Concern for Equality in Education: Concerns and Issues

- Universalisation of school education
 - (i) Issues of (a) Universal enrollment
 - (b) Universal Retention
 - (c) Universal success
 - (ii) Issues of quality and equity

Unit – 4 Concern for Equality in Education

- Equality of Educational opportunity
- Prevailing nature and forms of inequality including Dominant and Minor groups and the related issues.
- Inequality in schooling : Public-private schools, Rural-urban schools, single teachers schools and many other forms of inequalities in school systems and the process leading to

disparity.

- Idea of common school system

Unit – 5 Education and Development – an interface

- Education for National Development : Education Commission (1964-66)
- Emerging trends in the interface between:
 - Political process and education
 - Economic Development and Education
 - Social cultural – changes in Education

References

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- World Bank, (2004). *Reaching The Child: An Integrated Approach to Child Development*. Oxford University Press, Delhi.

GE-1 Practical

Term paper

Each student is required to prepare a term paper on the educational ideas of any Indian Thinkers or on any contemporary issues on Education.

GENERIC ELECTIVE (G.E.) - 2

ASSESSMENT AND EVALUATION TECHNIQUES

INTRODUCTION

Assessment is considered to be one of the most crucial aspects of any teaching learning process, as it helps the teacher to record the growth of their students, planning for instructional strategy and most importantly helps to assess their own growth over the years. An effective method of assessment in the classroom helps to create conducive learning environment and a teacher must have to know different techniques of assessment which may improve students' learning. The key issues that involve in assessment are how to assess, when to assess, and what will be its implication on students learning. The paper outlines the above mentioned questions and different issues that involves in assessment.

Course Objectives

After completion of the course the students shall be able to:

- describe the role of assessment in education.
- differentiate measurement, assessment and evaluation.
- establish the relationship among measurement, assessment and evaluation.
- explain different forms of assessment that aid student learning.
- use wide range of assessment tools and techniques and construct these appropriately.
- classify educational objectives in terms of specific behavioral form
- prepare a good achievement test on any school subject

Unit – 1 The Measurement, Evaluation and Assessment Process

- Educational Testing and Assessment : Context, Issues and Trends.
- The Role of Measurement, Evaluation and Assessment in Teaching.
- Instructional Goals and objectives : Foundation for Assessment.
- Types of Assessment: Placement, Formative, Diagnostic and Summative.

Unit – 2 Classroom tests and Assessment

- Planning classroom tests and assessment
- Constructing objective test items: simple forms and multiple choice forms.
- Constructing Essay type questions: Form and uses; suggestions for scoring essay questions.

Unit – 3 Alternative Techniques of Assessment

- Observational Technique: Observation schedule, Anecdotal Records, Rating scales, Checklists
- Self – reporting Techniques: Interview, portfolio, questionnaire and inventories.
- Peer – appraisal: “Guess who” technique, sociometric technique.

Unit – 4 Processing and Reporting in Assessment

- Processing qualitative evaluation data: Content Analysis
- Considerations for reporting the performance
- Scheme of reporting: criterion – reformed and non reformed interpretation.
- Combining mark or grades over different subjects and reporting results of assessment to different users.

Unit – 5 Contemporary Trends in Assessment

- Marks vs Grading system
- Credit system
- Concept of Continuous and Comprehensive Evaluation (CCE)
- ☐ Computers in student evaluation

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- Linn, R.L. & Gronlund, N.E. (2000). *Measurement and Assessment in Teaching* London: Merrill Prentice Hall.

GE-2 Practical

Achievement Test Construction

Each student is required to construct 50 objective based objective type test items along with a blue print.

GENERIC ELECTIVE (G.E.) - 3

CONTEMPORARY PEDAGOGY

INTRODUCTION

It is important to note that 'education' is not synonymous with 'school'. It has always been the case that a range of activities that are educational in nature can, indeed should, occur outside the school, even from the earliest age given the educative role of the parents. The Delors Commission Report on education for the 21st century proposed 'learning to live together' as one of the four pillars of education. It advocates learning to live together by developing an understanding of other people and an appreciation of interdependence – carrying out joint projects and learning to manage conflicts in a spirit of respect for the values of pluralism, mutual understanding and peace (UNESCO, 1996). The policy context in India and around the globe is moving towards recognition of the educational value of newer forms of pedagogy in the 21st Century which will enable the children to develop critical reasoning power, justify their views, independent decision making power, expression of thoughts, and empathy to others' feelings. Recently NCERT (2005) and NCTE (2009) have changed their curriculum framework and accordingly revised their text books and teacher orientation process to empower the prospective teachers to cope up with emerging pedagogies and to promote higher order learning of the learners like, creative expression, authenticity, abstraction of ideas, and multiple thinking, etc. This paper is intended to give insight to the students on importance of pedagogy in education.

Course objectives

After completion of the course, the students shall be able to:

- explain the concept of pedagogy;
- differentiate pedagogy from other allied concepts;

Unit – 1 Meaning process and Aims of Education

- Concept of Teaching and learning
- Nature and characteristics of teaching
- Meaning and characteristics of learning

Unit – 2 The task of teaching

- Meaning and definition of teaching task
- Variables involved in teaching task
- Phases of teaching : Pre-active, interactive and post – active

- Levels of teaching : Memory, understanding and reflective

Lesson plan design : Herbartian steps, ICON Model and 5E Model

Unit – 3 Principles and maxims of teaching

- General principles of teaching
- Psychological principles of teaching
- Maxims of teaching

Unit – 4 Approaches and methods of teaching

- Inductive –Deductive
- Analytic and synthetic
- Problems solving and project method
- Shift in focus from teaching to learning – The constructivist approach.
- Activity based and child centered approach to teaching .

Unit – 5 Technology in teaching

- ICT tools and techniques facilitating teaching : www, internet applications in teaching and learning.
- Teaching Learning Material (TLM) : purpose, types and use
- Role of mass media in teaching learning.

GE-3 Practical

Preparation of Lesson

Plan

Each student is required to develop 05(Five) lesson plans on any school subject (Odia, English, History, Geography, Math, General Science) based on Herbartian approach / 5E Model / Icon design Model.

REFERENCES

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- Ryburn, W.M. (1955) Principles of Teaching, Geoffrey Cembidge, OUP
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- Sharma, R.A. (1986) Technology of Teaching, International Publishing House, Meerut.

GENERIC ELECTIVE (G.E.) – 4

EARLY CHILDHOOD CARE AND EDUCATION

INTRODUCTION

This paper will help the students to develop a sensitivity towards the needs and rights of children and will provide an understanding of their development. Students will also acquire skills that will help them to interact with children. Besides orienting the students towards a vocation in childcare, this course will orient the students towards organizing services for children. These services are crèches / day care centres and pre- schools for children upto six years of age. Students will enlighten themselves regarding how the pre-school education prepares the child for schooling which lies ahead. Pre-schools in our country are called by various names: anganwadi, balwadi, nursery school, kindergarden and play center.

Course Objectives

On completion of this course, students shall be able to:

- understand the importance of early childhood stage as the formative stage of growth and development
- explain the basic principles of curriculum formulation and their respective growth
- list out the activities for the different type of developmental needs of early child
- elaborate the learning materials needed for their appropriate developmental stage.

Unit – 1 Introduction to childcare and development

- Basic concepts in child development : Scope, growth and development, stages of development, areas of development, significance of study of child development.
- Principles of growth and development.

Unit – 2 Curriculum for ECCE

- Basic principles of the curricular framework
- Areas: cognitive development, language

development, social and emotional development, exploring, the environment, habit formation.

Unit – 3 Activities for physical development, movement and mobility.

- Activities for cognitive development
- Activities for language development
- Activities for social and emotional development
- Activities for exploring the environment
- Creative and aesthetic activities.

Unit – 4 Learning materials for ECCE

- Principles of selection of materials
- Type of materials
- Specific materials for different activities
- Preparation of teacher made materials
- Concept of toy bank

Unit – 5 Statutory framework for ECCE

- Constitutional framework
- National ECCE Policy, 2013
- Rights of the children

REFERENCES:

- Aggarawal J.C. and Gupta S. (2013) Early Childhood care and Education New Delhi: Shipra Publications
- Kaul Veneta (2009) Early child hood Education Programme, New Delhi, NCERT
- Soni Romila, Kapoor Rajendra & Vashishitha Krushna Kanta (2008) Early childhood Education an Introduction, New Delhi, NCERT
- NCF Curriculum Framework-2005

GE-4 Practical Observation of ECCE Centre

Each student is required to observe an ECCE centre and prepare a report.

SYLLABUS FOR B.A. (HONORS) ENGLISH
UNDER CHOICE BASED CREDIT SYSTEM OF
UTKAL UNIVERSITY, BHUBANESWAR

CBCS UG SYLLABUS Sem 1

Core 1

British Poetry and Drama: 14th to 17th Centuries

The paper seeks to introduce the students to British poetry and drama from the 14th to the 17th centuries. It offers the students an exploration of certain seminal texts that set the course of British poetry and plays.

British Poetry and Drama: 14th to 17th Centuries

Unit 1

A historical overview:

The period is remarkable in many ways: 14th century poetry evokes an unmistakable sense of “modern” and the spirit of Renaissance is marked in the Elizabethan Drama. The Reformation brings about sweeping changes in religion and politics. A period of expansion of horizons: intellectual and geographical.

Unit 2

Chaucer: *The Wife of Bath’s Tale* or *Sir Gawain and the Green Knight* (Part 1, lines 1-490)

Unit 3

Thomas Campion: “Follow Thy Fair Sun, Unhappy Shadow”, Sir Philip Sidney: “Leave , O Love, which reachest but to dust”, Edmund Waller: “Go, lovely Rose”, Ben Jonson: “Song to Celia”, William Shakespeare: Sonnets: “Shall I compare thee to a summer’s day?”, “When to the seasons of sweet silent thought”,

“Let me not to the marriage of true minds.”

Unit 4

William Shakespeare: *Macbeth* or *Twelfth*

Night. Unit 5

Marlowe: *The Jew of Malta* or Thomas Dekker: *The Shoemaker’s Holiday*.

Suggested Readings:

Weller series: *Macbeth&Twelfth Night*

Chaudhury & Goswami: *A History of English Literature: Traversing Centuries.*

Orient Blackswan

Harold Bloom: *Shakespeare: The Invention of the Human*

Sanders, Andrews: *The Short Oxford History of English Literature.* Oxford: OUP

CBCS UG SYLLABUS Sem 1

Core 2

British Poetry and Drama: 17th and 18th Century

The objective of this paper is to acquaint students with the Jacobean and the 18th century British poetry and drama, the first a period of the acid satire and the comedy of humours; and the second a period of supreme satiric poetry and the comedy of manners.

Unit 1

A historical overview

17th C: Period of the English Revolution (1640–60); the Jacobean period; metaphysical poetry; cavalier poetry; comedy of humours; masques and beast fables

18th C: Puritanism; Restoration; Neoclassicism; Heroic poetry; Restoration comedy; Comedy of manners

Unit 2

John Milton: *Lycidas* Or *L'Allegro* and *Il Penseroso*:

John Donne: *A Nocturnall upon S. Lucie's Day, Love's Deity*; and Andrew Marvel: *To His Coy Mistress*; *The Garden*; *A Dialogue between the Soul and the Body*

Unit 3

Ben Jonson: *Volpone* or *The Alchemist*:

Unit 4

Pope: *Ode on Solitude*, *Summer*, *Sound and Sense*, *The Dying Christian to his Soul*; and Robert Burns: *A Red Red Rose*, *A Fond Kiss*, *A Winter Night*, *My Heart's in the Highlands* **Unit 5**

Dryden : *All for Love* Or Congreve: *The Old Bachelor*

Suggested readings:

1. *A History of English Literature: Traversing the Centuries* - Chowdhury & Goswami, Orient Blackswan
2. *Lycidas* - John Milton (Eds. Paul & Thomas), Orient Blackswan
3. *The Norton Anthology of English Literature, Vol. B: The Sixteenth Century & The Early Seventeenth Century*
4. *The Norton Anthology of English Literature: The Restoration and the Eighteenth Century*

Core 3

British Literature: 18th Century

The objective of the paper is to acquaint the students with two remarkable forms of literature: Essay and novel. The period is also known for its shift of emphasis from reason to emotion.

Unit -1 A historical overview:

Restoration, Glorious Revolution, Neo-classicism, Enlightenment.

Unit-2 Joseph Addison : On Giving Advice

Reflections in Westminster Abbey

Defence and Happiness of Married

Life

Richard Steele: Recollections

On Long-Winded People

Unit-3 Daniel Defoe: *Robinson Crusoe*

Unit-4 Oliver Goldsmith: A City Night-Piece

On National

Prejudices Man in

Black

Samuel Johnson: Expectations of Pleasure frustrated

Domestic Greatness Unattainable

Mischiefs of Good Company

The Decay of Friendship

Unit-5 Thomas Gray: Elegy written in a country churchyard

Suggested Readings:

1. *A History of English Literature: Traversing the Centuries* - Chowdhury & Goswami, Orient Blackswan
2. *The Norton Anthology of English Literature: The Restoration and the Eighteenth Century*

CBCS UG SYLLABUS Sem 2

Core 4

Indian Writing in English

Though a late developer, Indian writing in English has been the fastest growing branch of Indian literature. It has delivered a rich and vibrant body of writing spanning all genres. As a 'twice born' form of writing, it partakes of both the native and alien perspectives and has an inherent inclination to be postcolonial. This paper attempts to introduce the students to the field of Indian writing in English through some representative works.

Unit – 1

A historical overview of Indian writing in English the key points of which are East India Company's arrival in India, Macaulay's 1835 Minutes of Education, India's first war of independence and the establishment of colleges to promote Western education. The focus in the literary setting will include Dean Mohammed's travel writing, said to be the first work of Indian English writing, Toru Dutt and Henry Derezio in poetry and Bankim Chandra Chatterjee and Lal Behari Day in prose fiction.

Unit 2

Crystallization: R.K. Narayan, *The Bachelor of Arts* or Mulk Raj Anand, *Untouchable*

Unit 3

Flowering: R. Parthasarathy (ed) *Ten Twentieth Century Indian Poets*. The following poets and their poems are to be studied. Nissim Ezekiel, "Good Bye Party for Miss Puspa T.S", "Poet, Lover, Bird Watcher", Arun Kolatkar, "The Boat Ride", "Jejuri", Kamala Das, "My Grandmother's House", "A Hot Noon in Malabar", Jayanta Mahapatra, "Indian Summer", "Grass", A. K. Ramanujan, "Looking for a Cousin on a Swing", "Small Scale Reflections on a Great House"

Unit 4

Performing: Mahesh Dattani, *The Final Solution* Or Manjula Padmanabhan, *The Harvest*

Unit 5

Maturation: Amitav Ghosh, *Shadow Lines* Or Kiran Desai, *The Inheritance of Loss*

Suggested Readings:

1. Arvind Krishna Mehrotra, *An illustrated History of Indian Literature in English*. Hyderabad: Orient BlackSwan, 2003.
2. R. Parthasarathy, *Ten Twentieth-Century Indian Poets*. Delhi: Oxford University Press, 1975.
3. Vinay Dharwadkar, "The Historical Formation of Indian-English Literature" in Sheldon Pollock (ed.) *Literary Cultures in History*. New Delhi: Oxford University Press,

CBCS UG SYLLABUS Sem 3

Core 5

British Romantic Literature

The paper aims at acquainting the students with the Romantic period and some of its representative writers. At the same time one of the chief objectives of the paper is to give the students with a broad idea of the social as well as historical contexts that shaped this unique upheaval.

UNIT I: A Historical Overview:

The period otherwise known as The Romantic Revival may also be called as The Age of Revolution as it owes its origin to the Epoch making French Revolution of 1789. The emphasis on individual liberty and unbridled desire free from the shackles of classicism made this period unique, intriguing and controversial.

UNIT-II

Robert Burns: "To a Muse" and "The Cotter's Saturday Night"

William Blake: "The Holy Thursday" and "London"

UNIT-III

William Wordsworth: "Tintern Abbey" and "Ode on Intimations of

Immortality" Samuel Taylor Coleridge: "Kubla Khan" and "Road to Xanadu"

UNIT-IV

John Keats "Ode on a Grecian Urn" and "Ode on Melancholy"

P.B. Shelley: "Ode to the West Wind" and "To a Skylark"

UNIT-V:

William Wordsworth: Preface to *Lyrical Ballads* (2nd Edition)

OR

P.B. Shelley: "A Defence of Poetry"

Suggested Reading:

The Routledge History of Literature in English

History of English Literature: Traversing the Centuries – Chowdhury & Goswami

Romantic Imagination by C. M. Bowra

Pelican Guide to English Literature. Vol.5. Edited by Boris Ford

CBCS UG SYLLABUS Sem 3

Core 6

19th Century British Literature

The paper seeks to expose students to the literature produced in Britain in the 19th century. The focus is mainly on prose (fictional and non-fictional) and criticism. The 19th century embraces three distinct periods of the Regency, Victorian and late Victorian.

Unit 1

A Historical Overview

The 19th century British literature though mainly famous for the Romantic Movement, was also a witness to major socio-political developments like industrialization, technological advancements and large scale mobilization of people from the rural to the urban centers. Much of these prosaic activities/developments needed the medium of prose for its articulation. Politically known as the Victorian period 19th century also witnessed what is known as the culture and society debate.

Unit 2 : Essays

Charles Lamb: "Old China"

William Hazlitt: "On Going Journey"

Leigh Hunt: "A Few Thoughts on sleep"

R L Stevenson: "Walking Tours"

Unit 3: Novels

Mary Shelly: *Frankenstein* OR R.L .Stevenson: *Dr. Jekyll and Mr. Hyde*

Unit 4: Novel

Jane Austen: *Pride and Prejudice* OR Elizabeth Gaskell: *Mary Barton*

Unit 5 : Criticism

Mathew Arnold: *Culture and Anarchy* (Chapter 1)

OR

William Hazlitt: "Lectures Chiefly on the Dramatic Literature of the Age of Elizabeth" from *Lectures on English Poets*

Suggested Reading:

- Chapter 4, 5 from a *Short Introduction to English Literature* by Jonathan Bate
- *The English Novel* by Terry Eagleton
- *The Cultural Critics* by Leslie Johnson

CBCS UG SYLLABUS Sem 3

Core 7

American Literature

This paper seeks to give the students a sense of how the great American themes of self-reliance, individualism, sin and redemption and multiculturalism were shaped through its rich and varied Literature.

Unit – I : Genesis and evolution, and the defining myths of American Literature—city on a hill, the frontier spirit, the American Dream, manifest destiny, e pluribus unum

Unit – II: Harriet Jacobs *Incidents in the Life of a Slave Girl* OR “Economy” , “Where I lived, and What I Lived for”, “Reading” and “Pond in Winter” from H D Thoreau’s *Walden*

Unit – III: *The Pioneers* – James Fennimore Cooper OR *Billy Budd*—Herman Melville

Unit – IV: (Any four poets to be studied)

- Walt Whitman: “when I heard the learn’d astronomer” and “A noiseless patient spider”
- Emily Dickinson: “Success is counted sweetest” and “‘Faith’ is fine invention”
- Robert Frost: “The road not taken” and “Fire and Ice”
- Wallace Stevens: “Thirteen ways of looking at a blackbird” and “Disillusionment of ten o’ clock”
- Adrienne Rich: “For the record” and “A valediction forbidding mourning”
- Susan Howe: “From the midnight” and “That this”
- Rita Dove: “Teach us to number our days” and “Exit”

Unit – V *Desire under the Elms*– Eugene O’Neill OR *The Dutchman*—Amiri Baraka

Suggested Reading

- Lewisohn, Ludwig. *The Story of American Literature*. The Modern Library, N. Y.
- Horton, Rod & Herbert W.. Edwards. *Backgrounds of American Literary Thought* . 3rd edition.
- Stewart, Randall(ed). *Living Masterpieces Of American Literature* . Brown University
- Norton Anthology of American Literature. 8th edition.

Core 8

British Literature: Early 20th Century

British Literature: Early 20th Century

This paper aims to familiarize the students with the new literature of Britain in the early decades of the 20th century. The course will mainly focus on the modernist canon, founded on Ezra Pound's idea of 'make it new', but will cover war poetry, social poetry of the 1930s and literary criticism.

Unit 1 (A historical overview): Highlights will include developments in society and economy, leading to a crisis in western society known as the First World War and the resultant change in the ways of knowing and perceiving. Such triggers for the modern consciousness as Marx's concept of class struggle, Freud's theory of the unconscious, Bergson's *duree*, Nietzsche's will to power and Einstein's theory of relativity are to be discussed.

Unit 2 T.S. Eliot "The Love Song of J. Alfred Prufrock"

W.B. Yeats	"Sailing to Byzantium"
Ezra Pound	"In a Station of the Metro"
T.E. Hulme	"Autumn"
Hilda Doolittle	"The Mysteries Remain"

Unit 3 War Poetry : Wilfred Owen "Dulce Et

Decorumest" Siegfried Sassoon "Suicide in the

Trenches"

Social Poetry: W.H Auden "The Unknown Citizen"

Stephen Spender "An Elementary Classroom in a

Slum" Louis MacNeice "Prayer before

Birth"

Unit 4 Virginia Woolf: *Mrs. Dalloway* OR

James Joyce: Stories from *Dubliners* ("The Sisters", "Evelyn", "An Encounter", "Clay", "Two Gallants")

Unit 5 Literary Criticism: Henry James, "The Art of Fiction" or T.S. Eliot, "Tradition and Individual Talent"

Suggested Readings:

1. *Pelican Guide to English Literature: The Modern Age*(ed.) Boris Ford
2. Jonathan Bate, *English Literature: A Very short Introduction*, Oxford Paperback
3. Peter Faulkner, *Modernism*. London: Methuen
4. Peter Childs, *Modernism, New Accents*. Routledge

CBCS UG SYLLABUS Sem 4

Core 9

European Classical Literature

The objective of this paper is to introduce the students to European Classical literature, commonly considered to have begun in the 8th century BC in ancient Greece and continued until the decline of the Roman Empire in the 5th century AD. The paper seeks to acquaint the students with the origins of the European canon.

Unit-1 A historical overview:

Classical Antiquity: ancient Greece, the rise and decline of the Roman Empire

Geographical space: cultural history of the Greco-Roman world centered on the Mediterranean Sea

Unit-2 Epic poetry:

Homer *Odyssey* (Book I) **OR**

Virgil *Aeneid* (Book I)

Unit-3 Tragedy:

Sophocles *Oedipus the King* **OR**

Aeschylus *Prometheus Bound*

Unit-4 Comedy:

Aristophanes *Frogs* **OR** Plautus *Asinaria*

Unit-5 Criticism:

Plato *Republic*, (Book 10) **OR**

Aristotle *Poetics*, Chapter 6,7,8 **OR**

Horace *Ars Poetica* or *Essay on Poetic Theory***OR**

Longinus *On the Sublime*, Chapter 7, 39

Suggested Readings:

Auerbach, Erich. *Mimesis: The Representation of Reality in Western Literature*. USA: Princeton University Press. 2013.

Beye, Charles Rowan. *Ancient Greek Literature and Society*. Ithaca, New York: Cornell University Press. 1987

*All the texts are available for access on Project Gutenberg <https://www.gutenberg.org/>

CBCS UG SYLLABUS Sem 4

Core 10

Women's writing

The course aims to acquaint the students with the complex and multifaceted literature by women of the world, reflecting the diversity of women's experiences and their varied cultural moorings. It embraces different forms of literature: poetry, fiction, short fiction, and critical writings. In certain respects, it interlocks concerns of women's literary history, women's studies and feminist criticism.

Unit 1: In Defence of A Literature of Their Own

Mary Wollstonecraft: "Introduction" from "A Vindication of the Rights of Women"

OR

Sarala Devi: "Narira Dabi" (The Claim of the Woman) Trans. S.Mohanty, Chapters 13 & 17 from the collective novel *Basanti* (The first two in *Lost Tradition: Early Women's Writing from Orissa* and the third in *Indian Literature No.*)

Unit 2: Desiring Self: Fiction by Women from the Centre

Charlotte Bronte: *Jane Eyre* OR Emily Bronte: *Wuthering Heights*

Jean Rhys: *Wide Sargasso Sea* OR Dorris Lessing: *The Grass is Singing*

Unit 3: Desiring and Dissenting Self: Fiction by Women from the Periphery

Krupabai Sathianadhan: *Saguna or Kamala*

OR

Prativa Ray: *Yajnaseni*

Unit 4: Tongues of Flame: Poetry by Women from Across the World

***Any Four Poets to be read**

Kamala Das "An Introduction" & "The

Sunshine Cat" Shanta Acharya

"Homecoming", "Shringara"

Eunice de Souza "Women in Dutch Painting" & "Remember

Medusa?" Tishani Doshi "Ode to the Walking Woman"

& "What the Body Knows"

Maya Angelou "Phenomenal Woman" & "I Know Why the Caged

Bird Sings" Sylvia Plath "Mirror" & "Barren Woman"

Margaret Atwood "This is a Photograph of me" & "The

Landlady" **Unit 5: Discoursing at Par: Literary Criticism**

by Women Virginia Woolf: "Chapter 1" from *A Room of*

One's Own

OR

Simone de Beauvoir: "Introduction" from *The Second Sex*

Web Resources:

- Virginia Woolf, *A Room of One's Own*
<https://victorianpersistence.files.wordpress.com/2013/03/a-room-of-ones-own-virginia-woolf-1929.pdf>
- Mary Wollstonecraft, *A Vindication of the Rights of Women*:
Introduction <http://pinkmonkey.com/dl/library1/vindicat.pdf>
- Maya Angelou's Poems
http://www.poemhunter.com/i/ebooks/pdf/maya_angelou_2012_6.pdf
- Sylvia Plath's Collected Poems
https://monoskop.org/images/2/27/Plath_Sylvia_The_Collected_Poems_1981.pdf
- Margaret Atwood's Poems
<http://www.poemhunter.com/margaret-atwood/poems/>
- Eunice de Souza, "Remember Medusa?" & "Women in Dutch Painting"
<http://www.poetrynook.com/poem/remember-medusa> ,
<http://www.gallerie.net/issue14/poetry1.html>
- Tishani Doshi's Poems

http://www.poemhunter.com/i/ebooks/pdf/tishani_doshi_2012_6.pdf

- Simone de Beauvoir *The Second Sex*
<http://burawoy.berkeley.edu/Reader.102/Beauvoir.I.pdf>

Suggested Reading:

- Toril Moi, *Sexual Textual Criticism*
- Elaine Showalter, *A Literature of Their Own*
- Sandra Gilbert and Susan Gubar, *The Mad Woman in the Attic*
- Gill Plain and Susan Sellers, *A History of Feminist Literary Criticism*. Cambridge University Press. 2007. Essays to be read: Helen Carr, "A History of Women's Writing" and Mary Eagleton, "Literary Representations of Women"
https://mthoyibi.files.wordpress.com/2011/09/05-history-of-feminist-literary-criticism_gill-plain-and-sus.pdf

CBCS UG SYLLABUS Sem 5

Core 11

Modern European Drama

The aim of this paper is to introduce the students to the best of experimental and innovative dramatic literature of modern Europe.

Unit 1: Politics, social change and the stage; text and performance; European Drama: Realism and Beyond; Tragedy and Heroism in Modern European Drama; The Theatre of the Absurd

Unit 2: Henrik Ibsen: *Ghosts* OR August Strindberg: *Miss Julie*

Unit 3: Luigi Pirandello: *Six Characters in Search of an Author* OR Heiner Müller: *Hamletmachine*

Unit 4: Eugene Ionesco: *Chairs* OR Jean Genet: *The Maids*

Unit 5: Samuel Beckett: *Waiting for Godot* OR Bertolt Brecht: *The Good Woman of Szechuan*

Web Resources

- *Hamletmachine*: <http://theater.augent.be/file/13>
- Pirandello: <http://www.eldritchpress.org/lp/six.htm>
- Ionesco: <http://www.kkworld.com/kitablar/ejen-ionesko-kergedan-eng.pdf>
- Genet: <http://web.mit.edu/jscheib/Public/phf/themaids.pdf>
- Ibsen: <http://www.gutenberg.org/files/8121/8121-h/8121-h.htm>
- Strindberg: <https://archive.org/details/missjulieotherpl00striiala>

Suggested Reading:

1. Constantin Stanislavski, *An Actor Prepares*, Chap. 8, 'Faith and the Sense of Truth', tr. Elizabeth Reynolds Hapgood (Harmondsworth: Penguin, 1967) sections 1,2, 7,8,9, pp. 121-5, 137-46.
2. Bertolt Brecht, 'The Street Scene', 'Theatre for Pleasure or Theatre for Instruction', and 'Dramatic Theatre vs Epic Theatre', in *Brecht on Theatre: The Development of an Aesthetic*, ed. And tr. John Willet (London: Methuen, 1992) pp.68-76, 121-8.
3. George Steiner, 'On Modern Tragedy', in *The Death of Tragedy* (London: Faber, 1995) pp. 303- 24.
4. Raymond Williams, "Tragedy and Revolution" in *Modern Tragedy*, Rvsd Ed (London: Verso, 1979) pp. 61-84.
5. Jean Genet, *Reflections on Theatre* (London: Faber & Faber) Chapter 2: "The Strange World Urb..." pp. 63-74.

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Core 12

Indian Classical Literature

This paper aims at creating awareness among the students of the rich and diverse literary culture of ancient India.

Unit 1: Vedic Literature

1. *Samjnana Sukta* Rig Veda X.19
2. *Sivasankalpa Sukta* Yajur Veda XXX.I.6
3. *Purusha Sukta* Yajur Veda XV.XXXI. 1-16

References: *The New Vedic Selection Vol 1*, Telang and Chaubey, Bharatiya Vidya Prakashan, New Delhi

Unit 2: Selections from Epic Lit.

Vyasa 'The Dicing' and 'The Sequel to Dicing,' 'The Book of the Assembly Hall', 'The Temptation of Karna', Book V 'The Book of Effort', in *The Mahabharata*: tr. And ed. J.A.B. van Buitenen (Chicago: Brill, 1975) pp. 106-69 OR 'Ayodhya Kanda' (Book II), 1st Canto—The Ramayana of Valmiki. Gita Press Edition.

Unit 3: Sanskrit Drama

Kalidasa, *Abhijnanasakuntalam*, Act IV, tr. M.R Kale, Motilal Banarasi Dass, New Delhi OR Bhavabhuti's *Rama's Last Act (Uttararamacharita)* tr. Sheldon Pollock (New York: Clay Sanskrit Library, 2007)

Unit 4: Sanskrit Drama

Mrcchakatika by Sudraka, Act I, tr. M.M. Ramachandra Kale (New Delhi: Motilal Banarasi Dass, 1962)

Unit 5: Aesthetics and Maxims

- Bharata's *Natyasastra*, Chapter VI on Rasa theory References- English Translation by M.M. Ghosh, Asiatic Society, Kolkata, 1950
- *Sahitya Darpana* of Vishvanatha Kaviraja Chaps-I & II References- English Translation by P.V. Kane, Motilal Banarsi Dass, N Delhi
- Nitisataka of Bhartrhari 20 verses from the beginning References- The Satakatrava edited by D.D. Kosambi, Published in Anandashrama Series, 127, Poona, 1945. Also English Translation published from Ramakrishna Mission, Kolkata

Suggested Reading:

- Kalidasa. Critical Edition, Sahitya Akademi
- B.B Choubey, New Vedic Selection, Vol 1, Bharatiya Vidya Prakashan, New Delhi
- H.H.Wilson (Tr.)- *Rig Veda*
- Bharata, *Natyashastra*, tr. Manomohan Ghosh, vol.I, 2 nd edn (Calcutta: Granthalaya, 1967) chap. 6: 'Sentiments', pp. 100–18.
- J.A.B.Van Buitenen, 'Dharma and Moksa', in Roy W. Perrett, ed., *Indian Philosophy*, vol. V, *Theory of Value: A Collection of Readings* (New York: Garland, 2000) pp.33–40.
- Vinay Dharwadkar, 'Orientalism and the Study of Indian Literature', in *Orientalism and the Postcolonial Predicament: Perspectives on South Asia*, ed. Carol A. Breckenridge and Peter van der Veer (New Delhi: OUP, 1994) pp. 158–95
- *Universals of Poetics* by Haldhar Panda

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Core 13

Postcolonial Literature

This paper seeks to introduce the students to postcolonial literature—a body of literature that responds to the discourses of European colonialism and empire in Asia, Africa, Middle East, the Pacific and elsewhere. By focusing on representative texts situated in a variety of locations, the paper aims to provide the students with the opportunity to think through and understand the layered response – compliance, resistance, mimicry and subversion - that colonial power has provoked from the nations in their search for a literature of their own.

Unit 1: Concept

- Definition and characteristics: Resistant descriptions, appropriation of the colonizer's language, reworking colonial art forms & etc.
- Scope and Concerns: Reclaiming spaces and places, asserting cultural integrity, revising history

Prescribed Reading:

Achebe, Chinua "An image of Africa: Racism in Joseph Conrad's *Heart of Darkness*," *Research in*

Unit 2: Indian

Raja Rao: *Kanthapura* OR R K Narayan: *The English Teacher*

Unit 3: Caribbean and African

V S Naipaul: *The Mimic Men* OR Chinua Achebe: *No Longer at Ease*

Unit 4: South African

Nadine Gordimer: *July's People* OR J M Coetzee: *Life & Times of Michael K*

Unit 5: Criticism

Chinua Achebe: "English and the African Writer" and
Ngugi wa Thiong'o: "The Quest for Relevance" from *Decolonising the Mind: The Politics of Language in African Literature*

Web Resources

- Achebe, Chinua "An image of Africa: Racism in Joseph Conrad's Heart of Darkness," *Research in African Literatures, Vol. 9, No.1, Special Issue on Literary Criticism. (Spring, 1978), pp. 1-15.* <http://english.gradstudies.yorku.ca/files/2013/06/achebe-chinua.pdf>
- Achebe, Chinua: "English and the African Writer" <https://mrvenglish.wikispaces.com/file/view/English+and+the+African+Writer.pdf>
- Thiong'o, Ngugi Wa. "The Quest for Relevance" from *Decolonising the Mind: The Politics of Language in African Literature* https://www.humanities.uci.edu/critical/pdf/Wellek_Readings_Ngugi_Quest_for_Relevance.pdf
- Ashcroft, Bill, Gareth Griffiths, Helen Tiffin. *Post-Colonial Studies: The Key Concepts*. New York: Routledge. 2007.

Suggested Reading:

- Ashcroft, Bill, Gareth Griffiths, Helen Tiffin. "Introduction", *The Empire Writes Back: Theory and Practice in Post-Colonial Literature*. London, New York: Routledge, 2nd edition, 2002.
- Bhabha, Homi K. *The Location of Culture*. Noida: Atlantic Books. 2012.
- Gandhi, Leela. *Postcolonial Theory: An Introduction*. OUP. 1998.
- Said, Edward. *Orientalism*. India: Penguin. 2001.
- Spivak, Gayatri Chakraborty. *Can the Subaltern Speak?*. UK: Macmillan.1998 <http://planetarities.web.unc.edu/files/2015/01/spivak-subaltern-speak.pdf>

Core 14

Popular Literature

This paper seeks to introduce the students to genres such as romance, detective fiction, campus fiction, fantasy/mythology, which have a “mass” appeal, and can help us gain a better understanding of the popular roots of literature.

Unit 1: Introduction to the concept

- What is popular literature?
- Debate between popular and high cultures ('high brow' v/s 'low brow')
- What is Genre fiction?
- Debate between genre fiction and literary

fiction

Essays for discussion:

- Lev Grossman: “Literary Revolution in the Supermarket Aisle: Genre Fiction is Disruptive Technology”
<http://entertainment.time.com/2012/05/23/genre-fiction-is-disruptive-technology/>
- Arthur Krystal: “Easy Writers: Guilty pleasures without guilt”
<http://www.newyorker.com/magazine/2012/05/28/easy-writers>
- Joshua Rothman: “A Better Way to Think About the Genre Debate”
<http://www.newyorker.com/books/joshua-rothman/better-way-think-genre-debate>

Stephen Marche: How Genre Fiction Became More Important than Literary Fiction”

<http://www.esquire.com/entertainment/books/a33599/genre-fiction-vs-literary-fiction/>Midterm:

Unit 2: Detective Fiction

Sherlock Holmes: *The Hound of the Baskervilles* OR Agatha Christie: *Murder on the Orient Express*

Unit 3: Romance

Shobha De: *Socialite Evenings* OR Nicholas Sparks: *The Notebook*

Unit 4: Campus Fiction

Chetan Bhagat: *Five Point Someone* OR David Lodge: *Small World: An Academic Romance*

Unit 5: Rewriting Mythology

Amish Tripathi: *The Immortals of Meluha* OR Anuja Chandramouli: *Arjuna: Saga of a Pandava Warrior-Prince*

Suggested Reading

- Leslie Fiedler, *What was Literature? Class, Culture and Mass Society*
- Leo Lowenthal, *Literature, Popular Culture and Society*
- *Popular Fiction: Essays in Literature and History* by Peter Humm, Paul Stigant, Peter Widdowson

CBCS UG SYLLABUS SEM 5

Discipline Specific Course

1. Literary Theory

Objective

The development of theory in the last half-century or more is a fact of critical importance in the academic study of literature. Far from being seen as a parasite on the text, theory has been seen as a discourse that provides the conceptual framework for literature. This paper aims to give the students a firm grounding in a major methodological aspect of literary studies known as theory.

Starred texts are to be taught. Questions with alternatives are also to be set from these

texts. Unit 1: Overview

- Crisis in literary criticism and the search for a method
- Rise of theory
- What does it mean to theorise?

Unit 2: New Criticism and Formalism: with an emphasis on the main critical concepts of NC such as paradox, irony, tension, intentional and affective fallacy, heresy of paraphrase and of Formalism such as ostranenie, literariness, foregrounding, dominant and deviant

- *Cleanth Brooks, "The Language of Paradox" Or W.K. Wimsatt Jr. and Monroe Beardsley, "The Intentional Fallacy"
- *Viktor Shklovsky, "Art as Device" Or Roman Jakobson, "Linguistics and Poetics"

Unit 3: Structuralism and Poststructuralism: with an emphasis on the main critical concepts of Structuralism such as binary opposition, synchrony and diachrony, syntagm and paradigm and of Poststructuralism such as collapse of the binary, difference, mise-en-abym, erasure

- *Gerard Genette, "Introduction" to *Narrative Discourse*
(https://archive.org/stream/NarrativeDiscourseAnEssayInMethod/NarrativeDiscourse-AnEssayInMethod_djvu.txt) Or Roland Barthes, "Face of Garbo" and "French Fries" (from *Mythologies*)
- Jacques Derrida, "On the Idea of the Supplement" (from *Of Grammatology*) Or Michel Foucault, "What is an Author?"
(<http://artsites.ucsc.edu/faculty/Gustafson/FILM%20162.W10/readings/foucault.author.pdf>) (Either of the two essays can be taught depending on availability)

Unit 4: Marxism and New Historicism: with an emphasis on main critical concepts of Marxism

such as base, superstructure, ideology, commodification, determination and of New Historicism
such as power, resistance, high-low dialectic

- *Louis Althusser, "Letters on Art" (from *Lenin and Philosophy and Other Essays*) Or Georg Lukacs, "On Reification" (from *History and Class Consciousness*)
- Raymond Williams, "In Memory of Lucien Goldmann" Or Stephen Greenblatt, "Learning to Curse" (Either of the two essays can be taught depending on availability)

Unit 5: Eco-criticism and Eco-feminism: with an emphasis on main critical concepts of Ecology as environment, balance, food chain and of Eco-feminism as body and its colonisation, patriarchy, woman as a creative principle in harmony with nature

- *Rachel Carson, "A Fable for Tomorrow" and "The Obligation to Endure" (from *Silent Spring* (http://library.uniteddiversity.coop/More_Books_and_Reports/Silent_Spring-Rachel_Carson-1962.pdf))
- *Mack-Canty, Colleen, "Third-Wave Feminism and the Need to Reweave the Nature/Culture Duality." *NWSA Journal* 16, no. 3 (2004): 154-179 (from [JSTOR Arts & Sciences VI](#))

Suggested Reading:

Terry Eagleton, *Literary Theory: An Introduction for Foreign Students*

David Robey and Anne Jefferson, *Modern Literary*

Theory Jonathan Culler, *Literary Theory: A Very Short*

Introduction Richard Barry, *Beginning Theory*

Tony Bennett, *Formalism and Marxism*

Terence Hawkes, *Structuralism and Semiotics*

Christopher Norris, *Deconstruction: Theory and*

Practice Veenser H. Aram (ed), *The New Historicism*

Reader

Greg Gerrard, *Eco-Criticism*

Discipline Specific Course

2: Reading World Literature

This paper proposes to introduce the students to the study of world literature through a representative selection of texts from around the world. The idea is to read beyond the classic European canon by including defining literary texts from other major regions/countries—except the United States of America—written in languages other than English, but made available to the readers in English translation.

Unit 1: Concept

- The idea of world literature: Scope and definition
- Uses of reading world literature

Unit 2: European

Albert Camus *The Outsider*

OR

Fyodor Dostoevsky *Notes from Underground*

Unit 3: Caribbean and African

V S Naipaul *In a Free State*

OR

Chimamanda Ngozi Adichie *Purple Hibiscus*

Unit 4: Canadian Short Fiction

Margaret Atwood *Stone Mattress* & *Pretend Blood*

OR

Alice Munro *The Bear Came Over the Mountain* & *Face*

Unit 5: Latin American Poetry

Pablo Neruda “Death Alone”, “Furies and Suffering”, “There’s no Forgetting”, “Memory”

OR

Octavio Paz “from San Ildefonso Nocturne”, “Between Going and Staying the Day
Wavers”, “Humayun’s Tomb”, “Motion”

Web Resources:

- The Complete Stories by Franz Kafka
http://www.vanderbilt.edu/olli/class-materials/Franz_Kafka.pdf
- What is world Literature? (Introduction) David Damrosch
<http://press.princeton.edu/chapters/i7545.html>
- Tagore’s comparative world literature
https://www.academia.edu/4630860/Rabindranath_Tagores_Comparative_World_Literature

- Dostoevsky's *Notes from Underground* <http://www.gutenberg.org/files/600/600-h/600-h.htm>
- Margaret Atwood's *Stone Mattress* <http://www.newyorker.com/magazine/2011/12/19/stone-mattress>
- Margaret Atwood's *Pretend Blood* <http://www.independent.co.uk/arts-entertainment/books/features/first-lives-club-pretend-blood-a-short-story-by-margaret-atwood-1779529.html>
- Alice Munro's short Stories <http://www.newyorker.com/magazine/2013/10/21/the-bear-came-over-the-mountain-2>, <http://www.newyorker.com/magazine/2008/09/08/face>
- Poems of Octavio Paz http://www.poetrysoup.com/famous/poems/best/octavio_paz

Suggested Reading:

- *Weltliteratur*: John Wolfgang von Goethe in *Essays on Art and Literature* Goethe : The Collected Works Vol.3
- Rabindranath Tagore "World Literature": *Selected Writings On Literature and Language*: Rabindranath Tagore Ed. Sisir Kumar Das and Sukanta Chaudhuri Damrosch
- Goethe's "World Literature Paradigm and Contemporary Cultural Globalization" by John Pizer "Something Will Happen to You Who Read": Adrienne Rich, Eavan Boland' by Victor Luftig .JSTOR iv. *Comparative Literature* University of Oregon.
- David Damrosch, *What is World Literature?* Princeton University Press
- "WLT and the Essay" *World Literature Today* Vol. 74, No. 3, 2000. JSTOR Irish University Review, Vol.23 Spring 1, Spring-Summer.

CBCS UG SYLLABUS SEM 6

Discipline Specific Course

3: Research Methodology

Research methodology is a discipline specific course pitched at a higher level than the generic academic preparatory courses. Research is at the core of every university course starting from the UG to the PhD level. This course is designed to develop the fundamentals of research from creating a questioning mechanism in the students' minds leading up to writing research papers and dissertations. Students learn the methodological issues imperative for conducting research and for research documentation. The course also aims to train students in the essentials of academic and research writing skills.

Unit 1 Research and the Initial Issues

- Research as systematic investigation
- Searching for and locating research questions; Finding the general background about research problem/question: review of existing literature and applicable theories

- Refining the research problem/question; formulating its rationale and objectives
- Writing a research synopsis

Unit 2 Literature review

- Selecting review areas based on the research objectives
- Primary, secondary and tertiary sources, and related theory/s (sources: library, databases, online sources, previous research, archives, media, social/psychological/political/educational contexts, and such others)
- Gathering, reading and analysing literature and related theory
- Writing the review with implications for the research question selected

Unit 3 Hypotheses and formulation of research design

- Formulating hypotheses based on research objectives
- Formulation of research design: qualitative, quantitative, combinatory; steps in research design Theory application
- Data collection tools: surveys, questionnaires, interviews, observation checklists, review checklists, comparison tools, text analysis tools
- Data analysis and interpretation

Unit 4 Results and documentation

- Preparing tables, charts, and graphs to present data; Collating the findings
- Testing hypotheses; Generalisation of results
- Writing a dissertation; MLA/APA citation: in-text and works cited pages
- Plagiarism and related problems

Unit 5 Practical (for Internal Assessment)

Students will write i. literature review of 1000 words on a research question and ii. a book review of 500 words.

Texts prescribed

- i. K Samantray, *Academic and Research Writing*. Orient Blackswan (2015)
- ii. Kothari & Garg, *Research Methodology*. New Age Publishers
- iii. Deepak Chawla & Neena Sondhi. *Research methodology: Concepts & Cases*. Vikas Publishing

Generic Elective

Academic Writing and Composition

This is a generic academic preparatory course designed to develop the students' writing skills from basic to academic and research purposes. The aim of this course is to prepare students to succeed in complex academic tasks in writing along with an improvement in vocabulary and syntax.

Unit 1 Instruments of writing I

- Vocabulary development: synonyms and antonyms; words used as different parts of speech; vocabulary typical to 'science' and 'commerce'
- Collocation; effective use of vocabulary in context

Unit 2 Instruments of writing II

- Syntax: word order; subject-predicate; subject-verb agreement; simple, complex, compound, compound-complex sentences; structure and uses of active and passive sentences
- Common errors in Indian writing

Unit 3 Academic writing I

- What is academic writing?
- The formal academic writing process: the 'what' and the 'how' of writing; use of cohesive and transitional devices in short and extended pieces of writing

Unit 4 Academic writing II

- Paragraph writing: topic sentence, appropriate paragraph development ; expository, descriptive, narrative and argumentative paragraphs
- Extended pieces of writing: process development using comparison-contrast, cause and effect, argumentation, and persuasion

Unit 5 Project writing: (writing projects)

- What's a Project: reading-based, field work-based project : how to pick a topic for the project; background reading
- Structure of a Project: Title, aim of the project (a short statement), other objectives if any, significance of the Project : why is the project being undertaken, sources/books to be consulted for the study, method: Is it quantitative (field work) or qualitative (text-related), analysis/interpretation, findings, conclusion

Texts prescribed

1. K Samantray, *Academic and Research Writing: A Course for Undergraduates*, Orient BlackSwan
2. Leo Jones (1998) *Cambridge Advanced English: Student's Book* New Delhi: CUP

CBCS UG SYLLABUS SEM 2-GE 2

Generic Elective

Modern Indian Literature

The paper aims at introducing students to the richness and diversity of modern Indian literature written in many languages and translated into English.

Unit-I Historical Overview

Background, definition of the subject and historical perspectives will be covered.

Unit-II The Modern Indian Novel

Fakir Mohan Senapati: *Six Acres and a Third* Or U. R. Ananthamurthy: *Sanskara*

Unit-III The Modern Indian Short Story

Selected stories by Fakir Mohan Senapati: "Rebati", Rabindra Nath Tagore: "Post Master" Premchand: "The Shroud", Ishmat Chughtai: "Lihaaf"

Unit-IV Modern Indian Life Writing

Excerpts from M.K. Gandhi's *Story of My Experiments with Truth* (First two chapters), Amrita Pritam's *The Revenue Stamp* (first two chapters), *Autobiography* by Rajendra Prasad (chapter six & seven)

Unit-V The Modern Indian Essay

- A. K. Ramanujan "Is there an Indian Way of Thinking? An Informal Essay" *Collected Essays*, OUP, 2013
- "Decolonising the Indian Mind" by Namwar Singh. Tr. Harish Trivedi *Indian Literature*, Vol. 35, No. 5 (151) (Sept.-Oct., 1992), pp. 145-156
- G. N. Devy's introduction to *After Amnesia*, pp. 1-5, *The G. N. Devy Reader*, Orient BlackSwan, 2009.

Suggested Readings:

1. Sisir Kumar Das, *History of Indian Literature 1910–1956, Triumph and Tragedy*, Sahitya Akademi, New Delhi, 2000
2. Amit Chaudhuri, *The Vintage Book of Modern Indian Literature*, 2004
3. M.K. Naik, *A History of Indian English Literature*, Sahitya Akademi, 2004

Generic Elective

Language, Literature and Culture

This is a broad-based course that aims to encourage students to be knowledgeable and inquiring into the nature of language, nature of literature and the role of culture in both. The course introduces students to how language is special for humans, and how literature and culture make human beings caring. There is a strong emphasis here on encouraging students to develop intercultural understanding, open-mindedness, and the attitudes necessary for them to respect and evaluate a range of points of view.

Unit 1 Language

- Nature of language
- Functions of language : transactional, informative, interactional

(use these terms under each category above: Instrumental language, Regulatory Language, Interactional Language, Personal Language, imaginative Language, Heuristic Language, Informative Language)

Unit 2 Language and Literature 1

- Literature and its language
- Literary terms, Figures of speech used in literature: simile, metaphor, metonymy, irony, paradox, synecdoche, oxymoron

Unit 3 Language and Literature 2

- Language used in poetry, fiction and non-fiction
- Text analysis

Unit 4 Language and culture 1

- Culture, its implications and interpretations
- Transmission of culture through language: Culture and society

Unit 5 Language and Culture 2

- Intercultural and cross-cultural communications
- Analysis and applications

Suggested Reading

- Kalyani Samantray, *Pragmatics* (E-Pathshala)
- Bibhudendra Narayan Patnaik & Kalyani Samantray, *Cross-Cultural and Intercultural Communications* ((E-Pathshala)
- Brown, G & Yule, G. *Discourse Analysis*. CUP
- **Scaglia, B (ed.)** *Language, Understood: Examining the Linguistics of Discourse Analysis and Studies*. Webster's Digital Service.
- **Culture and language**

- <http://www2.lib.nifs-k.ac.jp/HPBU/annals/an46/46-11.pdf>
- <http://barthimeous.blogspot.in/2011/03/relationship-between-culture-and.html>
- *Companion to Literary Forms* by Padmaja Ashok, Orient BlackSwan.2015
- *Literature and Language* (ed.) Loveleen Mohan, Randep Rana, Jaibir S. Hooda. Orient BlackSwan.

CBCS UG SYLLABUS SEM 4-GE 4

Generic Elective

Language and Linguistics

Unit 1:Language and Human Language

- Nature and features of Human language ; language and human communication; differences from other forms of communications
- Artificial intelligence and human language

Unit 2 :Linguistics and Language 1

- What is linguistics; development in the history of linguistic studies; contribution of linguistics to other areas of human inquiry
- Linguistics for jobs

Unit 3 :Linguistics and Language 2

- Phonetics and accuracy in pronunciation
- Fluency and contextual speaking

Unit 4 :Linguistics and Language 3

- Morphology and Nature of words
- Word formation processes

Unit 5: Linguistics and Language 4

- Nature of sentences and connected texts; syntax and discourse
- Language and meaning: semantics

Recommended reading

- i. *A Course in Linguistics*. Tarni Prasad. PHI
- ii. *Linguistics: A very short introduction*. P H

Mathews.OUP

Skill Enhancement Compulsory Course

2. SEC 1 (English Communication)
3. SEC 2
 - A. Soft Skills OR
 - B. Translation and Principles of Translation

SEC 1: Skill Enhancement Compulsory Course

for Arts Semester 1

Paper: 1 Marks: 100 Credits: 04

The purpose of this course is twofold: to train students in communication skills and to help develop in them a facility for communicative English.

Since language is which binds society together and serves as a crucial medium of interaction as well as interchange of ideas and thoughts, it is important that students develop a capacity for clear and effective communication, spoken and written, at a relatively young age. The need has become even more urgent in an era of globalization and the increasing social and cultural diversity that comes with it.

English, being a global language par excellence, it is important that any course in communication is tied to an English proficiency programme. The present course will seek to create academic and social English competencies in speaking, listening, arguing, enunciation, reading, writing and interpreting, grammar and usage, vocabulary, syntax, and rhetorical patterns.

Students, at the end of the course, should be able to unlock the communicator in them by using English appropriately and with confidence for further studies or in professional spheres where English is the indispensable tool of communication.

Unit-1:

[20]

Introduction

1. What is communication?
2. Types of communication
 - Horizontal
 - Vertical
 - Interpersonal
 - Grapevine

3. Uses of Communication

Prescribed Reading: Chapter 1 *Applying Communication Theory for Professional Life: A Practical Introduction* by Dainton and Zellely

http://tsime.uz.ac.zw/claroline/backends/download.php?url=L0ludHJvX3RvX2NvbW11bmljYXRpb25fVGhlb3J5L_nBkZg%3D%3D&cidReset=true&cidReq=MBA563

Unit-2: Language of Communication [20]

1. Verbal: spoken and written

2. Non-verbal

- Proxemics
- Kinesics
- Haptics
- Chronemics
- Paralinguistics

3. Barriers to communication

4. Communicative English

Unit-3: Reading Comprehension [20]

- Locate and remember the most important points in the reading
- Interpret and evaluate events, ideas, and information
- Read “between the lines” to understand underlying meanings
- Connect information to what they already know

Unit-4: Writing [20]

- Expanding an Idea
- Note Making
- Information Transfer
- Writing a Memo
- Writing Formal Email
- Writing a Business Letter
- Letters to the Editor
- CV & Resume Writing
- Covering Letter
- Report Writing
- News Story
- Interviewing for news papers

(The above-mentioned writing activities are covered in the prescribed textbook *Vistas and Visions*)

Unit 5: Language functions in listening and conversation [20]

- Discussion on a given topic in pairs
- Speaking on a given topic individually
- Group Discussion
- Interview
- Dialogue

(Practice to be given using the set pieces from the prescribed textbook *Vistas and Visions*)

Grammar and Usage

1. Phrasal Verbs
2. Collocation
3. Using Modals
4. Use of Prepositions
5. Common Errors in English Usage

(The above-mentioned grammar items are covered in the textbook *Vistas and Visions*)

Grammar questions must be set in contexts; not as isolated sentences as used for practice in the prescribed textbook.

Book Prescribed:

Vistas and Visions: An Anthology of Prose and Poetry. (Ed.) Kalyani Samantray, Himansu S. Mohapatra, Jatindra K. Nayak, Gopa Ranjan Mishra, Arun Kumar Mohanty. OBS

Texts to be

studied Prose

- Decoding Newspapers
- Pleasures of Ignorance
- Playing the English Gentleman
- Lifestyle English
- A Cup of Tea

Poetry

- Last Sonnet
- Sonnet 46 (Shakespeare)
- Pigeons
- Miracles

All grammar and writing activities in the textbook *Vistas and Visions*

Recommended Reading:

Fluency in English – Part II, OUP, 2006

Business English, Pearson, 2008

Communicative English. E. Suresh Kumar and P. Sreehari

Break Free: Unlock the Powerful Communicator in You. Rajesh, V. Rupa, 2015

Soft Skills Shalini Verma, 2009.

Language, Literature and Creativity, Orient BlackSwan, 2013

SEC 1

Skill Enhancement Compulsory Course for Science

Semester 1

Paper: 1 Marks: 100 Credits: 04

The purpose of this course is twofold: to train students in communication skills and to help develop in them a facility for communicative English.

Since language it is which binds society together and serves as a crucial medium of interaction as well as interchange of ideas and thoughts, it is important that students develop a capacity for clear and effective communication, spoken and written, at a relatively young age. The need has become even more urgent in an era of globalization and the increasing social and cultural diversity that comes with it.

English, being a global language par excellence, it is important that any course in communication is tied to an English proficiency programme. The present course will seek to create academic and social English competencies in speaking, listening, arguing, enunciation, reading, writing and interpreting, grammar and usage, vocabulary, syntax, and rhetorical patterns.

Students, at the end of the course, should be able to unlock the communicator in them by using English appropriately and with confidence for further studies or in professional spheres where English is the indispensable tool of communication.

Unit 1

[20]

Introduction

1. What is communication?
2. Types of communication
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 - Vertical
 - Interpersonal
 - Grapevine
3. Uses of Communication

Prescribed Reading: Chapter 1 *Applying Communication Theory for Professional Life: A Practical Introduction* by Dainton and Zellely

<http://tsime.uz.ac.zw/claroline/backends/download.php?url=L0ludHJvX3RvX2NvbW11bmljYXR>

Unit-2

[20]

Language of Communication

1. Verbal: spoken and written
2. Non-verbal
 - Proxemics
 - Kinesics
 - Haptics
 - Chronemics
 - Paralinguistics
3. Barriers to communication
4. Communicative English

Unit-3

[20]

Reading Comprehension

- Locate and remember the most important points in the reading
- Interpret and evaluate events, ideas, and information
- Read “between the lines” to understand underlying meanings
- Connect information to what they already know

Unit 4

[20]

Writing

- Expanding an Idea
- Note Making
- Information Transfer
- Writing a Memo
- Writing Formal Email
- Writing a Business Letter
- Letters to the Editor
- CV & Resume Writing
- Covering Letter
- Report Writing
- News Story
- Interviewing for news papers

(The above-mentioned writing activities are covered in the prescribed textbook *Vistas and Visions*)

Unit 5: Language functions in listening and conversation

[20]

1. Discussion on a given topic in pairs
2. Speaking on a given topic individually

3. Group Discussion
4. Interview
5. Dialogue

(Practice to be given using the set pieces from the prescribed textbook *Vistas and Visions*)

Grammar and Usage

1. Phrasal Verbs
2. Collocation
3. Using Modals
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5. Common Errors in English Usage

(The above-mentioned grammar items are covered in the textbook *Vistas and Visions*)

Book Prescribed:

Vistas and Visions: An Anthology of Prose and Poetry. (Ed.) Kalyani Samantray, Himansu S. Mohapatra, Jatindra K. Nayak, Gopa Ranjan Mishra, Arun Kumar Mohanty. OBS

Texts to be

studied Prose

- The Gold Frame
- Lifestyle English
- Need for Excellence
- Ecology and Community
- My Lost Dollar

Poetry

- The Darkling Thrush
- The Felling of the Banyan Tree
- Another Woman
- Meeting Poets

All grammar and writing activities in the textbook *Vistas and Visions*

Recommended Reading:

Fluency in English – Part II, OUP, 2006

Business English, Pearson, 2008

Communicative English. E. Suresh Kumar and P. Sreehari

Break Free: Unlock the Powerful Communicator in You. Rajesh, V. Rupa, 2015

Soft Skills Shalini Verma, 2009.

Language, Literature and Creativity, Orient BlackSwan, 2013

Language through Literature. (forthcoming) ed. Gauri Mishra, Dr. Ranajan Kaul, Dr. Brati Biswas

SEC 1

Skill Enhancement Compulsory Course for

Commerce Semester 1

Paper: 1 Marks: 100 Credits: 04

The purpose of this course is twofold: to train students in communication skills and to help develop in them a facility for communicative English.

Since language is which binds society together and serves as a crucial medium of interaction as well as interchange of ideas and thoughts, it is important that students develop a capacity for clear and effective communication, spoken and written, at a relatively young age. The need has become even more urgent in an era of globalization and the increasing social and cultural diversity that comes with it.

English, being a global language par excellence, it is important that any course in communication is tied to an English proficiency programme. The present course will seek to create academic and social English competencies in speaking, listening, arguing, enunciation, reading, writing and interpreting, grammar and usage, vocabulary, syntax, and rhetorical patterns.

Students, at the end of the course, should be able to unlock the communicator in them by using English appropriately and with confidence for further studies or in professional spheres where English is the indispensable tool of communication.

Unit 1

[20]

Introduction

1. What is communication?
2. Types of communication
 - Horizontal
 - Vertical
 - Interpersonal
 - Grapevine
3. Uses of Communication

Prescribed Reading: Chapter 1 *Applying Communication Theory for Professional Life: A Practical Introduction*

by Dainton and Zelle

<http://tsime.uz.ac.zw/claroline/backends/download.php?url=L0ludHJvX3RvX2NvbW11bmljYXRpb25fv>

Unit 2 [20]

Language of Communication

1. Verbal: spoken and written
2. Non-verbal
 - Proxemics
 - Kinesics
 - Haptics
 - Chronemics
 - Paralinguistics
3. Barriers to communication
4. Communicative English

Unit--3

[20]

Reading Comprehension

- Locate and remember the most important points in the reading
- Interpret and evaluate events, ideas, and information
- Read “between the lines” to understand underlying meanings
- Connect information to what they already know

Unit 4

[20]

Writing

- Expanding an Idea
- Note Making
- Information Transfer
- Writing a Memo
- Writing Formal Email
- Writing a Business Letter
- Letters to the Editor
- CV & Resume Writing
- Covering Letter
- Report Writing
- News Story
- Interviewing for news papers

(The above-mentioned writing activities are covered in the prescribed textbook *Vistas and Visions*)

Unit 5: Language functions in listening and conversation

[20]

1. Discussion on a given topic in pairs

2. Speaking on a given topic individually
3. Group Discussion
4. Interview
5. Dialogue

(Practice to be given using set pieces from the prescribed textbook *Vistas and Visions*)

Grammar and Usage

1. Phrasal Verbs
2. Collocation
3. Using Modals
4. Use of Prepositions
5. Common Errors in English Usage

(The above-mentioned grammar items are covered in the textbook *Vistas and Visions*)

Grammar questions must be set in contexts; not as isolated sentences as used for practice in the prescribed textbook.

Book Prescribed:

Vistas and Visions: An Anthology of Prose and Poetry. (Ed.) Kalyani Samantray, Himansu S. Mohapatra, Jatindra K. Nayak, Gopa Ranjan Mishra, Arun Kumar Mohanty. OBS

Texts to be

studied Prose

The Last Leaf

- Need for Excellence
- How Wealth Accumulates and Men Decay
- Values in Life
- Lifestyle English

Poetry

- Hidden Flame
- One Day I wrote Her Name
- The Darkling Thrush
- Meeting Poets

All grammar and writing activities in the textbook *Vistas and Visions*

Recommended Reading:

Fluency in English – Part II, OUP, 2006

Business English, Pearson, 2008

Communicative English. E. Suresh Kumar and P. Sreehari

Break Free: Unlock the Powerful Communicator in You. Rajesh, V. Rupa, 2015

Soft Skills Shalini Verma, 2009.

Language, Literature and Creativity, Orient BlackSwan, 2013

Language through Literature. (forthcoming) ed. Gauri Mishra, Dr. Ranajan Kaul, Dr. Brati Biswas

Skill Enhancement Course Credits: 4

Marks: 100

1. Soft Skills

Soft skills are 'people skills' that include communication skills, work ethic, positive attitude, emotional intelligence and other personal attributes crucial for success in business or career. Soft skills can be learnt and practiced for personal fulfillment and progress in career. This course provides the soft skills required mainly for professional achievements, and in the process, many of the personal requirements of an individual can be compiled with.

Unit 1

Soft skills and why they are important

What are soft skills?

Soft skills in communication; soft skills and intercultural communication

Unit 2

Soft skills in preparing for a career 1

Competency in verbal and written communication skills: active listening, interactive speaking, reading different types of texts, writing for formal and business contexts

Unit 3

Soft skills in preparing for a career 2

1. Using the Microsoft Office: word, excel, powerpoint; working online and offline; telephone and face-to-face etiquette in professional communication
2. Cross-Cultural etiquette: cultural awareness, cultural sensitivity, cultural flexibility, cross-cultural communication

Unit 4

Soft skills in getting jobs

CV Writing, writing job applications; GD Skills and interview taking skills; getting another job

Unit 5

Soft skills on the job

Emotional Intelligence; time and stress management; team work and net-working; presentation skills;

making meeting work: preparing, executing, following up; negotiation skills and crisis management

Prescribed Reading:

- i. Kalyani Samantray, Soft Skills for your Career, OUP
- ii. Himansu S. Mohapatra, Model of the Middle (Pieces to read: “ Our Literature Their Literature”, “ Life style English”, “Writing it Right”, “ The Vinglish way to English”)

Suggested Reading:

- i. Jayashri Mohanraj, Skill Sutras
- ii. Marian K Woodab, How to Communicate under Pressure

CBCS UG SYLLABUS SEM 4-SEC 2

Skill Enhancement Course Credits: 2

Marks: 50

2. Translation and Principles of Translation

This paper seeks to make students aware of a fundamental process of human communication which involves movement between languages. Known by the familiar term of translation, this process of transfer of meaning and values across language borders is as inevitable as it is problematic and challenging. The paper would acquaint students with the ‘what’, ‘why’ and ‘how’ of translation, approaches and problems of translation, and it would also sensitize them to the various ways of reading a translation.

Unit 1

What is Translation? Carrying across of meaning from source language to target language

Why Translation? Translation as a bridge, self –other interaction

Unit 2

Approaches to translation

- Domestication: Readability in the target language
- Foreignisation: Faithfulness to the source language text

Unit 3

How to Translate:

- sense translation based on difference (metaphrase), word-to-word translation based on

equivalence (paraphrase), regulated transformation (imitation)

- adaptation

Unit 4

Problems of translation

- Cultural gap
- Untranslatability
- Translation as appropriation of indigenous languages by English

Unit 5

How to read a translation:

Cultural difference and how to locate it, presence of the foreign in terms of cultural contexts and language

Text to be studied: *Rebati*, in *Bride Price and Other Stories* by Fakir Mohan Senapati, Rupa Publications.

Suggested Reading:

Translation Studies by Susan Bassnett

“Found in Translation” Hamid Dabashi http://opinionator.blogs.nytimes.com/2013/07/28/found-in-translation/?_r=0

“Cultural Translation” by Harish Trivedi, “Translation and Globalization” by Paul St-Pierre from *Translation: Reflection, Refraction, Transformation*. Ed. Paul St-Pierre, Prafulla C Kar

**SYLLABUS FOR B.A. (HONORS) HISTORY UNDER
CHOICE BASED CREDIT SYSTEM OF UTKAL UNIVERSITY,
BHUBANESWAR**

Semester I

C.C.I: HISTORY OF INDIA- I

Unit-I: Reconstructing Ancient Indian History

- [1] Early Indian notions of History
- [2] Sources of Historical Writings
- [3] Historical Geography (Identification of Ancient historic sites and their importance)

Unit-II: Pre-historic hunter-gatherers

- [1] Paleolithic culture- Upper, Middle and Lower; Tool making habit
- [2] Mesolithic culture-New developments in technology and economy; rock art.

Unit-III: The advent of food production

Neolithic and Chalcolithic cultures:

- [1] Regional and chronological distribution
- [2] Settlements and Food Production

Unit-IV: The Harappan civilization

- [1] Origins; settlement patterns and town planning
- [2] Agrarian base; craft productions and trade
- [3] Social and political organization; religious beliefs and practices
- [4] Causes of Decline

Unit-V: Cultures in transition

- [1] Origin of the Aryans
- [2] Early Vedic Age- Society, Polity, Religion and Philosophy
- [3] Later Vedic Age- Social Stratification (Varna and Gender), Polity, Religion, Literature and Philosophy

Reading List:

- R.S. Sharma, India's Ancient Past, New Delhi, OUP, 2007
R. S. Sharma, Material Culture and Social Formations in Ancient India, 1983.
R.S. Sharma, Looking for the Aryas, Delhi, Orient
Longman Publishers,1995
D. P. Agrawal, The Archaeology of India, 1985
Bridget & F. Raymond Allchin, The Rise of Civilization in India and Pakistan, 1983.
A. L. Basham, The Wonder that Was India, 1971.
D. K. Chakrabarti, The Archaeology of Ancient Indian Cities, 1997,
Paperback.
D. K. Chakrabarti, The Oxford Companion to Indian Archaeology, New Delhi, 2006.
H. C. Raychaudhuri, Political History of Ancient India, Rev. ed. With Commentary by
B. N. Mukherjee, 1996
K. A. N. Sastri, ed., History of South India, OUP, 1966.
Upinder Singh, A History of Ancient and Early Medieval India, 2008.
Romila Thapar, Early India from the Beginnings to 1300, London,
2002.
Irfan Habib, A People's History-Vol.1, PreHistory, 2001,
----Vol.-2, Indus Civilization: Including Other Copper Age Cultures and

the History of Language Change till 155 B.C., 2002
 Uma Chakravarti, The Social Dimensions of Early Buddhism. 1997.
 Rajan Gurukkal, Social Formations of Early South India, 2010.
 R. Champakalakshmi, Trade, Ideology and urbanization: South India 300 BC- AD 1300, 1996.
 Gregory L. Possehl, A Indus Civilization: The Contemporary Perspectives, New Delhi, Vistaar publications, 2002.

C.C.II: SOCIAL FORMATIONS AND CULTURAL PATTERNS OF THE ANCIENT WORLD

Unit-I: Evolution of humankind; Paleolithic and Mesolithic-cultures.

Unit-II: Neolithic Culture: Food production; beginnings of agriculture and animal husbandry

Unit-III: Bronze Age Civilizations: with reference to *any one* of the following: i) Egypt (Old

Kingdom); ii) Mesopotamia (Sumeria & Babylonia); iii) China (Shang); iv) Eastern Mediterranean (Minoan); economy, social stratification, state structure, religion.

Unit-IV: Nomadic groups in Central and West Asia; Advent of iron and its implications

Unit-V: Ancient Greece:

Agrarian economy, urbanization, trade and politics in Ancient Greece: Athens and Sparta; Greek Culture.

Reading List:

Burns and Ralph. World Civilizations.
 Cambridge History of Africa, Vol. I.
 I. Gordon Childe, What Happened in History.
 G. Clark, World Prehistory: A New Perspective.
 B. Fagan, People of the Earth.
 Amar Farooqui, Early Social Formations.
 M. I. Finley, The Ancient Economy.
 Jacquetta Hawkes, First Civilizations.
 G. Roux, Ancient Iraq.
 Bai Shaoyi, An Outline History of China.
 H. W. F. Saggs, The Greatness that was Babylon.
 B. Trigger, Ancient Egypt: A Social History.
 UNESCO Series: History of Mankind, Vols. I - III./ or New ed.
 History of Humanity.
 R. J. Wenke, Patterns in Prehistory.
 G. E. M. Ste Croix, Class Struggles in the Ancient Greek World.
 J. D. Bernal, Science in History, Vol. I.
 V. Gordon Childe, Social Evolution.
 Glyn Daniel, First Civilizations.
 A. Hauser, A Social History of Art, Vol. I.

A.E.C.C-I: Environmental Science

(to be prepared by University)

GE-I: For non-History students, Minor-1

Semester II

C.C.III: HISTORY OF INDIA-II

Unit-I: Economy and Society (circa 300 BCE to circa CE 300):

- [1] Expansion of agrarian economy
- [2] Urban growth; craft production: trade and trade routes
- [3] Social stratification: class, Varna, jati, untouchability; gender; marriage and property relations

Unit-II: Changing political formations (circa 300 BCE to circa CE 300):

- [1] The Mauryan Empire: Chandragupta Maurya and Asoka-Conquest and Administration;
- [2] Post-Mauryan Polities with special reference to the Kushanas and the Satavahanas- Kaniska I and Gautamiputra Satakarni

Unit-III: Towards early medieval India [circa CE fourth century to CE 750]:

- [1] Gupta Age: Agrarian expansion, land grants, graded Land rights and peasantry
- [2] The problem of urban decline: patterns of trade, currency, and urban Settlements.
- [3] Varna, proliferation of *jatis*: changing norms of marriage and property.
- [4] The nature of polities: the Gupta empire and its contemporaries: post- Gupta polities – Pallavas, Chalukyas

Unit-IV: Religion, philosophy and society (circa 300 BCE- CE 750):

- (1) Consolidation of the brahmanical tradition: dharma, *Varnashram*, *Purusharthas*, *Samskaras*.
- (2) Theistic cults (from circa second century BC): Mahayana; the Puranic tradition.
- (3) The beginnings of Tantricism

Unit-V: Cultural developments (circa 300 BCE- CE 750):

- [1] A brief survey of Sanskrit, Pali, Prakrit and Tamil literature. Scientific and technical treatises
- [2] Art and architecture; Mauryan, post-Mauryan, Gupta, post-Gupta

Reading List:

- B. D. Chattopadhyaya, *The Making of Early Medieval India*, 1994.
- D. P. Chattopadhyaya, *History of Science and Technology in Ancient India*, 1986.
- D. D. Kosambi, *An Introduction to the Study of Indian History*, 1975.
- S. K. Maity, *Economic Life in Northern India in the Gupta Period*, 1970.
- B. P. Sahu (ed), *Land System and Rural Society in Early India*, 1997.
- K. A. N. Sastri, *A History of South India*.
- R. S. Sharma, *Indian Feudalism*, 1980.
- R.S.Sharma, *Urban Decay in India, c.300-1000*, Delhi, Munshiram Manohar Lal, 1987
- Romila Thapar, *Asoka and the Decline of the Mauryas*, 1997.

Susan Huntington, *The Art of Ancient India: Buddhist, Hindu, and Jain*, New York, 1985.
N. N. Bhattacharya, *Ancient Indian Rituals and Their Social Contents*, 2nd ed., 1996.
J. C. Harle, *The Art and Architecture of the Indian Subcontinent*, 1987.
P. L. Gupta, *Coins*, 4th ed., 1996.
Kesavan Veluthat, *The Early Medieval in South India*, New Delhi, 2009
H. P. Ray *Winds of Change*, 1994.
Romila Thapar, *Early India: From the Origins to 1300*, 2002.

C.C. IV: SOCIAL FORMATIONS AND CULTURAL PATTERNS OF THE MEDIEVAL WORLD

Unit-I: Roman Republic: Polity and Empire in ancient Rome: Agrarian economy, urbanization, trade.

Unit-II: Religion and culture in ancient Rome; Crises of the Roman Empire- Rise and fall

of Julius Caesar

Unit-III: Economic developments in Europe from 7th to 14th centuries:

[1] Organization of production, towns and trade,

[2] Technological developments.

[3] Feudalism- Origin, growth and decline

Unit-IV: Religion and culture in medieval Europe: Medieval Church, Monastic Communities, and Papacy

Unit-V: Societies in Central Islamic Lands:

[1] The tribal background, *ummah*, Caliphate state; rise of Sultanates

[2] Religious developments: the origins of shariah, Sufism

[3] Urbanization and trade

Reading List:

Perry Anderson, *Passages from Antiquity to Feudalism*.

Marc Bloch, *Feudal Society*, 2 Vols.

Cambridge History of Islam, 2 Vols.

Georges Duby, *The Early Growth of the European Economy*.

Fontana, *Economic History of Europe*, Vol. I (relevant chapters).

P. K. Hitti, *History of the Arabs*.

P. Garnsey and Saller, *The Roman Empire*.

SUGGESTED READINGS

S. Ameer Ali, *The Spirit of Islam*.

J. Barrowclough, *The Medieval Papacy*.

Encyclopedia of Islam, 1st ed., 4 vols.

M. G. S. Hodgson, *The Venture of Islam*.

GE-II- (For non-History Students, Minor-2)

Semester III

C.C.V: HISTORY OF INDIA-III (c. 750 -1206)

Unit –I: Studying Early Medieval India:

[1] Historical geography

[2] Sources: texts, epigraphic and numismatic Data,

[3] Indian feudalism

[4] Rise of the Rajputs and the nature of the state

Unit-II: Political Structures:

[1] Evolution of political structures: Rashtrakutas, Palas, Pratiharas, and Cholas

[2] Legitimization of kingship; *Brahmanas* and temples; royal genealogies and rituals

[3] Arab conquest of Sindh: causes and impact

[4] Causes and consequences of early Turkish invasions: Mahmud of Ghazni; Shahab-ud-Din of Ghur

Unit-III: Agrarian Structure and Social Change:

[1] Agricultural expansion; crops

[2] Landlords and peasants

[3] Proliferation of castes; status of Untouchables

[4] Tribes as peasants and their place in the Varna Order

Unit-IV: Trade and Commerce:

[1] Inter-regional trade

[2] Maritime trade and forms of exchange [3] Process of urbanization

[4] Merchant guilds of South India

Unit-V: Religious and Cultural Developments:

[1] Bhakti, Tantrism, Puranic traditions; Condition of Buddhism and Jainism

[2] Islamic intellectual traditions: Al-Biruni; Al-Hujwiri

[3] Regional languages and literature

[4] Art and architecture: Evolution of regional styles: Kalingan and Dravidian style of Temple Architecture.

Reading List:

R.S. Sharma, *Indian Feudalism (circa 300 - 1200)*. B.D. Chattopadhyaya, *The Making of Early Medieval India*. R.S. Sharma and K.M. Shrivastava, eds, *Comprehensive History of India*, Vol. IV (A & B).

Mohammad Habib and K.A. Nizami, eds, *Comprehensive History of India*, Vol. V, *The Delhi Sultanate* Hermann Kulke, ed., *The State in India (AD 1000 - AD 1700)*.

Dissanayake, W. and K. M. Gokul Singh, *Indian Popular Cinema*, Trentham Book, London, 2004 John Storey, *Cultural Theory and Popular Culture*, London, 2001 Oberoi, Patricia, *Freedom and Destiny: Gender, Family and Popular Culture in India*, Delhi, 2009 Christopher Princy, *Camera Indica: The Social Life of Indian Photographs*, Chicago, 1998

Pankaj Rag, *Dhuno ke Yatri*, Rajkamal, New Delhi, 2006 (Hindi) Ramanujan, A.K. *Folktales from India A Selection of Oral Tales from Twenty-two Languages (Only Introduction)*. Ramaswamy, V. 'Women and the 'Domestic' in Tamil Folk Songs' in Kumkum Sangari and Uma Chakravarti, eds., *From Myths to Markets: Essays on Gender*, Shimla, 1999

Singh, Lata (ed.), *Theatre in Colonial India: Playhouse of Power*, New Delhi, 2009

N. Karashima, *South Indian History and Society (Studies from Inscriptions, AD 850 - 1800)*

Derryl N. Maclean, *Religion and Society in Arab Sindh*. Irfan Habib, *Medieval India: The Study of a Civilization*. Richard Davis *Lives of Indian Images*.

Romila Thapar, *Somanatha: The Many Voices of a History*. John S. Deyell, *Living*

Without Silver: The Monetary History of Early Medieval North India.
 Vijaya Ramaswamy, Walking Naked: Women, Society, and Spirituality in South India.
 Burton Stein, Peasant State and Society in Medieval South India.
 R. Champakalakshmi, Trade, Ideology and Urbanization: South India, 300 BC to 1300 AD.
 Al. Beruni's India, NBT edition. Ali Hujwiri, Kashful Mahjoob, tr. R. Nicholson.
 S C Mishra, Rise of Muslim Communities in Gujarat. J. Schwartzberg, Historical Atlas of South Asia.

C.C.VI: RISE OF THE MODERN WEST – I

Unit-I: Transition from feudalism to capitalism:

1. The problems of Transition: Economic Expansion, Industrial production, trade and commerce
2. Urban Development, Town life

Unit-II: Early colonial expansion:

1. Motives, voyages and explorations
2. The conquests of the Americas: Beginning of the era of colonization
3. Mining and plantation, The African slaves

Unit-III: Renaissance:

1. Its social roots, city-states of Italy
2. Spread of humanism in Europe
3. The Art of Renaissance- Architecture, Sculpture, Painting and Literature

Unit-IV: The Reformation

1. Origins, course and results
2. Spread of Reformation movements.
3. Emergence of European State system: Spain, France, England, Russia

Unit-V: Economic developments of the sixteenth century:

1. Shift of economic balance from the Mediterranean to the Atlantic.
2. Commercial Revolution- Causes and Nature
3. Growth of Industries and its impact

Reading List:

B. H. Slicher von Bath, The Agrarian History of Western Europe. AD.500 - 1850.
 Charles A. Nauert, Humanism and the Culture of the Renaissance (1996).
 D. H. Pennington, Seventeenth Century Europe.
 F. Rice, The Foundations of Early Modern Europe
 G. R. Elton, Reformation Europe, 1517 - 1559.
 Harry Miskimin, The Economy of Later Renaissance Europe: 1460 - 1600.
 J. Lynch, Spain under the Hapsburgs.
 James B. Collins, The State in Early Modern France, New Approaches to European History.
 L. W. Owie, Seventeenth Century Europe.
 M. P. Gilmore, The World of Humanism. 1453 - 1517.
 M. S. Anderson, Europe in the Eighteenth Century.
 Perry Anderson, The Lineages of the Absolutist State.
 Peter Kriedte, Peasants, Landlords and Merchant Capitalists. Peter Mathias, First Industrial Revolution.
 Stuart Andrews, Eighteenth Century Europe.
 The Cambridge Economic History of Europe. Vol. I - VI.
 The New Cambridge Modern History of Europe, Vols. I - VII.

C.C. VII: HISTORY OF INDIA IV (c.1206 - 1526)

Unit-I: Interpreting the Sources of Delhi Sultanate:

Survey of Sources: (a) Persian *Tarikh* Tradition, (b) Vernacular Histories; (c) Epigraphy

Unit-II: Sultanate Political Structures:

1. Consolidation of the Sultanate of Delhi: Balban, the Khaljis and the Tughluqs.
2. Theories of kingship: The ruling elites, Sufis, Ulema and the imperial monuments

Unit-III: Emergence of Regional Identities

1. Bahamanis, Vijayanagar, Gujarat and Odisha.
2. Regional Art, Architecture and Literature.

Unit-IV: Society and Economy:

1. Iqta and the Revenue-free Grants.
2. Agricultural production, Technology.
3. Market Regulations, Growth of Urban Centers.
4. Trade and Commerce, Indian Ocean (Maritime) Trade.

Unit-V: Religion, Society and Culture:

1. Sufi silsilas: Chishtis and Suhrawardis; doctrines and practices, Social roles
2. Bhakti movement and monotheistic traditions: Kabir, Nanak and Sri Chaitanya.
3. Social Impact of the Bhakti tradition: Rise of Liberal Thought, Ideology of Equality and Gender Relations

Reading List:

- K.A. Nizami, Religion and Politics in the Thirteenth Century.
S.A.A. Rizvi, A History of Sufism in India, Vol. I.
Satish Chandra, Medieval India, vol.I, Har Anand Publications, New Delhi.
Tapan Raychaudhuri and Irfan Habib, eds, Cambridge Economic History of India, Vol. I.
W.H. McLeod, Karine Schomer, et al, Eds, The Sants.
Burton Stein, New Cambridge History of India: Vijayanagara.
Pushpa Prasad, Sanskrit Inscriptions of the Delhi Sultanate.
Richard M. Eaton, ed., India's Islamic Traditions.
Sheldon Pollock, Languages of the Gods in the World of Men.
Vijaya Ramaswamy, Walking Naked: Women, Society, and Spirituality in South India.
K.C. Panigrahi, History of Orissa, Cuttack, Kitab Mahal, 2008

SEC.I: Understanding Heritage

This course will enable students to understand the different facets of heritage and their significance. It highlights the legal and institutional frameworks for heritage protection in India as also the challenges facing it. The implications of the rapidly changing interface between heritage and history will also be examined. The course will be strongly project-based and will require visits to sites and monuments. At least two Projects will be based on visits to Museums/Heritage Sites.

Unit-I: Defining Heritage

- [1] Meaning of 'antiquity'
- [2] Archaeological sites
- [3] Tangible heritage
- [4] Intangible heritage and art treasures

Unit-II: Evolution of Heritage -Legislation and the Institutional Framework:

[1] Conventions and Acts— national and international Heritage

[2] Heritage related government departments

[3] Museums, Regulatory Bodies

[4] Conservation Initiatives

Unit-III: Challenges facing Tangible and Intangible Heritage

[1] Development of Heritage Sites

[2] Antiquity smuggling.

[3] Conflicts (to be examined through specific case studies)

Unit-IV: Heritage and Travel:

[1] Viewing Heritage Sites

[2] The relationship between cultural heritage, landscape and travel, and recent trends

[3] Management of heritage sites

Unit-V: World Heritage Monuments:

[1] Tajmahal

[2] Red Fort

[3] Golden temple at Amritsar

[4] Sun temple at Konark

Reading List

David Lowenthal, *Possessed By The Past: The Heritage Crusade and The Spoils of History*, Cambridge, 2010

Layton, R. P. Stone and J. Thomas. *Destruction and Conservation of Cultural Property*. London: Rutledge, 2001

Lahiri, N. *Marshaling the Past - Ancient India and its Modern Histories*. Ranikhet: Permanent Black. 2012, Chapters 4 and 5.

S.S. Biswas, *Protecting the Cultural Heritage (National Legislations and International Conventions)*. New Delhi: INTACH, 1999.

Acts, Charters and Conventions are available on the UNESCO and ASI websites (www.unesco.org; www.asi.nic.in)

Agrawal, O.P., *Essentials of Conservation and Museology*, Delhi, 2006_Chainani, S. 2007. *Heritage and Environment*. Mumbai: Urban Design Research Institute, 2007

GE-III- (For non-History Students, Minor-1)

Semester IV

C.C.VIII: RISE OF THE MODERN WEST – II

Unit- I: 17th century European crisis: economic, social and political dimensions

Unit-II: The English Revolution and European politics in the 18th century:

(1) Major issues-political and intellectual Currents

(2) Parliamentary monarchy

(3) Patterns of Absolutism in Europe

Unit-III: Rise of modern science

(1) Development of Science from Renaissance to the 17th century

(2) Impact of Modern science on European society

Unit-IV: Mercantilism, European economics and Preludes to the Industrial Revolution

(1) Origin and spread of Mercantilism

(2) Impact of Mercantilism on European economy

(3) Agricultural and Scientific Background to the Industrial Revolution

Unit-V: The American Revolution, 1776

- (1) Political currents
- (2) Socio-Economic Issues
- (3) Significance of the American Revolution

Reading List:

- T.S. Aston and C.H.E. Philpin (eds.), *The Brenner Debate*.
- H. Butterfield, *The Origins of Modern Science*.
- Carlo M. Cipolla, *Fontana Economic History of Europe, Vols. II and III*. Carlo M. Cipolla, *Before the Industrial Revolution, European Society and Economy, 1000 -1700*. 3rd ed. (1993)
- . D.C. Coleman (ed.), *Revisions in Mercantilism*.
- Ralph Davis, *The Rise of the Atlantic Economics*.
- Maurice Dobb, *Studies in the Development of Capitalism*.
- J.R. Hale, *Renaissance Europe*.
- R. Hall, *From Galileo to Newton*.
- Christopher Hill, *A Century of Revolutions*.
- Rodney Hilton, *Transition from Feudalism to Capitalism*.
- Stephen J. Lee, *Aspects of European History, 1494 - 1789*.
- G. Parker, *Europe in Crisis, 1598 - 1648*.
- G. Parker and L.M. Smith, *General Crisis of the Seventeenth Century*.
- J.H. Parry, *The Age of Reconnaissance*.
- Meenaxi Phukan, *Rise of the Modern West: Social and Economic History of Early Modern Europe*.
- V. Poliensky, *War and Society in Europe. 1618 -48*. Theodore K. Rabb, *The Struggle for Stability in Early Modern Europe*.
- V. Scammell, *The First Imperial Age: European Overseas Expansion, 1400-1715*.
- Jan de Vries, *Economy of Europe in an Age of Crisis 1600- 1750*.
- B. V. Rao, *World History, New Delhi: Sterling Publishers*
- M. S. Anderson, *Europe in the Eighteenth Century*.
- Perry Anderson, *The Lineages of the Absolutist State*
- Stuart Andrews, *Eighteenth Century Europe*.
- B. H. Slicher von Bath, *The Agrarian History of Western Europe. AD. 500 - 1850*.
- The Cambridge Economic History of Europe. Vol. I - VI*.
- James B. Collins, *The State in Early Modern France, New Approaches to European History*.
- G. R. Elton, *Reformation Europe, 1517-1559*.
- M. P. Gilmore, *The World of Humanism. 1453 -1517*. Peter Kriedte, *Peasants, Landlords and Merchant Capitalists*.
- J. Lynch, *Spain under the Hapsburgs*.
- Peter Mathias, *First Industrial revolution*.
- Harry Miskimin, *The Economy of Later Renaissance Europe: 1460 - 1600*.
- Charles A. Nauert, *Humanism and the Culture of the Renaissance (1996)*.

The New Cambridge Modern History of Europe, Vols. I - VII.

L. W. Owie, Seventeenth Century Europe.

D. H. Pennington, Seventeenth Century Europe.

F. Rice, The Foundations of Early Modern Europe

C.C. IX: HISTORY OF INDIA V (c. 1526 - 1750)

Unit-I: Sources and Historiography:

- (1) Persian literary culture, translations; (2) Vernacular literary Traditions; (3) Memoirs and Travelogues

Unit-II: Establishment of Mughal rule:

- (1) India on the eve of advent of the Mughals
- (2) Fire arms, military technology and warfare
- (3) Sher Shah: Administrative and Revenue reforms

Unit-III: Consolidation of Mughal rule:

- (1) Incorporation of Rajputs and other indigenous groups in Mughal Nobility
- (2) Evolution of administrative institutions: *zabti*, *mansab*, *jagir*, *madad-i-maash*
- (3) Beginning of the crisis: Agrarian and Jagir crises; Revolts
- (4) Emergence of the Marathas; Shivaji; expansion under the Peshwas

Unit-IV: Society and Economy:

- (1) Land rights and revenue system: Zamindars and peasants
- (2) Trade routes and patterns of internal commerce; overseas trade
- (3) Urban Centres, Craft and Technology

Unit-V: Cultural ideals:

- (1) Religious tolerance and *sulh-i-kul*; Sufi mystical and intellectual interventions
- (2) Mughal Art and Architecture
- (3) Mughal and Rajput Paintings: Themes and Perspectives

Reading List:

M. Athar Ali, The Mughal Nobility under Aurangzeb.

Muzaffar Alam and Sanjay Subramanian, eds, The Mughal State, 1526 - 1750.

J.F. Richards, The Mughal Empire.

Satish Chandra, Essays on Medieval Indian History.-----, Medieval India, vol.2, Har Anand Publications, New Delhi

Irfan Habib, Agrarian System of Mughal India, 1526-1707. S.A.A. Rizvi, Muslim Revivalist Movements in Northern India.

S. Arsatnam, Maritime India in the Seventeenth Century. Satish Chandra, Parties and Politics at the Mughal Court.

Andre Wink, Land and Sovereignty in India. Harbans Mukhia, The Mughals of India.

Iqbal Husain, Ruhela Cheiftancies in 18th Century India.

C.C. X: HISTORICAL THEORIES & METHODS

Unit-I: Meaning and Scope of History

1. Definition, Nature and Scope of History.
2. Object and Value of History.
3. History, Science and Morality.

Unit-II: Traditions of Historical Writing

1. Ancient Greek Traditions – Herodotus, Thucydides
2. Ancient Roman Traditions - Polybius, Tacitus
3. Medieval Understanding: Western – St. Augustine, Arabic – Ibn Khaldun.

Unit-III: History as Interdisciplinary Practice

1. History and Archaeology, History and Anthropology.
2. History and Psychology, History and Literature.
3. History and Political Science

Unit-IV: Modern Theories

1. Scientific History: Ranke, Croce, Comte
2. Karl Marx, RG Collingwood, Toynbee
3. Total History: Marc Bloch, Lucien Febver, Fernand Braudel

Unit-V: Historical Methods

1. Sources of History: Written, Oral. Visual & Archaeological.
2. Historical facts.
3. Historical Causation.
4. Historical Objectivity

Reading List:

Arthur Marwick, *New Nature of History: Knowledge Evidence, Language* (Chapter V: The Historian at work: Forget 'facts' Foreground Sources), Lyceum Books Incorporated, 2001.

-----, *The Nature of History* (Chapter IV: History, Science and Social Science), London: Macmillan, 1989.

B. Sheik Ali, *History: Its Theory and Method*, Macmillan, Reprinted, 1996.

E. H. Carr, *What is History?*, Penguin Books, Reprinted, 1983.

E. Sreedharan, *A Text Book of Historiography*, Orient Longman, Reprinted, 2004.

Irfan Habib, *Interpreting Indian History*, Northeastern Hill University Publications, Shillong, 1988.

Marc Bloch, *The Historian's Craft*, Vintage Book, New York, 1953. (Introduction and Chapter-I: History Men and Time)

Maurice Aymard and Harbans Mukhia (eds), *French Studies in History*, Vols- I & II, Orient Longman, 1989.

Romila Thapar, *Past and Prejudice*, NBT, New Delhi, 1975.

S. K. Bajaj, *History: It's Philosophy, Theory & Methodology*, Patiala, 1987.

SEC.II: Understanding Popular Culture

The paper examines some popular cultures expressed in different mediums like visual, oral and cultural. In the process of their evolution, these cultures eclectically draw from traditions, articulate anxieties, and even give rise to new traditions. The paper endeavours to equip students with understanding such phenomena historically, with special reference to India. It is imperative that the Students use electronic devices to view, record, and document the subject matter.

Unit-I: Introduction of Popular Culture

[1] Meaning and Definition of popular culture

[2] Understanding it historically

Unit-II: Visual expressions:

[1] Folk art,

[2] Calendar art

[3] Photography

Unit-III: Performance:

[1] Theatres

[2] Music

[3] Folk tales/songs/Suang, Yatra and Nautanki: Identifying themes, functionality

Unit-IV: The audio-visual: cinema and television:

[1] Indian cinema: Mapping the influence of the national struggle for independence (1930s and 40s)

[2] Idealized nationalism (1950s), disillusionment and the anti-establishment mood (1970s and 80s)

[3] Documentary films, Expressions of popular culture in television; the impact of the Internet and audio-visual media

Unit-V: Fairs, Festivals and Rituals:

[1] Disentangling mythological stories

[2] Patronage

[3] Regional variations

[4] Impact on Society

Reading List:

Dissanayake, W. and K. M. Gokul Singh, Indian Popular Cinema, Trentham Book, London, 2004

John Storey, Cultural Theory and Popular Culture, London, 2001.

Oberoi, Patricia, Freedom and Destiny: Gender, Family and Popular Culture in India, Delhi, 2009

Christopher Princy, Camera Indica: The Social Life of Indian Photographs, Chicago, 1998

Pankaj Rag, Dhuno ke Yatri, Rajkamal, New Delhi, 2006(Hindi)

Ramanujan, A.K. Folktales from India A Selection of Oral Tales from Twenty-two Languages (Only Introduction).

Ramaswamy, V. 'Women and the 'Domestic' in Tamil Folk Songs' in

KumkumSangari and Uma Chakravarti, eds., From Myths to Markets: Essays on Gender, Shimla, 1999
Singh, Lata (ed.), Theatre in Colonial India: Playhouse of Power, New Delhi, 2009

G.E. IV:(For non-History students, Minor-2)

Semester V

C.C.XI: History of Modern Europe- I (c. 1780-1939)

Unit-I: The French Revolution:

- [1] Crisis of Ancient Regime
- [2] Intellectual currents.
- [3] Social classes and emerging gender relations.

Unit-II: Revolution and its European repercussions:

- [1] Phases of the French Revolution 1789 - 99.
- [2] Art and Culture of French Revolution.
- [3] Napoleonic consolidation - reform and empire.

Unit-III: Restoration and Revolution: c. 1815 - 1848:

- [1] Forces of conservatism & restoration of old hierarchies.
- [2] Social, Political and intellectual currents.
- [3] Revolutionary and Radical movements, 1830 - 1848.

Unit-IV: Capitalist Industrialization and Socio-Economic Transformation (Late 18th century to AD 1914)

- [1] Process of capitalist development in industry and agriculture: case Studies of Britain, France, the German States and Russia.
- [2] Evolution and Differentiation of social classes: Bourgeoisie, Proletariat, land owning classes and peasantry.
- [3] Changing trends in demography and urban patterns.
- [4] Family, gender and process of industrialization.

Unit-V: Varieties of Nationalism and the Remaking of States in the 19th and 20th Centuries.

- [1] Intellectual currents, popular movements and the formation of National identities in Germany, Italy
- [2] Specificities of economic development, political and administrative Reorganization - Italy, Germany

Reading List:

C.M. Cipolla: Fontana Economic History of Europe, Volume III: The Industrial Revolution.

Norman Davies, Europe.

J. Evans: The Foundations of a Modern State in 19th Century Europe.

T.S. Hamerow: Restoration, Revolution and Reaction: Economics and Politics in

Germany [1815 - 1871]. E.J. Hobsbawm: The Age of Revolution.

Lynn Hunt: Politics, Culture and Class in the French Revolution.

James Joll, Europe Since 1870. George Lefebvre, Coming of the French Revolution.

George Lichtheim : A Short History of Socialism. Alec Nove: An Economic History of the

USSR.

Andrew Porter, European Imperialism, 18760-1914 (1994). Anthony Wood, History of Europe, 1815 û 1960 (1983).

Stuart Woolf: History of Italy, 1700-1860. G. Barrowclough, An Introduction to Contemporary History.

Fernand Braudel, History and the Social Science in M. Aymard and H. Mukhia Ed. French Studies in History, Vol. I (1989).

Maurice Dobb: Soviet Economic Development Since 1917. M. Perrot and G. Duby [eds.]: A History of Women in the West, Volumes 4 and 5.

H.J. Hanham; Nineteenth Century Constitution, 1815 - 1914. E.J. Hobsbawm, Nations and Nationalism.

Charles and Barbara Jelavich: Establishment of the Balkan National States, 1840 û 1920. James Joll, Origins of the First World War (1989).

Jaon B. Landes: Women and the Public Sphere in the Age of the French Revolution. Colin Lucas: The French Revolution and the Making of Modern Political Culture, Volume Nicholas Mansergh: The Irish Question, 1840 û 1921.

K.O. Morgan: Oxford Illustrated History of Britain, Volume 3 [1789 -1983].

R.P. Morgan: German Social Democracy and the First International.

N.V. Riasanovsky: A History of Russia.

J.M. Robert, Europe 1880 û 1985. J.J. Roth (ed.), World War I : A Turning Point in Modern History.

Albert Soboul: History of the French Revolution (in two volumes).

Lawrence Stone, History and the Social Sciences in the Twentieth Century The Past and the Present (1981).

Dorothy Thompson: Chartists: Popular Politics in the Industrial Revolution.

E.P. Thompson: Making of the English Working Class.

Michel Vovelle, fall of the French Monarchy (1984).

H. Seton Watson: The Russian Empire.

Raymond Williams: Culture and Society.

C.C.XII: HISTORY OF INDIA VII (c. 1750 - 1857)

Unit-I: India in the mid 18th Century; Society, Economy, Polity

Unit-II: Expansion and Consolidation of colonial Power:

[1] Foreign trade and early forms of exactions from Bengal.

[2] Dynamics of expansion, with special reference to Bengal, Mysore, Awadh, Punjab

Unit-III: Colonial State and Ideology:

[1] Arms of the colonial state: army, police, law

[2] Ideologies of the Raj and racial attitudes

[3] Education: indigenous and modern

Unit-IV: Economy and Society:

[1] Land revenue systems- Permanent, Ryotwari and Mahalwari

[2] Commercialization of Agriculture- Consequences

[3] Drain of Wealth-causes and consequences

[4] Growth of modern industry

Unit-V: Popular Resistance: Causes and Consequences

[1] Santhal uprising (1856-57), Indigo rebellion (1860)

[2] Pabna agrarian Leagues (1873), Deccan riots (1875)

[3] Movement of 1857-causes and consequences

Reading List:

- C. A. Bayly, Indian Society and the Making of the British Empire, New Cambridge History of India.
- Bipan Chandra, Rise and Growth of Economic Nationalism in India.
- Suhash Chakravarty, The Raj Syndrome: A Study in Imperial Perceptions, 1989.
- J.S. Grewal, The Sikhs of the Punjab, New Cambridge History of India Ranajit Guha, ed., A Subaltern Studies Reader.
- Dharma Kumar and Tapan Raychaudhuri, eds., The Cambridge Economic History of India, Vol. II.
- P.J. Marshall, Bengal: The British Bridgehead, New Cambridge History of India.
- R.C. Majumdar, ed., History and Culture of Indian People, Vols. IX and X. British Paramountcy and Indian Renaissance.
- David Arnold and Ramchandra Guha, eds, Nature, Culture and Imperialism.
- Amiya Bagchi, Private Investment in India.
- Bipan Chandra, K.N. Panikkar, Mridula Mukherjee, Sucheta Mahajan and Aditya Mukherjee, India's Struggles for Independence.
- A.R. Desai, Peasant Struggles in India.
- R.P. Dutt, India today.
- M.J. Fisher, ed., Politics of Annexation (Oxford in India Readings).
- Ranjit Guha, Elementary Aspects of Peasant Insurgency in Colonial India (1983).
- P.C. Joshi, Rebellion 1857: A Symposium.
- J.Krishnamurti, Women in Colonial India.
- Dadabhai Naroji, Poverty and Un-British Rule in India.
- Rajat K. Ray, ed., Entrepreneurship and Industry in India, 1800-1947, Oxford In India Readings.
- Eric Stokes, English Utilitarians and India Thomas
- R. Metcalf, The Ideologies of the Raj

D.S.E-I: HISTORY OF THE UNITED STATES OF AMERICA (c.1776-1945)

Unit-I: The Background:

- [1] The land and indigenous people: settlement and colonization by Europeans
- [2] Early colonial society and politics; indentured labour-White and Black

Unit-II: Making of the Republic:

- [1] Revolution, Sources of conflict: Revolutionary groups, Ideology:
- [2] The American War of Independence- Causes and consequences
- [3] Processes and Features of Constitution making

Unit-III: Evolution of American Democracy:

- [1] Federalists: Jeffersonianism: Jacksonianism, Rise of political parties-1840-1960; Judiciary-role of the Supreme Court
- [2] Limits of democracy: Blacks and women.

Unit-IV: Early Capitalism:

- [1] Beginnings of Industrialization.
- [2] Immigrants and changing composition of Labour; Early Labour Movements.

Unit-V: The Agrarian South and Civil War:

- [1] Plantation economy.
- [2] Slave Society and Culture: Slave resistance.
- [3] Rise of Republicanism, Emancipation and Lincoln

Reading List:

- Bernard Bailyn, The Great Republic.
- Bernard Bailyn, The Ideological Origins of the American Revolution.
- Charles Beard, An Economic Interpretation of the American Constitution.
- Peter Carroll and David Noble, Free and Un-free: A New History of the United States.
- David B. Davis, The Problem of Slavery in the Age of Revolution.
- U. Faulkner, American Economic History.
- Eric Foner, America's Black Past.
- John Hope Franklin, From Slavery to Freedom.
- Gerald N. Grobb and George A. Billias, Interpretations of American History: Patterns and Perspectives, 2 Vols.
- David M. Potter, The Impending Crisis.
- J. G. Randall and David Donald, The Civil War and Reconstruction.
- Kenneth Stampp, The Peculiar Institution, Slavery in the Antebellum South.
- Federick Jackson Turner, The Frontier in American History.
- Lee Benson, The Concept of Jackson Democracy.
- Ray A. Billington, Westward Expansion.
- Paul Boyer, Harvard Sitkoff, Nancy Woloch, The Enduring Vision: A History of the American People, Vols. Land 2.
- Thomas Cochran, The Inner Revolution.
- A. O. Craven, The Growth of Southern Nationalism, 1848 - 1861.
- Carl N. Degler, At Odds: Women and Family in America from the Revolution to the Present.
- Lewis L. Gould (ed.), The Progressive Era.
- John D. Hicks, The Federal Union: A History of USA Since 1865.
- R.P. Kaushik, Significant Themes in American History.
- Irving Kristol, Gordon Wood and others, America's Continuing Revolution.
- Richard W. Leopold, The Growth of American Foreign Policy.
- Perry Miller, From Colony to Province.

Gary Nash (ed.), Retracing the Past.

Henry Pelling, American Labor.

Edward Pessen, Jacksonian Panorama.

Charles Sellers, Henry May and Neil McMillen, A Synopsis of American History; 2 Vols.

Donald Shiham, The Making of American History: The Emergence of the Nation, Vols. II & I.

Dwijendra Tripathi and S.C. Tiwari, Themes and Perspectives in American History.

DSE.II: History and Culture of Odisha

Unit-I: Socio-political life of Early and Medieval Odisha:

[1] Kalinga War (261 B.C.) and its significance

[2] Mahameghavahan Kharavela: His time and achievements

[3] The Bhauma Karas and The Somavamsis

[4] The Gangas and The Suryavamsis

Unit-II: Religion, Art and Literature of Early and Medieval Odisha:

[1] Buddhism, Jainism and Sanatana Dharma in Odisha.

[2] Development of Art and Architecture: Buddhist Art, Temples and Jain Sculptures

[3] Evolution and Growth of Odia Language

[4] Development of Odia Literature-Sarala Mohabharata

[5] Panchasakhas, Sri Chaitanya and Bhakti Movement in Odisha

Unit-III: Political and Economic structure in Medieval Odisha:

[1] Mughal Administration

[2] Maratha Administration

[3] Impact on Odisha's Socio-Economic Condition

Unit-IV: Colonialism in Odisha:

[1] The Early British Administration: Its Socio-economic impact

[2] The Odia Identity Movement

[3] Freedom Struggle in Odisha

Unit-V: Socio-cultural Changes in Modern Odisha:

[1] Development of Modern Education

[2] Social Reform Movements in Odisha

Reading List:

- A. Easchman et al (eds) The Cult of Jagannath and Regional Tradition of Orissa, Manohar, New Delhi, 1978.
- A. K. Mishra, Intellectual Tradition of Orissa: 2006.
- A. K. Mishra, The Raj, Nationalists and Reforms, 2007.
- A.K. Mishra, Indian Culture, Science and Technology (with special emphasis on Odisha), 2011.
- B.K. Mallik; Paradigms of Dissent and Protest: Social Movements in Eastern India (1400-1700 AD Manohar, New Delhi, 2004.
- J. Dora, Sakta Monuments of Orissa, A Study of Art, Architecture and Iconography, New Delhi, 2010.
- K.C. Mishra, The Cult Jagarnath.
- M.N. Das (ed) Sidelights on History and Culture of Orissa, Vidyapuri
- A.C. Pradhan, A Study of History of Orissa, Bhubaneswar, Panchsheel
- K.C. Panigrahi, History of Orissa, Cuttack, Kitab Mahal, First edition, 1981
- Chittaranjan Das, A Glimpse into Oriya Literature, Orissa Sahitya Akademi, Bhubaneswar, 1962
- K.B. Tripathi, The Evolution of Oriya Language and Script, Utkal University, Bhubaneswar
- K.C. Panigrahi, Sarala Dasa, Sahitya Akademi, New Delhi, 1975 Khageswar
- Mahapatra, (ed), Charyagitika

Semester VI

C.C. XIII: HISTORY OF INDIA VIII (c. 1857 - 1950)

Unit-I: Cultural changes and Social and Religious Reform

Movements:

- [1] The advent of printing and its implications
- [2] Reform and Revival: Brahmo Samaj, Arya Samaj, Aligarh Movement
- [3] Emancipation of Women, Sanskritization and Anti-Caste Movements

Unit-II: Nationalism: Trends up to 1919:

- [1] Political ideology and organizations, formation of INC
- [2] Moderates and Extremists.
 - [3] Swadeshi Movement
 - [4] Revolutionary Movements

Unit-III: Gandhian nationalism after 1919: Ideas and Movements:

- [1] Mahatma Gandhi: Perspectives and Methods

[2] Non- Cooperation, Civil Disobedience, Quit India, and INA

[3] Princely India: States' Peoples' Movement

[4] Nationalism and Social Groups: Peasants, Tribals, Dalits and Women

Unit-IV: Communalism and Partition:

[1] Ideologies and practices, Hindu Mahasabha, Muslim League

[2] Partition and Independence

Unit-V: Emergence of a New State:

[1] Making of the Constitution

[2] Integration of Princely States

[3] Land Reforms and beginnings of Planning

Reading List:

Judith Brown, Gandhi's rise to Power, 1915-22.

Paul Brass, The Politics of India Since Independence, OUP, 1990.

Bipan Chandra, Nationalism and Colonialism in Modern India, 1979.

Bipan Chandra, Rise and Growth of Economic Nationalism in India.

Mohandas K. Gandhi, An Autobiography or The Story of My Experiments with Truth.

Ranjit Guha, ed., A Subaltern Studies Reader.

Peter Hardy, Muslims of British India.

Mushirul Hasan, ed., India's Partition, Oxford in India Readings.

D.A. Low, ed., Congress and the Raj.

John R. McLane, Indian Nationalism and the Early Congress.

Jawaharlal Nehru, An Autobiography.

Gyanendra Pandey, The Construction of Communalism in colonial north India.

Sumit Sarkar, Modern India, 1885-1947. Anil

Seal, Emergence of Indian Nationalism.

Ram Lakhan Shukla (ed.), Adhunik Bharat ka Itihas.

Eleanor Zelliot, From Untouchable to Dalit: Essays on the Ambedkar Movement.

Judith Brown, Gandhi: (et al) A Prisoner of Hope.

Bipan Chandra, Communalism in Modern India, 2nd ed., 1987. Bipan

Chandra, K.N. Panikkar, Mridula Mukherjee, Sucheta Mahajan and

Aditya Mukherjee, India's, Struggles for Independence.

A.R. Desai, Social Background of Indian Nationalism.

A.R. Desai, Peasant Struggles in India.

Francine Frankel, India's Political Economy, 1947-77. Ranajit

Guha, and G.C. Spivak, eds. Select Subaltern Studies.

Charles Heimsath, Indian Nationalism and Hindu Social Reform.

F. Hutchins, Illusion of Permanence.

F. Hutchins, Spontaneous Revolution.

V.C. Joshi (ed.), Rammohan Roy and the process of Modernization in India.

J.Krishnamurti, Women in Colonial India

C.C. XIV: HISTORY OF MODERN EUROPE II (c. 1780 -1939)

Unit-I: Liberal Democracy, Working Class Movements and Socialism in the 19th and 20th Centuries:

[1] The struggle for parliamentary democracy and civil liberties in Britain.

[2] Forms of protest during early capitalism: food riots in France and England:

Luddites and Chartism.

[3] Early Socialist Thought; Marxian Socialism

Unit-II: The Crisis of Feudalism in Russia and Experiments in Socialism:

[1] Emancipation of serfs.

[2] Revolutions of 1905; the Bolshevik Revolution of 1917.

[3] Programmes of Socialist Construction.

Unit-III: Imperialism, War and Crisis: c. 1880-1939:

[1] Theories and mechanisms of imperialism; Growth of Militarism; Power blocks and alliances: expansion of European empires –First World War(1914 – 1918)

[2] The post 1919 World Order: economic crises, the Great Depression and Recovery.

[3] Fascism and Nazism.

[4] Origins of the Second World War.

Unit-IV: Cultural Transformation since circa 1850:

[1] Changing contexts: [i] Notions of Culture [ii] Creation of a New public sphere and mass media

[2] Creation of new cultural forms: from Romanticism to Abstract Art.

[3] Culture and the making of ideologies: Constructions of Race, Class and Gender, ideologies of Empire.

Unit-V: Intellectual Developments since circa 1850:

Major intellectual trends:

[1] Mass education and extension of literacy.

[2] Institutionalization of disciplines: History, Sociology and Anthropology.

[3] Darwin and Freud.

Reading List:

Gerald Brennan: The Spanish Labyrinth: An Account of the Social and Political Background of the Civil War

C.M. Cipolla: Fontana Economic History of Europe, Volume II the Present (1981). I : The Industrial Revolution.

Norman Davies, Europe.

J. Evans: The Foundations of a Modern State in 19th Century Europe.

T.S. Hamerow: Restoration, Revolution and Reaction: Economics and Politics in Germany [1815 - 1871].

E.J. Hobsbawm : The Age of Revolution. Lynn Hunt: Politics, Culture and Class in the French Revolution.

James Joll, Europe Since 1870. David Landes: Prometheus Unbound. George Lefebvre, Coming of the French Revolution.

George Lichtheim: A Short History of Socialism. Peter Mathias, First Industrial Revolution.

Alec Nove: An Economic History of the USSR. Andrew Porter, European Imperialism, 18760 -1914 (1994).

Anthony Wood, History of Europe, 1815 û 1960 (1983). Stuart Woolf: History of Italy, 1700 û 1860.

G. Barrowclough, An Introduction to Contemporary History.

Fernand Braudel, History and the Social Science in M. Aymard and H. Mukhia eds. French Studies in History, Vol. I (1989).

Maurice Dobb: Soviet Economic Development Since 1917.

M. Perrot and G. Duby [eds.]: A History of Women in the West, Volumes 4 and 5.

H.J. Hanham; Nineteenth Century Constitution, 1815 û 1914.
 E.J. Hobsbawm, Nations and Nationalism.
 Charles and Barbara Jelavich: Establishment of the Balkan National States, 1840 û 1920.
 James Joll, Origins of the First World war (1989).
 Jaon B. Landes: Women and the Public Sphere in the Age of the French Revolution.
 David lowenthal, The Past is a Foreign Country.
 Colin Licas: The French Revolution and the Making of Modern Political Culture, Volume 2.
 Nicholas Mansergh: The Irish Question, 1840 - 1921. K.O. Morgan: Oxford Illustrated History of Britain, Volume 3 [1789 - 1983].
 R.P. Morgan: German Social Democracy and the First International. N.V. Riasanovsky: A History of Russia.
 J.M. Robert, Europe 1880 - 1985.
 J.J. Roth (ed.), World War I: A Turning Point in Modern History. Albert Soboul: History of the French Revolution (in two volumes).

D.S.E. III: HISTORY OF THE UNITED STATES OF AMERICA-II (c.1776- 1945)

Unit-I: Reconstructions: Political changes and Economic transformation:

- [1] Conservative and Radical phases.
- [2] The New South: Participants and Reactions, Carpetbaggers; Scalawags, Blacks, Ku Klux Klan.
- [3] Growth of Capitalism
- [4] Depression.

Unit-II: Resistance and Reform:

- [1] Agrarian crises and populism
- [2] Urban corruption and progressivism
- [3] Labour movements and Unionization.
- [4] New Deal.

Unit-III: U.S. Imperialism:

- [1] Spanish-American War
- [2] Expansion in the Far East and Latin America
- [3] World War I and Fourteen Points
- [4] Americans in World War II: Bombing of Hiroshima and Nagasaki

Unit-IV: Afro-American Movements:

Black Movements: Booker T. Washington, W.E.B. Dubois; NAACP and Marcus Garvey.

Unit-V: Socio-Cultural, Religious and Intellectual Movements:

- [1] Abolitionists, Women's rights movement and Suffrage
- [2] Religious movements: Early Revivalism; Puritans, Quakers, Mormons; Temperance
- [3] Mass culture (circa 1900 - 1945)
- [4] Major literary trends (circa 1900 – 1945)

Reading List:

Bernard Bailyn, The Great Republic.
 Bernard Bailyn, The Ideological Origins of the American Revolution.
 Charles Beard, An Economic Interpretation of the American Constitution.
 Dee Brown, Bury My Heart at Wounded Knee, An Indian History of

the American West.

Peter Carroll and David Noble, *Free and Unfree: A New History of the United States*.

David B. Davis, *The Problem of Slavery in the Age of Revolution*.
32

U. Faulkner, *American Economic History*.

Robert Fogel, *Railroads and American Economic Growth*.

Eric Foner, *America's Black Past*.

John Hope Franklin, *From Slavery to Freedom*.

Gerald N. Grobb and George A. Billias, *Interpretations of American History: Patterns and Perspectives, 2 Vols*.

Richard Hofstadter, *The Age of Reform, From Bryan to FDR* Linda Kerber, *Women's America: Refocusing the Past*.

David M. Potter, *The Impending Crisis*.

W. Pratt, *A History of the United States Foreign Policy*.

James Randail, *The Civil War and Reconstruction*.

J. G. Randall and David Donald, *The Civil War and Reconstruction*.

Kenneth Stampp, *The Peculiar Institution, Slavery in the Antebellum South*.

Federick Jackson Turner, *The Frontier in American History*.

Robert Wiebe, *The Search for Order*.

Lee Benson, *The Concept of Jackson Democracy*.

Ray A. Billington, *Westward Expansion*.

Paul Boyer, Harvard Sitkoff, Nancy Woloch, *The Enduring Vision: A History of the American People, Vols. Land 2*.

Thomas Cochran, *The Inner Revolution*.

A. O. Craven, *The Growth of Southern Nationalism, 1848 - 1861*.

Lance E. Davis (ed.), *American Economic Growth*.

Carl N. Degler, *At Odds: Women and Family in America from the Revolution to the Present*.

Fogel and Engerman? *Time on the Cross-*.

Lewis L. Gould (ed.), *The Progressive Era*.

John D. Hicks, *The Federal Union: A History of USA Since 1865*.

R.P. Kaushik, *Significant Themes in American History*.

David M. Kennedy, Thomas Bailey and Mel Piehl, *The Brief American Pageant*.

Irving Kristol, Gordon Wood and others, *America's Continuing Revolution*.

Richard W. Leopold, *The Growth of American Foreign Policy*.

Perry Miller, *From Colony to Province*.

Gary Nash (ed.), *Retracing the Past*.

Henry Pelling, *American Labor*.

Edward Pessen, *Jacksonian Panorama*.

Charles Sellers, Henry May and Neil McMillen, *A Synopsis of American History; 2 Vols*.

Donald Shiham, *The Making of American History: The Emergence of the Nation, Vols. II & I*.

Dwijendra Tripathi and S.C. Tiwari, *Themes and Perspectives in American History*.

James Weinstein, *The Corporate Ideal in the Liberal state*.

GENERIC ELECTIVE (GE) PAPERS (For non-History students)

(1) HISTORY AND CULTURE OF ODISHA

Unit-I: Socio-political life of Early and Medieval Odisha:

- [1] Kalinga War (261 B.C.) and its significance
- [2] Mahameghavahan Kharavela: His times and achievements
- [3] The Bhauma Karas and The Somavamsis
- [4] The Gangas and The Suryavamsis

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- [2] Development of Art and Architecture: Buddhist Art, Temples and Jaina Sculptures
- [3] Evolution and Growth of Odia Language and Literature: Sarala Mohabharata
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- [3] Freedom Struggle in Odisha

Unit-V: Socio-cultural Changes in Modern Odisha:

- [1] Development of Modern Education
- [2] Social Reform Movements in Odisha
- [3] Modern Odia Literature: Radhanath Roy, Phakir Mohan Senapati and Gangadhar Meher

Reading List:

- A. Easchman et al (eds) The Cult of Jagannath and Regional Tradition of Orissa, Manohar, New Delhi, 1978.
- A. K. Mishra, Intellectual Tradition of Orissa, Bhubaneswar, 2006.
- , The Raj, Nationalists and Reforms, Bhubaneswar, 2007.
-, Indian Culture, Science and Technology (with special emphasis on Odisha), 2011.
- B.C. Ray, Orissa under the Mughals
- , Orissa under the Marahatas
- , Foundation of British Orissa
- B.K. Mallik, Medieval Orissa: Literature, Society, Economy, Bhubaneswar, 1996
- , Paradigms of Dissent and Protest: Social Movements in Eastern India (1400-1700 AD Manahar, New Delhi, 2004.

J. Dora, Sakta Monuments of Orissa, A Study of Art, Architecture and Iconography, New Delhi, 2010.

K.C. Mishra, The Cult Jagannath.

M.N. Das (ed) Sidelights on History and Culture of Orissa, Vidyapuri

M. A. Haq, Muslim Administration in Orissa

A.C. Pradhan, A Study of History of Orissa, Bhubaneswar, Panchsheel

K.C. Panigrahi, History of Orissa, Cuttack, Kitab Mahal, First edition, 1981

Chittaranjan Das, A Glimpse into Oriya Literature, Orissa Sahitya Akademi, Bhubaneswar, 1962

K.B. Tripathi, The Evolution of Oriya Language and Script, Utkal University, Bhubaneswar

K.C. Panigrahi, Sarala Dasa, Sahitya Akademi, New Delhi, 1975 Khageswar Mahapatra, (ed), Charyagitika

(2) FREEDOM MOVEMENT IN INDIA

Unit-I: Growth of National Consciousness in 19th century:

[1] Socio-Economic impact of British Rule

[2] Role of Press and Journalism

[3] Formation of Political associations prior to 1885

Unit-II: Nationalism: Trends up to 1919:

[1] Formation of Indian National Congress: Its ideology and Performance

[2] Moderates and Extremists

[3] Swadeshi Movement and its impact

Unit-III: Gandhian nationalism after 1919: Ideas and Movements:

[1] Mahatma Gandhi: Perspectives and Methods

[2] Non- Cooperation, Civil Disobedience, Quit India Movements

[3] Indian National Army (INA) and Subash Chandra Bose

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 Judith Brown, Gandhi: (et al) A Prisoner of Hope.
 Bipan Chandra, Communalism in Modern India, 2nd ed., 1987. Bipan Chandra, K.N. Panikkar, Mridula Mukherjee, Sucheta Mahajan and Aditya Mukherjee, India's, Struggles for Independence.
 A.R. Desai, Social Background of Indian Nationalism.
 A.R. Desai, Peasant Struggles in India.
 Francine Frankel, India's Political Economy, 1947-77. Ranajit Guha, and G.C. Spivak, eds. Select Subaltern Studies.
 Charles Heimsath, Indian Nationalism and Hindu Social Reform.
 F. Hutchins, Illusion of Permanence.
 F. Hutchins, Spontaneous Revolution.
 V.C. Joshi (ed.), Rammohan Roy and the process of Modernization in India.
 J.Krishnamurti, Women in Colonial India

(3) MAKING OF CONTEMPORARY INDIA

Unit-I: Towards Independence and Emergence of the New State :

Government of India Act 1935; Working of the GOI Act; Negotiations for Independence

and Popular Movements; Partition: Riots and Rehabilitation

Unit-II: Making of the Republic -The Constituent Assembly:

Drafting of the Constitution, Integration of Princely States

Unit-III: Indian Democracy at Work c1950- 1970s:

Language, Region, Caste and Religion; Electoral Politics and the Changing Party System;

Regional Experiences, India and the World (Non Aligned Movement)

Unit-IV: Economy c 1950-1970s:

The Land Question, Planning and Economy, Industry and Labour

Unit-V: Society and Culture c 1950-1970s:

The Women's Question: Movements and Legislation

Cultural Trends: Education, Institutions and Ideas, Science, Literature, Media, Arts

Reading List:

Granville Austin, Indian Constitution: Cornerstone of a Nation, New Edition, OUP, 2011

Francine Frankel, India's Political Economy, 1947-2004, New Delhi: Oxford University Press, 2006.

Paul Brass, The Politics of India Since Independence, Cambridge: Cambridge University Press, 1994.

Ram Chandra Guha, India after Gandhi: The History of the World's Largest Democracy, New Delhi: Picador, 2007

Bipan Chandra, et al (ed) India after Independence, New Delhi: Penguin Books, 1999

Appadurai, Domestic Roots of India's Foreign Policy 1947-1972. New Delhi: Oxford University Press, 1979.

Rajni Kothari, *Politics in India*, New Delhi: Orient Longman, 1970.
Joya Chatterji, *The Spoils of Partition: Bengal and India, 1947-67*,
Cambridge: Cambridge University Press, 2007.
Sunil Khilnani, *The Idea of India*, Penguin Books, New Delhi, 2004

(4) ISSUES IN THE CONTEMPORARY WORLD

Unit-I: Colonialism and Nationalism: Social Transformation after the Second World War; United Nations and UNESCO; NAM, Cold War: the character of Communist States

Unit-II: Perspectives on Development and

Underdevelopment: Globalization and Liberalization--Impact

Unit-III: Social Movements in the North and the South:

Feminist & Human Rights issues

Unit-IV: Ecological Movements: Recent Issues and Developments

Unit-V: Modernity and Cultural Transformation: Emerging trends in Culture, Media and

Consumption

Reading List:

E.J. Hobsbawm, *The Age of Extremes, 1914 – 1991*, New York: Vintage, 1996

Carter V. Findley and John Rothay, *Twentieth-Century World*, Boston: Houghton-Mifflin, 5th ed., 2003.

Norman Lowe, *Mastering Modern World History*, London: Palgrave Macmillan, 1997

Mark Mazower, *The Balkans: A Short History* [especially chap.

4], New York: Modern Library, 2000: paperback, 2002

Basil Davidson, *Modern Africa: A Social and Political History*, 3d edn. London / New Jersey: Addison – Wesley, 1995

I, Rigoberta Menchu, *An India Woman in Guatemala* [Memoir of

1992 Nobel Peace Prize Winner, London: Verso. 1987 {Hindi translation available}

Jonathan Spence, *The Gate of Heavenly Peace: The Chinese and Their Revolution, 1895 – 1980*, Penguin, 1982

SYLLABUS FOR B.A. (HONORS) ODIA UNDER CHOICE
BASED CREDIT SYSTEM OF UTKAL
UNIVERSITY, BHUBANESWAR

ଓଡ଼ିଆ ଭାଷା ଶିକ୍ଷା ଉନ୍ନତୀକରଣ କର୍ମସୂଚୀ

Ability Enhancement Compulsory Course (AECC)

ଓଡ଼ିଆ ଭାଷା ଶିକ୍ଷା ଉନ୍ନତୀକରଣ କର୍ମସୂଚୀ-୧

MIL Communications-Odia

ଓଡ଼ିଆ ଭାଷା ଶିକ୍ଷା ଉନ୍ନତୀକରଣ କର୍ମସୂଚୀ-୧, ଓଡ଼ିଆ ଭାଷା ଶିକ୍ଷା ଉନ୍ନତୀକରଣ କର୍ମସୂଚୀ-୧, ଓଡ଼ିଆ ଭାଷା ଶିକ୍ଷା ଉନ୍ନତୀକରଣ କର୍ମସୂଚୀ-୧

ଓଡ଼ିଆ ଭାଷା ଶିକ୍ଷା ଉନ୍ନତୀକରଣ କର୍ମସୂଚୀ-୧

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(Credits-2, total classes-20, one period-1 hours, course-II, Full Marks-50)

* ଓଡ଼ିଆ ଭାଷା ଶିକ୍ଷା ଉନ୍ନତୀକରଣ କର୍ମସୂଚୀ-୧:

Gjò _ôVýLiWÿûUò _i! | @ûiÚûbòðK (CBCS / iòàòìòGip) _ôVý _âYûkú @^êiûùe _âÊêZ ùjûAQòö aòbò^Û Éeùe @ûagýK @^êiûùe iciûcdòK _eòìÚòZòKê ù^A búaaò^òcd | _ûeÆeòK ù~ûMûù~ûM iÚû^ Kò_eò IWÿò@û bûhûùe ijRùe, iekùe | @û^!ùe ùjûA_ûeòà- G \òM _âZò G[òùe xû^ \ò@û~ûAQòö IWÿò@û bûhû | iûjòZýe i\ýZc _âûùdûMòK mû^e aòKûg ^òcòð +3 Éeúd aò\ýû[ðúuê Gòj _ôVýKâce LiWÿûUò iûjû~ý Keòàö ùi[ô_ûAñ _âPkòZ aòKûg ^òcòð +3 Éeúd aò\ýû[ðúuê Gjò _ôVýKâce LiWÿûUò iûjû~ý Keòàö ùi[ô_ûAñ _âPkòZ bûhûe ùa÷dûKeYòK, ayúajûeòK | _âûùdûMòK \òM _âZò G[òùe xû^ \ò@û~ûAQòö G[òùe iòû~ûM _âKòâdûee @^êaò]ô, ù~ûMûù~ûMe Z[ý | Zðß _âZò MéeêZß \ò@û~ûAQòö Gjû aò\ýû[ôðu búaaò^òcdûcòK \IZû aéjòùe ijû~ý Keòàö ùicûù^ gêj | _eòz^Û búauè ù~ùKøYìò _âKûe mû^e ìP^û Z[ý | iòjû«Kê ùcûLòK | fòLòZ Éeùe ijRùe _âKûg Keò_ûeòà Gaõ ùicû^u cûZébûhûe aòKûg NUò_ûeòàö

G[òùe _ôVý-1 / _ôVý-2 / _ôVý-3 / _ôVý-4 / _ôVý-5 / _ôVý-6 / _ôVý-7 Gjò_eò iûZùMûUò Z[ý, ìP^û | @û«aòð\ýûcìkK iòû~ûM _ôV ejòQòö aò\ýû[ðú ùicû^u eêPò | cêq _i! @^êiûùe ù~ ùKøYìò \êAUòKê aûQò ù^A_ûeòàö _â[c Zòù^ûUòeê ùMûUòG _â[c _~ðýûde (1c ùicòÁûe) | ùgh PûùeûUòeê ùMûUòG \ßòZúd _~ðýûd (2d ùicòÁûe) _ûAñ

aúQòùäö

cífýûu^ aòbûR^ _jZò :

- (K) _ûVe _âùZýK GKKeê (dê^òUþ) ùMûUòG ùMûUòG Keò ùcûU 4Uò
 \úNđ_âgÛ _Wÿòäö 600eê 700 g± cæùe 2Uòe C?e ù\âûKê ùjaö
 (2"12=24)
- (L) _ûVe _âùZýK GKKeê 4Uò iöìò¯ _âgÛ _Wÿòäö 2Uòe C?e 200eê 300 g±
 cæùe ù\âûKê ùja (2"8=16)
- (M) _ûVe _âùZýK GKKeê 2Uò ùfLûG 8Uò @Zò iöìò¯ _âgÛ @ûiòäö aò\ýû[đú
 ùMûUòG aûKýùe 5Uòe C?e ù\ùäö (2"5=10)
 ùcûU ^'e / cífýûu - 50ö

iaòùgh _ûVý

ù~ûMûù~ûMcikK cûZébûhû-IWÿò@û (AECC)

ù~ùKøYìò 2Uò _ûV aûQ

Elective-Any Two

_â[c _~đýûd / 1st SEMESTER

ûVý-1 / Course-3: aòmû ^ Kkû I bûhû-iûjòZý

- 1c GKK : aòmû_ ^e _eòbûhû, _eòie, _âKû~đý
- 2d GKK : aòmû_ ^e KkûcôK Cùÿgý
- 3d GKK : aòmû_ ^e _âKûe I _âÉêZò
- 4[đ GKK : ùfûK iö_Kđ-aòmû_ ^ I aòmû_ ^e bûhû
- 5c GKK : aòmû_ ^ Kkû I iûjòZý
- iöaû\, bûhû I iûjòZý

_ûVý-2 / Course-5

- 1. íû\e _eòbûhû I _eòie
- 2. íû\e _âKûe I C_ù~ûMòZû
- 3. MYcûæc]cđú iöaû\ _âÉêZò
- 4. eì_KûcôK `òPe É,eP^û, iµû\Kúd
- 5. iöaû\ I iûjòZý, íû\e bûhû

gévkuùK÷!òâK Azù]ú^ _ûV-IWÿò@û

(ù~ùKøYiò 4Uò aùQòàùKê ùja)

DISCIPLINE SPECIFIC (CENTRIC) ELECTIVE-ODIA (ANY FOUR)

- * ahðûjð ~ðýûd - 5c I 6Â (Semester-V, VI)
- * ahðûj ~ðýûd-5c (Semester-V) _â[c I \βòZúd _Zâ100+100=200 ^'e
- * ahðûj ~ðýûd-6Â (Semester-VI) ZÉZúd _Zâ
20 ^'e @û«ü _eúlû / 80 ^'e cêLý _eúlû) 100 ^'e
- * PZê[ð _Zâ - _âKì _âÉÊZò (hÂ ~ðýûd / Semester-VI
(75 ^'e _âKì ùfLû + 25 ^'e iûlûZKûe) 100 ^'e
ùcûU 400 ^'e
- * ùcûU @ûiÚûcìfýûu (Total Credits) 6 " 4 = 24
- * cìfýûu I _âgÛ_Zâ aòbûR^ ^òdc : _â[c Zòù^ûUò _Zâ _âùZýK 100 ^'e
aògòÁö 80 ^'e cêLý _eúlû I 20 ^'e @û«ü _eúlûö @û«ü _eúlûe 20 ^'e
_âgÛ @Zò iöìò`cìkK ùjaû CPòZpö G cêLý _eúlû 80 ^'e Gjûe aòbûR^
^òdc ùjCQò-
- (K) _âùZýK _Zâe _âùZýK (5Uò~ûK) GKKeê ùMûUòG ùfLûGñ ùcûU 5Uò
_âgÛ _Wòàö aò\ýû[ðúuê _i! @^êiûùe 600 eê 700 g±ùe 3Uò _âgÛe
C☑e ù\àùKê ùjaö ùcûU cìfýûu- 3 " 12=36ö
- (L) _âùZýK _Zâe _âùZýK (5Uò~ûK) GKKeê iöìò` ùaû]mû^cìkK 5Uò _âgÛ
_Wòàö Zòù^ûUòe C☑e 400 g± cæùe ù\àùKê ùjaö cìfýûu aòbûR^
3"8=24ö
- (M) _âùZýK _Zâe 5Uò~ûK GKKeê ùcûU 15ùMûUò _âgÛ @ûiòàö 10Uò
_âgÛe iöìò` C☑e 50Uò g± @[aû 2Uò aùKý cæùe ù\àùKê ùjaö 10 "2=20ö
- * bìcòKû (_òdû`f) : Gjò _ûVýKâcUò aò\ýû[ðúcuê IWÿògûe iûöÄÉZòK,
iûcûRòK I eûR^úZòK AZòjûie aòa☑ð^ aòhdùe mû^ @ûjeY _ûAñ
iêù~ûM ù\àö IWÿò@û iûjòZýùe icûR I iöÄÉZòe _âZò`k^, iûjòZýZ☑β,
iRð^gúkZû, bûhòK gévkû, iûjòZýe aòàò]Zû, iûjòZý g±ùKûh, fòL^ ùKøgk,
ùKûhMâ^Úû\ò iµû\^û I _âPkòZ bûhûe ayûKeY, Kûö_êUeòK ùKøgk
aò\ýû gòIY AZýû\ò \òMKê æû^ \ò@û~ûA G _ûVýKâcUò _âÉÊZ
ùjûAQöö
Gjò _ûVýKâcùe ùcûU 13ùMûUò _ûV @Qòö aò\ýû[ðú ^òÿòðÁ gévkûe
aò\ýû bûaùe ù~ùKøYiò PûùeûUò _ûVKê aùQò_ùeòùàö G[ôcæê
ùMûUòG _ûVKê @û]ùe Keò Zû' ijòZ @^ý aò\ýûKê iöù~ûM Keò hÂ

_~đýûd (ùicòÁe-6) _eúlû ùakKê _âKì Kû~đýUòG ùfLò 50 _éÂû cxùe
_âÉÊZ Keòau ùjuaö _âKìUò 4[đ _Zâ bûaùe aòuaPòZ ùjaö
aòugh \âÁáy : _â[c \éAUò _Zâ 1eê 8 iõLýK _ûVeê aQû~òao Zézúd _Zâ 9eê
iõLýK _ûVeê aQû~òao

iaòùgh _ûVýKâc

ùcûU 13 ùMûUò _ûV: 4Uò aûQòua

_Zâ iõLýû- 4

_âùZýK _Zâ- 100^'e (20 ^'e @û«ü _eúlû + 80^'e @«òc cêLý _eúlû)

@ûiÚû - cìfýûu = 6"4 = 24

_âùZýK _Zâ _ûAñ 40Uò _òeòdWp, _âZò _òeòdWp - 1N?û

ahđûiđ _~đýûd- 5/6 (ùicòÁe)

_ûVý-1: IWÿògûe iûđĂézòK AZòjûi | IWÿò@û iûjòZý (@ûiÚûcìfýûu 4+2=6)

1c GKK: IWÿògûe iõlò̄ AZòjûi | IWâ RûZòe HZòjý Gaõ ùa÷gòÁýö

2d GKK: IWÿògûe iõĂézò (iõùl_ùe Kkû, aûYòRý, ice, gâúRM^Üû[iõĂézò)ö

3d GKK: IWÿògûe aòbò^Ü lcđe aòKûg | Zûle iûjòZòýK _âZò`k^ (iûeûõg
mû^bò?òK)ö

4[đ GKK: ùaøj iõĂézò | P~đýû_ \, IWÿògûe iûcûRòK | iûđĂézòK AZòjûiùe
i~đýaõg | IWÿò@û iûjòZýö

5c GKK: IWÿò@û iûjòZýùe Mûşòau\ú Pò«û]ûeûö

_ûVý-2: iûjòZý Z?ß | iûjòZý _eòbûhû

1c GKK: eúzò, iòjû« ùeûcû?òK Pò«û]ûeû, aòNU^aû\ (_âûPý-_û½ûZý
aòPûeùe)

2d GKK: iRđ^gúkZû (_âûPý-_û½ûZý \éÁòbwúùe)

3d GKK: \kòZ iûjòZý | Zêk^ûcòK iûjòZý(_eòbûhû | C_ù~ûMòZû)

4[đ GKK: @ûbûi Mì, @Yê _ZâòKû, PòZâKì, c^Éû?ßòK C_^ýûi, cêq]ûeùe
^ûUK, _âûùdûMòK icûùfûP^ûö

5c GKK: @bò]û^ _âÉÊZòKkû | @şd^/iûjòZý g±ùKûh MV^ aò]òö

_ûVý-3: K[ûiûjòZý @şd^

1c GKK: @ia%õđ(\kòZ C_^ýûi)- aòbìZò _...^ûdK

2d GKK: céZêý egàò (ùà÷mû^òK C_^ýûi)-ùMûKêkû^! cjû_ûZâ
 3d GKK: \lòYûa[đ (_âûùdûMòK C_^ýûi)- gû«^ê Kêcûe @ûPû~đý
 4[đ GKK: ceûke céZêý (_â[c 3Uò Mì)- iêue!â cjû«ò
 5c GKK: lê\âmÌ @xd^ (Mì gzû±úe)- iõKk^ ù\áu _âi^Ü _...^ûdK, iõMc
 _aæòùKg^, aâjà_êe
 _ûVý Mì: cgûYòe `êf- iyò\û^! eûCZeûd
 Wòcòeò`êf- @Lòk ùcûj^ _...^ûdK
 cêLû- Ké¾ _âiû\ cògâ
 e^ôûKe- eaò _...^ûdK

_ûVý-4: ^ûUK I GKûuòKû @xd^ DSE III

1c GKK: @bò~û^ - KûkúPeY _...^ûdK
 2d GKK: aû^_âiÚ- aòRd cògâ
 3d GKK: aòZKđòZ @_eûjÛ- cù^ûeõR^ \ûi
 4[đ GKK: @[P PûYKý- e^ôKûe PA^ò
 5c GKK: GKûuòZû:
 _ûV: @kò_êeùe ^òùKûfûi- ùMû_ûk ùQûUeûd
 _âùag _âiÚû^ - aògßRòZp \ûi
 eûÉû ^ûjó- ^úkû\âò bìhY jeòP!^

_ûVý-5: IWÿò@û Kûaý-KaòZû @xd^ DSE I

1c GKK: M\û_ađ- iûekû \ûi
 2d GKK: ù_âciê]û^ò]ô (1c I 14g Qû!)- Cù_!â b-
 3d GKK: _gê_lúe Kûaý (_â[c Zòù^ûUò Mû[ûKaòZû)- eû]ûùcûj^ MWÿ^ûdK
 4[đ GKK: _âûPú^ cæKûkú^ KaòZû- _âûPú iûjòZý _âZòÂû^, KUK
 _ûVý KaòZû: bâce PòUûC- \ú^aşê eûRjeòP!^
 c^ùaû] PCZògû- bqPeY \ûi
 aûecûiú ùKûAfò- gue \ûi
 PKû^d^ ùj- cû]aú \ûiú
 5c GKK: @û]ê^òK KaòZû- KaòZû Pd^/iµû\^û- C}k aògßaò\ýûkd
 _ûVý KaòZû: K[êKòe bûa^û- eû]û^û[eûd
 a!úúe iûõæ @^êPò«û- ùMû_aşê \ûg
 ~ûZâû iwúZ- ùa÷KêY× ^û[_...^ûdK
 _âbûZ @aKûg- ^!Kòùgûe ak

icê\â I cêñ- ùiøbûMý Kêcûe cògâ

_ûVý-6/M\ý iûjòZý @xd^

1c GKK: cû\kû_û-ò- ~ûZò ùKgeú I @^wbúc ù\â- _âûPú^ M\ý _\ýû\gð-
IWÿògû iûjòZý GKûùWcú

2d GKK: IWÿò@û ecýeP^û
_ûVý _âiw: aUê@û- ùMûaò! Zâò_ûVúd
Az«ò\û_òùK- ùa÷¾a PeY iûcf
bêf- bêaù^gße ùaùjeû

3d GKK: Rúa^iáZò(1-20 _éÂû) ^ûeûdY aúeae iûc«, Mâ^Úc! òe

4[ð GKK: ù\ùgù\ùg (_â[c 3Uò _ûV)- aûeòÁe ùMûaò! \ûi

5c GKK: iRð^gúk _âa§- _âa§ Pd^, C}k aògßaò\ýûkd

_ûVý _âiw: @^« ù_âc- aògß^û[Ke
aògß bûZéZß- e^ôûKe _Zò
icûRaû\ú cû^aòKZû- eû]û^û[e[
Êû]ú^Zûe ^iZ^ cìfýùau]- ùMûùfûK aòjûeú]k

_ûVý- 7: IWÿò@û bûhû I aýûajûeòK aýûKeY

1c GKK: IWÿò@û bûhûe ùcøkòK ùa÷gòÁý I HZòjûiòK aòa[ð^

2d GKK: IWÿò@û]ß^ò I a%òðcûkû

3d GKK: IWÿò@û g± aòba (@û[òkòK I ù\gR)

4[ð GKK: IWÿò@û g± MV^aò]ô (eì_òcZ[ß/Êeaý-^ iõù~ûM aò]ô/_âZýd
iõù~ûM)

5c GKK: I^ò@û eìXòe MV^ I _âùdûM

_ûVý-8: iûjòZý fòL^ Kkû DSE II

1c GKK: _âa§ fòL^ Kkû

2d GKK: KaòZû fòL^ Kkû

3d GKK: ^ûUK eP^û I c[C_iÚû_ ^ Kkû

4[ð GKK: lê\âMì eP^û Kkû

5c GKK: ù~ùKøYiò KaòZûe _âùdûMòK @ûùfûP^û

(_ûV\û^ icdùe gòIKcûù^ ù~ùKøYiò 3Uò KaòZû ^cê^û eìù_ C_iÚû_ ^ Keò
ùfLK I ùfLûe ^ûc ^ù\A aò\ýû[ðú ^òùR ZûjûKê Kò_eò aêSò _âùdûMòK
\òMeê aýûLýû KeêQ«ò ZûjûKê ^òeì_Y Keòuaö _âùdûMòK icûùfûP^û

_jZòKê G ùlZâùe @^êieY Keû~òäö)

_ûVý-9: IWÿò@û bûhûe Kõ_êýUeòK aýajûe

1c GKK: Kõ_êUee _eòbûhû I C_ù~ûMòZû

2d GKK: i`Up ùlßdûee I jûWðùlßdûe Kõ_êUe- _âKû~ðý

3d GKK: IWÿò@û bûhûe Kõ_êýUeúKeY- IWÿò@û `ãUip, Kò-ùâûWð,
Kõ_êýUeòK g± _âKâòdû, a^û^ I aýûKeY ~ûõPK _âKòâdû

4[ð GKK: IWÿò@ûùe AõUeù^U aýajûee àòàò] \òM

5c GKK : IWÿò@û iûcûRòK ùlßâpiûAUipip

_ûVý-10 / Course-10 : IWÿò@û ùfûKiûjòZý DSC-III

1c GKK : ùfûKaò\ýû I ùfûKiûjòZý (iõmû, Êei_, _eòie)

2d GKK : IWÿò@û ùfûKMúz

3d GKK : IWÿò@û ùfûKKûjûYú I R^gîZò

4[ð GKK : IWÿò@û ùfûK ^ûUK

5c GKK : _âaû\, _âaP^, ^ñû\ò@û, eêXÿò, ùfûKûPûeúd (gKê^ àògßûi)

_ûVý-11 / Course-11 : IWÿò@û iûjòZýe AZòjûi

1c GKK : IWÿò@û iûjòZýee AZòjûi (AZòjûi I iûjòZýe AZòjûi, IWÿò@û iûjòZýe
AZòjûi eP^û]ûeû, ~êM aòbûMúKeY)

2d GKK : IWÿò@û @^êaû\ iûjòZýe AZòjûi

3d GKK : IWÿò@û _âa§ iûjòZýe AZòjûi

4[ð GKK : IWÿò@û _\ý iûjòZýe AZòjûi

5c GKK : IWÿò@û K[ûiûjòZý I ^ûUý iûjòZýe AZòjûi

_ûVý-12 / Course-12 : gûÈúd IWÿò@û bûhûe @û`òìòK _âudûM

1c GKK : bûhû-eûRbûhû, _âgûi^òK bûhû Gaõ IWÿò@û bûhûe eûRbûhû
bûaùe _âPkòZ ùjaùe AZòjûi, gûÈúd bûhû bûaùe IWÿò@û bûhûe
ùa÷gòÁýö

2d GKK : ^[úKeY _âKòâdûö

3d GKK : ieKûeú _Zâ, @û`òìòK aýqòMZ _Zâ, aûYòRòYK _Zâ, ùNûhYû _Zâö

4[ð GKK : @]ôìP^û, aòm^-ò, mû_ ^ I mû_ ^úd, aòaeYú fòL^, _âgûi^òK
g±ùKûhe bìcòKûö

5c GKK : PòVû, LiWÿû, \fòfp _âÉêZúKeY, ùa÷VKú _âÉûa I @^êùcû\^

_âKòâdûö

ijûdK Mâ^ÚîPú

1. _âúPú^ ù_ú[ô gêi iõ_ú\^ú _jZò | @^êaú\ ùKøgk-...^ûdK, @ûgêùZûh, bêaù^gße
2. fò_òe KµêUe gòlû - _eòWû eùcg P!â, aò\ýú_êeú, KUK
3. ùcøkòK KµêUe gòlû - cògâ ù\aKû«, ù`âŠip _aägđip, KUK
4. IWÿò@û _âa§ iûjòZýe AZòjûi - Ke aûCeúa§ê, ù`âŠip _aäògđip, KUK
5. K[û iûjòZýe Kkû | KûeòMeú - \ûi KòùgûeúPeY, AÁ%ođ ùcWò@û, bêaù^gße
6. IWÿògûe iûöÄézòK AZòjûi - cògâ _âuaû] Kêcûe, aò\ýú_êeú
7. IWÿò@û iûjòZýe @û\ò_ađ - cjû«ò iêùe!â
8. IWÿò@û iûjòZýe AZòjûi - _...^ûdK _VûYò, ^ûf!û
9. IWÿò@û iûjòZýùKûh - aògßûk aõgú]e, jòcûõgê _âKûg^, KUK
10. Rúa^ú iûjòZý ùK @æd^ - IWÿògû eûRý _ûVý _êÉK _âYd^ | _âKûg^ iõiÚû, bêaù^gße
11. _âûùdûMòK IWÿò@û bûhû - IWÿògû eûRý _ûVý _êÉK _âYd^ | _âKûg^ iõiÚû, bêaù^gße
12. IWÿò@û iûjòZýe iûcûRòK iûöÄézòK AZòjûi - \ûi PòZeõR^, IWÿògû eûRý _ûVý _êÉK _âYd^ | _âKûg^ iõiÚû, bêaù^gße
13. aòcgđ aòMâj - Zòâ_ûVú iù«ûh, ù`âŠip _aäògđi, KUK
14. iûjòZýe îPú_Zâ - _...^ûdK aòbìZò, ^ûf!û, KUK
15. IWÿò@û a%ođcûkû - UòKûdZ, ùK÷kûi P!â, _êeú
16. iûjòZýe Wûk_Zâ - iûcf ùa÷¾a PeY
17. iûjòZýe eì_ùeL - jeòP!^ ^úku\òâ bìhY
18. _âPkòZ IWÿò@û bûhûe aýûKeY - cjû_ûZâ aòRd _âiû\, aò\ýú_êeú
19. iõù~ûM @^êaò]ô - Zòâ_ûVú iù«ûh, ^ûf!û, KUK

UTKAL UNIVERSITY

CBCS : BA (Hons.) 2015-16

C}k aògßaò\ýûkd

_i! | @ûiÚûbòZòK _ûVýLiWÿû : iÛûZK (IWÿò@û i'û^) 2015-16

_â]û^ _ûVýûõg- Core Course

ùcûU _Zâ iõLýû-14

_âùZýK _Zâ - 100 cìfýûu aògòÁ (20 ^'e cjûaò\ýûkd Éeúd @û«ü _~đýûd _eúlû +k 80 aògßaò\ýûkd Éeúd cû^K @«òc _eúlû)

- i¹u[^] : RùY iÜZK - i¹u[^]e (@[^]ið) aò\ýú[đú - ùcùUþ 1400 [^]ee _eúlú ù\ùäö
- (K) @Zò Kcpùe (ùcùUþ) 50Uò Kù~đý [^]òNđđU (_òeòdWþ)ùe ùMùUòG
_Zâe _ùV\ù[^] ùgh ùjaö ùMùUòG Kù~đý [^]òNđđU aù _òeòdWþ-60
cò[^]òUþ aù 1 NđUù)
- (L) _âùZýK _Zâ 5ùMùUò dè[^]òUþ / GKK / C_ùðgùe aòbq ùjùAQòö
- (M) _âùZýK _Zâ 6 @ùíÚùbòZòK Kù~đý [^]òNđđU (4+2 ùKâWòUþ) _ùAùäö
ùMùUòG @ùíÚùbòZòK Kù~đý [^]òNđđUe cjZß ùjCQò- 10 _òeòdWþ ijòZ
icù[^]ö
ùcùU 14 ùMùUò i¹u[^] _Zâe @ùíÚùcífýúu (ùKâWòUþ) ùjCQò - 14 " 6
(4+2)= 84ö G[ôcxeê 14 " 4 = 56 ZùZßòK _ùV (Theory) Gaö 14 " 2 = 28
ÊKúd ùgâYú ùaù]K _ùV (Tutorial) ijòZ RWòZö
- (N) _eúlú _~đýùdKâc (Semester) | _âÉùàòZ _ùV ù~ùR[^]ù :
- (O) aò\ýú[đú[^]u Êù]ú[^] cêq ùc]ùaézò _eúlú _ùAñ ùicù[^]u _i| |
ùaù]mù[^]cikK \ùNđ iöìò⁻, @Zò iöìò⁻ _eúlú [^]òcù« C_iÚù[^] Keù~òäö
- (P) [^]e / cìkýúu aòbùR[^] _jZò :
1. _âùZýK _â]ù[^] _ùVýùðg aù _âùZýK _Zâ - 100 [^]e aògòÁ
 2. cjùaò\ýùkdÉeúd @ù«ü_eúlú - 20 [^]e
aògßaò\ýùkdÉeúd cêLý @ù«ü_eúlú - 80 [^]e
 3. aògßaò\ýùkdÉeúd cêLý _eúlúùe [^]òcÜcùZ _âgÜ _Wÿòà:
- (K) _âùZýK _Zâe _âùZýK GKKeê 5Uò \ùNđ _âgÜ _Wÿòäö aò\ýú[đú 3Uò
_âgÜe Cùe 600 eê 700Uò g± cæùe ù\ùäö (3"12=36 [^]e)
- (L) _âùZýK _Zâe _âùZýK GKKeê 5Uò iöìò⁻ _âgÜ _Wÿòäö aò\ýú[đú 3Uò
_âgÜe CZe 300 g± cæùe ù\ùäö (3"8=24)
- (M) ùcùU 5ùMùUò iöìò⁻ _âgÜ _âùZýK GKKeê @ù]ùe Keò _Wÿòäö 3Uò
_âgÜe CZe aò\ýú[đú 50 g± cæùe ù\ùäö (3"5=15)
- (N) 8Uò @Zò iöìò⁻ _âgÜ _Wÿòäö aò\ýú[đú 5Uòe CZe ùMùUòG g±ùe @[aù
ùMùUòG aùKýùe ù\ùäö (5"1=5)

_ùV bìcòKù (_òâd'k)

iÜZK ùgâYúùe IWÿò@ù bûhù | iùjòZý í'súd _ùV\ù[^] [^]òcù« Gjò
_ùVýKâce LiWÿùUò _âÉêZ ùjùAQòö Gjùe _âÉêZò ùlZâùe aògßaò\ýùkd
@ùùdùMu _âùùdùRòZ " _i| | @ùíÚùbòZòK [^]iZ[^] _ùVýaò[^]ýùi _jZò"Kê
MâjY Keù~ùAQòö Gjò _ùVýLiWÿùUò i\ýZc bûhù iùjòZý í'súd mù[^]

aýaiÚû I Pk«ú icdùe C_ù~ûMòZûKê Pûjó _âÉÊZ ùjûAQòö \êAgj ahðe IWÿò@û bûhûe Cù^àh, àòKûg]ûeû ijòZ Gjûe iûõ_âZòK iUòZò, aýûKeYbòZòK I bûhûZûZßòK ùa÷gòÁý iõ_Kðùe àò\ýû[ðúcu^ue iaòùgh]ûeYû Gjò _ûVýKâceê còkò_ûeêQòö G[ôijòZ IWÿò@û bûhûe fòLòZ IWÿò@û iûjòZýe _âûd 1200 ahðe iûjòZòýK àòKûg]ûeû àòhdùe àò\ýû[ðúcu^ue]ûeYû ^ò½òZ iKûeûcòK ùjûA_ûeòa G[ô_âZò xû^ \ò@û~ûAQòö IWÿò@û iûjòZýe aýûajûeòK _âùdûR^ I cjZß _âZò xû^ G[òùe \ò@û~ûAQòö IWÿò@û iûjòZýe àòàò] iûjòZòýK _âûei_, àòbò^Ü icde iûjòZý-]ûeû I àògòÁ iûjòZý-ùfLKu cìk_ûV ijòZ àò\ýû[ðúcu^ue ù~ûWÿòù\âuùe _ûVýLiWÿûUò i`k ùjCQòö IWÿò@û bûhû I iûjòZýKê iaðbûeZúd bûhû iûjòZý ijòZ ù~ûWÿò ù\âuKê I @û«RðûZúd iûjòZý àò\ýû @^êKìk Keò àòPûe KeòâuKê Gjò LiWÿûUò àò\ýû[ðúu C_ù~ûMú ùjûA_ûeêQòö LiWÿûUòKê ùcûU 14ùMûUò _Zâùe I _âùZýK _ZâKê 5Uò ùfLûGñ GKK aû C_ûõgùe àòbq Keû~ûAQòö

aòùgh \âÁáy : +3 i'û^ (@^ið) ùgâYú ^òcòZ _âÉÊZ Gjò _ûVýKâce 14ùMûUò _ûV / _Zâeê ùgh \êAUòKê KûUò\ò@û~ûA iû]ûeY +3 Azû]ú^ (B.A Programme) ùgâYú _ûAñ _â]û^ _ûVýûõg eìù__âPk^ Keû~òàö @^êei_ bûaùe Cbùd SEC / DSE icû^ bûaùe @^ý i'û^ I Azû]ú^ (B.A. Honours / Pass) àò\ýû[ðú _â\Z _ûVýKâc @^êiùe @û«ügevku àò\ýZû bûaùe aûQò_ûeòàö

iaòùgh _ûVýKâc (Detail Syllabus)

â[c~ðýûd (Semester-1)

cìk_ûV : **IWÿò@û iûjòZýe AZòjûi**

_â]û^ _ûVýûõg-1 (Core Course-1): **IWÿò@û iûjòZýe AZòjûi** (i`ceê ùhûWÿg gZû±ú_~ðý«)

1c GKK / dê^òUþ-1 : _âûKþ-iûekû iûjòZý (P~ðýûMúz, ^û[iûjòZý)

2d GKK / dê^òUþ-2 : iûekû iûjòZý (iûekû \ûiu eP^ûi,ûe I ùiiaêe iûjòZòýK, iûcûRòK I iûõÄézòK ùa÷gòÁý)

3/ GKK / dê^òUþ-3 : _õPiLû iûjòZýe _éÂbìcò I ùfLK (akeûc RM^Üû[)

4[ð GKK / dê^òUþ-4 : _õPiLû iûjòZýe ùa÷gòÁý

5c GKK / dê^òUþ-5 : _õPiLû iûjòZýe iûcûRòK I iûõÄézòK @ûùa\^

_â]û^ _ûVýûõg-2 (Core Course-2: **ç~êMúd IWÿò@û iûjòZýe AZòjûi**

- 1c GKK / dê^òUþ-1 : cœ~êMúd / IWÿò@û iûjòZýe _éÂbìcò I aòKûg]ûeû
- 2d GKK / dê^òUþ-2 : cœ~êMúd / IWÿò@û iûjòZý (@ûLýûdòKû Kûáy, _êeûYgòâZ, ùa÷¾a Kûáy)
- 3d GKK / dê^òUþ-3 : cœ~êMúd Kûáy @ûwòK ùa÷PòZâý (@ûkuêeòKZû, iûwúZòKZû, eúZòùa÷PòZâý)
- 4[ð GKK / dê^òUþ-4 : cœ~êMúd Kûáy @ûcòK ùa÷PòZâý (eiùPZ^û, aòhdaÉê aò^ýûi, PeòZâPòZâY)
- 5c GKK / dê^òUþ-5 : cœ~êMúd MúzòKûáy _eõ_eû (Põ_ì, PC_\ú, PCZògû)

\βòZúd _~đýûd (Semester-II)

_â]û^ _ûVýûõg-3 (Core Course-3): @û]ê^òK IWÿò@û iûjòZý

ZéZúd _Zâ

- 1c GKK / dê^òUþ-1 : @û]ê^òK IWÿò@û iûjòZýe _éÂbìcò I ^aRûMeYe bìcòKû
- 2d GKK / dê^òUþ-2 : _âûKþ @û]ê^òK Kûke IWÿò@û Kûáy KaòZû I K[ûiûjòZý
- 3d GKK / dê^òUþ-3 : IWÿò@û iûjòZýùe izýaû\ú]ûeû
- 4[ð GKK / dê^òUþ-4 : IWÿò@û iûjòZýùe iaêR]ûeû
- 5c GKK / dê^òUþ-5 : IWÿò@û _âMZòaû\ú I aûÉaaû\ú iûjòZý]ûeû

_â]û^ _ûVýûõg-4 (Core Course-4): Êû]ú^Zûe IWÿò@û ijòZý

PZê[ð _Zâ

- 1c GKK / dê^òUþ-1 : Êû]ú^Zû _eaZđú IWÿò@û KaòZû
- 2d GKK / dê^òUþ-2 : Êû]ú^Zû _eaZđú IWÿò@û C_^ýûi I Mì
- 3d GKK / dê^òUþ-3 : Êû]ú^Zû _eaZđú IWÿò@û ^ûUK I GKûuòKû
- 4[ð GKK / dê^òUþ-4 : Êû]ú^Zû _eaZđú IWÿò@û M\ý iûjòZý (_âa§ I icûùfûP^û)
- 5c GKK / dê^òUþ-5 : Êû]ú^Zû _eaZđú IWÿò@û iûjòZýùe _Zâ_ZòâKû
- _ûVýûõg 1 eê _ûVýûõg 4 ^òcù« ijûdK Mâ^ÚiìPú :
1. IWÿò@û iûjòZýe @û\ò_ađ I CZe cœ_ađ : cjû«ò iêùe!â, KUK ÁêùWõUip ùÁûe
 2. @û]ê^òK IWÿò@û iûjòZýe AZòjûi : iûc«eûd ^Uae, aûYúba^, bêaù^gße
 3. IWÿò@û iûjòZýe iõlò _eòPd : @ûPû~đý aé!ûa^, Mâ^Úc!òe, KUK

4. IWÿò@û iûjòZýe AZòjûi : cû^iòðj cûdû]e, Mâ^Úc|òe, KUK
5. IWÿò@û iûjòZýe AZòjûi : Ke aûCeúaŝê, ù`âŠip _aäògđip, KUK
6. @û]ê^òK IWÿò@û iûjòZýe aòKûg]ûeû : Zòâ_ûVú iù«ûh Kêcûe, iê|eMWÿ
7. IWÿò@û iûjòZýe AZòjûi : _...^ûdK _VûYò, ^ûk|û, KUK
8. IWÿò@û iûjòZýe AZòjûi : _ûXú ùaYê]e, _âûPú iûjòZý _âZòÂû^, KUK
9. @û]ê^òK Kûaý Ròmûiû, PòZâKÌ : \ûi \ûge[ô, @Mâ\iz, KUK
10. KaòZûe cû^PòZâ : cjû«ò Rû^Kú afäb, ù`âŠip _aäògđip, KUK
11. IWÿò@û iûjòZýe KâcaòKûg : cjû«ò iêue|â, @Mâ\iz, KUK
12. @^êaû\ iûjòZýe ZZß I _âùdûM : _â]û^ cû^ûeõR^, IWÿògû aêKp ùÁûe, KUK
13. iûjòZý iìPú_Zâ : _...^ûdK aòbìZò, ^ûf|û, KUK
14. CZe @û]ê^òKZû ZZß I _âùdûM : iõ. gZ_[ú ù\au _âiû\, @Mâ\iz, KUK
15. @û]ê^òKaû\ I CZe @û]ê^òKaû\ : e[_â\ú_ Kêcûe, izý^ûeûdY aêKpùÁûe, KUK
16. IWÿò@û Kûaý ùKøgk : @ûPû~đý iê\gđ^, aâjà_êe
17. K[ûiûjòZýe K[^òKû : IZû aò¾ê_òâdû, _âûPú iûjòZý _âZòÂû^, KUK
18. iûekû cjûbûeZ iéÁòe bìcò_ađ : iûjê C\d^û[, Pò^àd _âKûg^, KUK
19. iaêReê iûõ_âZòK : gZ_[ú ^òZýû^|, Mâ^Úc|òe, KUK
20. IWÿò@û iûjòZýe _âMZòaû\ú]ûeû : gZ_[ú aòRd Kêcûe, IWÿògû aêKp ùÁûe, KUK
21. IWÿò@û C_^ýûi : ùaùjeû Ké¾PeY, RM^Ûû[e[, KUK
22. @ûùfûP^û cûkû : cògâ KûjÛëPeY, ù`âŠip _aäògđip, KUK
23. IWÿò@û iûjòZýe AZòjûi : @û\ý _âdûi - cjû«ò _âi^Û Kêcûe, KUK

ZéZúd _~đýûd (Semester-III)

_â]û^ _ûVýûõg-5 (Core Course-5): **IWÿò@û bûhûe HZòjûiòK aòKûgKâc_õPc_Zâ**

1c GKK / dê^òUp-1 : IWÿò@û bûhûe C_òZò I KâcaòKûg

2d GKK / dê^òUp-2 : IWÿò@û fò_òe HZòjûiòK aòZđ^ I fIY

3d GKK / dê^òUp-3 : IWÿò@û gòkûùfLe bûhû

4[đ GKK / dê^òUp-4 : P~đýû_ \ I iûekû iûjòZýe bûhû

5c GKK / dê^òUp-5 : IWÿò@û bûhû ijòZ @^ý bûhûe iµKđ (\âûaòWÿ, @ÁòK, ~ûa^òK, AõeûRú)

_â]û^ _ûVýûõg-6 (Core Course-6): IWÿò@û bûhûe ùcøkòK Êeì_ I fIY

hÂ _Zâ

1c GKK / dê^òUþ-1 : gûÊúd bûhû, IWÿò@û bûhûe gûÊúd fIY, IWÿò@û bûhûe ùcøkòK I ùa÷gòÁý

2d GKK / dê^òUþ-2 : IWÿògûe J_bûhòKú bûhûùlZâ I IWÿò@û @ûõPkòK bûhû-C_bûhû-ùâûfö

3d GKK / dê^òUþ-3 : IWÿò@û cû^K bûhû I K[ôZ bûhû

4[õ GKK / dê^òUþ-4 : IWÿò@û M\ý bûhûe àòâZõ^

5c GKK / dê^ò~þ-5 : IWÿò@û g± àòba I Gjûe @[õ ^ò¿Zò cìkK ùa÷gòÁý (@bò]ûcìkK, fIYûcìkK, aý~^ûcìkK)

_â]û^ _ûVýûõg-7 (Core Course-7): IWÿò@û bûhûe _âùdûM I aýûajûeòK aýûKeY

1c GKK / dê^òUþ-1 : IWÿò@û iûcûRòK I iûõÄézòK]ûeûùe iêbûhY I @_bûhY

2d GKK / dê^òUþ-2 : IWÿò@û iûcûRòK - ùfûKûPûecìkK g± I Zû'e _âùdûM

3d GKK / dê^òUþ-3 : @gêj a^û^ I bîfþ fòL^e KûeY I Zû'e gêj ^òeûKeY

4[GKK / dê^òUþ-4 : IWÿò@û @leZZß I a%õ òbûR^

5c GKK / dê^òUþ-5 : IWÿò@û aûKýe MXÿY, _âKûe I _âùdûMPûZêeú, aòeûcPòjÛe aýajûe, cê\âY ZîUò iõùgû]^ _jZò, aòmû_^e bûhû, ùNûhYû Kkû (@ûueòõ@ûUõ) I bûhòK C_ûd

PZê[õ _~õýûd (Semester-IV)

_â]û^ _ûVýûõg-8 (Core Course-8): (ùfûK]ûeû/IWÿò@û bûhûe ùcøLòK _eõ_eû)

1c GKK / dê^òUþ-1: ùfûK iõÄézò I ùfûKiûjòZý (iõmû, Êeì_, _âKûeùb\)

2d GKK / dê^òUþ-2 : IWÿò@û ùfûKMúz, Gjûe _âKûeùb\ I ùa÷gòÁý

3d GKK / dê^òUþ-3 : IWÿò@û ùfûKKûjûYú I R^gîZò

4[õ GKK / dê^òUþ-4 : IWÿò@û ùfûùKûqò, _âKûeùb\, iûcûRòK-iûõÄézòK @ûùà\^

5c GKK / dê^òUþ-5 : ùfûK^ûUK

bòZò _ûVýûõg-1 (Core Course-9): **IWÿò@û iûjòZýe Êeì_, ZZß I iûjòZòýK g±**

1c GKK / dê^òUþ-1 : KaòZû, C_ ^ýûi, @ûcôRúa^ú

2d GKK / dê^òUþ-2 : @û]ê^òKZû, C_ ^òùagaû\, eiaû\

3d GKK / dê^òUþ-3 : _âùdûMòK icúlû, ùg÷kúZûZßòK icúlû

4[đ GKK / dê^òUþ-4 : Zêk^ûcôK iûjòZýe _eòbûhû I C_ ù~ûMòZû

5c GKK / dê^òUþ-5 : @^êaû\ZZß I @^êaû\e _âKûeùb\

cìk / _â]û^ _ûVýûõg-10 (Core Course-10): **IWÿò@û iûjòZýe iaòùgh @xd^ ùfLKúd _ûV**

1c GKK / dê^òUþ-1 : RM^Ûû[\ûi, C_ |â b-

2d GKK / dê^òUþ-2 : búcùbûA, iyò\û^ |

3d GKK / dê^òUþ-3 : MûlòK gû«^ê Kêcûe @ûPû~đý, J_ ^ýûiòK ùMû_ú^û[cjû«ò

4[đ GKK / dê^òUþ-4 : ^ûUýKûe RMù^àûj^ fûf I eùcg _âiû\ _ûYòMâûjú

5c GKK / dê^òUþ-5 : _âûaşòK PòZeõR^ \ûi I icûùfûPK ^Uae iûc«eùd

_?c _~đýûd (Semester-V)

cìk / _â]û^ _ûVýûõg-11 (Core Course-11): **IWÿò@û iûjòZýe iaòùgh @xd^ Kûaý KaòZû _ûV**

1c GKK / dê^òUþ-1 : cjûbûeZ-M\û_ađ (iûekû \ûi)

2d GKK / dê^òUþ-2 : Kòùgûûe P|âû^^ Põ_ì (K-N @^ê_âûi)- Kaòi~đý akù\ae[

3d GKK / dê^òUþ-3 : PòfòKû-eû]û^û[

4[đ GKK / dê^òUþ-4 : _âûPú^ cæKûkú^ IWÿò@û KaòZû, _âûPú iûjòZý _âZòÂû^, KUK

* gâúeûc ùKûAfò-akeûc \ûi

* cjûaûjê - a^cûkò

* @û\ý cûMđgúe - @PêýZû^| \ûi

* c^ûaû] PCZògû - bqPeY

5c GKK / dê^òUþ-5 : @û]ê^òK IWÿò@û KaòZû - iõ_û\^û iÛûZùKûZe gòlû _eòh\, C}k aògßaò\ýûkd, iê]û _âKûg^ú, KUK

* @céZcd- Mwû]e ùcùje

* ^cÄûe - cûdû]e cû^iòđj

* Mûşûeúe @ûgúaðû\ - Kûkò|úPeY _ûYòMâûjú

* IWÿògû - iúZûKû« cjû_ûZâ

* bd - ecûKû« e[

cik / _â]û^ _ûVýûõg-12 (Core Course-12): **IWÿò@û iûjòZýe @xd^ - K[ûiûjòZý / ^ûUýiûjòZý**

1c GKK / dê^òUþ-1 : @ûKûge Aiûeû (C_ ^ýûi)- cù^ûR \ûi

2d GKK / dê^òUþ-2 : @cûaûiýûe P!â (C_ ^ýûi) - ùMûaò! iû

3d GKK / dê^òUþ-3 : lê\âMì

_ûVýMì : * eûšò_ê@ @^«û -`Kúeùcûj^

* ^úkcûÁâûYú-ùMû\ûaeúg cjû_ûZâ

* gâúKé¾u ùgh jûi - iêùe!â cjû«ò

* ùcûl - _âZòbû eûd

4[đ GKK / dê^òUþ-4 : cwK @cwK aòkß cwK (^ûUK) - aòRd Kêcûe gZ_[ú, @Mâ\iZ, KUK

@[aû

* iaûùgh ùfûK (^ûUK) - ^eûdY iûjê

5c GKK / dê^òUþ-5 : GKûuòKû _ûV

_ûVý_âiw : * @ûaòÃûe - _âûYaşê Ke

* Q\àùagú - aògßRòZþ \ûi

* cKÿcû - ùMû_ûk ùQûUeûd

hÂ _~đýûd (Semester-VI)

_â]û^ _ûVýûõg-13 (Core Course-13): **IWÿò@û iûjòZý @xd^ - M\ý iûjòZý**

1c GKK / dê^òUþ-1 : ùcû icde IWÿògû-WKÖe Ké¾P!â _ûYòMâûjú (30 _éÂûe _ûVýûõg _V^úd)

2d GKK / dê^òUþ-2 : \êA \òM«e @ûKûg (bâcY KûjûYú)-Kê-aòjûeú \ûg _â[c 4Uò @xûd / 1c bûM

3d GKK / dê^òUþ-3 : Kûaý í'û\ (icûùfûP^û-1/2d @xûd) - \ûge[ô \ûi

4[đ GKK / dê^òUþ-4 : e[i_ K (1c, 2d @xûd)-P!âùgLe e[

5c GKK / dê^òUþ-5 : _âaş : @û]ê^òK IWÿò@û _âaş, iê]û _âKûg^ú,

_ûVý_âiw : cjûùiaûZ - aògß^û[Ke

* ^òR \ûdòZß - cûdû]e cû^iòđj

* _âkd iõùKZ - geZ Kêcûe cjû«ò

cik / _â]û^ _ûVýûõg-14 (Core Course-14): **IWyò@û bûhûe aýûajûeòK**
_âùdûM

1c GKK / dê^òUþ-1 : aýûajûeòK fòL^Kkû - _eòbûhû, Êeì_, ùa÷PòZâý

2d GKK / dê^òUþ-2 : Kû~đýûkd fòL^ @^êaò]ô (^[ô _âÉêZò I fòL^ / Uò®Yú
fòL^ / _âÉûa fòL^ I @^êùcû\^ / PòVû _âÉêZò I fòL^ / @]ôìP^û, aòm`ò
I ùNûhYû fòL^)

3d GKK / dê^òUþ-3 : iûjòZý I cê\òâZ MYcûæc (iûjòZý I iû'û\òKZû / iûjòZý I
iõ_û\Kúd fòL^ PûZêeú / É, aû `òPe eP^û / cê\òâZ MYcûæce bûhû)

4[đ GKK / dê^òUþ-4 : _êÉK eP^û ùKøgk

5c GKK / dê^òUþ-5 : iõ_û\^û Kkû (_Zâ/_ZòâKû)

_â]û^ _ûVýûõg-5eê _ûVýûõg 14 ^òcù« ijûdK Mâ^ÚiìPú:

1. IWyò@û bûhûe C_òZò I KâcaòKûg : cjû«ò aõgú]e, ù`âŠip _aäògđip, KUK
2. IWyò@û bûhûe Cù^àh I aòKûg : iûjê aûiêù\, ù`âŠip _aäògđip, KUK
3. IWyò@û bûhûZZß I fò_òe aòKûg : Zòâ_ûVú Kê-aòjûeú, eûRý_ûVý
_êÉK _âYd^ I _âKûg^ iõiÚû, bêaù^gße
4. aézò G ùcû ù_ûùh KêUé' : cjû«ò _õPû^^, bêaù^gße
5. iûekû cjûbûeZe bûhûZûZßòK @^êgúk^ : cjû_ûZâ]ù^gße, ù`âŠip
_aäògđi, KUK
6. IWyò@û bûhû aòba : cjû_ûZâ aòRd _âiû\, aò\ýû_êeú, KUK
7. aýûajûeòK IWyò@û bûhû I _âùdûMûcôK aýûKeY : Zòâ_ûVú iù«ûh,
^ûk'û, KUK
8. aýûajûeòK IWyò@û aýûKeY : cògâ je_âiû\, _âûPú iûjòZý _âZòÂû^,
KUK
9. IWyò@û ùfûKiûjòZý I ùfûK iõÄéZò : _â]û^ Ké¾P'â, aò\ýû_êeú, KUK
10. IWyò@û ùfûKiûjòZý icúlû : cjû_ûZâ gýûciê'e, aò\ýû_êeú, KUK
11. a%õđ _eòPd : UòKûdZeûd ùK÷kûi P'â, iêfb _âKûg^ú, _êeú
12. ùfûK^ûUK : \ûi ùjc« Kêcûe, Mâ^Úc'òe, KUK
13. IWyò@û @ûiuc I aõMkûe ùfûK^ûUý : iûjê ^ûeûdY, iZý^ûeûdY aêKþ
ùÁûe, KUK
14. IWyò@û ùfûKiõÄéZò I ùfûKiûjòZý : cògâ cùj'â Kêcûe, Mâ^Úc'òe, KUK
15. IWyò@û fò_ò I bûhû : cjû_ûZâ LùMgße, Mâ^Úc'òe, KUK
16. _âùdûMòK bûhû aòmû_ ^e \òMaò\òM : _...^ûdK ùK.aò., IWyò@û

- _ûVý_êÉK_âYd^ I _âKûg^ iõiÚû, bêaù^gße
17. aòPòZâ KaòZß : Zòâ_ûVú iù«ûh, ^ûk!û, KUK
 18. _âùdûMòK IWÿò@û bûhû : cògâ @Rd, KújûYú, KUK
 19. g±MV^ ùKûh : Zòâ_ûVú _â`êfä, bêaù^gße
 20. @û]ê^òK K[û iùjòZý : _...^ûdK aòbìZò, Mâ^Úc!òe, KUK
 21. IWÿò@û _âa§ iùjòZý : Ke aùCeòa§ê, cjúaúe _âKûg^, bêaù^gße
 22. _âùdûMòK IWÿò@û bûhû : eûRý _ûVý_êÉK_âYd^ I _âKûg^ iõiÚû, bêaù^gße
 23. _âPkòZ IWÿò@û bûhûe aýûKeY : cjû_ûZâ aòRd _âiû\, aò\ýû_êeú, KUK
 24. IWÿò@û iùjòZý ùKûh : aògßûk aõgú]e, jòcûõgê _âKûg^, KUK
 25. IWÿò@û iùjòZýe iúcûRòK I iùõÄéZòK AZòjûi : \ûi PòZeõR^, eûRý _ûVý_êÉK_âYd^ I _âKûg^ iõiÚû, bêaù^gße
 26. IWÿò@û bûhûZûZßòK _âa§ I icûùfûP^û : cògâ je_âiû\, @Mâ\ìZ, KUK
 27. IWÿò@û ùføKòK _\ (1c/2d bûM) : _âjeûR ùMû_ûk P!â, KUK ùUâWòõ Kõ_û^ú
 28. C]k MâûcýMúZ I Kkû : cjû_ûZâ PKâ]e, IWÿògû iùjòZý GKûùWcú
 29. iùjòZýe eì_ùeL : jeòP!^ ^úkû\òâ bìhY

**@û«üicÁòcìkK Azû]ú^ _ûV - IWÿò@û
GENERIC ELECTIVES (GE)- COURSE**

ìP^û

- * _ZâiõLýû - 4/8 ùMûUò _ûV \ò@û~òâ - 4ùMûUò _ûV 4Uò _Zâ_ûAñ aùQòaûKê ùjaö
- * _âùZýK _Zâ - 100 ^'e aògòÁ / ùcûU - 400
- * _âùZýK _Zâùe 5ùMûUò GKK ejòaö
- * _âùZýK _Zâe @ûiÚûcìfýûu (Credits) 6 / ùcûU cìfýûu 6 " 4 = 24
- * ahđûjđ _~đýûd 1, 2, 3, 4 (ùicòÁûe 1-2-3-4) _âùZýK _~đýûd aù ùicòÁûeùe ùMûUòG ùMûUòG _ûV_Zâ ejòaö ~[û-
 - * aùhđûjđ _~đýûd-1 (Sem-I) _â[c_Zâ / _ûV-1
 - * aùhđûjđ _~đýûd-2 (Sem-II)\ßòZúd _Zâ / _ûV-2
 - * aùhđûjđ _~đýûd-3 (Sem-III) _â[c_Zâ / _ûV-3
 - * aùhđûjđ _~đýûd-4 (Sem-IV) _â[c_Zâ / _ûV-4
- _âùZýK _Zâ_ûAñ ahđKê @ZòKcpùe 50Uò ùgâYú _ûV\û^ ùja Gaõ 10 ùMûUò ÊKúdùaû]^ cìkK ùgâYú gòlû\û^ (UêýùUêeû@ûfp Kâûip) ùjaö

^'e aòbûR^ aò]ô

(K) ùcûU ^'e - 100

(L) @û«ü_eúlû - 20 / cêLý_eúlû - 80

(M) cêLý_eúlûe_âùZýK GKKeê ùMûUòG ùfLûGñ_i|cìkK ùaû]mû^ cû_K
5Uò \úNđ_âgÛ_Wÿòäö 5Uò \úNđ_âgÛeê 3Uòe CZe 600 g± cæùe
ù\âûKê ùjaö 3`12=36

(N) _âùZýK GKKeê ùMûUòG ùfLûGñ f²mû^cìkK iöìò`_âgÛ_Wòäö ùcûU
5ùMûUò_âgÛeê 3ùMûUò_âgÛe CZe 400 g± cæùe ù\âûKê ùjaö
3`8=24

(O) _ûðùPûUò GKKeê ùcûU 8Uò @Zò iöìò`cìkK_âgÛ_Wÿòäö 5Uòe CZe
ùMûUòG aûKýùe ù\âûKê ùjaö
1`5=5

iaòùgh_ûVýKâc

â[c~đýûd (Semester-1) (ùMûUòG aûQ)

_ûV-2 / _Zâ-1 (Core Course-2) : **iRđ^ûgúk Kkû**

1c GKK : iRđ^gúkZûe iöìò`_ I fIY

2d GKK : iRđ^gúkZûe @û]ûe

3d GKK : ^ûUK iöìò`_ eP^û / M_-C_^ýûiKê ^ûUý eì_û«e

4[đ GKK : fòL^ Kkû I bûa iö_âiûeY_ìZò

5c GKK : Mì eP^û ùKøgk

@[aû

_ûV-4 / _Zâ-2 (Core Course-4) : **iûjòZý @xd^**

1c GKK : _âa§ Pd^ (iö. C}k aògßaò\ýûkd)

_ûVý : * @^« ù_âc - aògß^û[Ke

* iûekû iûjòZý - aöğú]e cjû«ò

* cêñ iZý[cđû KjêQò - P|âùgLe e[

2d GKK : KaòZû Pd^ (iö. C}k aògßaò\ýûkd)

_ûVý : * KõPêKòe bûa^û - eû]û^û[eûd

* Zòù^ûUò iù^U - cûdû]e cû^iòöj

* icê\â I cêñ - ùiøbûMý Kêcûe cògâ

3d GKK : @aùaû]_eúlY - (ùMûUòG_ý_eòùz\ 200 g± cæùe @]aû lê\â
KaòZûUòG_Wÿòäö Zjòeê 5Uò_âgÛ @aùaû]_eúlYcìkK CZe_ûAñ

@ûMZ ùjaö)
 4[đ GKK : _âaP^ / ìqò @ûgòâZ iRđ^ûcôK fòL^ (ùMûUòG _âaP^ / XM / ìqò
 @ûMZ Keû~òaaö Zû'e bûaûhđKê 200Uò g± cæùe iõ_âiûeY Keò
 ùfLôaûKê gòlû \ò@û~òaaö)
 5c GKK : g± @gêjò | Zûjûe gêj fòL^ (iřòcìkK @gêjò / _âZýdcìkK
 @gêjò / aP^MZ @gêjò / icûi-fòw-a^û^MZ @gêjò Gaõ ùiiaêe
 ^òeûKeY)

SYLLABUS FOR B.A. (HONORS) PHILOSOPHY UNDER CHOICE BASED
 CREDIT SYSTEM OF UTKAL UNIVERSITY, BHUBANESWAR

GENERAL PHILOSOPHY

- Unit-I** : Definition, Nature and Function of Philosophy, Philosophy in relation to other modes of thinking like science and Religion
- Unit – II** : Problems of Being : Monism and Pluralism
 Realism: (a) Naive Realism (b) Representative Realism (Locke), Idealism
 : Meaning, Esse est Percipi (Berkeley)
- Unit – III** : Problems of Knowledge: What is Knowledge? Sources of Knowledge
 : Empiricism, Rationalism
- Unit –IV** : Problems of Ethics : (1) Theories of Goodness : The Good and the Evil (2) Theories of Conduct : Egoism and Altruism
- Unit-V** : Problems of Metaphysics:
 (1) Substance and Universal
 (2) Mind and Body

Basic Study Materials:

1. John Hospers - An Introduction to Philosophical Analysis

2. G. T. W. Patrick - Introduction to Philosophy
3. G. W. Cunningham - Problems of Philosophy
4. B. Russell - Problems of Philosophy
5. D. W. Hamlyn - Metaphysics
6. Richard Taylor - Metaphysics

FIRST YEAR U. G. CORE COURSE

Semester – I

Paper – II: Logic & Scientific Method

Full Marks: 20 + 80 = 100

Credit Points: 04

- Unit-I** : Definition of Logic, Deductive & Inductive Arguments, Validity & Soundness of Arguments, Laws of Thought
- Unit – II** : Classification of Propositions (from Quality & quantity stand point) Distribution of terms, Square of Oppositions, Existential Import of Propositions, Interpretation of Categorical Propositions
- Unit-III** : Inference – Immediate Inference (Conversion & Observation) Mediate Inference (Syllogism) : Figure & Moods, Testing Validity of Arguments by syllogistic Rules
- Unit-IV** : Inductive Reasoning & Scientific Enquiry
- (a) Laws of Causation – Meaning & Definition cause and condition, Qualitative & Quantitative Marks of Causation
- (b) Mills Experimental Methods
- Unit-V** : Science & Probability : (a) Scientific Explanation and Unscientific explanation (b) Hypothesis & Confirmation

Recommended Books:

1. Copi, Cohen & MacMahan – Introduction to Logic (14th Edition)
2. Cohen & Nagel – Introduction to Logic & Scientific Method
3. Alex Rosenberg – Philosophy of Science : A Cont. Introduction
4. W. Kneale – Probability & Introduction
5. John Hospers – Philosophical Analysis

Semester-II / Paper-III / Phil. Core

SYSTEMS OF INDIAN PHILOSOPHY (I)

Full Mark: 20 + 80 = 100

Credit Points: 04

- Unit-I** : Salient Features of Indian Philosophy, Astika & Nastika systems,
Basic concepts like Rta, Rna, Purusartha, Law of Karma
- Unit – II** : Carvakas – Epistemology and Metaphysics (Lokayatamata)
- Unit-III** : Jainism – Syadvada, Anekantavada Jaina ethics (concept of Triratna)
- Unit-IV** : Buddhism – Four Noble Truths, Doctrine of Momentariness,
Dependant Origination, No Soul Theory, Nirvana
- Unit-V** : Samkhya Dualistic System : Purusa, Prakriti, Theory of Causation,
Theory of Evolution

Books Recommended:

1. G. C. Nayak (ODIA) - Bharatiya Darshana
2. B. B. Choudhury (ODIA) - Bharatiya Darshanara Ruparekha (Trans.) of M. Hiriyana's Outline of Indian Philosophy
3. Dutta & Chatterjee – An Introduction to Indian Philosophy
4. C. D. Sharma – A Critical Survey of Indian Philosophy
5. R. K. Puligandla – Fundamentals of Indian Philosophy
6. S. Radhakrishnan – Indian Philosophy, Vol. I / II
7. J. N. Sinha – Indian Philosophy

Semester-II / Paper-IV / Phil. Core

SYMBOLIC LOGIC

Full Mark: 20 + 80 = 100

Credit Points: 04

Books Prescribed: Basson & O' Corner: Introduction to Symbolic Logic

Unit-I	Chapter-I	Introduction
	Chapter-II	The Calculus of Propositions
Unit – II	Chapter-III	Calculus of Propositions (Sec 1 to 60
Unit-III	Chapter – III	Calculation of Propositions (Sec 7 to 9)
Unit-IV	Chapter-V	The Elements of Predicate Calculus (Section 1 to 9)
Unit-V	Appendix	(Sec-1 to Sec-4)

2nd Year U. G. Philosophy (Core)

Semester-III / Paper-VI / Ethics

Full Mark: 20 + 80 = 100

Credit Points: 04

Unit-I	: Definition, Nature & Scope of Ethics. Ethics in relation to Politics, Sociology and Religion
Unit – II	: Distinction between moral and non-moral action Moral Judgement and factual judgement, subject or Moral judgement
Unit-III	: Utilitarianism, Hedonism
Unit-IV	: Rigorism, Perfectionism
Unit-V	: Theories of punishment; Retributive, Reformative and Preventive theory

Books for Reference:

1. J. N. Sinha – A Manual of Ethics
2. W. Frankena – Ethics

Semester – II Paper

– VII / Phil. (Core)

HISTORY OF GREEK PHILOSOPHY

F. M.: 20 + 80 = 100

Credits: 04

- Unit-I** : Nature of Greek Philosophy: What is Philosophy? Origin, development and salient features of early Greek Thought
- Unit – II** : Pre-Socratic Thought : The Being of Thales, Becoming of Heraclitus and Atomism of Democritus
- Unit-III** : Socrates : Problem before Socrates, Dialectical method, epistemology of Socrates and ethics
- Unit-IV** : Plato : Theory of Idea, Theory of Knowledge and Theory of Soul
- Unit-V** : Aristotle : A Critique of Plato, Theory of Form and Matter, Theory of Causation

Suggested Readings:

- (1) W. T. Stace - Greek Philosophy
- (2) Burnet - Greek Philosophy
- (3) Y. Masih - A Critical History of Philosophy
- (4) F. Thilly - A History of Philosophy
- (5) B. Russell - A History of Western Philosophy
- (6) B. A. G. Fuller - A History of Greek Philosophy

Semester – III

Paper – V / Phil. (Core)

SYSTEMS OF INDIAN PHILOSOPHY (II)

F. M.: 20 + 80 = 100

Credits: 04

- Unit-I** : Yoga system of Patanjali: Citta Vriti Nirodha and Astanga Yoga
- Unit – II** : Nyaya: Pramanas
Vaisesika: Categories (Padarthas)
- Unit-III** : Upanisadic view of Atman and Brahman Vidya & Avidya, Para Vidya & Apra Vidya
- Unit-IV** : Sankara's View on Maya, Jiva, Isvara & Brahman and Liberation (Jivanmukti & Videhamukti)
- Unit-V** : Ramanuja – Refutation of Sankara's view of Maya, Concept of Brahman, Jiva and Liberation

Books Recommended:

- (1) G. C. Nayak (ODIA) - Bharatiya Darshana
- (2) B. B. Choudhury (ODIA) (Trans.) - Bharatiya Darshanara Ruparekha
- (3) Dutta & Chatterjee – An Introduction to Indian Philosophy
- (4) J. N. Sinha – Indian Philosophy
- (5) R. K. Puligandla – Fundamentals of Indian Philosophy
- (6) S. Radhakrishnan – Indian Philosophy (Vol. I & II)
- (7) J. N. Sinha – Indian Philosophy

Semester – IV

U. G. Arts Core (Philosophy)

Paper - VII

CONTEMPORARY INDIAN PHILOSOPHY

F. M.: 20 + 80 = 100

Credits: 04

- Unit-I** : R. N. Tagore : God and Reality, Nature of Religion Man and his destiny
- Unit – II** : Swami Vivekananda : Concept of Man and his Destiny, Practical Vedanta, Universal Religion
- Unit-III** : Sri Aurovindo: Nature of World, Maya, Theory of Evolution, Satchidananda, Integral Yoga
- Unit-IV** : M. K. Gandhi: Truth, God, Non-violence, Satyagraha and Sarvodaya
- Unit-V** : S. Radhakrishnan : Concept of Man, Reality, Intellect & Institution Religion

Basic Study Materials:

- (1) B. K. Lal – Contemporary Indian Philosophy
- (2) T. M. P. Mahadevan & V. Saroja – Contemporary Indian Philosophy
- (3) H. Sahoo (ed.) – Contemporary Indian Philosophy

Semester – IV

Paper – IX

(HISTORY OF MODERN EUROPEAN PHILOSOPHY)

F. M. : 20 + 80 = 100

Credits : 04

- Unit-I** : Bacon – Theory of Idola, Inductive Method
Descartes – Universal Doubt, Cogito-ergo-sum, Existence of God,
Interactionism
- Unit – II** : Spinoza – Substance, Attribute and Modes Psycho-physical parallelism
Leibnitz – Theory of Monads, pre-established Harmony
- Unit-III** : Locke : Refutation of Innate Ideas, Sources of Knowledge
Berkeley : Subjective Idealism, Esse-est-Percipi
- Unit-IV** : Hume – Impression & Ideas, Scepticism, Theory of Causality
- Unit-V** : Kant – Reconciliation between Empiricism and Rationalism, Possibility
of Synthetic Apriority Judgement Space & Time

Books Prescribed

1. Y. Masih – History of Western Philosophy
2. H. Ray & G. Das – (O) Paschatya Darshanara Itihasa
3. Fran Thilly – A History of Philosophy
4. Ira Sengupta – A History of Western Philosophy
5. B. Russell – History of Western Philosophy
6. Barlingay & Kulkarni – A critical survey of Western Philosophy

Semester – IV

(Philosophy Core)

Paper – X

(PHILOSOPHY OF LANGUAGE)

F. M.: 20 + 80 = 100

Credits: 04

- Textual Study** : John Hospers – An Introduction to Philosophical Analysis
- Unit-I** : Word – Meaning : Meaning of the word “Meaning” Ambiguity and vagueness
- Unit – II** : Definitions : Denotative, Connotative, & Ostensive Defining and Accompanying characteristics stipulate & Reparative Definition, Persuasive definition
- Unit-III** : Sentence – Meaning : Proposition and sentence word-meaning and sentence – meaning, criteria of sentence – meaning/
- Unit –IV** : Analytic – synthetic, a priori – a posteriori, distinction, logical possibility and impossibility.
- Unit – V** : Concept ; Nature and source
Truth : Correspondence, Coherence and Truth as it “Works”

B.A. (Hons)

Semester – V / Paper – XI

F.M. 20+80

=100

3rd Year

Study of Western Classic

Credits -04

[Meditations of Rene Descartes]

Unit-I

Meditation – I

Sceptical Doubts

Meditation – II

Cogito ergo sum, Sum res cogitans The wax
Argument

Unit – II

Meditation – III

Clear and distinct perceptions Theory of Ideas,
Existence of God

Unit-III

Meditation – IV

God is no Deceiver, Will, Intellect and
Possibility of Error

Unit – IV

Meditation – V

Essence of Material Things, Existence of God

Unit – V

Meditation – VI

Mind-body Dualism, Primary & Secondary
Quality

Book Recommended

1. Rene Descartes - Meditations on First Philosophy
2. Rae Langton - A study guide to Descartes Meditations
3. Amelie Rorty - Essays on Descartes Meditations

ISA UPANISADS WITH SANKARA’S COMMENTARY

Unit-I	What are Upanisads, place of Upanisads in Indian Philosophy and Culture – Isa Upanisad
Unit – II	Mantra 1 to 44
Unit-III	Mantra 5 to 9
Unit – IV	Mantra 10 to 14
Unit – V	Mantra 15 to 18

Basic Study Materials:

1. The Isa Upanisad with Sankara’s Commentary
2. S. Radhakrishnan - The Principal Upanisad
3. Satyavadi Mishra - Central Philosophy of the Upanisads

SOCIAL & POLITICAL PHILOSOPHY

Unit-I	Sociality, Social Science & Social Laws Philosophy of Social Science – Relation between Individual society (Mechanical, Organic and Idealistic view)
Unit – II	Political Ideals – Justice, Liberty, Equality, Equality Political Doctrines – Humanism, Secularism Feminism, Philosophy Ecology
Unit-III	Democratic Ideals: Democratic Government, Conditions for successful functioning of Democracy.
Unit – IV	Political Ideologies (a) Anarchism (b) Marxism (C) Sarvodaya
Unit – V	Social progress: Human Rights: Origin and development, Declaration of Human Rights : Theory and Practice

Basic for Suggested Readings:

1. O.P. Gauba – An Introduction to Political Philosophy
2. J. Sinha – Outlines of Political Philosophy
3. D.D. Raphael – Problems of Political Philosophy
4. Krishna Ray & Chhanda Gupta – Essays in Social & Political Philosophy
5. M.K. Gandhi – Hind Swaraj

APPLIED ETHICS

- Unit – I** What is Applied Ethics : Nature & Scope of applied ethics – Ethical Theories – Deontology, Utilitarianism, Relativism and Subjectivism
- Unit – II** **Taking Life : Animals** – Animals Rights, Reverence for life, killing of animals
- Unit – III** **Taking Life : Humans** – Euthanasia : Types Abortion
- Unit – IV** Environmental Ethics : Relation between man and nature, Anthropocentrism, Non-Anthropocentrism
Western Tradition – Responsibility for Future Generation, Deep Ecology
- Unit – V** Professional Ethics : (a) Business ethics – Rights and obligations, justice & honesty in ethics.
(b) Bio-medical Ethics – Hippocratic Oath, Rights and obligations of Health – care Professionals, Doctor- Patient-Relationship

Books Recommended

1. Peter Singer – Practical Ethics
2. J. Jagadev – Biomedical Ethics
3. Tom Regan – Animal Rights
4. J.P. Thirou – Ethics : Theory & Practice

Discipline Specific Elective (DSE)

Semester – V

(Credits 4/F.M. 100)

Paper – I

THE PHILOSOPHY OF BHAGBAD GITA

- Unit – I** The Bhagabad Gita: Concept of Yoga, Concept of life and death.
- Unit – II** Karma & Karmaphala in the Bhagabad Gita, classification of Karma :
Karma, Akarma, Vikarma
- Unit- III** Concepts like Jnana & Vijnana, Ksara and Aksara, Uttama Purusa in Bhagabad Gita.
- Unit – IV** Chapter XVIII (Verse 1 to 36) with Sankara’s commentary

Basic Study Materials:

1. S.Radhakrishnan (Trans. & Ed) - The Bhagabad Gita
2. S.C. Panigrahi - Concept of Yoga in the Gita
3. A.G.K. Warrior (Trans.) - Srimad Bhagabad Gita Bhasya of Sri Sankaracharya
4. K.M. Munshi & R.R. Diwakar - Bhagabad Gita & Modern Life
5. P.N. Srinivasachari - The Ethical Philosophy of the Gita

Paper – II Philosophy

of Religion (DSE-II)

- Basic Text** John Hick – Philosophy of Religion
- Unit – I** Introduction to Philosophy of Religion Judaism – Christian Concept of God (Chapter – 1)
- Unit – II** Grounds for belief in existence of God (Chapter – 2)
- Unit – III** Grounds for belief against existence of God (Chapter – 3)
- Unit – IV** The Problem of Evil (Chapter – 4)
- Unit- V** Conflicting Truth Claims of different Religions (Chapter – 9)
Religious Pluralism

Books for Reference

1. Y. Masih- Introduction to Religious Philosophy
2. Arvind Sharma – Philosophy of Religion

Paper – III

Philosophy of Mind (DSE-3)

- Unit – I Nature and Scope of Philosophy of Mind, Mind and Soul, Nature of Mental Phenomena Consciousness – Theories of Mental Phenomena
- Unit – II The Third Person Account: Merits and Limitations. The First Person Account, Theory of intentionality.
- Unit – III Some theories of Mind – Dualism, Materialism, Identity Theory, Double Aspect Theory.
- Unit – IV The Concept of a person and the problem of personal Identity.
- Unit – V Some theories of Mind – Interactionism, Parallelism, Epiphenomenalism, The Problem of Free will.

Basic Study Materials

1. J.A. Shaffer – Philosophy of Mind
2. S. Shoemaker – Self knowledge & self- identity
3. S. Hampshire – Philosophy of Mind
4. T.E. Wilkerson – Minds brains and people

SEMESTER – VI

PAPER - I

Project Compulsory

(Dissertation 60 + Viva 40 Marks)

The student has to prepare a project of his own selecting a topic from Philosophical perspective in consultation with a teacher. He / She has to prepare a dissertation of 60 marks which will be evaluated by an external examiner and he / she will face a viva-voice test (40 marks) by an external examiner along with his / her supervisor of the concerned project.

Paper – II

Gandhian Studies

- Unit – I Political Thought of Gandhi** : Gandhi's concept of Politics – goals and methods of action; concept and claim of spiritualizing politics, Satyagraha
- Unit – II Economic Thought of Gandhi** : Gandhi's ideas and efforts in the field of economics; Gandhi's critique of industrialization – evils and consequences; philosophy of work & employment, need and greed
- Unit – III Gandhi's Social Thought and Social Work:** Philosophy of Sarvodaya, concept of Gram Swaraj, Varnashrama Versus Caste system untouchability.
- Unit- IV Gandhi on Education:** Meaning and aims of education Basic education (Nai Talim), Duties of Students, Parents and Teachers in education and their interrelationship.
- Unit – V Gandhi's idea of Peace:** Meaning of peace and violence; peace and Disarmament; Non-violent way to world peace. Combating terrorism through non-violence; Gandhian Approach to conflict Resolution – Shanti Sena

Basic Study Materials :

1. Mahatma Gandhi - Autobiography
2. Mahatama Gandhi - Hind- Swaraj
3. Mahatama Gandhi - Towards Non-violent Socialism
4. Mahatma Gandhi - Towards New Education
5. S. Radhakrishnan (ed.) - Mahatma Gandhi: Essays & Reflect
6. R.K. Prabhu & U.R. Rao- The mind of Mahatma Gandhi
7. Sarat Mahanty (ODIA) - Gandhi Manisha

Semester – VI DSE**Study of Major Religions of the World****Paper –III**

- unit– I** Sanatan Dharma: Basic features of Sanatan Dharma, The
Conception of Man (amritasya Putra), His Pursuits: Dharma , Artha,
Kama &
Moksa
- Unit – II** Buddhism: Basic features of Buddhism, Four noble truths, Eight-fold
Path, Nirvana
- Unit – III** Jainism: Three Gems, Five Vows, Liberation
- Unit – IV** Christianity: Basic features, God, World ,Salvation
- Unit – V** Islam: Basic features, Man ,God & Human Destiny

Suggested Readings:

- 1.Y. Masih - A Comparative Study of Religions
2. Lloyd Ridgeon - Major World Religions
3. K. N.Tiwary - Comparative Religion

Ethics: Theory & Practice

Unit – I	Definition, Nature & Scope of Ethics, Distinction between moral & non-moral action, stages of development of voluntary Action.
Unit – II	Distinction between factual and moral judgment, objects of moral judgment.
Unit – III	Moral Standards : Hedonism, Mill’s Utilitarianism, Kant’s Rigorism & Perfectionism
Unit – IV	Environmental Ethics: Relation between Man & Nature, Anthropocentrism and Non - Anthropocentrism
Unit- V	Concept of Bio-centric, Egalitarianism, Deep Ecology – Man’s Responsibility for the future generation

Recommended Study Materials :

1. William Franken – Ethics
2. J.N. Sinha – A Manual of Ethics
3. Peter Singer – Practical Ethics

SKILL ENHANCEMENT COURSE

Paper – I

F.M 50

Critical Thinking

- Unit – I Introduction to Critical Thinking : Standards of Critical thinking, benefits and limitations
- Unit – II Arguments & Recognising arguments : Definition & Contents of argument premises, hidden premises, conclusions intermediate conclusions

Book Recommended :

1. Hurley, Patrick. J. – A concise Introduction to Logic (2015) 12th Ed.
2. Madhuchhanda Sen - An Introduction to Critical Thinking (2010)

SKILL ENHANCEMENT COURSE

Paper – II

F.M 50

Applied Reasoning

- Unit – I Fallacies: Introduction, fallacies of Relevance, fallacies of Presumption, Fallacies of Ambiguity, Illicit Transference, fallacies in Ordinary language
- Unit – II Types of Reasoning: Analogical, Legal and Moral
- Unit – III Science & Superstition: Distinction, Evidentiary Support, Objectivity Integrity

Book Recommended :

1. H. Patrick, J. – A Concise Introduction to Logic (2015) 12th Edition
2. M. Sen - An Introduction to Critical Thinking (2010)

SYLLABUS FOR B.A. (HONORS) POLITICAL SCIENCE
UNDER CHOICE BASED CREDIT SYSTEM OF UTKAL
UNIVERSITY, BHUBANESWAR

1.1

Paper I- Understanding Political Theory

Course Objective: This course is divided into two sections. Section A introduces the studentsto the idea of political theory, its history and approaches, and an assessment of its critical and contemporary trends. Section B is designed to reconcile political theory and practice through reflections on the ideas and practices related to democracy.

I: Introducing Political Theory (30 Lectures)

1. What is Politics: Theorizing the 'Political'
2. Traditions of Political Theory: Liberal, Marxist, Anarchist and Conservative
3. Approaches to Political Theory: Normative, Historical and Empirical
Critical and Contemporary Perspectives in Political Theory: Feminist and Postmodern

II: Political Theory and Practice (30 Lectures)

The Grammar of Democracy

1. Democracy: The history of an idea
2. Procedural Democracy and its critique
3. Deliberative Democracy

4. Participation and Representation

Essential Readings

I: Introducing Political Theory

Bhargava, R. (2008) 'What is Political Theory', in Bhargava, R and Acharya, A. (eds.) *Political Theory: An Introduction*. New Delhi: Pearson Longman, pp. 2-16.

Bellamy, R. (1993) 'Introduction: The Demise and Rise of Political Theory', in Bellamy, R. (ed.) *Theories and Concepts of Politics*. New York: Manchester University Press, pp. 1-14.

Glaser, D. (1995) 'Normative Theory', in Marsh, D. and Stoker, G. (eds.) *Theory and Methods in Political Science*. London: Macmillan, pp. 21-40.

Sanders, D. (1995) 'Behavioral Analysis', in Marsh, D. and Stoker, G. (eds.) *Theory and Methods in Political Science*. London: Macmillan, pp. 58-75.

Chapman, J. (1995) 'The Feminist Perspective', in Marsh, D. and Stoker, G. (eds.) *Theory and Methods in Political Science*. London: Macmillan, pp. 94-114.

Bhargava, R. 'Why Do We Need Political Theory', in Bhargava, R. and Acharya, A. (eds.) *Political Theory: An Introduction*. New Delhi: Pearson Longman, pp. 17-36.

Bannett, J. (2004) 'Postmodern Approach to Political Theory', in Kukathas, Ch. and Gaus, G. F. (eds.) *Handbook of Political Theory*. New Delhi: Sage, pp. 46-54.

Vincent, A. (2004) *The Nature of Political Theory*. New York: Oxford University Press, 2004, pp. 19-80.

II: The Grammar of Democracy

Srinivasan, J. (2008) 'Democracy', in Bhargava, R. and Acharya, A. (eds.) *Political Theory: An Introduction*. New Delhi: Pearson Longman, pp. 106-128.

Owen, D. (2003) 'Democracy', in Bellamy, R. and Mason, A. (eds.) *Political Concepts*. Manchester and New York: Manchester University Press, pp. 105-117.

Christiano, Th. (2008) 'Democracy', in Mckinnon, C. (ed.) *Issues in Political Theory*, New York: Oxford University Press, pp. 80-96.

Arblaster, A. (1994) *Democracy*. (2nd Edition). Buckingham: Open University Press.

Roy, A. 'Citizenship', in Bhargava, R. and Acharya, A. (eds.) *Political Theory: An Introduction*. New Delhi: Pearson Longman, pp. 130-146.

Brighouse, H. (2008) 'Citizenship', in Mckinnon, C. (ed.) *Issues in Political Theory*, New York: Oxford University Press, pp. 241-258.

1.2 Paper II- Constitutional Government and Democracy in India

Course objective: This course acquaints students with the constitutional design of state structures and institutions, and their actual working over time. The Indian Constitution accommodates conflicting impulses (of liberty and justice, territorial decentralization and a strong union, for instance) within itself. The course traces the embodiment of some of these conflicts in constitutional provisions, and shows how these have played out in political practice. It further encourages a study of state institutions in their mutual interaction, and in interaction with the larger extra-constitutional environment.

I. The Constituent Assembly and the Constitution (16 lectures)

- a. Philosophy of the Constitution, the Preamble, and Features of the Constitution (2 weeks or 8 lectures)
- b. Fundamental Rights and Directive Principles (2 weeks or 8 lectures)

II. Organs of Government (20 lectures)

- a. The Legislature: Parliament (1.5 weeks or 6 lectures)
- b. The Executive: President and Prime Minister (2 weeks or 8 lectures)
- c. The Judiciary: Supreme Court (1.5 weeks or 6 lectures)

III. Federalism and Decentralization (12 lectures)

- a. Federalism: Division of Powers, Emergency Provisions, Fifth and Sixth Schedules (2 weeks or 8 lectures)
- b. Panchayati Raj and Municipalities (1 week or 4 lectures)

READING LIST

I. The Constituent Assembly and the Constitution

a. Philosophy of the Constitution, the Preamble, and Features of the Constitution

Essential Readings:

G. Austin, (2010) 'The Constituent Assembly: Microcosm in Action', in *The Indian Constitution: Cornerstone of a Nation*, New Delhi: Oxford University Press, 15th print, pp.1-25.

R. Bhargava, (2008) 'Introduction: Outline of a Political Theory of the Indian Constitution', in R. Bhargava (ed.) *Politics and Ethics of the Indian Constitution*, New Delhi: Oxford University Press, pp. 1-40.

Additional Reading:

D. Basu, (2012) *Introduction to the Constitution of India*, New Delhi: Lexis Nexis.

S. Chaube, (2009) *The Making and Working of the Indian Constitution*, Delhi: National Book Trust.

b. Fundamental Rights and Directive Principles

Essential Readings:

G. Austin, (2000) 'The Social Revolution and the First Amendment', in *Working a Democratic Constitution*, New Delhi: Oxford University Press, pp. 69-98.

A. Sibal, (2010) 'From Niti to Nyaya,' *Seminar*, Issue 615, pp 28-34.

Additional Reading:

The Constitution of India: Bare Act with Short Notes, (2011) New Delhi: Universal, pp. 4-16.

II. Organs of Government

a. The Legislature: Parliament

Essential Readings:

B. Shankar and V. Rodrigues, (2011) 'The Changing Conception of Representation: Issues, Concerns and Institutions', in *The Indian Parliament: A Democracy at Work*, New Delhi: Oxford University Press, pp. 105-173.

V. Hewitt and S. Rai, (2010) 'Parliament', in P. Mehta and N. Jayal (eds.) *The Oxford Companion to Politics in India*, New Delhi: Oxford University Press, pp. 28-42.

b. The Executive: President and Prime Minister

Essential Readings:

J. Manor, (2005) 'The Presidency', in D. Kapur and P. Mehta P. (eds.) *Public Institutions in India*, New Delhi: Oxford University Press, pp.105-127.

J. Manor, (1994) 'The Prime Minister and the President', in B. Dua and J. Manor (eds.) *Nehruto the Nineties: The Changing Office of the Prime Minister in India*, Vancouver: University of British Columbia Press, pp. 20-47.

H. Khare, (2003) 'Prime Minister and the Parliament: Redefining Accountability in the Age of Coalition Government', in A. Mehra and G. Kueck (eds.) *The Indian Parliament: A Comparative Perspective*, New Delhi: Konark, pp. 350-368.

c. The Judiciary: Supreme Court

Essential Readings:

U. Baxi, (2010) 'The Judiciary as a Resource for Indian Democracy', *Seminar*, Issue 615, pp. 61-67.

R. Ramachandran, (2006) 'The Supreme Court and the Basic Structure Doctrine' in B. Kirpal et.al (eds.) *Supreme but not Infallible: Essays in Honour of the Supreme Court of India*, New Delhi: Oxford University Press, pp. 107-133.

Additional Reading:

L. Rudolph and S. Rudolph, (2008) 'Judicial Review Versus Parliamentary Sovereignty', in *Explaining Indian Institutions: A Fifty Year Perspective, 1956-2006: Volume 2: The Realm of Institutions: State Formation and Institutional Change*. New Delhi: Oxford University Press, pp. 183-210.

III. Federalism and Decentralization

a. Federalism: Division of Powers, Emergency Provisions, Fifth and Sixth Schedules

Essential Readings:

M. Singh, and R. Saxena (eds.), (2011) 'Towards Greater Federalization,' in *Indian Politics: Constitutional Foundations and Institutional Functioning*, Delhi: PHI Learning Private Ltd., pp.166-195.

V. Marwah, (1995) 'Use and Abuse of Emergency Powers: The Indian Experience', in B. Arora and D. Verney (eds.) *Multiple Identities in a Single State: Indian Federalism in a Comparative Perspective*, Delhi: Konark, pp. 136-159.

B. Sharma, (2010) 'The 1990s: Great Expectations'; 'The 2000s: Disillusionment Unfathomable', in *Unbroken History of Broken Promises: Indian State and Tribal People*, Delhi: Freedom Press and Sahyog Pustak Kuteer, pp. 64-91.

The Constitution of India: Bare Act with Short Notes, (2011) New Delhi: Universal, pp 192-213.

Additional Readings:

R. Dhavan and R. Saxena, (2006) 'The Republic of India', in K. Roy, C. Saunders and J. Kincaid (eds.) *A Global Dialogue on Federalism*, Volume 3, Montreal: Queen's University Press, pp. 166-197.

R. Manchanda, (2009) *The No Nonsense Guide to Minority Rights in South Asia*, Delhi: Sage Publications, pp. 105-109.

b. Panchayati Raj and Municipalities

Essential Readings:

P. deSouza, (2002) 'Decentralization and Local Government: The Second Wind of Democracy in India', in Z. Hasan, E. Sridharan and R. Sudarshan (eds.) *India's Living Constitution: Ideas, Practices and Controversies*, New Delhi: Permanent Black, pp. 370-404.

M. John, (2007) 'Women in Power? Gender, Caste and Politics of Local Urban Governance', in *Economic and Political Weekly*, Vol. 42(39), pp. 3986-3993.

Raghunandan, J. R (2012) *Decentralization and local governments: The Indian Experience*, Orient Black Swan, New Delhi

Baviskar, B.S and George Mathew (eds) 2009 *Inclusion and Exclusion in local governance: Field Studies from rural India*, New Delhi, Sage

2.1 Paper III – Political Theory-Concepts and Debates

Course Objective: This course is divided into two sections. Section A helps the student familiarize with the basic normative concepts of political theory. Each concept is related to a crucial political issue that requires analysis with the aid of our conceptual understanding. This exercise is designed to encourage critical and reflective analysis and interpretation of social practices through the relevant conceptual toolkit. Section B introduces the students to the important debates in the subject. These debates prompt

us to consider that there is no settled way of understanding concepts and that in the light of new insights and challenges, besides newer ways of perceiving and interpreting the world around us, we inaugurate new modes of political debates.

Section A: Core Concepts

I. Importance of Freedom (10 Lectures)

a) Negative Freedom: Liberty

b) Positive Freedom: Freedom as Emancipation and Development

Important Issue: Freedom of belief, expression and dissent

II. Significance of Equality (12 lectures)

a) Formal Equality: Equality of opportunity

b) Political equality

c) Egalitarianism: Background inequalities and differential treatment

Important Issue: Affirmative action

III. Indispensability of Justice (12 Lectures)

a) Procedural Justice

b) Distributive Justice

c) Global Justice

Important Issue: Capital punishment

IV. The Universality of Rights (13 Lectures)

a) Natural Rights

b) Moral and Legal Rights

c) Three Generations of Rights

d) Rights and Obligations

Important Issue: Rights of the girl child

Section B: Major Debates (13 Lectures)

I. Why should we obey the state? Issues of political obligation and civil disobedience.

II. Are human rights universal? Issue of cultural relativism.

III. How do we accommodate diversity in plural society? Issues of multiculturalism and toleration.

Essential Readings Section

A: Core Concepts

I. Importance of Freedom

Riley, Jonathan. (2008) 'Liberty' in McKinnon, Catriona (ed.) *Issues in Political Theory*, New York: Oxford University Press, pp. 103-119.

Knowles, Dudley. (2001) *Political Philosophy*. London: Routledge, pp. 69- 132.

Swift, Adam. (2001) *Political Philosophy: A Beginners Guide for Student's and Politicians*. Cambridge: Polity Press, pp. 51-88.

Carter, Ian. (2003) 'Liberty', in Bellamy, Richard and Mason, Andrew (eds.). *Political Concepts*. Manchester: Manchester University Press, pp. 4-15.

Sethi, Aarti. (2008) 'Freedom of Speech and the Question of Censorship', in Bhargava, Rajeev and Acharya, Ashok. (eds.) *Political Theory: An Introduction*. New Delhi: Pearson Longman, pp. 308-319.

II. Significance of Equality

Swift, Adam. (2001) *Political Philosophy: A Beginners Guide for Student's and Politicians*. Cambridge: Polity Press, pp. 91-132.

Casal, Paula & William, Andrew. (2008) 'Equality', in McKinnon, Catriona. (ed.) *Issues in Political Theory*. New York: Oxford University Press, pp. 149- 165.

Acharya, Ashok. (2008) 'Affirmative Action', in Bhargava, Rajeev and Acharya, Ashok. (eds.) *Political Theory: An Introduction*. New Delhi: Pearson Longman, pp. 298-307.

III. Indispensability of Justice

Menon, Krishna. (2008) 'Justice', in Bhargava, Rajeev and Acharya, Ashok. (eds.) *Political Theory: An Introduction*. New Delhi: Pearson Longman, pp. 74-86.

Wolf, Jonathan. (2008) 'Social Justice', in McKinnon, Catriona. (ed.) *Issues in Political Theory*. New York: Oxford University Press, pp. 172-187.

Swift, Adam. (2001) *Political Philosophy: A Beginners Guide for Student's and Politicians*.

Cambridge: Polity Press, pp. 9-48.

Knowles, Dudley. (2001) *Political Philosophy*. London: Routledge, pp. 177-238.

McKinnon, Catriona. (ed.) (2008) *Issues in Political Theory*. New York: Oxford University Press, pp. 289-305.

Bedau, Hugo Adam. (2003) 'Capital Punishment', in LaFollette, Hugh (ed.). *The Oxford Handbook of Practical Ethics*. New York: Oxford University Press, pp. 705-733.

IV. The Universality of Rights

Seglow, Jonathan. (2003) 'Multiculturalism' in Bellamy, Richard and Mason, Andrew (eds.). *Political Concepts*. Manchester: Manchester University Press, pp. 156-168.

Tulkdar, P.S. (2008) 'Rights' in Bhargava, Rajeev and Acharya, Ashok. (eds.) *Political Theory: An Introduction*. New Delhi: Pearson Longman, pp. 88-104.

McKinnon, Catriona. (2003) 'Rights', in Bellamy, Richard and Mason, Andrew. (eds.) *Political Concepts*. Manchester: Manchester University Press, pp. 16-27.

Menlowe, M.A. (1993) 'Political Obligations', in Bellamy Richard.(ed.) *Theories and Concepts of Politics*. New York: Manchester University Press, pp. 174-194.

Amoah, Jewel. (2007) 'The World on Her Shoulders: The Rights of the Girl-Child in the Context of Culture & Identity', in *Essex Human Rights Review*, 4(2), pp. 1-23.

Working Group on the Girl Child (2007), *A Girl's Right to Live: Female Foeticide and Girl Infanticide*, available on [http://www.crin.org/docs/Girl's infanticide CSW 2007.txt](http://www.crin.org/docs/Girl's%20infanticide%20CSW%202007.txt)

Section B: Major Debates

Hyums, Keith. (2008) 'Political Authority and Obligation', in Mckinnon, Catriona. (ed.) *Issues in Political Theory*, New York: Oxford University Press, pp. 9-26

Martin, Rex. (2003) 'Political Obligation', in Bellamy, Richard and Mason, Andrew. (eds.) *Political Concepts*, Manchester: Manchester University Press, pp. 41-51.

Campbell, Tom. (2008) 'Human Rights' in Mckinnon, Catriona. (ed.) *Issues in Political Theory*. New York: Oxford University Press, pp. 194-210.

Mookherjee, Monica, 'Multiculturalism', in Mckinnon, Catriona. (ed.) *Issues in*

Political Theory. New York: Oxford University Press, pp. 218- 234.

Seglow, Jonathan, 'Multiculturalism', in Bellamy, Richard and Mason, Andrew. (eds.) *Political Concepts*, Manchester: Manchester University Press, pp. 156-168.

2.2 Paper IV- Political Process in India

Course objective: Actual politics in India diverges quite significantly from constitutional legal rules. An understanding of the political process thus calls for a different mode of analysis - that offered by political sociology. This course maps the working of 'modern' institutions, premised on the existence of an individuated society, in a context marked by communitarian solidarities, and their mutual transformation thereby. It also familiarizes students with the working of the Indian state, paying attention to the contradictory dynamics of modern state power.

I. Political Parties and the Party System (1.5 weeks or 6 lectures)

Trends in the Party System; From the Congress System to Multi-Party Coalitions

II. Determinants of Voting Behaviour (2 weeks or 8 lectures)

Caste, Class, Gender and Religion

III. Regional Aspirations (2 weeks or 8 lectures)

The Politics of Secession and Accommodation

IV. Religion and Politics (2 weeks or 8 lectures)

Debates on Secularism; Minority and Majority Communalism

V. Caste and Politics (1.5 weeks or 6 lectures)

Caste in Politics and the Politicization of Caste

VI. Affirmative Action Policies (1.5 weeks or 6 lectures)

Women, Caste and Class

VII. The Changing Nature of the Indian State (1.5 weeks or 6 lectures)

Developmental, Welfare and Coercive Dimensions

READING LIST

I. Political Parties and the Party System: Trends in the Party System; From the Congress System to Multi-Party Coalitions

Essential Readings:

R. Kothari, (2002) 'The Congress System', in Z. Hasan (ed.) *Parties and Party Politics in India*, New Delhi: Oxford University Press, pp 39-55.

E. Sridharan, (2012) 'Introduction: Theorizing Democratic Consolidation, Parties and Coalitions', in *Coalition Politics and Democratic Consolidation in Asia*, New Delhi: Oxford University Press.

Additional Reading:

Y. Yadav and S. Palshikar, (2006) 'Party System and Electoral Politics in the Indian States, 1952-2002: From Hegemony to Convergence', in P. deSouza and E. Sridharan (eds.) *India's Political Parties*, New Delhi: Sage Publications, pp. 73-115.

II. Determinants of Voting Behaviour: Caste, Class, Gender and Religion

Essential Readings:

Y. Yadav, (2000) 'Understanding the Second Democratic Upsurge', in F. Frankel, Z. Hasan, and R. Bhargava (eds.) *Transforming India: Social and Political Dynamics in Democracy*, New Delhi: Oxford University Press, pp. 120-145.

C. Jaffrelot, (2008) 'Why Should We Vote? The Indian Middle Class and the Functioning of World's Largest Democracy', in *Religion, Caste and Politics in India*, Delhi: Primus, pp. 604-619.

R. Deshpande, (2004) 'How Gendered was Women's Participation in Elections 2004?', *Economic and Political Weekly*, Vol. 39, No. 51, pp. 5431-5436.

S. Kumar, (2009) 'Religious Practices Among Indian Hindus,' *Japanese Journal of Political Science*, Vol. 10, No. 3, pp. 313-332.

III. Regional Aspirations: The Politics of Secession and Accommodation

Essential Readings:

M. Chadda, (2010) 'Integration through Internal Reorganisation', in S. Baruah (ed.) *Ethnonationalism in India: A Reader*, New Delhi: Oxford University Press, pp. 379-402.

P. Brass, (1999) 'Crisis of National Unity: Punjab, the Northeast and Kashmir', in *The Politics of India Since Independence*, New Delhi: Cambridge University Press and Foundation Books, pp. 192-227.

IV. Religion and Politics: Debates on Secularism: Minority and Majority Communalism

Essential Readings:

T. Pantham, (2004) 'Understanding Indian Secularism: Learning from its Recent Critics', in R. Vora and S. Palshikar (eds.) *Indian Democracy: Meanings and Practices*, New Delhi: Sage, pp. 235-256.

N. Menon and A. Nigam, (2007) 'Politics of Hindutva and the Minorities', in *Power and Contestation: India since 1989*, London: Fernwood Publishing, Halifax and Zed Books, pp. 36-60.

Additional Reading:

N. Chandhoke, (2010) 'Secularism', in P. Mehta and N. Jayal (eds.) *The Oxford Companion to Politics in India*, New Delhi: Oxford University Press, pp. 333-346.

V. Caste and Politics: Caste in Politics and the Politicization of Caste

Essential Readings:

R. Kothari, (1970) 'Introduction', in *Caste in Indian Politics*, Delhi: Orient Longman, pp.3-25. M. Weiner, (2001) 'The Struggle for Equality: Caste in Indian Politics', in Atul Kohli (ed.) *The Success of India's Democracy*, New Delhi: Cambridge University Press, pp. 193-225.

G. Omvedt, (2002) 'Ambedkar and After: The Dalit Movement in India', in G. Shah (ed.) *Social Movements and the State*, New Delhi: Sage Publications, pp. 293-309.

VI. Affirmative Action Policies: Women, Caste and Class

Essential Readings:

M. Galanter, (2002) 'The Long Half-Life of Reservations', in Z. Hasan, E. Sridharan and R. Sudarshan (eds.) *India's Living Constitution: Ideas, Practices, Controversies*, New Delhi: Permanent Black, pp. 306-318.

C. Jaffrelot, (2005) 'The Politics of the OBCs', in *Seminar*, Issue 549, pp. 41-45.

M. John, (2011) 'The Politics of Quotas and the Women's Reservation Bill in India', in M. Tsujimura and J. Steele (eds.) *Gender Equality in Asia*, Japan: Tohoku University Press, pp. 169-195.

VII. Changing Nature of the Indian State: Developmental, Welfare and Coercive Dimensions

Essential Readings:

S. Palshikar, (2008) 'The Indian State: Constitution and Beyond', in R. Bhargava (ed.) *Politics and Ethics of the Indian Constitution*, New Delhi: Oxford University Press, pp. 143-163.

R. Deshpande, (2005) 'State and Democracy in India: Strategies of Accommodation and Manipulation', Occasional Paper, Series III, No. 4, Special Assistance Programme, Department of Politics and Public Administration, University of Pune.

M. Mohanty, (1989) 'Duality of the State Process in India: A Hypothesis', *Bhartiya Samajik Chintan*, Vol. XII (1-2)

Additional Readings:

T. Byres, (1994) 'Introduction: Development Planning and the Interventionist State Versus Liberalization and the Neo-Liberal State: India, 1989-1996', in T. Byres (ed.) *The State, Development Planning and Liberalization in India*, New Delhi: Oxford University Press, 1994, pp.1-35.

A. Verma, (2007) 'Police Agencies and Coercive Power', in S. Ganguly, L. Diamond and M. Plattner (eds.) *The State of India's Democracy*, Baltimore: John Hopkins University Press, pp. 130-139.

3.1 Paper V- Introduction to Comparative Government and Politics

Course objective: This is a foundational course in comparative politics. The purpose is to familiarize students with the basic concepts and approaches to the study of comparative politics. More specifically the course will focus on examining politics in a historical framework while engaging with various themes of comparative analysis in developed and developing countries.

I. Understanding Comparative Politics (8 lectures)

- a. Nature and scope
- b. Going beyond Eurocentrism

II. Historical context of modern government (16 lectures)

- a. Capitalism: meaning and development: globalization
- b. Socialism: meaning, growth and development
- c. Colonialism and decolonization: meaning, context, forms of colonialism; anti-colonialism struggles and process of decolonization

III. Themes for comparative analysis (24 lectures)

A comparative study of constitutional developments and political economy in the following countries: Britain, Brazil, Nigeria and China.

I. Understanding Comparative Politics

Essential Readings:

J. Kopstein, and M. Lichbach, (eds), (2005) *Comparative Politics: Interests, Identities, and Institutions in a Changing Global Order*. Cambridge: Cambridge University Press, pp.1-5; 16-36; 253-290.

M. Mohanty, (1975) 'Comparative Political Theory and Third World Sensitivity', in *Teaching Politics*, Nos. 1 and 2, pp. 22-38

Additional Readings:

A. Roy, (2001) 'Comparative Method and Strategies of Comparison', in *Punjab Journal of Politics*. Vol. xxv (2), pp. 1-15.

J. Blondel, (1996) 'Then and Now: Comparative Politics', in *Political Studies*. Vol. 47 (1), pp. 152-160.

N. Chandhoke, (1996) 'Limits of Comparative Political Analysis', in *Economic and Political Weekly*, Vol. 31 (4), January 27, pp. PE 2-PE2-PE8

II Historical context of modern government a. Capitalism

Essential Readings:

R. Suresh, (2010) *Economy & Society -Evolution of Capitalism*, New Delhi, Sage Publications, pp. 151-188; 235-268.

G. Ritzer, (2002) 'Globalization and Related Process I: Imperialism, Colonialism, Development, Westernization, Easternization', in *Globalization: A Basic Text*. London: Wiley-Blackwell, pp. 63-84.

Additional Readings:

M. Dobb, (1950) 'Capitalism', in *Studies in the Development of Capitalism*. London: Routledge and Kegan Paul Ltd, pp. 1-32.

E. Wood, (2002) 'The Agrarian origin of Capitalism', in *Origin of Capitalism: A Long View*. London: Verso, pp. 91-95; 166-181.

A. Hoogvelt, (2002) 'History of Capitalism Expansion', in *Globalization and Third World Politics*. London: Palgrave, pp. 14-28.

b. Socialism

Essential Readings:

A. Brown, (2009) 'The Idea of Communism', in *Rise and Fall of Communism*, Harpercollins (e-book), pp. 1-25; 587-601.

J. McCormick, (2007) 'Communist and Post-Communist States', in *Comparative Politics in Transition*, United Kingdom: Wadsworth, pp. 195-209

Additional Readings:

R. Meek, (1957) 'The Definition of Socialism: A Comment', *The Economic Journal*. 67 (265), pp. 135-139.

c. Colonialism, decolonization& postcolonial society

Essential Readings:

P. Duara, (2004) 'Introduction: The Decolonization of Asia and Africa in the Twentieth Century', in P. Duara, (ed), *Decolonization: Perspective From Now and Then*. London: Routledge, pp. 1-18.

J. Chiryankandath, (2008) 'Colonialism and Post-Colonial Development', in P. Burnell, et. al, *Politics in the Developing World*. New Delhi: Oxford University Press, pp. 31-52.

Additional Reading:

M. Mohanty, (1999) 'Colonialism and Discourse in India and China', Available at http://www.ignca.nic.in/ks_40033.html http, Accessed: 24.03.2011.

III. Themes for Comparative Analysis

Essential Reading:

L. Barrington et. al (2010) *Comparative Politics - Structures & Choices*, Boston, Wadsworth, pp. 212-13; 71-76; 84-89.

M. Grant, (2009) 'United Kingdom Parliamentary System' in *The UK Parliament*. Edinburgh: Edinburgh University Press, pp. 24-43

J. McCormick, (2007) *Comparative Politics in Transition*, UK: Wadsworth, pp. 260-270 (China)

M. Kesselman, J. Krieger and William (2010), *Introduction to Comparative Politics: Political Challenges and Changing Agendas*, UK: Wadsworth. pp. 47-70 (Britain); 364-388 (Nigeria); 625-648 (China); 415-440 (Brazil).

Additional Reading:

P. Rutland, (2007) 'Britain', in J. Kopstein and M. Lichbach. (eds.) *Comparative Politics: Interest, Identities and Institutions in a Changing Global Order*. Cambridge: Cambridge University Press, pp. 39-79.

3.2 PERSPECTIVES ON PUBLIC ADMINISTRATION

Objective: The course provides an introduction to the discipline of public administration. This paper encompasses public administration in its historical context with an emphasis on the various classical and contemporary administrative theories. The course also explores some of the recent trends, including feminism and ecological conservation and how the call for greater democratization is restructuring public administration. The course will also attempt to provide the students a comprehensive understanding on contemporary administrative developments.

I. PUBLIC ADMINISTRATION AS A DISCIPLINE [15 lectures]

- Meaning, Dimensions and Significance of the Discipline
- Public and Private Administration
- Evolution of Public Administration

II. THEORETICAL PERSPECTIVES [25 lectures]

CLASSICAL THEORIES

- Scientific management (F.W.Taylor)
- Administrative Management (Gullick, Urwick and Fayol)
- Ideal-type bureaucracy (Max Weber)

NEO-CLASSICAL THEORIES

- Human relations theory (Elton Mayo)
- Rational decision-making (Herbert Simon)

CONTEMPORARY THEORIES

- Ecological approach (Fred Riggs)
- Innovation and Entrepreneurship (Peter Drucker)

III. PUBLIC POLICY [10 lectures]

- Concept, relevance and approaches
- Formulation, implementation and evaluation

IV. MAJOR APPROACHES IN PUBLIC ADMINISTRATION [20 lectures]

- New Public Administration
- New Public Management
- New Public Service Approach
- Good Governance
- Feminist Perspectives

READINGS

I. Public Administration as a Discipline

Meaning, Dimensions and Significance of the Discipline.

Nicholas Henry, *Public Administration and Public Affairs*, Prentice Hall, 1999

D. Rosenbloom, R. Kravchuk. and R. Clerkin, (2009) *Public Administration: Understanding Management, Politics and Law in Public Sector*, 7th edition, New Delhi: McGraw Hill, pp. 1-40

W. Wilson, (2004) 'The Study of Administration', in B. Chakrabarty and M. Bhattacharya (eds), *Administrative Change and Innovation: a Reader*, New Delhi: Oxford University Press, pp. 85-101

b. Public and Private Administration.

M. Bhattacharya, (2008) *New Horizons of Public Administration*, 5th Revised Edition. New Delhi: Jawahar Publishers, pp. 37-44.

G. Alhson, (1997) 'Public and Private Management', in Shafritz, J. and Hyde, A. (eds.) *Classic of Public Administration*, 4th Edition. Forth Worth: Hartcourt Brace, TX, pp. 510-529.

Evolution of Public Administration

N. Henry, *Public Administration and Public Affairs*, 12th edition. New Jersey: Pearson, 2013

M. Bhattacharya, *Restructuring Public Administration: A New Look*, New Delhi: Jawahar Publishers, 2012

P. Dunleavy and C. Hood, "From Old Public Administration to New Public Management", *Public Money and Management*, Vol. XIV No-3, 1994

M. Bhattacharya, *New Horizons of Public Administration*, New Delhi: Jawahar

Publishers, 2011

Basu, Rumki, *Public Administration : Concepts and Theories* Sterling Publishers, New Delhi 2014

II. Theoretical Perspectives Scientific Management

D. Gvishiani, *Organisation and Management*, Moscow: Progress Publishers, 1972

F. Taylor, 'Scientific Management', in J. Shafritz, and A. Hyde, (eds.) *Classics of PublicAdministration*, 5th Edition. Belmont: Wadsworth, 2004

P. Mouzelis, 'The Ideal Type of Bureaucracy' in B. Chakrabarty, And M. Bhattacharya, (eds), *Public Administration: A Reader*, New Delhi: Oxford University Press,2003

Administrative Management

H.Ravindra Prasad, Y. Pardhasaradhi, V. S. Prasad and P. Satyrnarayana, [eds.], *Administrative Thinkers*, Sterling Publishers, 2010

I. J. Ferreira, A. W. Erasmus and D. Groenewald , *Administrative Management*, Juta Academics, 2010

Ideal Type-Bureaucracy

R. Weber, 'Bureaucracy', in C. Mills, and H. Gerth, *From Max Weber: Essays in Sociology*. Oxford: Oxford University Press, 1946

Warren. G.Bennis, *Beyond Bureaucracy*, Mc Graw Hill, 1973

Human Relations Theory

D. Gvishiani, *Organisation and Management*, Moscow: Progress Publishers, 1972

B. Miner, 'Elton Mayo and Hawthorne', in *Organisational Behaviour 3: Historical Origins andthe Future*. New York: M.E. Sharpe, 2006

Rational-Decision Making

S. Maheshwari, *Administrative Thinkers*, New Delhi: Macmillan, 2009

Fredrickson and Smith, 'Decision Theory', in *The Public Administration Theory Primer*. Cambridge: Westview Press, 2003

Ecological approach

R. Arora, 'Riggs' Administrative Ecology' in B. Chakrabarty and M. Bhattacharya (eds), *PublicAdministration: A reader*, New Delhi, Oxford University Press, 2003

A. Singh, *Public Administration: Roots and Wings*. New Delhi: Galgotia Publishing Company, 2002

F. Riggs, *Administration in Developing Countries: The Theory of Prismatic Society*. Boston: Houghton Mifflin,1964

Innovation and Entrepreneurship

Peter Drucker, *Innovation and Entrepreneurship*, Harper Collins,1999

Peter F. Drucker , *The Practice of Management*, Harper Collins, 2006

III. Public Policy

Concept, Relevance and Approaches

T. Dye, (1984) *Understanding Public Policy*, 5th Edition. U.S.A: Prentice Hall, pp. 1- 44
The Oxford Handbook of Public Policy ,OUP,2006

Xun Wu, M.Ramesh, Michael Howlett and Scott Fritzen ,*The Public Policy Primer: ManagingThe Policy Process*, Rutledge, 2010

Mary Jo Hatch and Ann .L. Cunliffe *Organisation Theory : Modern, Symbolicand Postmodern Perspectives*, Oxford University Press,2006

Michael Howlett, *Designing Public Policies : Principles And Instruments*, Rutledge, 2011
The Oxford Handbook Of Public Policy, Oxford University Press, 2006

Formulation, implementation and evaluation

Prabir Kumar De, *Public Policy and Systems*, Pearson Education, 2012

R.V. Vaidyanatha Ayyar, *Public Policy Making In India*, Pearson,2009

Surendra Munshi and Biju Paul Abraham [Eds.] *Good Governance, Democratic Societies AndGlobalisation*, Sage Publishers, 2004

IV. Major Approaches in Public Administration a. Development administration

M. Bhattacharya, 'Chapter 2 and 4', in *Social Theory, Development Administration andDevelopment Ethics*, New Delhi: Jawahar Publishers, 2006

F. Riggs,*The Ecology of Public Administration, Part 3*, New Delhi: Asia Publishing House, 1961

c. New Public Administration

Essential Reading:

M. Bhattacharya, *Public Administration: Issues and Perspectives*, New Delhi: Jawahar Publishers, 2012

H. Frederickson, 'Toward a New Public Administration', in J. Shafritz, & A. Hyde, (eds.) *Classics of Public Administration*, 5th Edition, Belmont: Wadsworth, 2004

d.New Public Management

U. Medury, *Public administration in the Globalization Era*, New Delhi: Orient Black Swan, 2010

A. Gray, and B. Jenkins, 'From Public Administration to Public Management' in E. Otenyo and N. Lind, (eds.) *Comparative Public Administration: The Essential Readings*: Oxford University Press, 1997

C. Hood, 'A Public Management for All Seasons', in J. Shafritz, & A. Hyde, (eds.) *Classics ofPublic Administration*, 5th Edition, Belmont: Wadsworth, 2004

d. New Public Service Approach

R.B.Denhart & J.V.Denhart [Arizona State University] “ The New Public Service: Serving Rather Than Steering”, in Public Administration Review ,Volume 60, No-6,November-December 2000

e. Good Governance

A. Leftwich, ‘Governance in the State and the Politics of Development’, in *Development and Change*. Vol. 25,1994

M. Bhattacharya, ‘Contextualizing Governance and Development’ in B. Chakrabarty and M. Bhattacharya, (eds.) *The Governance Discourse*. New Delhi: Oxford University Press,1998 B. Chakrabarty, *Reinventing Public Administration: The India Experience*. New Delhi: Orient Longman, 2007

U. Medury, *Public administration in the Globalisation Era*, New Delhi: Orient Black Swan, 2010

f. Feminist Perspective

Camila Stivers, *Gender Images In Public Administration*, California : Sage Publishers,2002 Radha Kumar, *The History of Doing*, New Delhi: Kali For Women, 1998

Sylvia Walby, *Theorising Patriarchy*, Oxford, Basil Blackwell.1997

Amy. S. Wharton, *The Sociology Of Gender*, West Sussex : Blackwell-Wiley Publishers,2012 Nivedita Menon [ed.], *Gender and Politics*, Delhi: Oxford University Press, 1999

Simone De Beauvoir, *The Second Sex*, London: Picador, 1988

Alison Jaggar, *Feminist Politics And Human Nature*, Brighton: Harvester Press,1983

Maxine Molyneux and Shahra Razavi , *Gender, Justice, Development and Rights* ,Oxford: Oxford University Press, 2002

3.3 Paper VII- Perspectives on International Relations and World History

Course Objective: This paper seeks to equip students with the basic intellectual tools for understanding International Relations. It introduces students to some of the most important theoretical approaches for studying international relations. The course begins by historically contextualizing the evolution of the international state system before discussing the agency-structure problem through the levels-of-analysis approach. After having set the parameters of the debate, students are introduced to different theories in International Relations. It provides a fairly comprehensive overview of the major political developments and events starting from the twentieth century. Students are expected to learn about the key milestones in world history and equip them with the tools to understand and analyze the same from different perspectives. A key objective of the course is to make students aware of the implicit Euro - centricism of International Relations by highlighting certain specific perspectives from the Global South.

A. Studying International Relations (15 Lectures)

- i. How do you understand International Relations: Levels of Analysis (3 lectures)
- ii. History and IR: Emergence of the International State System (2 Lectures)
- iii. Pre-Westphalia and Westphalia (5 lectures)
- iv. Post-Westphalia (5 lectures)

D. Theoretical Perspectives (25 Lectures)

- i. Classical Realism & Neo-Realism (6 lectures)
- ii. Liberalism & Neoliberalism (5 lectures)
- iii. Marxist Approaches (5 lectures)
- iv. Feminist Perspectives (4 lectures)
- v. Eurocentricism and Perspectives from the Global South (5 Lectures)

C. An Overview of Twentieth Century IR History (20 Lectures)

- i. World War I: Causes and Consequences (1 Lecture)
- ii. Significance of the Bolshevik Revolution (1 Lecture)
- iii. Rise of Fascism / Nazism (2 Lectures)
- iv. World War II: Causes and Consequences (3 Lectures)
- v. Cold War: Different Phases (4 Lectures)
- vi. Emergence of the Third World (3 Lectures)
- vii. Collapse of the USSR and the End of the Cold War (2 Lectures)
- viii. Post Cold War Developments and Emergence of Other Power Centers of Power (4 Lectures)

Essential Readings:

M. Nicholson, (2002) *International Relations: A Concise Introduction*, New York: Palgrave, pp. 1-4.

R. Jackson and G. Sorensen, (2007) *Introduction to International Relations: Theories and Approaches*, 3rd Edition, Oxford: Oxford University Press, pp. 2-7

S. Joshua. Goldstein and J. Pevehouse, (2007) *International Relations*, New York: Pearson Longman, 2007, pp. 29-35

C. Brown and K. Ainley, (2009) *Understanding International Relations*, Basingstoke: Palgrave, pp. 1-16.

Additional Readings:

K. Mingst and J. Snyder, (2011) *Essential Readings in International Relations*, New York: W.W. Norton and Company, pp. 1-15.

M. Smith and R. Little, (eds) (2000) 'Introduction', in *Perspectives on World Politics*, New York: Routledge, 2000, 1991, pp. 1-17.

J. Baylis and S. Smith (eds), (2008) *The Globalization of World Politics: An Introduction to International Relations*, New York: Oxford University Press, pp. 1- 6.

R. Mansbach and K. Taylor, (2008) *Introduction to Global Politics*, New York: Routledge, pp. 2-32.

Rumki Basu, (ed)(2012) *International Politics: Concepts, Theories and Issues* New Delhi, Sage.

History and IR: Emergence of the International State System:

Essential Readings:

R. Mansbach and K. Taylor, (2012) *Introduction to Global Politics*, New York: Routledge, pp. 33-68.

K. Mingst, (2011) *Essentials of International Relations*, New York: W.W. Norton and Company, pp. 16-63.

P. Viotti and M. Kauppi, (2007) *International Relations and World Politics: Security, Economy, Identity*, Pearson Education, pp. 40-85.

Additional Readings:

J. Baylis, S. Smith and P. Owens, (2008) *The Globalization of World Politics: An Introduction to International Relations*, New York: Oxford University Press, pp. 36- 89.

R. Mansbach and K. Taylor, (2008) *Introduction to Global Politics*, New York: Routledge, pp. 70-135.

J Goldstein and J. Pevehouse, (2007) *International Relations*, New York: Pearson Longman, pp. 50-69.

E. Hobsbawm, (1995) *Age of Extremes: The Short Twentieth Century 1914-1991*, Vikings.

S. Lawson, (2003) *International Relations*, Cambridge: Polity Press, pp. 21-60.

How do you Understand IR (Levels of Analysis):

Essential Readings:

J. Singer, (1961) 'The International System: Theoretical Essays', *World Politics*, Vol. 14(1), pp. 77-92.

B. Buzan, (1995) 'The Level of Analysis Problem in International Relations Reconsidered,' in K. Booth and S. Smith, (eds), *International Relations Theory Today*, Pennsylvania: The Pennsylvania State University Press, pp. 198-216.

Additional Readings:

K. Mingst, (2011) *Essentials of International Relations*, New York: W.W. Norton and Company, pp. 93-178.

J. Goldstein and J. Pevehouse, (2007) *International Relations*, New York: Pearson Longman, pp. 35-49.

K. Waltz, (1959) *Man, The State and War*, Columbia: Columbia University Press.

Theoretical Perspectives:

Classical Realism and Neorealism

Essential Readings:

E. Carr, (1981) *The Twenty Years Crisis, 1919-1939: An Introduction to the Study of International Relations*, London: Macmillan, pp. 63-94.

H. Morgenthau, (2007) 'Six Principles of Political Realism', in R. Art and R. Jervis, *International Politics*, 8th Edition, New York: Pearson Longman, pp. 7-14.

T. Dunne and B. Schmidt, (2008) 'Realism', in J. Baylis and S. Smith (eds), *The Globalization of World Politics: An Introduction to International Relations*, New York: Oxford University Press, pp. 90-107.

K. Waltz, (2007) 'The Anarchic Structure of World Politics', in R. Art and R. Jervis, *International Politics*, 8th Edition, New York: Pearson Longman, pp. 29-49.

Additional Readings:

M. Nicholson, (2002) *International Relations: A Concise Introduction*, New York: Palgrave, pp. 6-7.

H. Bull, (2000) 'The Balance of Power and International Order', in M. Smith and R. Little (eds), *Perspectives on World Politics*, New York: Routledge, pp. 115-124.

Liberalism and Neoliberalism

Essential Readings:

T. Dunne, (2008) 'Liberalism', in J. Baylis and S. Smith (eds.), *The Globalization of World Politics: An Introduction to International Relations*, New York: Oxford University Press, pp. 108-123.

R. Keohane and J. Nye, (2000) 'Transgovernmental Relations and the International Organization', in M. Smith and R. Little (eds.), *Perspectives on World Politics*, New York: Routledge, pp. 229-241.

Additional Readings:

J. Goldstein and J. Pevehouse, (2007) *International Relations*, New York: Pearson Longman, pp. 127-137.

R. Jackson and G. Sorensen, (2007) *Introduction to International Relations: Theories and Approaches*, 3rd Edition, Oxford: Oxford University Press, pp. 97- 128.

Marxist Approaches

Essential Readings:

I. Wallerstein, (2000) 'The Rise and Future Demise of World Capitalist System: Concepts for Comparative Analysis', in Michael Smith and Richard Little (eds), *Perspectives on World Politics*, New York: Routledge, pp. 305-317.

S. Hobden and R. Jones, (2008) 'Marxist Theories of International Relations' in J. Baylis and S. Smith (eds), *The Globalization of World Politics: An Introduction to International Relations*, New York: Oxford University Press, pp. 142-149; 155-158.

J. Goldstein and J. Pevehouse, (2007) *International Relations*, New York: Pearson Longman, pp. 494-496; 500-503.

Additional Readings:

J. Galtung, (2000) 'A Structural Theory of Imperialism', in M. Smith and R. Little, (eds), *Perspectives on World Politics*, New York: Routledge, pp. 292-304.

A. Frank, (1966) 'The Development of Underdevelopment' *Monthly Review*, pp. 17-30.

P. Viotti and M. Kauppi (2007), *International Relations and World Politics: Security, Economy, Identity*, Pearson Education, pp. 40-85.

Modern History Sourcebook: Summary of Wallerstein on World System Theory, Available at <http://www.fordham.edu/halsall/mod/Wallerstein.asp>, Accessed: 19.04.2013

Feminist Perspectives

Essential Readings:

J. Tickner, (2007) 'A Critique of Morgenthau's Principles of Political Realism', in R. Art and R. Jervis, *International Politics*, 8th Edition, New York: Pearson Longman, pp. 15-28.

F. Halliday, (1994) *Rethinking International Relations*, London: Macmillan, pp. 147-166. Additional Readings:

M. Nicholson, *International Relations: A Concise Introduction*, New York: Palgrave, 2002, pp. 120-122.

J. Goldstein and J. Pevehouse, (2007) *International Relations*, New York: Pearson

Longman, pp. 138-148.

S. Smith and P. Owens, (2008) 'Alternative Approaches to International Theory' in J. Baylis and S. Smith (eds), *The Globalization of World Politics: An Introduction to International Relations*, New York: Oxford University Press, pp. 181-184.

IR, Eurocentrism and Perspectives from the Global South on Eurocentrism

Essential Readings:

A. Acharya and B. Buzan, (2007) 'Why Is There No Non- Western IR Theory: Reflections on and From Asia', *International Relations Of The Asia- Pacific*, Vol 7(3), pp. 285-286.

T. Kayaoglu, (2010) 'Westphalian Eurocentrism in I R Theory', in *International Studies Review*, Vol. 12(2), pp. 193-217.

Additional Readings:

O. Weaver and A. Tickner, (2009) 'Introduction: Geocultural Epistemologies', in A. Tickner and O. Waever (eds), *International Relations: Scholarship Around The World*, London: Routledge, pp. 1-31.

R.Kanth (ed), (2009) *The Challenge of Eurocentrism: Global Perspectives, Policy & Prospects*, New York: Palgrave-McMillan.

S. Amin, (2010) *Eurocentrism: Modernity, Religion & Democracy*, New York: Monthly Review Press.

An Overview of Twentieth Century IR History

(a) World War I: Causes and Consequences

Hobsbawm, E. (1995) *Age of Extreme: The Short Twentieth Century, 1914—1991*. London: Abacus, pp. 22-35.

(b) Significance of the Bolshevik Revolution

Hobsbawm, E. (1995) *Age of Extreme: The Short Twentieth Century, 1914—1991*. London: Abacus, pp. 54-78.

(c) Rise of Fascism / Nazism

Hobsbawm, E. (1995) *Age of Extreme: The Short Twentieth Century, 1914—1991*. London: Abacus, pp. 108-141.

Carr, E.H. (2004) *International Relations between the Two World Wars: 1919-1939*. New York: Palgrave, pp. 197-231 and 258-278.

(d) World War II: Causes and Consequences

Taylor, A.J.P. (1961) *The Origins of the Second World War*. Harmondsworth: Penguin,

pp.29-65.

Carruthers, S.L. (2005) 'International History, 1900-1945' in Baylis, J. and Smith, S. (eds.) (2008)

The Globalization of World Politics. An Introduction to International Relations. 4th edn. Oxford: Oxford University Press, pp. 76-84.

(e) Cold War: Different Phases

Calvocoressi, P. (2001) *World Politics: 1945—2000*. Essex: Pearson, pp. 3-91.

Scott, L. (2005) 'International History, 1945-1990' in Baylis, J. and Smith, S. (eds.) (2008) *The Globalization of World Politics. An Introduction to International Relations.* 4th edn. Oxford: Oxford University Press, pp. 93-101.

Hobsbawm, E. (1995) *Age of Extreme: The Short Twentieth Century, 1914—1991*. London: Abacus, pp. 225-226.

(f) Emergence of the Third World

Hobsbawm, E. (1995) *Age of Extreme: The Short Twentieth Century, 1914—1991*. London: Abacus, pp. 207-222.

(g) Collapse of the USSR and the End of the Cold War

Scott, L. (2005) 'International History, 1945-1990' in Baylis, J. and Smith, S. (eds.) (2008) *The Globalization of World Politics. An Introduction to International Relations.* 4th edn. Oxford: Oxford University Press, pp. 93-101.

(h) Post Cold War Developments and Emergence of Other Power Centres of Power: Japan, European Union (EU) and Brazil, Russia, India, China (BRIC)

Brezemski, Z. (2005) *Choice: Global Dominance or Global Leadership*. New York: Basic Books, pp. 85-127.34

Gill, S. (2005) 'Contradictions of US Supremacy' in Panitch, L. and Leys, C. (eds.) *Socialist Register: The Empire Reloaded*. London: Merlin Press. 2004, London, Merlin Press and New York, Monthly Review Press. *Socialist Register*, pp.24-47.

Therborn, G. (2006) 'Poles and Triangles: US Power and Triangles of Americas, Asia and Europe' in Hadiz, V.R. (ed.) *Empire and Neo Liberalism in Asia*. London: Routledge, pp.23-37.

4.1 Paper VIII- Political Processes and Institutions in Comparative Perspective

Course objective: In this course students will be trained in the application of comparative methods to the study of politics. The course is comparative in both what we study and how we study. In the process the course aims to introduce undergraduate students to some of the range of issues, literature, and methods that cover comparative political.

I. Approaches to Studying Comparative Politics (8

lectures) a. Political Culture

b. New Institutionalism

II. Electoral System (8 lectures)

Definition and procedures: Types of election system (First Past the Post, Proportional Representation, Mixed Representation)

III. Party System (8 lectures)

Historical contexts of emergence of the party system and types of parties

IV. Nation-state (8 lectures)

What is nation–state? Historical evolution in Western Europe and postcolonial contexts
'Nation' and 'State': debates

V. Democratization (8 lectures)

Process of democratization in postcolonial, post- authoritarian and post-communist countries

VI. Federalism (8 lectures) Historical context Federation and Confederation: debates around territorial division of power.

READING LIST

I: Approaches to Studying Comparative Politics

Essential Readings:

M. Pennington, (2009) 'Theory, Institutional and Comparative Politics', in J. Bara and Pennington. (eds.) *Comparative Politics: Explaining Democratic System*. Sage Publications, New Delhi, pp. 13-40.

M. Howard, (2009) 'Culture in Comparative Political Analysis', in M. Lichback and A. Zuckerman, pp. 134- S. (eds.) *Comparative Political: Rationality, Culture, and Structure*. Cambridge: Cambridge University Press.

B. Rosamond, (2005) 'Political Culture', in B. Axford, et al. *Politics*, London: Routledge, pp. 57-81.

Additional Readings:

P. Hall, Taylor and C. Rosemary, (1996) 'Political Science and the Three New Institutionalism', *Political Studies*. XLIV, pp. 936-957.

L. Rakner, and R. Vicky, (2011) 'Institutional Perspectives', in P. Burnell, et .al. (eds.) *Political in the Developing World*. Oxford: Oxford University Press, pp. 53-70.

II: Electoral System

Essential Readings:

A. Heywood, (2002) 'Representation, Electoral and Voting', in *Politics*. New York: Palgrave, pp. 223-245.

A. Evans, (2009) 'Elections Systems', in J. Bara and M. Pennington, (eds.) *Comparative politics*. New Delhi: Sage Publications, pp. 93-119.

Additional Reading:

R. Moser, and S. Ethan, (2004) 'Mixed Electoral Systems and Electoral System Effects: Controlled Comparison and Cross-national Analysis', in *Electoral Studies*. 23, pp. 575-599.

III: Party System

Essential Readings:

A. Cole, (2011) 'Comparative Political Parties: Systems and Organizations', in J. Ishiyama, and M. Breuning, (eds) *21st Century Political Science: A Reference Book*. Los Angeles: Sage Publications, pp. 150-158.

A. Heywood, (2002) 'Parties and Party System', in *Politics*. New York : Palgrave, pp. 247-268.

Additional Readings:

- B. Criddle, (2003) 'Parties and Party System', in R. Axtmann, (ed.) *Understanding Democratic Politics: An Introduction*. London: Sage Publications, pp. 134-142.

IV: Nation-state

Essential Readings:

W. O'Conner, (1994) 'A Nation is a Nation, is a Sate, is a Ethnic Group, is a ...', in J. Hutchinson and A. Smith, (eds.) *Nationalism*. Oxford: Oxford University Press, pp. 36-46.

K. Newton, and J. Deth, (2010) 'The Development of the Modern State ', in *Foundations of Comparative Politics: Democracies of the Modern World*. Cambridge: Cambridge University Press, pp. 13-33.

Additional Reading:

A. Heywood, (2002), 'The State', in *Politics*. New York: Palgrave, pp. 85-102

V. Democratization

Essential Readings:

T. Landman, (2003) 'Transition to Democracy', in *Issues and Methods of Comparative Methods: An Introduction*. London: Routledge, pp. 185-215.

K. Newton, and J. Deth, (2010) 'Democratic Change and Persistence', in *Foundations of Comparative Politics: Democracies of the Modern World*. Cambridge: Cambridge University Press, pp. 53-67.

J. Haynes, (1999) 'State and Society', in *The Democratization*. Oxford: Blackwell, pp. 20-38; 39-63.

Additional Reading:

B. Smith, (2003) 'Democratization in the Third World', in *Understanding Third World Politics: Theories of Political Change and Development*. London: Palgrave Macmillan, pp.250-274.

VI: Federalism

Essential Readings:

M. Burgess, (2006) *Comparative Federalism: Theory and Practice*. London: Routledge, pp. 135-161.

R. Watts, (2008) 'Introduction', in *Comparing Federal Systems*. Montreal and Kingston: McGill Queen's University Press, pp. 1-27

Additional Reading:

R. Saxena, (2011) 'Introduction', in Saxena, R (eds.) *Varieties of Federal Governance: Major Contemporary Models*. New Delhi: Cambridge University Press, pp. xii-x1.

4.2 Paper-IX PUBLIC POLICY AND ADMINISTRATION IN INDIA

Objective: The paper seeks to provide an introduction to the interface between public policy and administration in India. The essence of public policy lies in its effectiveness in translating the governing philosophy into programs and policies and making it a part of the community living. It deals with issues of decentralization, financial management, citizens and administration and social welfare from a non-western perspective.

I. Public Policy [10 lectures]

a. Definition, characteristics and models

b. Public Policy Process in India

II. Decentralization [10 lectures]

- g. Meaning, significance and approaches and types
- h. Local Self Governance: Rural and Urban

III. Budget [12 lectures]

- h. Concept and Significance of Budget
- i. Budget Cycle in India
- j. Various Approaches and Types Of Budgeting

IV. Citizen and Administration Interface [15 lectures]

- a. Public Service Delivery
- b. Redressal of Public Grievances: RTI, Lokpal, Citizens' Charter and E-Governance

V. Social Welfare Administration [20 lectures]

- a. Concept and Approaches of Social Welfare
- b. Social Welfare Policies:
 - Education:** Right To Education,
 - Health:** National Health Mission,
 - Food:** Right To Food Security
 - Employment:** MNREGA

READINGS

Public Policy

T. Dye, (1984) *Understanding Public Policy*, 5th Edition. U.S.A: Prentice Hall

R.B. Denhardt and J.V. Denhardt, (2009) *Public Administration*, New Delhi: Brooks/Cole

J. Anderson, (1975) *Public Policy Making*. New York: Thomas Nelson and sons Ltd.

M. Howlett, M. Ramesh, and A. Perl, (2009), *Studying Public Policy: Policy Cycles and Policy subsystems*, 3rd edition, Oxford: Oxford University Press

T. Dye, (2002) *Understanding Public Policy*, New Delhi: Pearson

Y. Dror, (1989) *Public Policy Making Reexamined*. Oxford: Transaction Publication

Decentralization

Satyajit Singh and Pradeep K. Sharma [eds.] *Decentralisation: Institutions And Politics In Rural India*, OUP, 2007

D. A. Rondinelli and S. Cheema, *Decentralisation and Development*, Beverly Hills: Sage Publishers, 1983

N.G. Jayal, *Democracy and The State: Welfare, Secular and Development in Contemporary India*, Oxford : Oxford University Press, 1999

Bidyut Chakrabarty, *Reinventing Public Administration: The Indian Experience*, Orient Longman, 2007

Noorjahan Bava, *Development Policies and Administration in India*, Delhi: Uppal Publishers, 2001

Gabriel Almond and Sidney Verba, *The Civic Culture*, Boston: Little Brown, 1965 M.P. Lester,

Political Participation- How and Why do People Get Involved in Politics
Chicago: McNally, 1965

III. Budget

Erik-Lane, J. (2005) *Public Administration and Public Management: The Principal Agent Perspective*. New York: Routledge

Henry, N. (1999) *Public Administration and Public Affairs*. New Jersey: Prentice Hall

Caiden, N. (2004) 'Public Budgeting Amidst Uncertainty and Instability', in Shafritz, J.M. & Hyde, A.C. (eds.) *Classics of Public Administration*. Belmont: Wadsworth

IV Citizen And Administration Interface

R. Putnam, *Making Democracy Work*, Princeton University Press, 1993

Jenkins, R. and Goetz, A.M. (1999) 'Accounts and Accountability: Theoretical Implications of the Right to Information Movement in India', in *Third World Quarterly*. June

Sharma, P.K. & Devasher, M. (2007) 'Right to Information in India' in Singh, S. and Sharma, P. (eds.) *Decentralization: Institutions and Politics in Rural India*. New Delhi: Oxford University Press

Vasu Deva, *E-Governance In India: A Reality*, Commonwealth Publishers, 2005

World Development Report, World Bank, Oxford University Press, 1992.

M.J. Moon, *The Evolution of Electronic Government Among Municipalities: Rhetoric or Reality*, American Society For Public Administration, *Public Administration Review*, Vol 62, Issue 4, July – August 2002

Pankaj Sharma, *E-Governance: The New Age Governance*, APH Publishers, 2004

Pippa Norris, *Digital Divide: Civic Engagement, Information Poverty and the Internet*

in Democratic Societies, Cambridge: Cambridge University Press, 2001.

Stephan Goldsmith and William D. Eggers, *Governing By Network: The New Shape of the Public Sector*, Brookings Institution [Washington], 2004

United Nation Development Programme, *Reconceptualising Governance*, New York, 1997
Mukhopadhyay, A. (2005) 'Social Audit', in *Seminar*. No.551.

V. Social Welfare Administration

Jean Drèze and Amartya Sen, *India, Economic Development and Social Opportunity*, Oxford: Oxford University Press, 1995

J.Dreze and Amartya Sen, *Indian Development: Selected Regional Perspectives*, Oxford: Clareland Press, 1997

Reetika Khera- Rural Poverty And Public Distribution System, EPW, Vol-XLVIII, No.45-46, Nov 2013

Pradeep Chaturvedi [ed.], *Women And Food Security: Role Of Panchayats*, Concept Publishers, 1997

National Food Security Mission: nfsm.gov.in/Guidelines/XIIPlan/NFSMXII.pdf

Jugal Kishore, *National Health Programs of India: National Policies and Legislations*, Century Publications, 2005

K. Lee and Mills, *The Economic Of Health In Developing Countries*, Oxford: Oxford University Press, 1983

K. Vijaya Kumar, *Right to Education Act 2009: Its Implementation as to Social Development in India*, Delhi: Akansha Publishers, 2012.

Marma Mukhopadhyay and Madhu Parhar(ed.) *Education in India: Dynamics of Development*, Delhi: Shipra Publications, 2007

Nalini Juneja, *Primary Education for All in the City of Mumbai: The Challenge Set By Local Actors'*, International Institute For Educational Planning, UNESCO: Paris, 2001

Surendra Munshi and Biju Paul Abraham [eds.] *Good Governance, Democratic Societies and Globalisation*, Sage Publishers, 2004

Basu Rumki (2015) *Public Administration in India Mandates, Performance and Future Perspectives*, New Delhi, Sterling Publishers

www.un.org/millenniumgoals
<http://www.cefsindia.org>
www.righttofoodindia.org

4.3 Paper X- Global Politics

Course objective: This course introduces students to the key debates on the meaning and nature of globalization by addressing its political, economic, social, cultural and technological dimensions. In keeping with the most important debates within the globalization discourse, it imparts an understanding of the working of the world economy, its anchors and resistances offered by global social movements while analyzing the changing nature of relationship between the state and trans-national actors and networks. The course also offers insights into key contemporary global issues such as the proliferation of nuclear weapons, ecological issues, international terrorism, and human security before concluding with a debate on the phenomenon of global governance.

I. Globalization: Conceptions and Perspectives (23 lectures)

- a. Understanding Globalization and its Alternative Perspectives (6 lectures)
- b. Political: Debates on Sovereignty and Territoriality (3 lectures)
- c. Global Economy: Its Significance and Anchors of Global Political Economy: IMF,
- d. World Bank, WTO, TNCs (8 lectures)
- e. Cultural and Technological Dimension (3 lectures)
- f. Global Resistances (Global Social Movements and NGOs) (3 lectures)

II. Contemporary Global Issues (20 lectures)

- a. Ecological Issues: Historical Overview of International Environmental Agreements, Climate Change, Global Commons Debate (7 lectures)
- b. Proliferation of Nuclear Weapons (3 lectures)
- c. International Terrorism: Non-State Actors and State Terrorism; Post 9/11 developments (4 lectures)
- d. Migration (3 lectures)
- e. Human Security (3 lectures)

III. Global Shifts: Power and Governance (5 lectures)

READING LIST

I. Globalization – Conceptions and Perspectives Understanding Globalization and its Alternative Perspectives

Essential Readings:

G. Ritzer, (2010) *Globalization: A Basic Text*, Sussex: Wiley-Blackwell, pp. 33-62.
M. Strager, (2009) *Globalization: A Very Short Introduction*, London: Oxford University Press, pp. 1-16.
R. Keohane and J. Nye Jr, (2000) 'Globalization: What's New? What's Not? (And So What?)', in *Foreign Policy*, No 118, pp. 104-119.

Additional Reading:

A. McGrew, (2011) 'Globalization and Global Politics', in J. Baylis, S. Smith and P. Owens (eds.) *Globalization of World Politics: An Introduction to International Relations*, New York: Oxford University Press, pp. 14-31.
A. Heywood, (2011) *Global Politics*, New York: Palgrave-McMillan, pp. 1-24.
W. Ellwood, (2005) *The No-nonsense Guide to Globalization*, Jaipur: NI-Rawat Publications, pp. 12-23.

Political: Debates on Sovereignty and Territoriality

Essential Readings:

A. Heywood, (2011) *Global Politics*, New York: Palgrave-McMillan, pp. 112-134.
R. Keohane, (2000) 'Sovereignty in International Society', in D. Held and A. McGrew (eds.) *The Global Trans-Formations Reader*, Cambridge: Polity Press, pp. 109-123.

Additional Reading:

K. Shimko, (2005) *International Relations: Perspectives and Controversies*, New York: Houghton Mifflin, pp. 195-219.

Global Economy: Its Significance and Anchors of Global Political Economy: IMF, World Bank, WTO, TNCs

Essential Readings:

A. Heywood, (2011) *Global Politics*, New York: Palgrave-McMillan, pp. 454-479.
T. Cohn, (2009) *Global Political Economy: Theory and Practice*, pp. 130-140 (IMF), 208-218 (WTO).
R. Picciotto, (2003) 'A New World Bank for a New Century', in C. Roe Goddard et al., *International Political: State-Market Relations in a Changing Global Order*, Boulder: LynneReinner, pp. 341-351.
A. Narlikar, (2005) *The World Trade Organization: A Very Short Introduction*, New York: Oxford University Press, pp. 22-98.
J. Goldstein, (2006) *International Relations*, New Delhi: Pearson, pp. 392-405 (MNC).
P. Hirst, G. Thompson and S. Bromley, (2009) *Globalization in Question*, Cambridge: Polity Press, pp. 68-100 (MNC).

Additional Readings:

G. Ritzer, (2010) *Globalization: A Basic Text*, Sussex: Wiley-Blackwell, pp. 180-190.
F. Lechner and J. Boli (ed.), (2004) *The Globalization Reader*, London: Blackwell, pp. 236-239 (WTO).
D. Held et al, (1999) *Global Transformations: Politics, Economics and Culture*,

California: Stanford University Press, pp. 242-282 (MNC).

T. Cohn, (2009) *Global Political Economy*, New Delhi: Pearson, pp. 250-323 (MNC).

Cultural and Technological Dimension

Essential Readings:

D. Held and A. McGrew (eds.), (2002) *Global Transformations Reader: Politics, Economics and Culture*, Cambridge: Polity Press, pp. 1-50; 84-91.

M. Steger, (2009) 'Globalization: A Contested Concept', in *Globalization: A Very Short Introduction*, London: Oxford University Press, pp. 1-16.

A. Appadurai, (2000) 'Grassroots Globalization and the Research Imagination', in *Public Culture*, Vol. 12(1), pp. 1-19.

Additional Reading:

J. Beynon and D. Dunkerley, (eds.), (2012) *Globalisation: The Reader*, New Delhi: Rawat Publications, pp. 1-19.

A. Vanaik, (ed.), (2004) *Globalization and South Asia: Multidimensional Perspectives*, New Delhi: Manohar Publications, pp. 171-191, 192-213, 301-317, 335-357.

Global Resistances (Global Social Movements and NGOs)

Essential Readings:

G. Ritzer, (2010) *Globalization: A Basic Text*, Sussex: Wiley-Blackwell, pp. 487-504.

R. O'Brien et al., (2000) *Contesting Global Governance: Multilateral Economic Institutions and Global Social Movements*, Cambridge: Cambridge University Press, pp. 1-23.

J. Fisher, (1998) *Non-Governments: NGOs and Political Development in the Third World*, Connecticut: Kumarian Press, pp. 1- 37 (NGO).

Additional Readings:

G. Laxter and S. Halperin (eds.), (2003) *Global Civil Society and Its Limits*, New York: Palgrave, pp. 1-21.

A. Heywood, (2011) *Global Politics*, New York: Palgrave-McMillan, pp. 150-156 (NGO).

P. Willets, (2011) 'Trans-National Actors and International Organizations in Global Politics', in J. Baylis, S. Smith and P. Owens (eds.) *Globalization of World Politics*, New York: Oxford University Press, pp. 334-342. (NGO)

II. Contemporary Global Issues

Ecological Issues: Historical Overview of International Environmental Agreements, Climate Change, Global Commons Debate

Essential Readings:

J. Volger, (2011) 'Environmental Issues', in J. Baylis, S. Smith and P. Owens (eds.) *Globalization of World Politics*, New York: Oxford University Press, pp. 348-362.

A. Heywood, (2011) *Global Politics*, New York: Palgrave, pp. 383-411.

N. Carter, (2007) *The Politics of Environment: Ideas, Activism, Policy*, Cambridge: Cambridge University Press, pp. 13-81.

Additional Readings:

P. Bidwai, (2011) 'Durban: Road to Nowhere', in *Economic and Political Weekly*,

Vol.46, No. 53, December, pp. 10-12.

K.Shimko, (2005) *International Relations Perspectives and Controversies*, New York: Hughton-Mifflin, pp. 317-339.

Proliferation of Nuclear Weapons

Essential Readings:

D. Howlett, (2011) 'Nuclear Proliferation', in J. Baylis, S. Smith and P. Owens (eds.) *Globalization of World Politics*, New York: Oxford University Press, pp. 384-397.

P. Viotti and M. Kauppi, (2007) *International Relations and World Politics: Security, Economy and Identity*, New Delhi: Pearson, pp. 238-272.

Additional Reading:

A. Heywood, (2011) *Global Politics*, New York: Palgrave, pp. 264-281.

International Terrorism: Non-State Actors and State Terrorism; Post 9/11 developments

Essential Readings:

P. Viotti and M. Kauppi, (2007) *International Relations*, New Delhi: Pearson, pp. 276-307.

A.Heywood, (2011) *Global Politics*, New York: Palgrave, pp. 282-

301. Additional Readings:

J. Kiras, (2011) 'Terrorism and Globalization', in J. Baylis, S. Smith and P. Owens (eds.) *Globalization of World Politics*, New York: Oxford University Press, pp. 366- 380.

A.Vanaik, (2007) *Masks of Empire*, New Delhi: Tulika, pp. 103-128.

Migration

Essential Readings:

G. Ritzer, (2010) *Globalization: A Basic Text*, Sussex: Wiley-Blackwell, pp. 298-322.

S. Castles, (2012) 'Global Migration', in B. Chimni and S. Mallavarapu (eds.) *International Relations: Perspectives For the Global South*, New Delhi: Pearson, pp. 272-285.

Human Security

Essential Readings:

A. Acharya, (2011) 'Human Security', in J. Baylis, S. Smith and P. Owens (eds.) *Globalization of World Politics*, New York: Oxford University Press, pp. 480-493.

S. Tadjbakhsh and A. Chenoy, (2007) *Human Security*, London: Routledge, pp. 13-19; 123-127; 236-243.

Additional Reading:

A. Acharya, (2001) 'Human Security: East versus West', in *International Journal*, Vol. 56, no. 3, pp. 442-460.

III. Global Shifts: Power and Governance

Essential Readings:

J. Rosenau, (1992) 'Governance, Order, and Change in World Politics', in J. Rosenau, and

E. Czempiel (eds.) *Governance without Government: Order and Change in World Politics*, Cambridge: Cambridge University Press, pp. 1-29.

A. Kumar and D. Messner (eds), (2010) *Power Shifts and Global Governance: Challenges from South and North*, London: Anthem Press.

P. Dicken, (2007) *Global Shift: Mapping the Changing Contours of the World Economy*, New York: The Guilford Press.

J. Close, (2001) 'The Global Shift: A quantum leap in human evolution', Available at <http://www.stir-global-shift.com/page22.php>, Accessed: 19.04.2013.

5.1

Paper XI- Classical Political Philosophy

Course objective: This course goes back to Greek antiquity and familiarizes students with the manner in which the political questions were first posed. Machiavelli comes as an interlude inaugurating modern politics followed by Hobbes and Locke. This is a basic foundation course for students.

I. Text and Interpretation (2 weeks)

II. Antiquity Plato (2 weeks)

Philosophy and Politics, Theory of Forms, Justice, Philosopher King/Queen, Communism Presentation theme: Critique of Democracy; Women and Guardianship, Censorship

Aristotle (2 weeks)

Forms, Virtue, Citizenship, Justice, State and Household
Presentation themes: Classification of governments; man as zoon politikon

III. Interlude:

Machiavelli (2 weeks)

Virtu, Religion, Republicanism
Presentation themes: morality and statecraft; vice and virtue

IV. Possessive

Individualism Hobbes (2 weeks)

Human nature, State of Nature, Social Contract, State
Presentation themes: State of nature; social contract; Leviathan; atomistic individuals.

Locke (2 weeks)

Laws of Nature, Natural Rights, Property,
Presentation themes: Natural rights; right to dissent; justification of property

READING LIST

I. Text and Interpretation

Essential Readings:

T. Ball, (2004) 'History and Interpretation' in C. Kukathas and G. Gaus, (eds.) *Handbook of Political Theory*, London: Sage Publications Ltd. pp. 18-30.

B. Constant, (1833) 'The Liberty of the Ancients Compared with that of the Moderns', in D. Boaz, (ed), (1997) *The Libertarian Reader*, New York: The Free Press.

Additional Readings:

J. Coleman, (2000) 'Introduction', in *A History of Political Thought: From Ancient Greece to Early Christianity*, Oxford: Blackwell Publishers, pp. 1-20.

Q. Skinner, (2010) 'Preface', in *The Foundations of Modern Political Thought Volume I*, Cambridge: Cambridge University Press pp. ix-xv.

II.

Antiquity:

Plato

Essential Readings:

A. Skoble and T. Machan, (2007) *Political Philosophy: Essential Selections*. New Delhi: Pearson Education, pp. 9-32.

R. Kraut, (1996) 'Introduction to the study of Plato', in R. Kraut (ed.) *The Cambridge Companion to Plato*. Cambridge: Cambridge University Press, pp. 1-50.

C. Reeve, (2009) 'Plato', in D. Boucher and P. Kelly, (eds) *Political Thinkers: From Socrates to the Present*, Oxford: Oxford University Press, pp. 62-80

Additional Readings:

S. Okin, (1992) 'Philosopher Queens and Private Wives', in S. Okin *Women in Western Political Thought*, Princeton: Princeton University Press, pp. 28-50

R. Kraut, (1996) 'The Defence of Justice in Plato's Republic', in R. Kraut (ed.) *The Cambridge Companion to Plato*. Cambridge: Cambridge University Press, pp. 311-337

T. Saunders, (1996) 'Plato's Later Political Thought', in R. Kraut (ed.) *The Cambridge Companion to Plato*. Cambridge: Cambridge University Press, pp. 464-492.

Aristotle

Essential Readings:

A. Skoble and T. Machan, (2007) *Political Philosophy: Essential Selections*. New Delhi: Pearson Education, pp. 53-64.

T. Burns, (2009) 'Aristotle', in D. Boucher, and P. Kelly, (eds) *Political Thinkers: From*

Socrates to the Present. Oxford: Oxford University Press, pp.81-99.

C. Taylor, (1995) 'Politics', in J. Barnes (ed.), *The Cambridge Companion to Aristotle*. Cambridge: Cambridge University Press, pp. 232-258

Additional Readings:

J. Coleman, (2000) 'Aristotle', in J. Coleman *A History of Political Thought: From Ancient Greece to Early Christianity*, Oxford: Blackwell Publishers, pp.120-186

D. Hutchinson, (1995) 'Ethics', in J. Barnes, (ed.), *The Cambridge Companion to Aristotle* Cambridge: Cambridge University Press, pp. 195-232.

III. Interlude:

Machiavelli

Essential Readings:

A. Skoble and T. Machan, (2007) *Political Philosophy: Essential Selections*. New Delhi: Pearson Education, pp. 124-130

Q. Skinner, (2000) 'The Adviser to Princes', in *Machiavelli: A Very Short Introduction*, Oxford: Oxford University Press, pp. 23-53

J. Femia, (2009) 'Machiavelli', in D. Boucher, and P. Kelly, (eds) *Political Thinkers: From Socrates to the Present*. Oxford: Oxford University Press, pp. 163-184

Additional Reading:

Q. Skinner, (2000) 'The Theorist of Liberty', in *Machiavelli: A Very Short Introduction*. Oxford: Oxford University Press, pp. 54-87.

IV. Possessive

Individualism Hobbes

Essential Readings:

A. Skoble and T. Machan, (2007) *Political Philosophy: Essential Selections*. New Delhi: Pearson Education pp. 131-157.

D. Baumgold, (2009) 'Hobbes', in D. Boucher and P. Kelly (eds) *Political Thinkers: From Socrates to the Present*. Oxford: Oxford University Press, pp. 189-206.

C. Macpherson (1962) *The Political Theory of Possessive Individualism: Hobbes to Locke*. Oxford University Press, Ontario, pp. 17-29.

Additional Readings:

I. Hampsher-Monk, (2001) 'Thomas Hobbes', in *A History of Modern Political Thought: Major Political Thinkers from Hobbes to Marx*, Oxford: Blackwell Publishers, pp. 1-67.

A. Ryan, (1996) 'Hobbes's political philosophy', in T. Sorell, (ed.) *Cambridge Companion to Hobbes*. Cambridge: Cambridge University Press, pp. 208-245.

Locke

Essential Readings:

A. Skoble and T. Machan, (2007) *Political Philosophy: Essential Selections*. New Delhi: Pearson Education, pp. 181-209.

J. Waldron, (2009) 'John Locke', in D. Boucher and P. Kelly, (eds) *Political Thinkers: From Socrates to the Present*. Oxford: Oxford University Press, pp. 207-224

C. Macpherson, (1962) *The Political Theory of Possessive Individualism: Hobbes to Locke*. Oxford University Press, Ontario, pp. 194-214.

Additional Readings:

R. Ashcraft, (1999) 'Locke's Political Philosophy', in V. Chappell (ed.) *The Cambridge Companion to Locke*, Cambridge. Cambridge University Press, pp. 226-251.

I. Hampsher-Monk, (2001) *A History of Modern Political Thought: Major Political Thinkers from Hobbes to Marx*, Oxford: Blackwell Publishers, pp. 69-116

5.2 Paper XII- Indian Political Thought-I

Course objective: This course introduces the specific elements of Indian Political Thoughtspanning over two millennia. The basic focus of study is on individual thinkers whose ideas are however framed by specific themes. The course as a whole is meant to provide a sense of the broad streams of Indian thought while encouraging a specific knowledge of individual thinkers and texts. Selected extracts from some original texts are also given to discuss in class. The list of additional readings is meant for teachers as well as the more interested students.

I. Traditions of Pre-colonial Indian Political Thought (8 lectures)

- a. Brahmanic and Shramanic
- b. Islamic and Syncretic.

II. Ved Vyasa (Shantiparva): Rajadharma (5 lectures)

III. Manu: Social Laws (6 lectures)

IV. Kautilya: Theory of State (7 lectures)

V. Aggannasutta (Digha Nikaya): Theory of kingship (5 lectures)

VI. Barani: Ideal Polity (6 lectures)

VII. Abul Fazal: Monarchy (6 lectures)

VIII. Kabir: Syncretism (5 lectures)

READING LIST

I. Traditions of Pre-modern Indian Political Thought:

Essential Readings:

B. Parekh, (1986) 'Some Reflections on the Hindu Tradition of Political Thought', in T. Pantham, and K. Deutsch (eds.), *Political Thought in Modern India*, New Delhi: Sage Publications, pp. 17- 31.

A. Altekar, (1958) 'The Kingship', in *State and Government in Ancient India*, 3rd edition, Delhi: Motilal Banarsidass, pp. 75-108.

M. Shakir, (1986) 'Dynamics of Muslim Political Thought', in T. Pantham, and K. Deutsch (eds.), *Political Thought in Modern India*, New Delhi: Sage Publications, pp. 142- 160

G. Pandey, (1978) *Sraman Tradition: Its History and Contribution to Indian Culture*, Ahmedabad: L. D. Institute of Indology, pp. 52-73.

S. Saberwal, (2008) 'Medieval Legacy', in *Spirals of Contention*, New Delhi: Routledge, pp.1-31

II. Ved Vyasa (Shantiparva): Rajadharm

Essential Readings:

The Mahabharata (2004), Vol. 7 (Book XI and Book XII, Part II), Chicago and London:University of Chicago Press.

V. Varma, (1974) *Studies in Hindu Political Thought and Its Metaphysical Foundations*, Delhi: Motilal Banarsidass, pp. 211- 230.

B. Chaturvedi, (2006) 'Dharma-The Foundation of Raja-Dharma, Law and Governance', in
The Mahabharata: An Inquiry in the Human Condition, Delhi: Orient Longman, pp. 418- 464.

III. Manu: Social Laws

Essential Readings:

Manu, (2006) 'Rules for Times of Adversity', in P. Olivelle, (ed. & trans.) *Manu's Code of Law: A Critical Edition and Translation of the Manava- Dharamsastra*, New Delhi: OUP, pp. 208-213.

V. Mehta, (1992) 'The Cosmic Vision: Manu', in *Foundations of Indian Political Thought*, Delhi: Manohar, pp. 23- 39.

R. Sharma, (1991) 'Varna in Relation to Law and Politics (c 600 BC-AD 500)', in *Aspects of Political Ideas and Institutions in Ancient India*, Delhi: Motilal Banarsidass, pp. 233-251.

P. Olivelle, (2006) 'Introduction', in *Manu's Code of Law: A Critical Edition and Translation of the Manava –Dharmasastra*, Delhi: Oxford University Press, pp. 3- 50.

IV. Kautilya: Theory of State

Essential Readings:

Kautilya, (1997) 'The Elements of Sovereignty' in R. Kangle (ed. and trns.), *Arthashastra of Kautilya*, New Delhi: Motilal Publishers, pp. 511- 514.

V. Mehta, (1992) 'The Pragmatic Vision: Kautilya and His Successor', in *Foundations of Indian Political Thought*, Delhi: Manohar, pp. 88- 109.

R. Kangle, (1997) *Arthashastra of Kautilya-Part-III: A Study*, Delhi: Motilal Banarsidass, rpt., pp. 116- 142.

Additional Reading:

J. Spellman, (1964) 'Principle of Statecraft', in *Political Theory of Ancient India: A Study of Kingship from the Earliest time to Circa AD 300*, Oxford: Clarendon Press, pp. 132-170.

V. Agganna Sutta (Digha Nikaya): Theory of Kingship

Essential Readings:

S. Collins, (ed), (2001) *Agganna Sutta: An Annotated Translation*, New Delhi: Sahitya Academy, pp. 44-49.

S. Collins, (2001) 'General Introduction', in *Agganna Sutta: The Discussion on What is Primary (An Annotated Translation from Pali)*, Delhi: Sahitya Akademi, pp. 1- 26.

B. Gokhale, (1966) 'The Early Buddhist View of the State', in *The Journal of Asian Studies*, Vol. XXVI, (1), pp. 15- 22.

Additional Reading:

L. Jayasurya, 'Buddhism, Politics and Statecraft', Available at ftp.buddhism.org/Publications/.../Voll1_03_Laksiri%20Jayasuriya.pdf, Accessed: 19.04.2013.

VI. Barani: Ideal Polity

Essential Reading:

I. Habib, (1998) 'Ziya Barani's Vision of the State', in *The Medieval History Journal*, Vol. 2,

(1), pp. 19- 36.

Additional Reading:

M. Alam, (2004) 'Sharia Akhlaq', in *The Languages of Political Islam in India 1200- 1800*, Delhi: Permanent Black, pp. 26- 43

VII. Abul Fazal: Monarchy

Essential Readings:

A. Fazl, (1873) *The Ain-i Akbari* (translated by H. Blochmann), Calcutta: G. H. Rouse, pp. 47-57.

V. Mehta, (1992) 'The Imperial Vision: Barani and Fazal', in *Foundations of Indian Political Thought*, Delhi: Manohar, pp. 134- 156.

Additional Readings:

M. Alam, (2004) 'Sharia in Naserean Akhlaq', in *Languages of Political Islam in India 1200-1800*, Delhi: Permanent Black, pp. 46- 69.

I. Habib, (1998) 'Two Indian Theorist of The State: Barani and Abul Fazal', in *Proceedings of the Indian History Congress*. Patiala, pp. 15- 39.

VIII. Kabir: Syncreticism

Essential Readings:

Kabir. (2002) *The Bijak of Kabir*, (translated by L. Hess and S. Singh), Delhi: Oxford University Press, No. 30, 97, pp. 50- 51 & 69- 70.

V. Mehta, (1992) *Foundation of Indian Political Thought*, Delhi: Manohar, pp. 157- 183.

G. Omvedt, (2008) 'Kabir and Ravidas, Envisioning Begumpura', in *Seeking Begumpura: The Social Vision of Anti Caste Intellectual*, Delhi: Navayana, pp. 91- 107.

Additional Reading:

L. Hess and S. Singh, (2002) 'Introduction', in *The Bijak of Kabir*, New Delhi: Oxford University Press, pp. 3- 35.

6.1 Paper XIII- Modern Political Philosophy

Course objective: Philosophy and politics are closely intertwined. We explore this convergence by identifying four main tendencies here. Students will be exposed to the manner in which the questions of politics have been posed in terms that have implications for larger questions of thought and existence.

I. Modernity and its discourses (8 lectures)

This section will introduce students to the idea of modernity and the discourses around modernity. Two essential readings have been prescribed.

II. Romantics (16 lectures)

a. Jean Jacques Rousseau (8 Lectures)

Presentation themes: General Will; local or direct democracy; self-government; origin of inequality.

b. Mary Wollstonecraft (8 Lectures)

Presentation themes: Women and paternalism; critique of Rousseau's idea of education; legal rights

III. Liberal socialist (8 lectures)

a. John Stuart Mill

Presentation themes: Liberty, suffrage and subjection of women, right of minorities; utility principle.

IV. Radicals (16 lectures)

a. Karl Marx (8 Lectures)

Presentation themes: Alienation; difference with other kinds of materialism; class struggle

b. Alexandra Kollontai (8 Lectures)

Presentation themes: Winged and wingless Eros; proletarian woman; socialization of housework; disagreement with Lenin

Reading List

I. Modernity and its discourses

Essential Readings:

I. Kant. (1784) 'What is Enlightenment?,' available at <http://theliterarylink.com/kant.html>, Accessed: 19.04.2013

S. Hall (1992) 'Introduction', in *Formations of Modernity* UK: Polity Press pages 1-16

II. Romantics

Essential Readings:

B. Nelson, (2008) *Western Political Thought*. New York: Pearson Longman, pp. 221- 255.

M. Keens-Soper, (2003) 'Jean Jacques Rousseau: The Social Contract', in M. Forsyth and M. Keens-Soper, (eds) *A Guide to the Political Classics: Plato to Rousseau*. New York: Oxford University Press, pp. 171-202.

C. Jones, (2002) 'Mary Wollstonecraft's *Vindications* and their Political Tradition' in C. Johnson, (ed.) *The Cambridge Companion to Mary Wollstonecraft*, Cambridge: Cambridge University Press, pp. 42-58.

S. Ferguson, (1999) 'The Radical Ideas of Mary Wollstonecraft', in *Canadian Journal of Political Science* XXXII (3), pp. 427-50, Available at <http://digitalcommons.ryerson.ca/politics>, Accessed: 19.04.2013.

III. Liberal Socialist

Essential Readings:

H. Magid, (1987) 'John Stuart Mill', in L. Strauss and J. Cropsey, (eds), *History of Political Philosophy*, 2nd edition. Chicago: Chicago University Press, pp. 784-801.

P. Kelly, (2003) 'J.S. Mill on Liberty', in D. Boucher, and P. Kelly, (eds.) *Political Thinkers: From Socrates to the Present*. New York: Oxford University Press, pp. 324- 359.

IV. Radicals

Essential Readings:

J. Cropsey, (1987) 'Karl Marx', in L. Strauss and J. Cropsey, (eds) *History of Political Philosophy*, 2nd Edition. Chicago: Chicago University Press, pp. 802-828.

L. Wilde, (2003) 'Early Marx', in D. Boucher and P. Kelly, P. (eds) *Political Thinkers: From Socrates to the Present*. New York: Oxford University Press, pp. 404-435.

V. Bryson, (1992) 'Marxist Feminism in Russia' in *Feminist Political Theory*, London: Palgrave Macmillan, pp. 114-122

C. Sypnowich, (1993) 'Alexandra Kollontai and the Fate of Bolshevik Feminism' *Labour/Le Travail* Vol. 32 (Fall 1992) pp. 287-295

A. Kollontai (1909), *The Social Basis of the Woman Question*, Available at <http://www.marxists.org/archive/kollonta/1909/social-basis.htm>, Accessed: 19.04.2013

Additional Readings:

A. Bloom, (1987) 'Jean-Jacques Rousseau', in Strauss, L. and Cropsey, J. (eds.) *History of Political Philosophy*, 2nd edition. Chicago: Chicago University Press, pp. 559-580.

Selections from *A Vindication of the Rights of Woman*, Available at <http://oregonstate.edu/instruct/phl302/texts/wollstonecraft/woman-a.html#CHAPTER%20II>, Accessed: 19.04.2013.

A. Skoble and T. Machan, (2007) *Political Philosophy: Essential Selections*, New Delhi: Pearson Education, pp. 328-354.

B. Ollman (1991) *Marxism: An Uncommon Introduction*, New Delhi: Sterling Publishers.

G. Blakely and V. Bryson (2005) *Marx and Other Four Letter Words*, London: Pluto

A. Skoble, and T. Machan, (2007) *Political Philosophy: Essential Selections*, New Delhi: Pearson Education, pp. 286-327.

A. Kollontai, (1977) 'Social Democracy and the Women's Question', in *Selected Writings of Alexandra Kollontai*, London: Allison & Busby, pp. 29-74.

A. Kollontai, (1977) 'Make Way for Winged Eros: A Letter to the Youth', in *Selected Writings of Alexandra Kollontai* Allison & Busby, pp. 201-292.

C. Porter, (1980) *Alexandra Kollontai: The Lonely Struggle of the Woman who defied Lenin*, New York: Dutton Children's Books.

6.2 Paper XIV- Indian Political Thought-II

Course objective: Based on the study of individual thinkers, the course introduces a wide span of thinkers and themes that defines the modernity of Indian political thought. The objective is to study general themes that have been produced by thinkers from varied social and temporal contexts. Selected extracts from original texts are also given to discuss in the class. The list of additional readings is meant for teachers as well as the more interested students.

I. Introduction to Modern Indian Political Thought (4 lectures)

II. Rammohan Roy: Rights (4 lectures)

III. Pandita Ramabai: Gender (4 lectures)

IV. Vivekananda: Ideal Society (5 lectures)

V. Gandhi: Swaraj (5 lectures)

VI. Ambedkar: Social Justice (5 lectures)

VII. Tagore: Critique of Nationalism (4 lectures)

VIII. Iqbal: Community (5 lectures)

IX. Savarkar: Hindutva (4 lectures)

X. Nehru: Secularism (4 lectures)

XI. Lohia: Socialism (4 lectures)

Reading List

I. Introduction to Modern Indian Political Thought

Essential Readings:

V. Mehta and T. Pantham (eds.), (2006) '*A Thematic Introduction to Political Ideas in Modern India: Thematic Explorations, History of Science, Philosophy and Culture in Indian civilization*'

Vol. 10, Part: 7, New Delhi: Sage Publications, pp. xxvii-ixi.

D. Dalton, (1982) 'Continuity of Innovation', in *Indian Idea of Freedom: Political Thought of Swami Vivekananda, Aurobindo Ghose, Rabindranath Tagore and Mahatma Gandhi*, Academic Press: Gurgaon, pp. 1-28.

II. Rammohan Roy: Rights

Essential Readings:

R. Roy, (1991) 'The Precepts of Jesus, the Guide to Peace and Happiness', S. Hay, (ed.) *Sources of Indian Tradition, Vol. 2*. Second Edition. New Delhi: Penguin, pp. 24-29.

C. Bayly, (2010) 'Rammohan and the Advent of Constitutional Liberalism in India 1800-1830', in Sh. Kapila (ed.), *An intellectual History for India*, New Delhi: Cambridge University Press, pp. 18- 34.

T. Pantham, (1986) 'The Socio-Religious Thought of Rammohan Roy', in Th. Panthom and K. Deutsch, (eds.) *Political Thought in Modern India*, New Delhi: Sage, pp.32-52.

Additional Reading:

S. Sarkar, (1985) 'Rammohan Roy and the break With the Past', in *A Critique on colonial India*, Calcutta: Papyrus, pp. 1-17.

III. Pandita Ramabai: Gender

Essential Readings:

P. Ramabai, (2000) 'Woman's Place in Religion and Society', in M. Kosambi (ed.), *Pandita Ramabai Through her Own Words: Selected Works*, New Delhi: Oxford

University Press, pp.150-155.

M. Kosambi, (1988) 'Women's Emancipation and Equality: Pandita Ramabai's Contribution to Women's Cause', in *Economic and Political Weekly*, Vol. 23(44), pp. 38-49.

Additional Reading:

U. Chakravarti, (2007) *Pandita Ramabai - A Life and a Time*, New Delhi: Critical Quest, pp. 1-40.

G. Omvedt, (2008) 'Ramabai: Women in the Kingdom of God', in *Seeking Begumpura: The Social Vision of Anti Caste Intellectuals*, New Delhi: Navayana. pp. 205-224.

IV. Vivekananda: Ideal Society

Essential Readings:

S. Vivekananda, (2007) 'The Real and the Apparent Man', S. Bodhasarananda (ed.), *Selections from the Complete Works of Swami Vivekananda*, Kolkata: Advaita Ashrama, pp.126-129.

A. Sen, (2003) 'Swami Vivekananda on History and Society', in *Swami Vivekananda*, Delhi: Oxford University Press, pp. 62- 79.

H. Rustav, (1998) 'Swami Vivekananda and the Ideal Society', in W. Radice (ed.), *Swami Vivekananda and the Modernisation of Hinduism*, Delhi: Oxford University Press, pp. 264-280.

Additional Reading:

Raghuramaraju, (2007) 'Swami and Mahatma, Paradigms: State and Civil Society', in *Debates in Indian Philosophy: Classical, Colonial, and Contemporary*, Delhi: Oxford University Press, pp. 29-65.

V. Gandhi: Swaraj

Essential Readings:

M. Gandhi, (1991) 'Satyagraha: Transforming Unjust Relationships through the Power of the Soul', in S. Hay (ed.), *Sources of Indian Tradition*, Vol. 2. Second Edition, New Delhi: Penguin, pp. 265-270.

A. Parel, (ed.), (2002) 'Introduction', in *Gandhi, freedom and Self Rule*, Delhi: Vistaar Publication.

D. Dalton, (1982) *Indian Idea of Freedom: Political Thought of Swami Vivekananda, Aurobindo Ghose, Mahatma Gandhi and Rabindranath Tagore*, Gurgaon: The Academic Press, pp. 154- 190.

Additional Reading:

R. Terchek, (2002) 'Gandhian Autonomy in Late Modern World', in A. Parel (ed.), *Gandhi, Freedom and Self Rule*. Delhi: Sage.

VI. Ambedkar: Social Justice

Essential Readings:

B. Ambedkar, (1991) 'Constituent Assembly Debates', S. Hay (ed.), *Sources of Indian Tradition, Vol. 2*, Second Edition, New Delhi: Penguin, pp. 342-347.

V. Rodrigues, (2007) 'Good society, Rights, Democracy Socialism', in S. Thorat and Aryama (eds.), *Ambedkar in Retrospect - Essays on Economics, Politics and Society*, Jaipur: IIDS and Rawat Publications.

B. Mungekar, (2007) 'Quest for Democratic Socialism', in S. Thorat, and Aryana (eds.), *Ambedkar in Retrospect - Essays on Economics, Politics and Society*, Jaipur: IIDS and Rawat Publications, pp. 121-142.

Additional Reading:

P. Chatterjee, (2005) 'Ambedkar and the Troubled times of Citizenship', in V. Mehta and Th. Pantham (eds.), *Political ideas in modern India: Thematic Explorations*, New Delhi: Sage, pp. 73-92.

VII. Tagore: Critique of Nationalism

Essential Readings:

R. Tagore, (1994) 'The Nation', S. Das (ed.), *The English Writings of Rabindranath Tagore, Vol. 3*, New Delhi: Sahitya Akademi, pp. 548-551.

R. Chakravarty, (1986) 'Tagore, Politics and Beyond', in Th. Panthams and K. Deutsch (eds.), *Political Thought in Modern India*, New Delhi: Sage, pp. 177-191.

M. Radhakrishnan, and Debasmita, (2003) 'Nationalism is a Great Menace: Tagore and Nationalism' in P. Hogan, Colm and L. Pandit, (eds.) *Rabindranath Tagore: Universality and Tradition*, London: Rosemont Publishing and Printing Corporation, pp. 29-39.

Additional Reading:

A. Nandy, (1994) 'Rabindranath Tagore & Politics of Self', in *Illegitimacy of Nationalism*, Delhi: Oxford University Press, pp. 1-50.

VIII. Iqbal: Community

Essential Readings:

M. Iqbal, (1991) 'Speeches and Statements', in S. Hay (ed.), *Sources of Indian Tradition, Vol.2*, Second Edition, New Delhi: Penguin, pp. 218-222.

A. Engineer, (1980) 'Iqbal's Reconstruction of Religious Thought in Islam', in *Social Scientist*, Vol.8 (8), pp. 52-63.

Madani, (2005) *Composite Nationalism and Islam*, New Delhi: Manohar, pp. 66-91.

Additional Reading:

L. Gordon-Polonskya, (1971) 'Ideology of Muslim Nationalism', in H. Malik (ed.), *Iqbal: Poet-Philosopher of Pakistan*, New York: Columbia University Press, pp. 108- 134.

IX. Savarkar: Hindutva

Essential Readings:

V.Savarkar, 'Hindutva is Different from Hinduism', available at <http://www.savarkar.org/en/hindutva-/essentials-hindutva/hindutva-different-hinduism>, Accessed: 19.04.2013

J. Sharma, (2003) *Hindutva: Exploring the Idea of Hindu Nationalism*, Delhi: Penguin, pp. 124-172.

Additional Reading:

Dh. Keer, (1966) *Veer Savarkar*, Bombay: Popular Prakashan, pp. 223-250.

X. Nehru: Secularism

Essential Readings:

J. Nehru, (1991) 'Selected Works', in S. Hay (ed.), *Sources of Indian Tradition, Vol. 2*, Second Edition, New Delhi: Penguin, pp. 317-319.

R. Pillai, (1986) 'Political thought of Jawaharlal Nehru', in Th. Pantham, and K. Deutsch (eds.), *Political Thought in Modern India*, New Delhi: Sage, pp. 260- 274.

B. Zachariah, (2004) *Nehru*, London: Routledge Historical Biographies, pp. 169-213.

Additional Reading:

P. Chatterjee, (1986) 'The Moment of Arrival: Nehru and the Passive Revolution', in *Nationalist Thought and the Colonial World: A Derivative Discourse?* London: Zed Books, pp.131-166

XI. Lohia: Socialism

Essential Readings:

M. Anees and V. Dixit (eds.), (1984) *Lohia: Many Faceted Personality*, Rammanohar Lohia Smarak Smriti.

S. Sinha, (2010) 'Lohia's Socialism: An underdog's perspective', in *Economic and Political Weekly*, Vol. XLV (40) pp. 51-55.

- A. Kumar, (2010) 'Understanding Lohia's Political Sociology: Intersectionality of Caste, Class, Gender and Language Issue', in *Economic and Political Weekly*, Vol. XLV (40), pp. 64-70.

B) Generic Elective (Interdisciplinary): 4

1.

Feminism: Theory and Practice

Course Objective: The aim of the course is to explain contemporary debates on feminism and the history of feminist struggles. The course begins with a discussion on construction of gender and an understanding of complexity of patriarchy and goes on to analyze theoretical debates within feminism. Part II of the paper covers history of feminism in the west, socialist societies and in anti-colonial struggles. Part III focuses a gendered analysis of Indian society, economy and polity with a view to understanding the structures of gender inequalities. And the last section aims to understand the issues with which contemporary Indian women's movements are engaged with.

I. Approaches to understanding Patriarchy (22 Lectures)

- Feminist theorising of the sex/gender distinction. Biologism versus social constructivism
- Understanding Patriarchy and Feminism
- Liberal, Socialist, Marxist, Radical feminism, New Feminist Schools/Traditions

II. History of Feminism (22 Lectures)

- Origins of Feminism in the West: France, Britain and United States of America
- Feminism in the Socialist Countries: China, Cuba and erstwhile USSR
- Feminist issues and women's participation in anti-colonial and national liberation movements with special focus on India

III. The Indian Experience (16 Lectures)

- Traditional Historiography and Feminist critiques. Social Reforms Movement and position of women in India. History of Women's struggle in India
- Family in contemporary India - patrilineal and matrilineal practices. Gender Relations in the Family, Patterns of Consumption: Intra Household Divisions, entitlements and bargaining, Property Rights
- Understanding Woman's Work and Labour – Sexual Division of Labour, Productive and Reproductive labour, Visible - invisible work – Unpaid (reproductive and

care), Underpaid and Paid work,- Methods of computing women's work , Female headed households

Essential Readings

I. Approaches to understanding Patriarchy

Geetha, V. (2002) *Gender*. Calcutta: Stree.

Geetha, V. (2007) *Patriarchy*. Calcutta: Stree.

Jagger, Alison. (1983) *Feminist Politics and Human Nature*. U.K.: Harvester Press, pp. 25-350.

Supplementary Readings:

Ray, Suranjita. *Understanding Patriarchy*. Available at:

http://www.du.ac.in/fileadmin/DU/Academics/course_material/hrge_06.pdf

Lerner, Gerda. (1986) *The Creation of Patriarchy*. New York: Oxford University Press.

II. History of Feminism

Rowbotham, Shiela. (1993) *Women in Movements*. New York and London: Routledge, Section I, pp. 27-74 and 178-218.

Jayawardene, Kumari. (1986) *Feminism and Nationalism in the Third World*. London: Zed Books, pp. 1-24, 71-108, and Conclusion.

Forbes, Geraldine (1998) *Women in Modern India*. Cambridge: Cambridge University Press, pp. 1-150.

Supplementary Readings:

Eisentein, Zillah. (1979) *Capitalist Patriarchy and the Case for Socialist Feminism*. New York: Monthly Review Press, pp. 271-353.

Funk, Nanette & Mueller, Magda. (1993) *Gender, Politics and Post-Communism*. New York and London: Routledge, Introduction and Chapter 28.

Chaudhuri, Maiyatee. (2003) 'Gender in the Making of the Indian Nation State', in Rege, Sharmila. (ed.) *The Sociology of Gender: The Challenge of Feminist Sociological Knowledge*. New Delhi: Sage.

Banarjee, Sikata. (2007) 'Gender and Nationalism: The Masculinisation of Hinduism and

Female Political Participation', in Ghadially, Rehana. (ed.) *Urban Women in Contemporary India: A Reader*. New Delhi: Sage.

III. Feminist Perspectives on Indian Politics

Roy, Kumkum. (1995) 'Where Women are Worshipped, There Gods Rejoice: The Mirage of the Ancestress of the Hindu Women', in Sarkar, Tanika & Butalia, Urvashi. (eds.) *Women and the Hindu Right*. Delhi: Kali for Women, pp. 10-28.

Chakravarti, Uma. (1988) 'Beyond the Altekarian Paradigm: Towards a New Understanding of Gender Relations in Early Indian History', *Social Scientist*, Volume 16, No. 8.

Banerjee, Nirmala. (1999) 'Analysing Women's work under Patriarchy' in Sangari, Kumkum & Chakravarty, Uma. (eds.) *From Myths to Markets: Essays on Gender*. Delhi: Manohar.

Additional Readings

Gandhi, Nandita & Shah, Nandita. (1991) *The Issues at Stake – Theory and Practice in Contemporary Women's Movement in India*. Delhi: Zubaan, pp. 7-72.

Shinde, Tarabai (1993) 'Stri-Purush Tulna', in Tharu, Susie & Lalita, K. (eds.) *Women Writing in India, 600 BC to the Present. Vol. I*. New York: Feminist Press.

Desai, Neera & Thakkar, Usha. (2001) *Women in Indian Society*. New Delhi: National Book Trust.

2. Gandhi and the Contemporary World

Course objective: Locating Gandhi in a global frame, the course seeks to elaborate Gandhian thought and examine its practical implications. It will introduce students to key instances of Gandhi's continuing influence right up to the contemporary period and enable them to critically evaluate his legacy.

I. Gandhi on Modern Civilization and Ethics of Development (2 weeks)

- a. Conception of Modern Civilisation and Alternative Modernity
- b. Critique of Development: Narmada Bachao Andolan

II. Gandhian Thought: Theory and Action (4 weeks)

- a. Theory of Satyagraha
- b. Satyagraha in Action
 - i. Peasant Satyagraha: Kheda and the Idea of Trusteeship
 - ii. Temple Entry and Critique of Caste
 - iii. Social Harmony: 1947 and Communal Unity

III. Gandhi's Legacy (4 weeks)

- a) Tolerance: Anti - Racism Movements (Anti - Apartheid and Martin Luther King)
- b) The Pacifist Movement
- c) Women's Movements
- d) *Gandhigiri*: Perceptions in Popular Culture

IV. Gandhi and the Idea of Political (2 weeks)

- a) Swaraj
- b) Swadeshi

READINGS

I. Gandhi on Modern Civilization and Ethics of Development

Essential Readings:

B. Parekh, (1997) 'The Critique of Modernity', in *Gandhi: A Brief Insight*, Delhi: Sterling Publishing Company, pp. 63-74.

K. Ishii, (2001) 'The Socio-economic Thoughts of Mahatma Gandhi: As an Origin of Alternative Development', *Review of Social Economy*. Vol. 59 (3), pp. 297-312.

D. Hardiman, (2003) 'Narmada Bachao Andolan', in *Gandhi in his Time and Ours*. Delhi: Oxford University Press, pp. 224- 234.

A Baviskar, (1995) 'The Politics of the Andolan', in *In the Belly of the River: Tribal Conflict Over Development in the Narmada Valley*, Delhi: Oxford University Press, pp.202-228.

R Iyer, (ed) (1993) 'Chapter 4' in *The Essential Writings of Mahatma Gandhi*, New Delhi: Oxford University Press.

R. Ramashray, (1984) 'Liberty Versus Liberation', in *Self and Society: A Study in Gandhian Thought*, New Delhi: Sage Publication.

II. Gandhian Thought: Theory and Action

Essential Readings:

B. Parekh, (1997) 'Satyagrah', in *Gandhi: A Brief Insight*, Delhi: Sterling Publishing Company, pp. 51-63.

D. Dalton, (2000) 'Gandhi's originality', in A. Parel (ed) *Gandhi, Freedom and Self- Rule*, New Delhi: Lexington Books, pp.63-86.

D. Hardiman, (1981) 'The Kheda Satyagraha', in *Peasant Nationalists of Gujarat: Kheda District, 1917-1934*, Delhi: Oxford University Press, pp. 86-113.

J. Brown, (2000) 'Gandhi and Human Rights: In search of True humanity', in A. Parel

(ed) *Gandhi, Freedom and Self-Rule*, New Delhi: Lexington Books, pp. 93- 100.

R. Iyer, (2000) 'Chapter 10 and 11', in *The Moral and Political Thought of Mahatma Gandhi*, New Delhi: Oxford University Press, pp. 251-344

I. Knudegaard, (2010), *Gandhi's Vision for Indian Society: Theory and Action*, Master Thesis in History, University of Oslo, Available at

https://docs.google.com/viewer?a=v&q=cache:Eqj9br1n3_oJ:https://www.duo.uio.no/bi/tst

[ream/handle/123456789/23275/IngfridKnudegaardxmasteroppavexixhistorie.pdf?sequence%3D1+gandhi+and+temple+entry&hl=en&gl=in&pid=bl&srcid=ADGEEsiKGssA7q2z1kxiut3bciHPH_HI3chWKbJIVo9HE4LcWCLmKdKXCirPalzh7Tp47fyBQJHX9GUesefn8YCAQeaQSKMRdrwvYT2Q8c7XV95tQhSGuO9bNCGEdIYGoBjzoVdJc&sig=AHIEtbQ78zwxGvh92AnwmRHiA7t2wWXXJQ](https://docs.google.com/viewer/a=v&q=cache:Eqj9br1n3_oJ:https://www.duo.uio.no/bi/tst), Accessed: 14.04.2013, pp.27-38.

P. Rao, (2009) 'Gandhi, Untouchability and the Postcolonial Predicament: A Note'. *SocialScientist*. Vol. 37 (1/2). Pp. 64-70.

B. Parekh, (1999) 'Discourse on Unsociability', in *Colonialism, Tradition and Reform: An Analysis of Gandhi's Political Discourse*, New Delhi: Sage Publication.

D. Hardiman, (2003) 'Fighting Religious Hatreds', in *Gandhi in His Time and Ours*. Delhi: Oxford University Press.

III. Gandhi's Legacy

Essential Readings:

D. Hardiman, (2003) 'Gandhi's Global Legacy', in *Gandhi in His Time and Ours*. Delhi: Oxford University Press, pp. 238-283.

Manimala, (1984) 'Zameen Kenkar? Jote Onkar: Women's participation in the Bodhgaya struggles', in M. Kishwar and R. Vanita (eds) *In Search of Answers: Indian Women's Voices from Manushi*, London: Zed Press.

M. Shah, (2006) 'Gandhigiri; A Philosophy of Our Times', *The Hindu* Available at <http://www.hindu.com/2006/09/28/stories/2006092802241000.htm>, Accessed: 14.04.2013.

A. Ghosh and T. Babu, (2006) 'Lage Raho Munna Bhai: Unravelling Brand 'Gandhigiri'', *Economic and Political Weekly*, 41 (51), pp. 5225 – 5227.

H. Trivedi (2011) 'Literary and Visual Portrayal of Gandhi', in J Brown and A Parel (eds) *Cambridge Companion to Gandhi*, Cambridge University Press 2011, pp. 199-218.

IV. Gandhi and the Idea of Political

Essential Readings:

P. Chatterjee, (1986) 'The Moment of Maneuver', in *Nationalist Thought and the Colonial World: A derivative discourse?*, Delhi: Zed Books.

Indian Council for Historical Research (1976) 'The Logic of Gandhian Nationalism: Civil Disobedience and the Gandhi – Irwin Pact, 1930-31', *Indian Historical Review*, Available at <http://www.ichrindia.org/journal.pdf>, Accessed: 18.04.2013.

D. Dalton, (1996) 'Swaraj: Gandhi's Idea of Freedom', in *Mahatma Gandhi: Selected Political Writings*, USA: Hackett Publishing, pp. 95-148.

A. Parel (ed.) (1997) 'Editor's Introduction', in *Gandhi, Hind Swaraj and Other Writings* Cambridge: Cambridge University Press.

Additional Readings:

A. Baviskar, (1995) 'National Development, Poverty and the environment', in *In the Belly of the River: Tribal Conflict Over Development in the Narmada Valley*, Delhi: Oxford University Press, pp. 18-33.

B. Parekh, (1997) 'Religious Thought', in *Gandhi: A Brief Insight*, Delhi: Sterling Publishing Company.

R. Iyer, (1993) *The Essential Writings of Mahatma Gandhi*, New Delhi: Oxford University Press, pp. 299-344; 347-373.

S. Sarkar, (1982) *Modern India 1885-1947*, New Delhi: Macmillan, pp. 432-39.

R. Iyer, (2001) *The Moral and Political Thought of Mahatma Gandhi*, New Delhi: Oxford University Press. pp. 344-358.

H. Coward, (2003) 'Gandhi, Ambedkar, and Untouchability', in H. Coward (ed) *Indian Critiques of Gandhi*, New York: State University of New York Press, pp. 41-66.

J. Lipner, (2003) 'A Debate for Our Times', in Harold Coward (ed) *Indian Critiques of Gandhi*, New York: State University of New York Press, pp. 239-58

M. Gandhi, (1941) 'Chapter 1, 2, 9, 15, and 16', in *Constructive Programme: Its Meaning and Place*, Ahmedabad: Navjivan Trust.

R. Terchek, (1998) *Gandhi: Struggling for Autonomy*, USA: Rowman and Littlefield Publishers.

N. Dirks, (2001), 'The Reformation of Caste: Periyar, Ambedkar and Gandhi', in *Castes of Mind: Colonialism and the making of Modern India*, Princeton: Princeton University

Press.

R. Mukharjee, (ed) (1995), *The Penguin Gandhi Reader*, New Delhi: Penguin.

T. Weber, (2006) 'Gandhi is dead, Long live Gandhi- The Post Gandhi Gandhian Movement in India', in *Gandhi, Gandhism and the Gandhians*, New Delhi: Roli.

A. Taneja, (2005) *Gandhi Women and the National Movement 1920-1947*, New Delhi: Haranand Publishers.

J. Brown, (2008) *Gandhi and Civil Disobedience: The Mahatma in Indian Politics*, Cambridge: Cambridge University Press, 2008

R. Ramashray, (1984) 'What Beyond the Satanic Civilization?', in *Self and Society: A Study in Gandhian Thought*, New Delhi: Sage Publication.

Activities

Topic 1

1. Reading of primary texts:- M K Gandhi Chapter VI and XIII "Hind Swaraj" Navjeevan Trust, Ahmedabad, 1910

2. A site visit to any on-going developmental project preferably in NCT Delhi by students and submission of report on Environmental law Violation and Resistance by People in a Gandhian Way.

Topic 2

1. Reading of primary texts:- M K Gandhi Chapter XII&XIII, "Satyagraha in South Africa, Navjivan Trust, Ahmedabad, 1928, pp. 95-107

2. A Report followed by presentation on functioning of Cooperative and Community engagement for example Amul and/or SEWA in Gujarat to understand Trusteeship and its relevance

Topic 3

1. Movie Screenings (Movies like Lage Raho Munna Bhai, Gandhi by Richard Attenborough and Student's Participation in reviewing/discussing the movie from a Gandhian perspective or Cultural engagement of Students with Gandhian Ideas through Staging of a street play.

Topic 4

Student Visit to Any Gandhian Institution in Delhi like, Gandhi Darshan and Smriti to understand on-going Gandhian work and programme and interacting with Gandhian activists.

3. GOVERNANCE: ISSUES AND CHALLENGES

Objectives: This paper deals with concepts and different dimensions of governance highlighting the major debates in the contemporary times. There is a need to understand the importance of the concept of governance in the context of a globalising world, environment, administration, development. The essence of governance is explored through the various good governance initiatives introduced in India.

1. GOVERNMENT AND GOVERNANCE: CONCEPTS [12 lectures]

Role of State In The Era Of Globalisation State, Market and Civil Society

2. GOVERNANCE AND DEVELOPMENT [12 lectures]

Changing Dimensions of Development Strengthening Democracy through Good Governance

3. ENVIRONMENTAL GOVERNANCE [12 lectures]

Human-Environment Interaction

Green Governance: Sustainable Human Development

4. LOCAL GOVERNANCE [12 lectures]

Democratic

Decentralisation

n

People's Participation In Governance

5. GOOD GOVERNANCE INITIATIVES IN INDIA: BEST PRACTICES [20 lectures]

- a. Public Service Guarantee Acts
- b. Electronic Governance
- c. Citizens Charter & Right to Information
- d. Corporate Social Responsibility

READINGS

GOVERNMENT AND GOVERNANCE: CONCEPTS

B. Chakrabarty and M. Bhattacharya, (eds.) *The Governance Discourse*. New Delhi: Oxford University Press, 1998

Surendra Munshi and Biju Paul Abraham [eds.], *Good Governance, Democratic Societies And Globalisation*, Sage Publishers, 2004

United Nation Development Programme, *Reconceptualising Governance*, New York, 1997

Carlos Santiso, *Good Governance and Aid Effectiveness: The World Bank and Conditionality*

Johns Hopkins University, The Georgetown Public Policy Review ,Volume VII, No.1, 2001

Vasudha Chotray and Gery Stroker , *Governance Theory: A Cross Disciplinary Approach* ,

Palgrave Macmillan ,2008

J. Rosenau, 'Governance, Order, and Change in World Politics', in J. Rosenau, and E. Czempiel (eds.) *Governance without Government: Order and Change in World Politics*, Cambridge: Cambridge University Press ,1992

B. Nayar (ed.), *Globalization and Politics in India*. Delhi: Oxford University Press, 2007 pp. 218-240.

Smita Mishra Panda , *Engendering Governance Institutions: State, Market And Civil Society*, Sage Publications,2008

Neera Chandhoke, *State And Civil Society Explorations In Political Theory* , Sage Publishers,1995

GOVERNANCE AND DEVELOPMENT

B. C. Smith, *Good Governance and Development*, Palgrave, 2007

World Bank Report, *Governance And Development*, 1992

P. Bardhan, 'Epilogue on the Political Economy of Reform in India', in *The Political Economy of Development in India*. 6th edition, Delhi: Oxford University Press, 2005

J. Dreze and A. Sen, *India: Economic Development and Social Opportunity*. New Delhi: Oxford University Press, 1995

Niraja Gopal Jayal[ed.], *Democracy in India*, Oxford University Press, 2007

ENVIRONMENTAL GOVERNANCE

Ramachandra Guha, *Environmentalism: A Global History*, Longman Publishers, 1999

J.P. Evans, *Environmental Governance*, Routledge , 2012

Emilio F. Moran, *Environmental Social Science: Human - Environment interactions and Sustainability*, Wiley-Blackwell, 2010

Burns H Weston and David Bollier, *Green Governance: Ecological Survival, Human Rights, and the Law of the Commons*, Cambridge University Press, 2013

Bina Agarwal, *Gender And Green Governance* , Oxford University Press, Oxford, 2013

J. Volger, 'Environmental Issues', in J. Baylis, S. Smith and P. Owens (eds.) *Globalization of World Politics*, New York: Oxford University Press, 2011, pp. 348- 362.

A. Heywood, *Global Politics*, New York: Palgrave, 2011, pp. 383-411.

N. Carter, *The Politics of Environment: Ideas, Activism, Policy*, Cambridge: Cambridge University Press, 2007, pp. 13-81.

LOCAL GOVERNANCE

Pranab Bardhan and Dilip Mookherjee, *Decentralization And Local Governance In Developing Countries: A Comparative Perspective*, MIT Press, 2006

T.R. Raghunandan, *Decentralization And Local Governments: The Indian Experience, Readings On The Economy, Polity And Society*, Orient Blackswan, 2013

Pardeep Sachdeva, *Local Government In India*, Pearson Publishers, 2011

P. de Souza, (2002) 'Decentralization and Local Government: The Second Wind of Democracy in India', in Z. Hasan, E. Sridharan and R. Sudarshan (eds.) *India's Living Constitution: Ideas, Practices and Controversies*, New Delhi: Permanent Black, 2002

Mary John, 'Women in Power? Gender, Caste and Politics of Local Urban Governance', in *Economic and Political Weekly*, Vol. 42(39), 2007

GOOD GOVERNANCE INITIATIVES IN INDIA: BEST PRACTICES

Niraja Gopal Jayal, *Democracy and the State: Welfare, Secularism, and Development in Contemporary India*, Oxford University Press, 1999

Reetika Khera [ed.], *The Battle for Employment Guarantee*, Oxford University Press, 2011

Nalini Juneja, *Primary Education for All in the City of Mumbai: The Challenge Set By Local Actors*, International Institute For Educational Planning, UNESCO : Paris, 2001

Maxine Molyneux and Shahra Razavi, *Gender, Justice, Development, and Rights*, Oxford University Press, 2002

Jugal Kishore, *National Health Programs of India: National Policies and Legislations*, Century Publications, 2005

Jean Drèze and Amartya Sen, *India, Economic Development and Social Opportunity*, Oxford University Press, 1995

K. Lee and Mills, *The Economic Of Health In Developing Countries*, Oxford University Press, 1983

Marmar Mukhopadhyay and Madhu Parhar (eds.) *Education in India: Dynamics of Development*, Shipra Publications, 2007

K. Vijaya Kumar, *Right to Education Act 2009: Its Implementation as to Social Development in India*, Akansha Publishers, 2012

Amartya Sen and Jean Dreze, *Omnibus: Poverty and Famines, Hunger and Public Action, India- Economic Development and Social Opportunity*, Oxford University Press, 1998

Jean Dreze and Amartya Sen, *An Uncertain Glory: India And Its Contradictions*, Princeton University Press, 2013

Reetika Khera- *Rural Poverty And Public Distribution System*, EPW, Vol- XLVIII, No. 45-46, Nov 2013

Pradeep Chaturvedi , *Women And Food Security: Role Of Panchayats* , Concept Publishing House, 2002

Bidyut Mohanty, "Women, Right to Food and Role of Panchayats", *Mainstream*, Vol. LII, No. 42, October 11, 2014

D. Crowther, *Corporate Social Responsibility*, Deep and Deep Publishers, 2008

Sanjay K. Agarwal, *Corporate Social Responsibility in India*, Sage Publishers, 2008

Pushpa Sundar, *Business & Community: The Story of Corporate Social Responsibility in India*, New Delhi: Sage Publications, 2013

4. UNITED NATIONS AND GLOBAL CONFLICTS

Course Objective: This course provides a comprehensive introduction to the most important multilateral political organization in international relations. It provides a detailed account of the organizational structure and the political processes of the UN, and how it has evolved since 1945, especially in terms of dealing with the major global conflicts. The course imparts a critical understanding of the UN's performance until now and the imperatives as well as processes of reforming the organization in the context of the contemporary global system.

I. The United Nations (29 Lectures)

(a) An Historical Overview of the United Nations

(b) Principles and Objectives

(c) Structures and Functions: General Assembly; Security Council, and Economic and Social Council; the International Court of Justice and the specialised agencies (International Labour Organisation [ILO], United Nations Educational, Scientific and Cultural Organisation [UNESCO], World Health Organisation [WHO], and UN programmes and funds: United Nations Children's Fund [UNICEF], United Nations Development Programme [UNDP], United

Nations Environment Programme [UNEP], United Nations High Commissioner for Refugees [UNHCR])

(d) Peace Keeping, Peace Making and Enforcement, Peace Building and Responsibility to Protect (e) Millennium Development Goals

II. Major Global Conflicts since the Second World War (20 Lectures)

(a) Korean War

(b) Vietnam War

(c) Afghanistan Wars

(d) Balkans: Serbia and Bosnia

III. Assessment of the United Nations as an International Organisation: Imperatives of Reforms and the Process of Reforms (11 Lectures)

Essential Readings I. The United Nations (a) An Historical Overview of the United Nations

Moore, J.A. Jr. and Pubantz, J. (2008) *The new United Nations*. Delhi: Pearson Education, pp. 39-62.

Goldstein, J. and Pevehouse, J.C. (2006) *International relations*. 6th edn. New Delhi: Pearson, pp. 265-282.

Taylor, P. and Groom, A.J.R. (eds.) (2000) *The United Nations at the millennium*. London: Continuum, pp. 1-20.

Gareis, S.B. and Varwick, J. (2005) *The United Nations: an introduction*. Basingstoke: Palgrave, pp. 1-40.

Gowan, P. (2010) 'US: UN', in Gowan, P. 'A calculus of power: grand strategy in the twenty-first century. London: Verso, pp. 47-71.

Baylis, J. and Smith, S. (eds.) (2008) *The globalization of world politics. an introduction to international relations*. 4th edn. Oxford: Oxford University Press, pp. 405-422.

Thakur, R. (1998) 'Introduction', in Thakur, R. (eds.) *Past imperfect, future uncertain: The UN at Fifty*. London: Macmillan, pp. 1-14.

Basu, Rumki (2014) *United Nations: Structure and Functions of an international organization*, New Delhi, Sterling Publishers

(b) Principles and Objectives

Gareis, S.B. and Varwick, J. (2005) *The United Nations: An introduction*. Basingstoke: Palgrave, pp. 15-21.

(c) Structures and Functions: General Assembly; Security Council, and Economic and Social Council; the International Court of Justice and the specialised agencies (International Labour Organisation [ILO], United Nations Educational, Scientific and Cultural Organisation [UNESCO], World Health Organisation [WHO], and UN programmes and funds: United Nations Children's Fund [UNICEF], United Nations Development Programme [UNDP], United Nations Environment Programme [UNEP], United Nations High Commissioner for Refugees [UNHCR])

Taylor, P. and Groom, A.J.R. (eds.) (2000) *The United Nations at the millennium*. London: Continuum, pp. 21-141.

Moore, J.A. Jr. and Pubantz, J. (2008) *The new United Nations*. Delhi: Pearson Education, pp. 119-135.

(d) Peace Keeping, Peace Making and Enforcement, Peace Building and Responsibility to Protect

Nambiar, S. (1995) 'UN peace-keeping operations', in Kumar, S. (eds.) *The United Nations at fifty*. New Delhi, UBS, pp. 77-94.

Whittaker, D.J. (1997) 'Peacekeeping', in *United Nations in the contemporary world*. London: Routledge, pp. 45-56.

White, B. et al. (eds.) (2005) *Issues in world politics*. 3rd edn. New York: Macmillan, pp. 113-132.

(e) Millennium Development Goals

Moore, J.A. Jr. and Pubantz, J. (2008) *The new United Nations*. Delhi: Pearson Education, pp.264-266.

Sangal, P.S. (1986) 'UN, peace, disarmament and development', in Saxena, J.N. et.al. *United Nations for a better world*. New Delhi: Lancers, pp.109-114.

Baxi, U. (1986) 'Crimes against the right to development', in Saxena, J.N. et.al. *United Nations for a better world*. New Delhi: Lancers, pp.240-248.

Ghali, B.B. (1995) *An agenda for peace*. New York: UN, pp.5-38.

United Nations Department of Public Information. (2008) *The United Nations Today*. New York: UN.

II. Major Global Conflicts since the Second World War (a) Korean War

Calvocoressi, P. (2001) *World Politics: 1945-200*. 3rd edn. Harlow: Pearson Education, pp. 116-124.

Armstrong, D., Lloyd, L. and Redmond, J. (2004) *International organisations in world politics*. 3rd edn. New York: Palgrave Macmillan, pp. 42-43.

Moore, J.A. Jr. and Pubantz, J. (2008) *The new United Nations*. Delhi: Pearson Education, pp. 64-65 and 172-173.

(b) Vietnam War

Calvocoressi, P. (2001) *World Politics: 1945-200*. 3rd edn. Harlow: Pearson Education, pp. 528-546.

Baylis, J. and Smith, S. (eds.) (2008) *The globalization of world politics. an introduction to international relations*. 4th edn. Oxford: Oxford University Press, pp. 562-564.

(c) Afghanistan Wars

Achcar, G. (2004) *Eastern cauldron*. New York: Monthly Review Press, pp. 29-45 and 234-241.

Achcar, G. (2003) *The clash of barbarisms: Sept. 11 and the making of the new world disorder*. Kolkata: K.P. Bachi & Co., pp. 76-81.

Prashad, V. (2002) *War against the planet*. New Delhi: Leftword, pp. 1-6. Ali, T. (ed.) (2000) *Masters of the Universe*. London: Verso, pp. 203-216.

Calvocoressi, P. (2001) *World Politics: 1945-200*. 3rd edn. Harlow: Pearson Education, pp. 570-576.

(d) Balkans: Serbia and Bosnia Ali, T. (ed.) (2000) *Masters of the Universe*. London: Verso, pp. 230-245 and 271-284.

Kaldor, M. and Vashee, B. (eds.) (1997) *New wars*. London: Wider Publications for the UN University, pp. 137-144 and 153-171.

Viotti, P.R. and Kauppi, M.V. (2007) *International relations and world politics- security, economy, identity*. 3rd edn. New Delhi: Pearson Education, pp. 470-471.

Goldstein, J.S. (2003) *International relations*. 3rd edn. Delhi: Pearson Education, pp. 43-51.

Moore, J.A. Jr. and Pubantz, J. (2008) *The new United Nations*. Delhi: Pearson Education, pp. 24-27.

III. Political Assessment of the United Nations as an International Organisation: Imperatives of Reforms and the Process of Reforms

Roberts, A. and Kingsbury, B. (eds.) (1994) *United Nations, Divided World*. 2nd edn. Oxford: Clarendon Press, pp. 420-436.

Taylor, P. and Groom, A.J.R. (eds.) (2000) *The United Nations at the millennium*. London: Continuum, pp. 196-223 and 295-326.

Gareis, S.B. and Varwick, J. (2005) *The United Nations: An introduction*. Basingstoke: Palgrave, pp. 214-242.

Moore, J.A. Jr. and Pubantz, J. (2008) *The new United Nations*. Delhi: Pearson Education, pp. 91-112.

Additional Readings

Claude, I. (1984) *Swords into plowshares: the progress and problems of international organisation*. 4th edn. New York: Random House.

Dodds, F. (ed.) (1987) *The way forward: beyond the agenda 21*. London: Earthscan.

Rajan, M.S., Mani, V.S and Murthy, C.S.R. (eds.) (1987) *The nonaligned and the United Nations*. New Delhi: South Asian Publishers.

South Asia Human Rights Documentation Centre. (2006) *Human rights: an overview*. New Delhi: Oxford University Press.

Anan, K. (1997) *Renewing the United Nations: A Programme for Survival*. General Assembly Document: A/51/950; 14 July 1997. Available from:

[http://daccessdds.un.org/doc/UNDOC/GEN/N97/189/79/1MG/n9718979.pdf](http://daccessdds.un.org/doc/UNDOC/GEN/N97/189/79/1MG/n9718979.pdf?OpenElement), Open Element (accessed on 13 October 2011).

(C) DISCIPLINE SPECIFIC ELECTIVE -4 (DSE)

1.

Human Rights in a Comparative Perspective

Course objective: This course attempts to build an understanding of human rights amongst students through a study of specific issues in a comparative perspective. It is important for students to see how debates on human rights have taken distinct forms historically and in the contemporary world. The course seeks to anchor all issues in the Indian context, and pulls out another country to form a broader comparative frame. Students will be expected to use a range of resources, including films, biographies, and official documents to study each theme. Thematic discussion of sub-topics in the second and third sections should include state response to issues and structural violence questions.

I. Human Rights: Theory and Institutionalization (3 weeks)

- a. Understanding Human Rights: Three Generations of Rights
- b. Institutionalization: Universal Declaration of Human Rights
- c. Rights in National Constitutions: South Africa and India

II. Issues (5 weeks)

- a. Torture: USA and India
- b. Surveillance and Censorship: China and India

c. Terrorism and Insecurity of Minorities: USA and India

III. Structural Violence (4 weeks)

a. Caste and Race: South Africa and India

b. Gender and Violence: India and Pakistan

c. Adivasis/Aboriginals and the Land Question: Australia and India

READING LIST

I. Human Rights: Theory and Institutionalization

Essential Readings:

J. Hoffman and P. Graham, (2006) 'Human Rights', *Introduction to Political Theory*, Delhi, Pearson, pp. 436-458.

SAHRDC (2006) 'Introduction to Human Rights'; 'Classification of Human Rights: An Overview of the First, Second, and Third Generational Rights', in *Introducing Human Rights*, New Delhi: Oxford University Press.

The Constitution of the Republic of South Africa, Chapter 2: Bill of Rights.

The Constitution of India, Chapter 3: Fundamental Rights

II. Issues

a. Torture: USA and India

Essential Readings:

M. Lippman, (1979) 'The Protection of Universal Human Rights: The Problem of Torture' *Universal Human Rights*, Vol. 1(4), pp. 25-55

J. Lokaneeta, (2011) 'Torture in the TV Show 24: Circulation of Meanings'; 'Jurisprudence on Torture and Interrogations in India', in *Transnational Torture Law, Violence, and State Power in the United States and India*, Delhi: Orient Blackswan,

D. O'Byrne, (2007) 'Torture', in *Human Rights: An Introduction*, Delhi: Pearson, pp. 164-197.

b. Surveillance and Censorship: China and India

Essential Readings:

D. O'Byrne, (2007) 'Censorship', in *Human Rights: An Introduction*, Delhi: Pearson, pp. 106-138.

D. Lyon, (2008) Surveillance Society, Talk for Festival del Diritto, Piacenza, Italia, September 28, pp.1-7.

Fu Hualing, (2012) 'Politicized Challenges, Depoliticized Responses: Political Monitoring in China's Transitions', paper presented at a conference on States of Surveillance: Counter-Terrorism and Comparative Constitutionalism, at the

University of New South Wales, Sydney, 13-14 December.

U. Singh, (2012) 'Surveillance Regimes in India', paper presented at a conference on States of Surveillance: Counter-Terrorism and Comparative Constitutionalism, at the University of New South Wales, Sydney, 13-14 December.

c. Terrorism and Insecurity of Minorities: USA and India

Essential Readings:

E. Scarry, (2010) 'Resolving to Resist', in *Rule of Law, Misrule of Men*, Cambridge: Boston Review Books, MIT, pp.1-53.

M. Ahmad, (2002) 'Homeland Insecurities: Racial Violence the Day after September 11', *Social Text*, 72, Vol. 20(3), pp. 101-116.

U. Singh, (2007) 'The Unfolding of Extraordinariness: POTA and the Construction of Suspect Communities', in *The State, Democracy and Anti-terror Laws in India*, Delhi: Sage Publications, pp.165-219

3. Structural Conflicts

a. Caste and Race: South Africa and India

Essential Readings:

A. Pinto, (2001) 'UN Conference against Racism: Is Caste Race?', in *Economic and Political Weekly*, Vol. 36(30)

D. O'Byrne, (2007) 'Apartheid', in *Human Rights: An Introduction*, Delhi: Pearson, pp. 241-262.

R. Wasserstorm, (2006), 'Racism, Sexism, and Preferential Treatment: An approach to the Topics', in R. Goodin and P. Pettit, *Contemporary Political Philosophy: an Anthology*, Oxford: Blackwell, pp-549-574

R. Wolfrum, (1998) 'Discrimination, Xenophobia and Racism' in J. Symonides, *Human Rights: New Dimensions and Challenges*, Aldershot, Ashgate/UNESCO, pp.181-198.

b. Gender and Violence: India and Pakistan

Essential Readings:

A. Khan and R. Hussain, (2008), 'Violence Against Women in Pakistan: Perceptions and Experiences of Domestic Violence', *Asian Studies Review*, Vol. 32, pp. 239 – 253

K. Kannabiran (2012) 'Rethinking the Constitutional Category of Sex', in *Tools of Justice: Non-Discrimination and the Indian Constitution*, New Delhi, Routledge, pp.425-443

N. Menon (2012) 'Desire', *Seeing Like a Feminist*, New Delhi: Zubaan/Penguin, pp. 91-146

c. Adivasis/Aboriginals and the Land Question: Australia and India

Essential Readings:

H. Goodall, (2011) 'International Indigenous Community Study: Adivasi Indigenous People in India', in A. Cadzow and J. Maynard (eds.), *Aboriginal Studies*, Melbourne: Nelson Cengage Learning, pp.254-259.

K. Kannabiran, (2012) 'Adivasi Homelands and the Question of Liberty', in *Tools of Justice: Non-Discrimination and the Indian Constitution*, New Delhi: Routledge, pp.242-271.

N. Watson (2011) 'Aboriginal and Torres Strait Islander Identities' in A. Cadzow and J. Maynard (eds.), *Aboriginal Studies*, Melbourne: Nelson Cengage Learning, pp.43-52.

W. Fernandes (2008) 'India's Forced Displacement Policy and Practice. Is Compensation up to its Functions?', in M. Cernea and H. Mathus (eds), *Can Compensation Prevent Impoverishment? Reforming Resettlement through Investments and Benefit-Sharing*, pp.181-207, New Delhi: Oxford University Press.

Additional Readings:

A. Laws and V. Iacopino, (2002) 'Police Torture in Punjab, India: An Extended Survey', in *Health and Human Rights*, Vol. 6(1), pp. 195-210

D. O'Byrne, (2007) 'Theorizing Human Rights', in *Human Rights: An Introduction*, Delhi, Pearson, pp.26-70.

J. Morsink, (1999) *The Universal Declaration of Human Rights: Origins, Drafting and Intent*, Philadelphia: University of Pennsylvania Press, pp. ix-xiv

J. Nickel, (1987) *Making Sense of Human Rights: Philosophical Reflections on the Universal Declaration of Human Rights*, Berkeley: University of California Press.

J. Goldman, (2005) 'Of Treaties and Torture: How the Supreme Court Can Restrain the Executive', in *Duke Law Journal*, Vol. 55(3), pp. 609-640.

K. Tsutsui and C. Wotipka, (2004) Global Civil Society and the International Human Rights Movement: Citizen Participation in Human Rights International Nongovernmental Organizations, in *Social Forces*, Vol. 83(2), pp. 587-620.

L. Rabben, (2001) Amnesty International: Myth and Reality, in *Agni*, No. 54, Amnesty International Fortieth Anniversary pp. 8-28

M. Mohanty, (2010) 'In Pursuit of People's Rights: An Introduction', in M. Mohanty et al., *Weapon of the Oppressed: Inventory of People's Rights in India*, New Delhi: Danish Books, pp.1-11

M. Cranston, (1973) *What are Human Rights?* New York: Taplinger

M. Ishay, (2004) *The History of Human Rights: From Ancient Times to the Globalization Era*, Delhi: Orient Blackswan.

R. Sharan, (2009) 'Alienation and Restoration of Tribal Land in Jharkhand in N Sundar (ed.) *Legal Grounds*, New Delhi: Oxford University Press, pp. 82-112

Text of UDHR available at <http://www.un.org/en/documents/udhr/index.shtml>

U. Baxi, (1989) 'From Human Rights to the Right to be Human: Some Heresies', in S. Kothari and H. Sethi (eds.), *Rethinking Human Rights*, Delhi: Lokayan, pp.181-166

2. Development Process and Social Movements in Contemporary India

Course objective: Under the influence of globalization, development processes in India have undergone transformation to produce spaces of advantage and disadvantage and new geographies of power. The high social reproduction costs and dispossession of vulnerable social groups involved in such a development strategy condition new theatres of contestation and struggles. A variety of protest movements emerged to interrogate and challenge this development paradigm that evidently also weakens the democratic space so very vital to the formulation of critical consensus. This course proposes to introduce students to the conditions, contexts and forms of political contestation over development paradigms and their bearing on the retrieval of democratic voice of citizens.

I. Development Process since Independence (2 weeks)

a. State and planning

b. Liberalization and reforms

II. Industrial Development Strategy and its Impact on the Social Structure (2 weeks)

a. Mixed economy, privatization, the impact on organized and unorganized labour

b. Emergence of the new middle class

III. Agrarian Development Strategy and its Impact on the Social Structure (2 weeks)

a. Land Reforms, Green Revolution

b. Agrarian crisis since the 1990s and its impact on farmers

IV. Social Movements (6 weeks)

a. Tribal, Peasant, Dalit and Women's movements

b. Maoist challenge

c. Civil rights movements

READING LIST

I. The Development Process since Independence

Essential Readings:

A. Mozoomdar, (1994) 'The Rise and Decline of Development Planning in India', in T. Byres (ed.) *The State and Development Planning in India*. Delhi: Oxford University Press, pp. 73-108.

A. Varshney, (2010) 'Mass Politics or Elite Politics? Understanding the Politics of India's Economic Reforms' in R. Mukherji (ed.) *India's Economic Transition: The Politics of Reforms*, Delhi: Oxford University Press, pp 146-169.

P. Chatterjee, (2000) 'Development Planning and the Indian State', in Zoya Hasan (ed.), *Politics and the State in India*, New Delhi: Sage, pp.116-140.

P. Patnaik and C. Chandrasekhar, (2007) 'India: Dirigisme, Structural Adjustment, and the Radical Alternative', in B. Nayar (ed.), *Globalization and Politics in India*. Delhi: Oxford University Press, pp. 218-240.

P. Bardhan, (2005) 'Epilogue on the Political Economy of Reform in India', in *The Political Economy of Development in India*. 6th impression, Delhi: Oxford University Press.

T. Singh, (1979) 'The Planning Process and Public Process: a Reassessment', *R. R. Kale Memorial Lecture*, Pune: Gokhale Institute of Politics and Economics.

II. Industrial development strategy and its impact on social structure

Essential Readings:

A. Aggarwal, (2006) 'Special Economic Zones: Revisiting the Policy Debate', in *Economic and Political Weekly*, XLI (43-44), pp.4533-36.

B. Nayar (1989) *India's Mixed Economy: The Role of Ideology and its Development*, Bombay: Popular Prakashan.

F. Frankel, (2005) 'Crisis of National Economic Planning', in *India's Political Economy (1947-2004): The Gradual Revolution*, Delhi: Oxford University Press, pp. 93-340.

L. Fernandes, (2007) *India's New Middle Class: Democratic Politics in an Era of Economic Reform*, Delhi: Oxford University Press.

S. Shyam, (2003) 'Organizing the Unorganized', in *Seminar*, [Footloose Labour: A Symposium on Livelihood Struggles of the Informal Workforce, 531] pp. 47-53.

S. Chowdhury, (2007) 'Globalization and Labour', in B. Nayar (ed.) *Globalization and Politics in India*, Delhi: Oxford University Press, pp.516-526.

V. Chibber, (2005) 'From Class Compromise to Class Accommodation: Labor's Incorporation into the Indian Political Economy' in R. Ray, and M.F. Katzenstein (eds.) *Social Movements in India*, Delhi: Oxford University Press, pp 32-60.

III. Agrarian development strategy and its impact on social structure

Essential Readings:

A. Desai, (ed.), (1986) *Agrarian Struggles in India After Independence*, Delhi: Oxford University Press, pp. xi-xxxvi

F. Frankel, (1971) *India's Green Revolution: Economic Gains and Political Costs*, Princeton and New Jersey: Princeton University Press.

F. Frankel, (2009) *Harvesting Despair: Agrarian Crisis in India*, Delhi: Perspectives, pp. 161-169.

J. Harriss, (2006) 'Local Power and the Agrarian Political Economy' in Harriss, J. (ed) *Power Matters: Essays on Institutions, Politics, and Society in India*, Delhi. Oxford University Press, pp. 29-32.

K. Suri, (2006) 'Political economy of Agrarian Distress', in *Economic and Political Weekly*, XLI(16) pp. 1523-1529.

P. Joshi, (1979) *Land Reforms in India: Trends and Perspectives*, New Delhi: Allied publishers.

P. Appu, (1974) 'Agrarian Structure and Rural Development', in *Economic and Political Weekly*, IX (39), pp.70 – 75.

P. Sainath, (2010) 'Agrarian Crisis and Farmers', Suicide', *Occasional Publication 22*, New Delhi: India International Centre (IIC).

M. Sidhu, (2010) 'Globalisation vis-à-vis Agrarian Crisis in India', in R. Deshpande and S. Arora, (eds.) *Agrarian Crises and Farmer Suicides (Land Reforms in India Series)*, New Delhi: Sage, pp. 149-174.

V. Sridhar, (2006) 'Why Do Farmers Commit Suicide? The Case Study of Andhra Pradesh', in *Economic and Political Weekly*, XLI (16).

IV. Social Movements

Essential Readings:

G. Haragopal, and K. Balagopal, (1998) 'Civil Liberties Movement and the State in India', in M. Mohanty, P. Mukherji and O. Tornquist, (eds.) *People's Rights: Social Movements and the State in the Third World* New Delhi: Sage, pp. 353-371.

M. Mohanty, (2002) 'The Changing Definition of Rights in India', in S. Patel, J. Bagchi, and K. Raj (eds.) *Thinking Social Sciences in India: Essays in Honour of Alice Thorner*

Patel, New Delhi: Sage.

G. Omvedt, (2012) 'The Anti-caste Movement and the Discourse of Power', in N. Jayal (ed.) *Democracy in India*, New Delhi: Oxford India Paperbacks, sixth impression, pp.481-508.

P. Ramana, (2011) 'India's Maoist Insurgency: Evolution, Current Trends and Responses', in M. Kugelman (ed.) *India's Contemporary Security Challenges*, Woodrow Wilson International Centre for Scholars Asia Programme, Washington D.C., pp.29-47.

A.Ray, (1996) 'Civil Rights Movement and Social Struggle in India', in *Economic and Political Weekly*, XXI (28). pp. 1202-1205.

A.Roy, (2010) 'The Women's Movement', in N.Jayal and P. Mehta (eds.) *The Oxford Companion to Politics in India*, New Delhi: Oxford University Press, pp.409-422.

N. Sundar, (2011) 'At War with Oneself: Constructing Naxalism as India's Biggest Security Threat', in M. Kugelman (ed.) *India's Contemporary Security Challenges*, Woodrow Wilson International Centre for Scholars Asia Programme, Washington D.C., pp.46-68.

M. Weiner, (2001) 'The Struggle for Equality: Caste in Indian Politics', in A.Kohli. (ed.) *The Success of India's Democracy*, Cambridge: CUP, pp.193-225.

S. Sinha, (2002) 'Tribal Solidarity Movements in India: A Review', in G. Shah. (ed.) *Social Movements and the State*, New Delhi: Sage, pp. 251-266.

Additional Readings:

S. Banerjee, (1986) 'Naxalbari in Desai', in A.R. (ed.) *Agrarian Struggles in India After Independence*. Delhi: Oxford University Press, pp.566-588.

B. Nayar, (ed.), (2007) *Globalization and Politics in India*. Delhi: Oxford University Press. S. Roy and K. Debal, (2004) *Peasant Movements in Post-Colonial India: Dynamics of Mobilization and Identity*, Delhi: Sage.

G. Omvedt, (1983) *Reinventing Revolution, New Social Movements and the Socialist Tradition in India*, New York: Sharpe.

G. Shah, (ed.), (2002) *Social Movements and the State*. New Delhi: Sage Publications.

G. Shah, (2004) *Social Movements in India: A Review of Literature*, New Delhi: Sage Publications.

G. Rath, (ed.), (2006) *Tribal development in India: The Contemporary Debate*,

New Delhi: Sage Publications.

J. Harris, (2009) *Power Matters: Essays on Institutions, Politics, and Society in India*. Delhi: Oxford University press.

K. Suresh, (ed.), (1982) *Tribal Movements in India*, Vol I and II, New Delhi: Manohar (emphasis on the introductory chapter).

M. Mohanty, P. Mukherji and O.Tornquist, (1998) *People's Rights: Social Movements and the State in the Third World*. New Delhi: Sage Publications.

M. Rao, (ed.), (1978) *Social Movements in India*, Vol. 2, Delhi: Manohar.

N. Jayal, and P. Mehta, (eds.), (2010) *The Oxford Companion to Politics in India*, Delhi:Oxford University Press.

P. Bardhan, (2005) *The Political Economy of Development in India*, 6th impression, Delhi: Oxford University Press.

R. Mukherji, (ed.), (2007) *India's Economic Transition: The Politics of Reforms*, Delhi: Oxford University Press.

R, Ray and M. Katzenstein, (eds.), (2005) *Social Movements in India*, Delhi: Oxford University Press.

S. Chakravarty, (1987) *Development Planning: The Indian Experience*, Delhi: Oxford University Press.

3.

India's Foreign Policy in a globalizing world

Course objective: This course's objective is to teach students the domestic sources and the structural constraints on the genesis, evolution and practice of India's foreign policy. The endeavour is to highlight integral linkages between the 'domestic' and the 'international' aspects of India's foreign policy by stressing on the shifts in its domestic identity and the corresponding changes at the international level. Students will be instructed on India's shifting identity as a postcolonial state to the contemporary dynamics of India attempting to carve its identity as an 'aspiring power'. India's evolving relations with the superpowers during the Cold War and after, bargaining strategy and positioning in international climate change negotiations, international economic governance, international terrorism and the United Nations facilitate an understanding of the changing positions and development of India's role as a global player since independence.

I. India's Foreign Policy: From a Postcolonial State to an Aspiring Global Power (7 lectures)

II. India's Relations with the USA and USSR/Russia (9

lectures) III. India's Engagements with China (6 lectures)

IV. India in South Asia: Debating Regional Strategies (9 lectures)

V. India's Negotiating Style and Strategies: Trade, Environment and Security Regimes (11 lectures)

VI. India in the Contemporary Multipolar World (6 lectures)

READING LIST

I. India's Foreign Policy: From a Postcolonial State to an Aspiring Global Power

Essential Readings:

S. Ganguly and M. Pardesi, (2009) 'Explaining Sixty Years of India's Foreign Policy', in *IndiaReview*, Vol. 8 (1), pp. 4–19.

Ch. Ogden, (2011) 'International 'Aspirations' of a Rising Power', in David Scott (ed.), *Handbook of India's International Relations*, London: Routledge, pp.3-31

W. Anderson, (2011) 'Domestic Roots of Indian Foreign Policy', in W. Anderson, *Trusts with Democracy: Political Practice in South Asia*, Anthem Press: University Publishing Online.

Additional Reading:

J. Bandhopadhyaya, (1970) *The Making Of India's Foreign Policy*, New Delhi: Allied Publishers.

II: India's Relations with the USA and USSR/Russia

Essential Readings:

S. Mehrotra, (1990) 'Indo-Soviet Economic Relations: Geopolitical and Ideological Factors', in *India and the Soviet Union: Trade and Technology Transfer*, Cambridge University Press: Cambridge, pp. 8-28.

R. Hathaway, (2003) 'The US-India Courtship: From Clinton to Bush', in S. Ganguly (ed.), *India as an Emerging Power*, Frank Cass: Portland.

A. Singh, (1995) 'India's Relations with Russia and Central Asia', in *International Affairs*, Vol. 71 (1): 69-81.

M. Zafar, (1984), 'Chapter 1', in *India and the Superpowers: India's Political Relations with the Superpowers in the 1970s*, Dhaka, University Press.

Additional Readings:

H. Pant, (2008) 'The U.S.-India Entente: From Estrangement to Engagement', in H. Pant, *Contemporary Debates in Indian Foreign and Security Policy: India Negotiates Its Rise in the International System*, Palgrave Macmillan: London.

D. Mistry, (2006) 'Diplomacy, Domestic Politics, and the U.S.-India Nuclear Agreement', in *Asian Survey*, Vol. 46 (5), pp. 675-698.

III: India's Engagements with China

Essential Readings:

H. Pant, (2011) 'India's Relations with China', in D. Scott (ed.), *Handbook of India's International Relations*, London: Routledge, pp. 233-242.

A. Tellis and S. Mirski, (2013) 'Introduction', in A. Tellis and S. Mirski (eds.), *Crux of Asia: China, India, and the Emerging Global Order*, Carnegie Endowment for International Peace: Washington.

S. Raghavan, (2013) 'Stability in Southern Asia: India's Perspective', in A. Tellis and S. Mirski (eds.), *Crux of Asia: China, India, and the Emerging Global Order*, Carnegie Endowment for International Peace: Washington.

Additional Reading:

Li Li, (2013) 'Stability in Southern Asia: China's Perspective', in A. Tellis and S. Mirski (eds.), *Crux of Asia: China, India, and the Emerging Global Order*, Carnegie Endowment for International Peace: Washington.

IV: India in South Asia: Debating Regional Strategies

Essential Readings:

S. Muni, (2003) 'Problem Areas in India's Neighbourhood Policy', in *South Asian Survey*, Vol. 10 (2), pp. 185-196.

S. Cohen, (2002) *India: Emerging Power*, Brookings Institution Press. V. Sood, (2009) 'India and regional security interests', in Alyssa Ayres and C. Raja Mohan (eds), *Power realignments in Asia: China, India, and the United States*, New Delhi: Sage.

Additional Readings:

M. Pardesi, (2005) 'Deducing India's Grand Strategy of Regional Hegemony from Historical and Conceptual Perspectives', IDSS Working Paper, 76, Available at <http://www.rsis.edu.sg/publications/WorkingPapers/WP76.pdf>, Accessed: 19.04.2013.

D. Scott, (2009) 'India's "Extended Neighbourhood" Concept: Power Projection for a Rising Power', in *India Review*, Vol. 8 (2), pp. 107-143

V: India's Negotiating Style and Strategies: Trade, Environment and Security Regimes

Essential Readings:

S. Cohen, (2002) 'The World View of India's Strategic Elite', in S. Cohen, *India: Emerging Power*, Brookings Institution Press, pp. 36-65.

A. Narlikar, (2007) 'All that Glitters is not Gold: India's Rise to Power', in *Third World Quarterly*, Vol. 28 (5) pp. 983 – 996.

N. Dubash, (2012) 'The Politics of Climate Change in India: Narratives of Enquiry and Co-benefits', Working Paper, New Delhi: Centre for Policy Research.

N. Jayaprakash, (2000) 'Nuclear Disarmament and India', in *Economic and Political Weekly*, Vol. 35 (7), pp. 525-533.

Additional Readings:

P. Bidwai, (2005) 'A Deplorable Nuclear Bargain', in *Economic and Political Weekly*, Vol. 40 (31), pp. 3362-3364.

A. Anant, (2011) 'India and International Terrorism', in D. Scott (ed.), *Handbook of India's International Relations*, London: Routledge, pp. 266-277.

VI: India in the Contemporary Multipolar World

Essential Readings:

R. Rajgopalan and V. Sahni (2008), 'India and the Great Powers: Strategic Imperatives, Normative Necessities', in *South Asian Survey*, Vol. 15 (1), pp. 5– 32.

C. Mohan, (2013) 'Changing Global Order: India's Perspective', in A. Tellis and S. Mirski (eds.), *Crux of Asia: China, India, and the Emerging Global Order*, Carnegie Endowment for International Peace: Washington.

A. Narlikar, (2006) 'Peculiar Chauvinism or Strategic Calculation? Explaining the Negotiating Strategy of a Rising India', in *International Affairs*, Vol. 82 (1), pp. 59-76.

Additional Reading:

P. Mehta, (2009) 'Still Under Nehru's Shadow? The Absence of Foreign Policy Frameworks in India', in *India Review*, Vol. 8 (3), pp. 209–233.

Online Resources:

Government of India's Ministry of External Relations website at <http://www.mea.gov.in/> and specially its library which provides online resources at <http://mealib.nic.in/>

The Council of Foreign Relations has a regularly updated blog on India's foreign policy: <http://www.cfr.org/region/india/ri282> Centre for Policy Research's blog on IR and strategic affairs though it is not exclusively on India's foreign policy. <http://www.cprindia.org/blog/international-relations-and-security-blog>

Institute for Defence Studies and Analyses: <http://www.idsa.in/>
Research and Information System: www.ris.org.in/

Indian Council of World Affairs: www.icwa.in/
Institute of Peace and Conflict Studies:
www.ipcs.org/

Indian Council for Research on International Economic Relations: www.icrier.org/

4. Women, Power and Politics

Course objective: This course opens up the question of women's agency, taking it beyond 'women's empowerment' and focusing on women as radical social agents. It attempts to question the complicity of social structures and relations in gender inequality. This is extended to cover new forms of precarious work and labour under the new economy. Special attention will be paid to feminism as an approach and outlook. The course is divided into broad units, each of which is divided into three sub- units.

I. Groundings (6 weeks)

1. Patriarchy (2 weeks)

- a. Sex-Gender Debates
- b. Public and Private
- c. Power

2. Feminism (2 weeks)

3. Family, Community,
State (2weeks)

- a. Family
- b. Community
- c. State

II. Movements and Issues (6 weeks)

1. History of the Women's Movement in India (2 weeks)

2. Violence against women (2 weeks)

3. Work and Labour (2 weeks)

- a. Visible and Invisible work
- b. Reproductive and care work
- c. Sex work

Reading List

I. Groundings

1. Patriarchy

Essential Readings:

T. Shinde, (1993) 'Stree Purusha Tulna', in K. Lalitha and Susie Tharu (eds), *Women Writing in India*, New Delhi, Oxford University Press, pp. 221-234

U. Chakravarti, (2001) 'Pitrasatta Par ek Note', in S. Arya, N. Menon & J. Lokneeta (eds.)

Naarivaadi Rajneeti: Sangharsh evam Muddey, University of Delhi: Hindi Medium Implementation Board, pp.1-7

a. Sex Gender Debates

Essential Reading:

V. Geetha, (2002) *Gender*, Kolkata, Stree, pp. 1- 20 **b.**

Public and Private

Essential Reading:

M. Kosambi, (2007) *Crossing the Threshold*, New Delhi, Permanent Black, pp. 3-10; 40-46 **c.**

Power

Essential Reading:

N. Menon, (2008) 'Power', in R. Bhargava and A. Acharya (eds), *Political Theory: An Introduction*, Delhi: Pearson, pp.148-157

2. Feminism

Essential Readings:

B. Hooks, (2010) 'Feminism: A Movement to End Sexism', in C. Mc Cann and S. Kim (eds), *The Feminist Reader: Local and Global Perspectives*, New York: Routledge, pp. 51-57

R. Delmar, (2005) 'What is Feminism?', in W. Kolmar & F. Bartkowski (eds)

Feminist Theory: A Reader, pp. 27-37

3. Family, Community and State

a. Family

Essential Readings:

R. Palriwala, (2008) 'Economics and Patriliney: Consumption and Authority within the Household' in M. John. (ed) *Women's Studies in India*, New Delhi: Penguin, pp. 414-423

b. Community

Essential Reading:

U. Chakravarti, (2003) *Gendering Caste through a Feminist Lens*, Kolkata, Stree, pp. 139-159.

c. State

Essential Reading:

C. MacKinnon, 'The Liberal State' from *Towards a Feminist Theory of State*, Available at <http://fair-use.org/catharine-mackinnon/toward-a-feminist-theory-of-the-state/chapter-8>, Accessed: 19.04.2013.

Additional Readings:

K. Millet, (1968) *Sexual Politics*, Available at <http://www.marxists.org/subject/women/authors/millett-kate/sexual-politics.htm>, Accessed: 19.04.2013.

N. Menon (2008) 'Gender', in R. Bhargava and A. Acharya (eds), *Political Theory: An Introduction*, New Delhi: Pearson, pp. 224-233

R.Hussain, (1988) 'Sultana's Dream', in *Sultana's Dream and Selections from the Secluded Ones – translated by Roushan Jahan*, New York: The Feminist Press

S.Ray 'Understanding Patriarchy', Available at http://www.du.ac.in/fileadmin/DU/Academics/course_material/hrge_06.pdf, Accessed: 19.04.2013.

S.de Beauvoir (1997) *Second Sex*, London: Vintage.

Saheli Women's Centre, (2007) *Talking Marriage, Caste and Community: Women's Voices from Within*, New Delhi: monograph

II. Movements and Issues

1. History of Women's Movement in India

Essential Readings:

I. Agnihotri and V. Mazumdar, (1997) 'Changing the Terms of Political Discourse: Women's Movement in India, 1970s-1990s', *Economic and Political Weekly*, 30 (29), pp. 1869-1878.

R. Kapur, (2012) 'Hecklers to Power? The Waning of Liberal Rights and Challenges to Feminism in India', in A. Loomba *South Asian Feminisms*, Durham and London: Duke University Press, pp. 333-355

2. Violence against Women

Essential Readings:

N. Menon, (2004) 'Sexual Violence: Escaping the Body', in *Recovering Subversion*, New Delhi: Permanent Black, pp. 106-165

3. Work and Labour

a. Visible and Invisible work

Essential Reading:

P. Swaminathan, (2012) 'Introduction', in *Women and Work*, Hyderabad: Orient Blackswan, pp.1-17

b. Reproductive and care work

Essential Reading:

J. Tronto, (1996) 'Care as a Political Concept', in N. Hirschmann and C. Stephano, *Revisioning the Political*, Boulder: Westview Press, pp. 139-156

c. Sex work

Essential Readings:

Darbar Mahila Samanwaya Committee, Kolkata (2011) 'Why the so-called Immoral Traffic (Preventive) Act of India Should be Repealed', in P. Kotiswaran, *Sex Work*, New Delhi, Women Unlimited, pp. 259-262

N. Jameela, (2011) 'Autobiography of a Sex Worker', in P. Kotiswaran, *Sex Work*, New Delhi: Women Unlimited, pp. 225-241

Additional Readings:

C. Zetkin, 'Proletarian Woman', Available at <http://www.marxists.org/archive/zetkin/1896/10/women.htm>, Accessed: 19.04.2013.

F. Engels, *Family, Private Property and State*, Available at <http://readingfromtheleft.com/PDF/EngelsOrigin.pdf>, Accessed: 19.04.2013.

J. Ghosh, (2009) *Never Done and Poorly Paid: Women's Work in Globalising India*, Delhi: Women Unlimited

Justice Verma Committee Report, Available at <http://nlrd.org/womens-rights-initiative/justice-verma-committee-report-download-full-report>, Accessed: 19.04.2013.

N. Gandhi and N. Shah, (1992) *Issues at Stake – Theory and Practice in the Women's Movement*, New Delhi: Kali for Women.

V. Bryson, (1992) *Feminist Political Theory*, London: Palgrave-MacMillan, pp. 175- 180; 196-200

M. Mies, (1986) 'Colonisation and Housewifisation', in *Patriarchy and Accumulation on a World Scale* London: Zed, pp. 74-111, Available at

<http://caringlabor.wordpress.com/2010/12/29/maria-mies-colonization-and-housewifization/>, Accessed: 19.04.2013.

R. Ghadially, (2007) *Urban Women in Contemporary India*, Delhi: Sage Publications.

S. Brownmiller, (1975) *Against our Wills*, New York: Ballantine.

Saheli Women's Centre (2001) 'Reproductive Health and Women's Rights, Sex Selection and feminist response' in S Arya, N. Menon, J. Lokneeta (eds), *Nariwadi Rajneeti*, Delhi, pp. 284-306

V. Bryson (2007) *Gender and the Politics of Time*, Bristol: Polity Press

Readings in Hindi:

D. Mehrotra, (2001) *Bhartiya Mahila Andolan: Kal, Aaj aur Kal*, Delhi: Books for Change

G. Joshi, (2004) *Bharat Mein Stree Asmaanta: Ek Vimarsh*, University of Delhi: Hindi Medium Implementation Board

N. Menon (2008) 'Power', in R. Bhargava and A. Acharya (eds) *Political Theory: An Introduction*, New Delhi: Pearson

N. Menon (2008) 'Gender', in R. Bhargava and A. Acharya (eds) *Political Theory: An Introduction*, New Delhi, Pearson

R. Upadhyay and S. Upadhyay (eds.) (2004) *Aaj ka Stree Andolan*, Delhi: Shabd Sandhan.

S. Arya, N. Menon and J. Lokneeta (eds.) (2001) *Naarivaadi Rajneeti: Sangharsh evam Muddey*, University of Delhi: Hindi Medium Implementation Board.

(D) Ability Enhancement (Skill Based)-2 1.

Legislative Practices and Procedures

Course objective: To acquaint the student broadly with the legislative process in India at various levels, introduce them to the requirements of peoples' representatives and provide elementary skills to be part of a legislative support team and expose them to real life legislative work. These will be, to understand complex policy issues, draft new legislation, track and analyse ongoing bills, make speeches and floor statements, write articles and press releases, attend legislative meetings, conduct meetings with various stakeholders, monitor media and public developments, manage constituent relations and handle inter-office communications. It will also deepen their understanding and appreciation of the political process and indicate the possibilities of making it work for democracy.

I. Powers and functions of people's representative at different tiers of governance (6 lectures)

Members of Parliament, State legislative assemblies, functionaries of rural and urban local self-government from Zila Parishad, Municipal Corporation to Panchayat/ward.

II. Supporting the legislative process (2 lectures)

How a bill becomes law, role of the Standing committee in reviewing a bill, legislative consultants, the framing of rules and regulations.

III. Supporting the Legislative Committees (6 lectures)

Types of committees, role of committees in reviewing government finances, policy, programmes, and legislation.

IV. Reading the Budget Document (6 lectures)

Overview of Budget Process, Role of Parliament in reviewing the Union Budget, Railway Budget, Examination of Demands for Grants of Ministries, Working of Ministries.

V. Support in media monitoring and communication (4 lectures)

Types of media and their significance for legislators; Basics of communication in print and electronic media.

READING LIST

I. Powers and functions of people's representative at different tiers of governance

Essential Readings:

M. Madhavan, and N. Wahi, (2008) *Financing of Election Campaigns* PRS, Centre for Policy Research, New Delhi, Available at:

http://www.prsindia.org/uploads/media/conference/Campaign_finance_brief.pdf, Accessed: 19.04.2013

S. Vanka, (2008) *Primer on MPLADS*, Centre for Policy Research, New Delhi, Available at <http://www.prsindia.org/parliamenttrack/primers/mplads-487/>, Accessed: 19.04.2013

H. Kalra, (2011) *Public Engagement with the Legislative Process* PRS, Centre for Policy Research, New Delhi, Available at:

<http://www.prsindia.org/administrator/uploads/media/Conference%202011/Public%20Engagement%20with%20the%20Legislative%20Process.pdf>, Accessed: 19.04.2013.

Government of India (Lok Sabha Secretariat), (2009) *Parliamentary Procedures (Abstract Series)*, Available at <http://164.100.47.132/LssNew/abstract/index.aspx>, Accessed: 19.04.2013

II. Supporting the legislative process

Essential Readings:

Government of India, (Ministry of Parliamentary Affairs), (2009) *Legislation, Parliamentary Procedure*, Available at http://mpa.nic.in/Manual/Manual_English/Chapter/chapter-09.htm, Accessed: 19.04.2013

Government of India, (Ministry of Parliamentary Affairs) (2009), *Subordinate Legislation, Parliamentary Procedure*, Available at: http://mpa.nic.in/Manual/Manual_English/Chapter/chapter-11.htm Accessed: 19.04.2013

D. Kapur and P. Mehta, (2006) 'The Indian Parliament as an Institution of Accountability', *Democracy, Governance and Human Rights*, Programme Paper Number 23, United Nations Research Institute for Social Development, Available at: [http://www.unrisd.org/UNRISD/website/document.nsf/240da49ca467a53f80256b4f005ef245/8e6fc72d6b546696c1257123002fcceb/\\$FILE/KapMeht.pdf](http://www.unrisd.org/UNRISD/website/document.nsf/240da49ca467a53f80256b4f005ef245/8e6fc72d6b546696c1257123002fcceb/$FILE/KapMeht.pdf), Accessed: 19.04.2013

O. Agarwal and T. Somanathan, (2005) '*Public Policy Making in India: Issues and Remedies*', Available at: http://www.cprindia.org/admin/paper/Public_Policy_Making_in_India_14205_TV_SO_MANA_THAN.pdf, Accessed: 19.04.2013

B. Debroy, (2001) 'Why we need law reform' *Seminar* January.

III. Supporting the Legislative Committees

Essential Readings:

P. Mehta, 'India's Unlikely Democracy: The Rise of Judicial Sovereignty', *Journal of Democracy*, Vol. 18(2), pp.70-83.

Government link: <http://loksabha.nic.in/>; <http://rajyasabha.nic.in/>; <http://mpa.nic.in/>

K. Sanyal, (2011) *Strengthening Parliamentary Committees* PRS, Centre for Policy Research, New Delhi, Available at: <http://www.prsindia.org/administrator/uploads/media/Conference%202011/Strengthening%20Parliamentary%20Committees.pdf>, Accessed: 19.04.2013

IV. Reading the Budget Document

Essential Readings

A. Celestine, (2011) *How to Read the Union Budget* PRS, Centre for Policy Research, New Delhi, Available at <http://www.prsindia.org/parliamenttrack/primers/how-to-read-the-union-budget-1023/>, Accessed: 19.04.2013

V. Support in media monitoring and communication

Essential Reading:

G. Rose, (2005) 'How to Be a Media Darling: There's No getting Away From It', *State Legislatures*, Vol. 31(3).

Additional Readings:

N. Jayal and P. Mehta (eds), (2010) *The Oxford Companion to Politics in India*, Oxford University

Press: New Delhi,

B. Jalan, (2007) *India's Politics*, New Delhi: Penguin.

Initiating Discussion on Various Type of Debates in *Rajya Sabha*, Available at http://rajyasabha.nic.in/rsnew/publication_electronic/75RS.pdf, Accessed: 19.04.2013. *Praxis of Parliamentary Committees: Recommendations of Committee on Rules* published by *Rajya Sabha*, available at: http://rajyasabha.nic.in/rsnew/publication_electronic/Praxis.pdf, Accessed: 19.04.2013.

S.J. Phansalkar, *Policy Research in the Indian Context*

N. Singh, '*Some Economic Consequences of India's Institutions of Governance: A Conceptual Framework*', Available at: http://econ.ucsc.edu/faculty/boxjenk/wp/econ_conseq_2003_rev2.pdf, Accessed: 19.04.2013.

R. Guha, (2007), *India After Gandhi*, Macmillan: New Delhi.

Parliamentary Procedures (Abstract Series) published by *Lok Sabha*, Available at <http://164.100.47.132/LssNew/abstract/index.aspx>, website: www.loksabha.nic.in, Accessed: 19.04.2013.

Committees of Lok Sabha, Available at: http://164.100.47.134/committee/committee_list.aspx Accessed: 19.04.2013.

Ethics Committee of Rajya Sabha, available at: http://rajyasabha.nic.in/rsnew/publication_electronic/ethics_committee.pdf, Accessed: 19.04.2013.

Committees of Parliament, Parliamentary Procedure, Ministry of Parliamentary Affairs, Available at http://mpa.nic.in/Manual/Manual_English/Chapter/chapter-12.htm, Accessed: 19.04.2013.

Nomination of Members of Parliament on Committees, Councils, Boards and Commissions, etc., set up by the Government, Ministry of Parliament Affairs, Available at http://mpa.nic.in/Manual/Manual_English/Chapter/chapter-14.htm, Accessed: 19.04.2013.

Parliamentary Procedures: Problems and Perspectives 2009 Published by *Rajya Sabha*, Available at http://rajyasabha.nic.in/rsnew/publication_electronic/parl_procedure2009.pdf, Accessed: 19.04.2013.

Primer on the Budget Process published by PRS, Available at <http://www.prsindia.org/parliamenttrack/primers/the-budget-process-484/>, Accessed: 19.04.2013.

Background note on Financial Oversight by Parliament published by PRS, Available at <http://www.prsindia.org/administrator/uploads/media/Conference%20note/Conference%20note%20on%20financial%20oversight.pdf>, Accessed: 19.04.2013.

P. Keefer and S Khemani, (2009) 'When Do Legislators Pass On "Pork"? The Determinants of Legislator Utilization of a Constituency Development Fund in India', in *World Bank Policy Research Working Paper Series* 4929, pp. 1-45, Available at SSRN: <http://ssrn.com/abstract=1405160>, Accessed: 19.04.2013.

Parliamentary Procedures (Abstract Series), Lok Sabha, Available at<http://164.100.47.132/LssNew/abstract/process.htm>
Budget, Parliamentary Procedure, Ministry of Parliamentary Affairs, available athttp://mpa.nic.in/Manual/Manual_English/Chapter/chapter-07.htm, Accessed: 19.04.2013. <http://mpa.nic.in/mpahandbook/parlia13.pdf>

2. Peace and Conflict Resolution

Course Objective: The objective of an undergraduate application course for common students in Peace and Conflict Studies will cover in-depth knowledge of conflict analysis, conflict resolution, conflict prevention, as well as the historical and cultural context of organized violence. Peace and Conflict Resolution addresses the sources of war, social oppression and violence and the challenges of promoting peace and justice internationally and domestically. It also introduces more equitable, cooperative and nonviolent methods that can be used to transform unjust, violent or oppressive world situations. This course provides students with an overview of the Peace and Conflict Studies discipline, including key concepts and related theories. The course is designed to familiarize students with the historical background of various peace movements, to analyze principles used to resolve conflict, and to provide a view of how peace and conflict resolution are being pursued today. The course will also cover extensive understanding of current research and development within the field of peace and conflict studies and perspective of the environment, gender, migration, and ethnicity.

Unit-1 International Peace and Conflict Resolution: Sources of War: International and Domestic Issues and Trends

Unit-2-What is Conflict: Introduction to International Conflict Resolution

Unit-3 International Conflict Resolution Theory: Models developed by Johan Galtung, Joseph Montville, Morton Deutsch, William Zartman, Levy Jack

Unit-4-Conflict resolution: Back ground of Various Peace Movements and Concepts, Principles used to resolve conflict

Unit-5-Cross-boarder relationships between the world's peaceful and war-torn zones (migration and information flows, economic transactions, international rules and regulations, normative concepts and political decisions)

Unit-6 -Conflict Transformation: is Peace Possible? Resolve problems through conflict analyses and instrumentation of peace concepts

Unit-7 -Current perspective of peace and conflict resolution: Grass-roots level perspective on war and Peace

READING LIST

Essential Readings

International Conflict Resolution: Sources of War: International and Domestic Issues and Trends

Kriesberg, Louis, *Constructive Conflicts: From Escalation to Resolution*, Rowman & Littlefield, Maryland, 1998, pp. 58-150

Starkey, Boyer, and Wilkenfield, *Negotiating a Complex World*. Rowman & Littlefield, Maryland, 1999, pp. 1-74

Desirable Readings:

Zartman, William (ed.), *Collapsed States: The Disintegration and Restoration of Legitimate Authority*, Reiner, Boulder, 1995, pp. 1-14 and 267-273

Zartman, William & Touval, Saadia "International Mediation in the Post- Cold War Era", in Crocker et al., *Managing Global Chaos*, USIP, 1996, pp. 445-461

Essential Readings

What is Conflict: Introduction to International Conflict Resolution

Zartman, William, "Dynamics and Constraints in Negotiations in Internal Conflicts", in Zartman, William (ed), *Elusive Peace: Negotiating an End to Civil Wars*, The Brookings Institution, Washington, 1995, pp. 3-29

Desirable Readings

Zartman, William (ed.), *Collapsed States: The Disintegration and Restoration of Legitimate Authority*, Reiner, Boulder, 1995, pp. 1-14 and 267-273

Zartman, William & Touval, Saadia "International Mediation in the Post- Cold War Era", in Crocker et al., *Managing Global Chaos*, USIP, 1996, pp. 445-461

Essential Readings

International Conflict Resolution Theory: Models developed by Johan Galtung, Joseph Montville, Morton Deutsch, William Zartman, Levy Jack

Levy, Jack, "Contending Theories of International Conflict: A Levels-of- Analysis Approach" in Crocker et al, *Managing Global Chaos*, USIP, 1995, pp. 3-24

Carr, Edward H., "Realism and Idealism," Richard Betts (ed), *Conflict After the Cold War*, Boston: Simon & Schuster, 1994.

Desirable Readings

Carr, Edward H., "Realism and Idealism," Richard Betts (ed), *Conflict After the Cold War*, Boston: Simon & Schuster, 1994.

Waltz, Kenneth N., "Structural Causes and Economic Effects," Richard Betts (ed), *Conflict After the Cold War*, Boston: Simon & Schuster, 1994.

Conflict resolution: Back ground of Various Peace Movements and Concepts, Principles used to

resolve conflict

Essential Readings

Hampson, Fen Osler, Nurturing Peace, USIP, 1996, pp. 3-25

Galtung, Johan, There Are Alternatives: Four Roads to Peace and Security, Nottingham, Spokesman, 1984, pp. 162-205

Desirable Readings

Galtung, Johan, Peace by Peaceful Means: Peace and conflict, Development and Civilization, Sage, London, 1996, pp. 9-114

Galtung, Johan, The True Worlds: A Transnational Perspective, New York, Free Press, 1980, pp. 107-149

Cross-boarder relationships between the world's peaceful and war-torn zones (migration and information flows, economic transactions, international rules and regulations, normative concepts and political decisions)

Essential Readings

Kelman, Herbert C., "Interactive Problem Solving", in Fisher, Ronald J. (ed.) Interactive Conflict Resolution, Syracuse University Press, 1997, pp. 56-74

Kritz, Neil J., "The Rule of Law in the Post-conflict Phase: Building a Stable Peace", in Crocker et al, Managing Global Chaos, USIP, 1996, pp. 587-606

Desirable Readings

Galtung, Johan, "The Basic Need Approach", in Human Needs: a Contribution to the Current Debate, Verlag, Cambridge, 1980, pp. 55-126

Saunders, Harold H., A Public Peace Process: Sustained Dialogue to Transform Racial and Ethnic Conflicts, New York, 1999, pp. 1-80

Conflict Transformation: is Peace Possible: Resolve problems through conflict analyses and instrumentation of peace concepts

Essential Readings

Galtung, Johan, There Are Alternatives: Four Roads to Peace and Security, Nottingham, Spokesman, 1984, pp. 162-205

Galtung, Johan, "The Basic Need Approach", in Human Needs: a Contribution to the Current Debate, Verlag, Cambridge, 1980, pp. 55-126

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Galtung, Johan, Peace by Peaceful Means: Peace and conflict, Development and Civilization, Sage, London, 1996, pp. 9-114

Galtung, Johan, The True Worlds: A Transnational Perspective, New York, Free Press, 1980, pp. 107-149

1980, pp. 107-149

Current perspective of peace and conflict resolution: Grass-roots level perspective on war and Peace: Grass-roots level perspective on war and Peace

Essential Readings

Deutsch, Morton, *The Resolution of Conflict: Constructive and Destructive Processes*, New Haven, Yale University Press, 1973, pp. 1-123

Galtung, Johan, *Peace by Peaceful Means: Peace and conflict, Development and Civilization*, Sage, London, 1996, pp. 9-114

Desirable Readings

Zartman, William, "Dynamics and Constraints in Negotiations in Internal Conflicts", in Zartman, William (ed), *Elusive Peace: Negotiating an End to Civil Wars*, The Brookings Institution, Washington, 1995, pp. 3-29

Kelman, Herbert C., "Interactive Problem Solving", in Fisher, Ronald J. (ed.) *Interactive Conflict Resolution*, Syracuse University Press, 1997, pp. 56-74

PSYCHOLOGY(HONOURS)

SEMESTER-I

C:1-INTRODUCTORY PSYCHOLOGY

(Credits:6, Theory-4, Practical-2) Lectures:
60 (Theory:40, Practical:20) Max.
Marks:100(Theory:70, Practical:30)

Introduction:

The course is designed to give the student a basic understanding of the psychology of human behavior. The students will be given exposure to concepts, terminology, principles, and theories that comprise an introductory course in psychology.

Learning Objectives:

1. To help the students to know the sources and processes of development of modern scientific psychology.
2. To help the students to develop a scientific temperament in studying and understanding human behavior.

Expected outcomes: Students will be able to

1. Define the term psychology and demonstrate command of the basic terminology, concepts, and principles of the discipline.
2. Gain knowledge of scientific methodology the variety of ways in which psychological data are gathered and evaluated / interpreted.
3. Identify and compare the major perspectives in psychology: Recognize how each approach views human thought and behavior.
4. Understand the physiological and biochemical links of human behavior.

UNIT-I: Introducing Psychology

- (i) Concept and definition of psychology, Roots of psychology, Psychology as a scientific discipline.
- (ii) Key Perspectives in Psychology- Behavioral, Cognitive, Humanistic, Psychodynamic, and Sociocultural

UNIT-II: Methods in Psychology

- (i) Natural Observation, Survey and Case Study- Nature, advantages and limitations.
- (ii) Experimental and Correlational methods-Nature, advantages and limitations.

UNIT-III: Biological Bases of Behavior

- (i) Structure and functions of the neurons, Communication within and between neurons, Chemical regulation of the endocrine glands.
- (ii) Structure and functions of the Central nervous system and Autonomic nervous system.

UNIT-IV: States of Mind

- (i) Nature of consciousness; changes in consciousness- sleep-wake schedules
- (ii) Extended states of Consciousness- Hypnosis, Meditation and Hallucinations

PRACTICAL

(i) R.L. by Method of Limits: To find out the R. L. of volar surface of the right arm of a subject by method of limits.

(ii) D.L. by Method of Constant Stimuli: To find out the D.L. for lifted weight of your subject by method of constant stimuli.

Recommended Books

1. Baron, R. A. (2002). Psychology (5th Edition), New Delhi: Pearson Education.
2. Dash, U.N., Dash, A.S., Mishra, H.C., Nanda, G.K. & Jena, N. (2004). Practical Exercises in Psychology: Learning about Yourself and Others. Panchasila, Bhubaneswar
3. Feldman, R.S. (2004). Understanding Psychology (6th Edition), New Delhi, Tata-McGraw Hill.
4. Gerrig, R.J. & Zimbardo, P.G. (2010). Psychology and Life (19th Ed.). Delhi: Allyn & Bacon.
5. Hilgard & Atkinson- Introduction to Psychology (2003) 14th Edition, Thomson Learning Inc.
6. Mohanty, N., Varadwaj, K. & Mishra, H.C. (2014). Explorations of Human Nature and Strength: Practicals in Psychology, Divya Prakashani, Samantarapur, Bhubaneswar.
7. Morgan, C.T., King, R.A., Weisz, J.R., & Schopler, J. (2008). Introduction to psychology (7th edition) Bombay: Tata-McGraw Hill.
8. Morris, C. G. (1990). Psychology: An Introduction. New Delhi: Prentice Hall.
9. Passer, M.W. & Smith, R.E. (2007). Psychology: The Science of Mind and Behaviour (3rd Ed.). New Delhi: Tata McGraw-Hill
10. Zimbardo, P.G. & Weber, A.L. (1997 Ed.)- Psychology- New York, Harper Collins College Publishers

C:2-BASIC DEVELOPMENTAL PROCESSES

(Credits:6, Theory-4, Practical-2) Lectures:
60 (Theory:40, Practical:20) Max.
Marks:100(Theory:70, Practical:30)

Introduction:

The course is designed to expose students to a basic understanding about the fundamental concerns of developmental psychology and provide examples of the following three dimensions of development: growth, differentiation, and orderly progression.

Learning Objectives:

1. To help students gain some key ideas about human development and the perspectives to understand and explain such developments.
2. To help the students to understand the significance of prenatal period for human development.
3. To help the students to understand the developmental preparations of the childhood and the implications of developmental milestones for the normal human development.

Expected outcomes: Students will be able to

1. Understand the nature, types, and principle of development.
2. Understand the processes of formation of life and development during pre- and post-natal periods.
3. Understand about the different aspects of preparation for future life.

UNIT-I: Basics of development

- (i) Meaning, nature, and types of development; Principles of development; Factors influencing development
- (ii) Perspectives of development- Psychoanalytic; Mechanistic; Organismic; Humanistic

UNIT-II: Life in formation

- (i) Fertilization, determination of sex, multiple birth; Prenatal development- germinal stage, embryonic stage, fetal stage; Factors influencing prenatal development
- (ii) Physical and motor developments, Social and emotional developments during childhood.

UNIT-III: Life in preparation

- (i) Physical and motor developments, Social and emotional developments during adolescence.
- (ii) Piagets stage of cognitive development; Kohlbergs stages of moral development

UNIT-IV: Self and identity

- (i) Emergence of self; Structure of the self; Development of personal identity

- (ii) Development of self control; Development of gender differences and gender roles

PRACTICAL

- (i) **Locus of Control:** To assess the Locus of Control of four college students by using Rotters Locus of Control Scale.
- (ii) **Emotional Intelligence:** To measure the emotional intelligence of four college students by using the Schuttles Emotional Intelligence Scale

Recommended Books

1. Baron, R. A. (2002). Psychology (5th Edition), New Delhi, Pearson Education.
2. Berk, L. E. (2010). Child Development (8th Ed.). New Delhi: Prentice Hall.
3. Dash, U.N., Dash, A.S., Mishra, H.C., Nanda, G.K. & Jena, N. (2004). Practical Exercises in Psychology: Learning about Yourself and Others. Panchasila, Bhubaneswar
4. Hurlock, E. Developmental Psychology (1995). IV Edition. New Delhi: Tata McGraw Hill.
5. Mohanty, N., Varadwaj, K. & Mishra, H.C. (2014). Explorations of Human Nature and Strength: Practicals in Psychology, DivyaPrakashani, Samantarapur, Bhubaneswar.
6. Papilia, Diane E., Sally Wendos Olds (2006). Human Development. 9th Edition. New Delhi: Tata McGraw Hill
7. Santrock, J. W. (2008). Child Development (11th Ed.). New Delhi: Tata McGraw Hill.
8. Sigelman, G.K. & Schaffer, D.R. (1995). Life-span Human Development, Brooks / Cole Publishing Co. Pacific Grove, California

GE:1-INTRODUCTORY PSYCHOLOGY

(Credits:6, Theory-4, Practical-2) Lectures:
60 (Theory:40, Practical:20) Max.
Marks:100(Theory:70, Practical:30)

Introduction:

The course is designed to give the student a basic understanding of the psychology of human behavior. The students will be given exposure to concepts, terminology, principles, and theories that comprise an introductory course in psychology.

Learning Objectives:

1. To help the students to know the sources and processes of development of modern scientific psychology.
2. To help the students to develop a scientific temperament in studying and understanding human behavior.

Expected outcomes: Students will be able to

1. Define the term psychology and demonstrate command of the basic terminology, concepts, and principles of the discipline.
2. Gain knowledge of scientific methodology the variety of ways in which psychological data are gathered and evaluated / interpreted.
3. Identify and compare the major perspectives in psychology: Recognize how each approach views human thought and behavior.
4. Understand the physiological and biochemical links of human behavior.

UNIT-I: Introducing Psychology

- (i) Concept and definition of psychology, Roots of psychology, Psychology as a scientific discipline.
- (ii) Key Perspectives in Psychology- Behavioral, Cognitive, Humanistic, Psychodynamic, and Sociocultural

UNIT-II: Methods in Psychology

- (i) Natural Observation, Survey and Case Study- Nature, advantages and limitations.
- (ii) Experimental and Correlational methods- Nature, advantages and limitations.

UNIT-III: Biological Bases of Behavior

- (i) Structure and functions of the neurons, Communication within and between neurons, Chemical regulation of the endocrine glands.
- (ii) Structure and functions of the Central nervous system and Autonomic nervous system.

UNIT-IV: States of Mind

- (i) Nature of consciousness; changes in consciousness- sleep-wake schedules
- (ii) Extended states of Consciousness- Hypnosis, Meditation and Hallucinations

PRACTICAL

- (i) R.L. by Method of Limits:** Students are required to find out the R. L. of volar surface of the right arm of a subject by method of limits
- (ii) D.L. by Method of Constant Stimuli:** To find out the D.L. for lifted weight of your subject by method of constant stimuli.

Recommended Books

1. Baron, R. A. (2002). Psychology (5th Edition), New Delhi: Pearson Education.

2. Dash, U.N., Dash, A.S., Mishra, H.C., Nanda, G.K. & Jena, N. (2004). Practical Exercises in Psychology: Learning about Yourself and Others. Panchasila, Bhubaneswar
3. Feldman, R.S. (2004). Understanding Psychology (6th Edition), New Delhi, Tata-McGraw Hill.
4. Gerrig, R.J. & Zimbardo, P.G. (2010). Psychology and Life (19th Ed.). Delhi: Allyn & Bacon.
5. Hilgard & Atkinson- Introduction to Psychology (2003) 14th Edition, Thomson Learning Inc.
6. Mohanty, N., Varadwaj, K. & Mishra, H.C. (2014). Explorations of Human Nature and Strength: Practicals in Psychology, Divya Prakashani, Samantarapur, Bhubaneswar.
7. Morgan, C.T., King, R.A., Weisz, J.R., & Schopler, J. (2008). Introduction to psychology (7th edition) Bombay: Tata-McGraw Hill.
8. Morris, C. G. (1990). Psychology: An Introduction. New Delhi: Prentice Hall.
9. Passer, M.W. & Smith, R.E. (2007). Psychology: The Science of Mind and Behaviour (3rd Ed.). New Delhi: Tata McGraw-Hill
10. Zimbardo, P.G. & Weber, A.L. (1997 Ed.)- Psychology- New York, Harper Collins College Publishers

SEMESTER-II

C:3-BASIC PSYCHOLOGICAL PROCESSES

(Credits:6, Theory-4, Practical-2) Lectures:
60 (Theory:40, Practical:20) Max.
Marks:100(Theory:70, Practical:30)

Introduction:

The course is designed to provide the student a basic understanding of the psychological processes from sensation to thought and communication. The student will be given exposure to the concepts, terminology, principles, and theories relating to each of the mental processes that constitute human psychology.

Learning Objectives:

1. To help the students to understand the mental processes to begin with sensation and perception up to how it results in thoughts and communication.
2. To help the students gather knowledge about the structural and functional dynamics of each of the mental processes and their interconnectedness.

Expected outcomes: Students will be able to

1. Understand the bases sensory actions and the processes of integration of sensory actions in creating and interpreting perceptual events.

2. Gain knowledge of the important processes and principles of human learning as well as the structural functional attributes of human memory to help conserve the learning outcomes.
3. Understand the structural and functional properties of language and the way it helps thought, communication, problem solving and decision making through development of concepts, ideas, images, and so on.

UNIT-I: Sensation and Perception

- (i) Basics of sensation- Sensory receptors (eye and ear), transduction, sensory thresholds, and sensory adaptation
- (ii) Nature of perceptual process- Figure and ground, Grouping (Gestalt laws), Perceptual constancies, and illusions, Perception of distance and depth.

UNIT-II: Learning and Memory

- (i) Nature and principles of Classical conditioning, Operant conditioning, and Observational learning
- (ii) The Atkinson and Shiffrin Model of Memory; Types of Memory- episodic, semantic and procedural; Causes of Forgetting- interference, repression, and amnesia

UNIT-III: Language and Communication

- (i) Properties and structure of language, Linguistic hierarchy, Language acquisition-predisposition, Nature of effective communication
- (ii) Stages of language development; critical period controversy; speech error and its implications

UNIT-IV: Thinking and Reasoning

- (i) Thinking process; concepts, categories and prototypes, Decision making and factors of influencing decision making.
- (ii) Inductive and deductive reasoning; Problem solving approaches; Steps in problem solving

PRACTICAL

- (i) Learning Curve:** To demonstrate the Learning Curve as a function of Learning trials using Nonsense Syllables.
- (ii) Serial Position Effect:** To demonstrate the serial position effect on memory in learning a list of nonsense syllables.

Recommended Books

1. Baron, R. A. (2002). Psychology (5th Edition), New Delhi, Pearson Education.
2. Dash, U.N., Dash, A.S., Mishra, H.C., Nanda, G.K. & Jena, N. (2004). Practical Exercises in Psychology: Learning about Yourself and Others. Panchasila, Bhubaneswar
3. Feldman, R.S. (2004). Understanding Psychology (6th Edition), New Delhi, Tata Mc. Graw Hill.
4. Gallotti, K.M.: Cognitive Psychology In and Out of the Laboratory. 3rd Ed, Int. Thomson Pub. Co. Bangalore, 2004

5. Gerrig, R.J. & Zimbardo, P.G. (2010). Psychology and Life (19th Ed.). Delhi: Allyn & Bacon.
6. Mohanty, N., Varadwaj, K. & Mishra, H.C. (2014). Explorations of Human Nature and Strength: Practicals in Psychology, DivyaPrakashani, Samantarapur, Bhubaneswar.
7. Morgan, C.T., King, R.A., Weisz, J.R., & Schopler, J. (2008). Introduction to psychology (7th edition) Bombay: Tata-McGraw Hill.
8. Morris, C. G. (1990). Psychology: An Introduction. New Delhi: Prentice Hall.
9. Passer, M.W. & Smith, R.E. (2007). Psychology: The Science of Mind and Behavior (3rd Ed.). New Delhi: Tata McGraw-Hill
10. Solso, R.L. (2000). Cognitive Psychology (6th Edition), USA, Allyn Bacon.
11. Zimbardo, P.G. & Weber, A.L. (1997 Ed.)- Psychology- New York, Harper Collins College Publishers

C:4-PROCESSES OF HUMAN EMPOWERMENT

(Credits:6, Theory-4, Practical-2) Lectures:
60 (Theory:40, Practical:20) Max.
Marks:100(Theory:70, Practical:30)

Introduction:

Human empowerment is ultimately an individual condition of gaining the power to control and modulate changes in one's own life those are considered important to one's identity and adjustment. The purpose of the course is to introduce students to the basics of human empowerment and how the empowerment processes are strengthened and improved.

Learning Objectives:

1. To help students gain ideas about intelligence and personality as foundations of human empowerment.
2. To make students understand how motivation and emotion are empowering processes to human development.
3. To help students gain insight into human behavior as products of empowerment

Expected outcomes: Students will be able to

1. Know the structural components and functional dynamics of both intelligence and personality.
2. Understand the significance of emotion and motivation in behavior management.
3. Understand significant aspects of social behavior as resulting in happiness, well-being and personal growth.

UNIT-I: Basics of empowerment

- (i) Intelligence- Theories of Gardner, and Stenberg; Heredity, environment, and intelligence

- (ii) Measuring Intelligence: intelligence tests; Interpretation of test score, Cross-cultural issues in testing intelligence

UNIT-II: Sources of Power (1)

- (i) Personality- Freuds theory, Humanistic theories, and Social cognitive theory
- (ii) Personality-Trait and type approach, Biological and sociocultural determinants, Psychometric and projective assessment.

UNIT-III: Sources of Power(2)

- (i) Motivation-Drive theory, Arousal theory, Expectancy theory, Maslows need hierarchy
- (ii) Emotion-Theories of James-Lange, Cannon-Bard, Schachter-Singer, and Opponent-Process

UNIT-IV: Proving empowered

- (i) Social behavior- Meaning of attribution and errors in attribution, Meaning of social cognition and processing of social information Motivation-Drive theory, Arousal theory, Expectancy theory, Maslows need hierarchy
- (ii) Positive Psychology-Scope and aims, Nature and characteristics of happiness, Subjective well-being and personal growth

PRACTICAL

- (i) Intelligence test-** To test the non-verbal intelligence of Two college students using Ravens Standard Progressive Matrices
- (ii) Personality Type-** To assess the personality type of a student obtaining responses from the student and two other significant persons in his /her life by using Glazers test of Personality Type

Recommended Books

1. Baron, R. A. & Byrne, D. (2003). Social Psychology, 10th Edition, Prentice Hall
2. Baron, R.A. (1995). Psychology- The Essential Science, Pearson Education Company of India Pvt. Ltd.
3. Dash, U.N., Dash, A.S., Mishra, H.C., Nanda, G.K. & Jena, N. (2004). Practical Exercises in Psychology: Learning about Yourself and Others. Panchasila, Bhubaneswar
4. Gerrig, R.J. & Zimbardo, P.G. (2010). Psychology and Life (19th Ed.). Delhi: Allyn & Bacon
5. Hilgard & Atkinson. Introduction to Psychology (2003). 14th Edition Thomson Learning Inc.
6. Misra, G. (2009). Psychology in India, Vol 1: Basic Psychological Processes and Human Development. India: Pearson

7. Mohanty, N., Varadwaj, K. & Mishra, H.C. (2014). Explorations of Human Nature and Strength: Practicals in Psychology, DivyaPrakashani, Samantarapur, Bhubaneswar.
8. Sigelman, G.K. & Schaffer, D.R. (1995 Eds.) Lifespan Human Development, Brooks/ Cole Publishing Co. , Pacific Group
9. Snyder, C.R. & Shane, J.L. (2005) Handbook of Positive Psychology: Oxford University Press.

GE:2-BASIC PSYCHOLOGICAL PROCESSES

(Credits:6, Theory-4, Practical-2) Lectures:
60 (Theory:40, Practical:20) Max.
Marks:100(Theory:70, Practical:30)

Introduction:

The course is designed to provide the student a basic understanding of the psychological processes from sensation to thought and communication. The student will be given exposure to the concepts, terminology, principles, and theories relating to each of the mental processes that constitute human psychology.

Learning Objectives:

1. To help the students to understand the mental processes to begin with sensation and perception up to how it results in thoughts and communication.
2. To help the students gather knowledge about the structural and functional dynamics of each of the mental processes and their interconnectedness.

Expected outcomes: Students will be able to

1. Understand the bases sensory actions and the processes of integration of sensory actions in creating and interpreting perceptual events.
2. Gain knowledge of the important processes and principles of human learning as well as the structural functional attributes of human memory to help conserve the learning outcomes.
3. Understand the structural and functional properties of language and the way it helps thought, communication, problem solving and decision making through development of concepts, ideas, images, and so on.

UNIT-I: Sensation and Perception

- (i) Basics of sensation- Sensory receptors (eye and ear), transduction, sensory thresholds, and sensory adaptation
- (ii) Nature of perceptual process- Figure and ground, Grouping (Gestalt laws), Perceptual constancies, and illusions, Perception of distance and depth.

UNIT-II: Learning and Memory

- (i) Nature and principles of Classical conditioning, Operant conditioning, and Observational learning
- (ii) The Atkinson and Shiffrin Model of Memory; Types of Memory- episodic, semantic and procedural; Causes of Forgetting- interference, repression, and amnesia

UNIT-III: Language and Communication

- (i) Properties and structure of language, Linguistic hierarchy, Language acquisition-predisposition, Nature of effective communication
- (ii) Stages of language development; critical period controversy; speech error and its implications

UNIT-IV: Thinking and Reasoning

- (i) Thinking process; concepts, categories and prototypes, Decision making and factors of influencing decision making.
- (ii) Inductive and deductive reasoning; Problem solving approaches; Steps in problem solving

PRACTICAL

(i) Learning Curve: To demonstrate the Learning Curve as a function of Learning trials using Non-sense Syllables.

(ii) Serial Position Effect: To demonstrate the serial position effect on memory in learning a list of nonsense syllables.

Recommended Books

1. Baron, R. A. (2002). Psychology (5th Edition), New Delhi, Pearson Education.
2. Dash, U.N., Dash, A.S., Mishra, H.C., Nanda, G.K. & Jena, N. (2004). Practical Exercises in Psychology: Learning about Yourself and Others. Panchasila, Bhubaneswar
3. Feldman, R.S. (2004). Understanding Psychology (6th Edition), New Delhi, Tata Mc. Graw Hill.
4. Gallotti, K.M.: Cognitive Psychology In and Out of the Laboratory. 3rd Ed, Int. Thomson Pub. Co. Bangalore, 2004
5. Gerrig, R.J. & Zimbardo, P.G. (2010). Psychology and Life (19th Ed.). Delhi: Allyn & Bacon.
6. Mohanty, N., Varadwaj, K. & Mishra, H.C. (2014). Explorations of Human Nature and Strength: Practicals in Psychology, DivyaPrakashani, Samantarapur, Bhubaneswar.
7. Morgan, C.T., King, R.A., Weisz, J.R., & Schopler, J. (2008). Introduction to psychology (7th edition) Bombay: Tata-McGraw Hill.
8. Morris, C. G. (1990). Psychology: An Introduction. New Delhi: Prentice Hall.
9. Passer, M.W. & Smith, R.E. (2007). Psychology: The Science of Mind and Behavior (3rd Ed.). New Delhi: Tata McGraw-Hill
10. Solso, R.L. (2000). Cognitive Psychology (6th Edition), USA, Allyn Bacon.
11. Zimbardo, P.G. & Weber, A.L. (1997 Ed.)- Psychology- New York, Harper Collins College Publishers

SEMESTER-III

C:5-PSYCHOLOGICAL STATISTICS

(Credits:6, Theory-4, Practical-2) Lectures:
60 (Theory:40, Practical:20) Max.
Marks:100(Theory:70, Practical:30)

Introduction:

The course is designed to equip students with knowledge in the fundamentals of statistics and research methods so that they understand the application of statistics to different research problems in psychology.

Learning Objectives:

1. To help students develop knowledge and understanding of the application of Statistics within Psychology
2. To help students develop Critical Thinking for application of appropriate statistical analysis in Psychological research

Expected outcomes: Students will be able to

1. The nature psychological variables and how to measure them with appropriate scale.
2. The processes of describing and reporting statistical data.
3. The methods of drawing inferences and conclusions for hypothesis testing by using appropriate statistical analysis.

UNIT-I: Fundamentals of statistics

- (i) Meaning and scope of statistics, Nature of variables- Categorical and Continuous, Levels of Measurement- Nominal, Ordinal, Interval, and Ratio
- (ii) Drawing frequency distribution; Graphical representation of grouped data-Polygon, Histogram, Ogive.

UNIT-II: Measures of Statistics

- (i) Measures of Central Tendency- Characteristics of mean, median and mode; Computation of mean, median, and mode
- (ii) Measures of Variability- Concept of variability, computation of semi-inter quartile range, Standard deviation and variance, Co-efficient of variation

UNIT-III: Sources and Applications

- (i) Concept of Probability; Characteristics of Normal Probability curve, Applications of NPC, Deviation from NPC- Skewness and Kurtosis
- (ii) Concept of correlation, Product-moment correlation (ungrouped data), Rank order correlation, Chi-square test (Contingency Table)

UNIT-IV: Hypothesis Testing

(i) Level of significance; Type I and Type II error; Computation of t for independent and dependent samples, The Mann-Whitney U test

(ii) Purpose and assumptions of ANOVA; One-way and two-way ANOVA; Kruskal-Wallis H test

PRACTICAL

(i) **Reporting of Statistical Results:** To collect data of 60 (30 boys and 30 girls) High School students about their Annual examination marks in four subjects and to report by descriptive statistical analyses.

(ii) **Computer Awareness:** To be familiar with software packages of statistics and their applications.

Recommended Books

1. Aron, A., Aron, E.N., & Coups, E.J. (2007). Statistics for Psychology. (4thEd.) India: Pearson Education, Prentice Hall.
2. Dash, U.N., Dash, A.S., Mishra, H.C., Nanda, G.K. & Jena, N. (2004). Practical Exercises in Psychology: Learning about Yourself and Others. Panchasila, Bhubaneswar
3. Ferguson, G.A. & Takane, Y. (1989). Statistical Analysis in Psychology & Education, Tata McGraw Hill Publishing Company, New Delhi
4. Garrett, H. E. & Woodworth, R.S. (1985). Psychology in Statistics and Education, Vakils, Feffer & Simons Ltd. Mumbai
5. Mangal, S.K. (2002) Statistics in Psychology and Education. (2ndedt). New Delhi: Prentice Hall of India.
6. Mohanty, N., Varadwaj, K. & Mishra, H.C. (2014). Explorations of Human Nature and Strength: Practicals in Psychology, DivyaPrakashani, Samantarapur, Bhubaneswar.
7. Siegal, S. (1994). Nonparametric Statistics. McGraw Hill, New Delhi
8. Singh, A.K. (1986). Tests, Measurements, & Research Methods in Behavioral Sciences, Tata McGraw Hill Publishing Company, New Delhi
9. Walaram, G. Statistics for Behavioral Sciences

C:6-SOCIAL PSYCHOLOGY

(Credits:6, Theory-4, Practical-2) Lectures:
60 (Theory:40, Practical:20) Max.
Marks:100(Theory:70, Practical:30)

Introduction:

Social psychology is the scientific study of the nature and causes of human behavior in a social context. This course is designed to introduce the students to the field of social psychology, to explain how social psychologists think about and study human behavior; to introduce the body of knowledge and underlying principles that currently exist in the field and to encourage reflection about the implications of social psychology for the situations we encounter in everyday life.

Learning Objectives:

1. To help students develop awareness of the concepts, problems and issues in the discipline of social psychology

2. To make students understand the individuals and groups in respect to patterns of social behavior and attitudes
3. To help students gain insight into the dynamics of intergroup relationships, conflict, prejudice and cooperation.

Expected outcomes: Students will be able to

1. Know the scope of studying social psychology and the methods to gather data in the social context to explain them.
2. Understand the significance of social cognition, attitudes, stereotypes and prejudices in explaining human behavior in the social contexts.
3. Understand the significant aspects group behavior and social influence that constitute the core of human relationships.

UNIT-I: Introduction

- (i) Nature, goal, and scope of Social Psychology; Methods of Social Psychology- Observation; Questionnaire, Interview, and Experiment
- (ii) Social Cognition- Perceiving ourselves: self-concept, self-esteem, self-presentation and self expression; Perceiving others and forming impressions

UNIT-II: Attitude, Prejudice and Stereotypes

- (i) Attitudes- Nature, characteristics and functions of attitude; Attitude formation and change; Attitude measurement
- (ii) Measures of Variability- Concept of variability, computation of semi-inter quartile range, Standard deviation and variance, Co-efficient of variation

UNIT-III: Group and Leadership

- (i) Group- Group structure and function, Task performance: Social facilitation, Social loafing; Conformity, Obedience and social modeling; Group cohesiveness-
- (ii) Leadership- Definitions and functions, Trait, situational, interactional and contingency approaches to leadership; Leadership effectiveness, The charismatic leadership

UNIT-IV: Social Behavior

- (i) Prosocial behavior-Cooperation and helping, personal, situational and socio-cultural determinants, Theoretical explanations of prosocial behavior.
- (ii) Aggression- Theoretical perspectives, Trait, situational and social learning approaches, social and personal determinants of aggression, prevention and control of aggression.

PRACTICAL

- (i) Ethical Values:** To assess the ethical values of five adolescents by using Donelsons Ethical Position Questionnaire (EPQ)
- (ii) Attitude towards Women:** To measure the attitude of three boys and three girls towards Women by using Spence, Helmrich & Stapps Attitude towards Women scale.

Recommended Books

1. Baron R. A & Byrne. D. (2003). Social Psychology. 10th Edition, Prentice Hall
2. Baron. R.A., Byrne, D. & Bhardwaj. G (2010). Social Psychology (12th Ed). New Delhi: Pearson
3. Dash, U.N., Dash, A.S., Mishra, H.C., Nanda, G.K. & Jena, N. (2004). Practical Exercises in Psychology: Learning about Yourself and Others. Panchasila, Bhubaneswar
4. Developments (ICSSR survey of advances in research). New Delhi: Pearson.
5. Misra, G. (1990) .Applied Social Psychology. New Delhi: Sage.
6. Misra, G. (2009). Psychology in India, Volume 4: Theoretical and Methodological
7. Mohanty, N., Varadwaj, K. & Mishra, H.C. (2014). Explorations of Human Nature and Strength: Practicals in Psychology, DivyaPrakashani, Samantarapur, Bhubaneswar.
8. Myers, David G. (2002). Social Psychology. 7th Edition, McGraw Hill Book Co.
9. Taylor,S.E., Peplau,L.A. & Sears, D.O. (2006). Social Psychology (12th Ed). New Delhi: Pearson

C:7-ENVIRONMENTAL PSYCHOLOGY

(Credits:6, Theory-4, Practical-2) Lectures:
60 (Theory:40, Practical:20) Max.
Marks:100(Theory:70, Practical:30)

Introduction:

Environmental psychology is an interdisciplinary field focused on the interplay between individuals and their surroundings. The field defines the term environment broadly, encompassing natural environments, social settings, built environments, learning environments, and informational environments. The course is designed to introduce to the students about all these aspects of environment.

Learning Objectives:

1. To highlight the simultaneous mutual interaction of environment and behavior.
2. To delineate psychological approaches to the study of environment.
3. To discuss the impact of ecological degradation and the need for enhanced awareness programs

Expected outcomes: Students will be able to

1. understand the interactional relationships between environment and behavior
2. understand the problems occurring to ecology and environment at the present time
3. understand different psychological approaches to the study of man-environment relationship.

UNIT-I: Environment and Behavior

- (i) Earth as a living system: The gala hypothesis, Deep ecology; Man-environment relationship-physical, social, cultural, orientation and product.
- (ii) Effects of Environment on behavior: Noise pollution, Air pollution, Crowding and population explosion.

UNIT-II: Ecology and Development

- (i) Human behavior Environmental Problems: Global warming, Greenhouse effect, energy depletion; Pro-environmental behaviors.
- (ii) Ecosystem and their components; Sustainable development; Resource use: Common property resources. Ecology: Acculturation and psychological adaptation

UNIT-III: Psychological Approaches to environment

- (i) Field theory approach; Eco-cultural Psychology (Berry); Biosocial Psychology (Dawson);
- (ii) Person environment transaction (Sokols & Ittelson); Ecological Psychology (Barker); Ecological system approach (Bronfenbrenner)

UNIT-IV: Environmental Assessment

- (i) Socio-psychological dimensions of environmental impact; Environmental deprivation-nature and consequences.
- (ii) Creating environmental awareness; Social movements- Chipko, Tehri, Narmada.

PRACTICAL

- (i) To assess the environmental literacy of 4 college students using Bob Simpsons Environment literacy and awareness survey questionnaire.
- (ii) To assess the environmental attitude, concern and sensitivity of 4 college students using Bob Simpsons Environment literacy and awareness survey questionnaire.

Recommended Books

1. Dash, U.N., Dash, A.S., Mishra, H.C., Nanda, G.K. & Jena, N. (2004). Practical Exercises in Psychology: Learning about Yourself and Others. Panchasila, Bhubaneswar
2. Dreze, J. and Sen, A. (1992). Indian Development. Delhi: Oxford University Press.
3. Gadgil, M. and Guha. R. (1995). Ecology and Equity. New Delhi, Penguin Books
4. Goldsmith, E. (1991). The way: The ecological World View. Boston: Shambhala
5. Mohanty, N., Varadwaj, K. & Mishra, H.C. (2014). Explorations of Human Nature and Strength: Practicals in Psychology, DivyaPrakashani, Samantarapur, Bhubaneswar.

GE:3-PSYCHOLOGICAL STATISTICS

(Credits:6, Theory-4, Practical-2) Lectures:
60 (Theory:40, Practical:20) Max.
Marks:100(Theory:70, Practical:30)

Introduction:

The course is designed to equip students with knowledge in the fundamentals of statistics and research methods so that they understand the application of statistics to different research problems in psychology.

Learning Objectives:

1. To help students develop knowledge and understanding of the application of Statistics within Psychology
2. To help students develop Critical Thinking for application of appropriate statistical analysis in Psychological research

Expected outcomes: Students will be able to

1. The nature psychological variables and how to measure them with appropriate scale.
2. The processes of describing and reporting statistical data.
3. The methods of drawing inferences and conclusions for hypothesis testing by using appropriate statistical analysis.

UNIT-I: Fundamentals of statistics

- (i) Meaning and scope of statistics, Nature of variables- Categorical and Continuous, Levels of Measurement- Nominal, Ordinal, Interval, and Ratio
- (ii) Drawing frequency distribution; Graphical representation of grouped data-Polygon, Histogram, Ogive.

UNIT-II: Measures of Statistics

- (i) Measures of Central Tendency- Characteristics of mean, median and mode; Computation of mean, median, and mode
- (ii) Measures of Variability- Concept of variability, computation of semi-inter quartile range, Standard deviation and variance, Co-efficient of variation

UNIT-III: Sources and Applications

- (i) Concept of Probability; Characteristics of Normal Probability curve, Applications of NPC, Deviation from NPC- Skewness and Kurtosis
- (ii) Concept of correlation, Product-moment correlation (ungrouped data), Rank order correlation, Chi-square test (Contingency Table)

UNIT-IV: Hypothesis Testing

- (i) Level of significance; Type I and Type II error; Computation of t for independent and dependent samples, The Mann-Whitney U test
- (ii) Purpose and assumptions of ANOVA; One-way and two-way ANOVA; Kruskal-Wallis H test

PRACTICAL

- (i) **Reporting of Statistical Results:** To collect data of 60 (30 boys and 30 girls) High School students about their Annual examination marks in four subjects and to report by descriptive statistical analyses.

(ii) Computer Awareness: To be familiar with software packages of statistics and their applications.

Recommended Books

1. Aron, A., Aron, E.N., & Coups, E.J. (2007). Statistics for Psychology. (4thEd.) India: Pearson Education, Prentice Hall.
2. Dash, U.N., Dash, A.S., Mishra, H.C., Nanda, G.K. & Jena, N. (2004). Practical Exercises in Psychology: Learning about Yourself and Others. Panchasila, Bhubaneswar
3. Ferguson, G.A. & Takane, Y. (1989). Statistical Analysis in Psychology & Education, Tata McGraw Hill Publishing Company, New Delhi
4. Garrett, H. E. & Woodworth, R.S. (1985). Psychology in Statistics and Education, Vakils, Feffer & Simons Ltd. Mumbai
5. Mangal, S.K. (2002) Statistics in Psychology and Education. (2ndedt). New Delhi: Prentice Hall of India.
6. Mohanty, N., Varadwaj, K. & Mishra, H.C. (2014). Explorations of Human Nature and Strength: Practicals in Psychology, DivyaPrakashani, Samantarapur, Bhubaneswar.
7. Siegal, S. (1994). Nonparametric Statistics. McGraw Hill, New Delhi
8. Singh, A.K. (1986). Tests, Measurements, & Research Methods in Behavioral Sciences, Tata McGraw Hill Publishing Company, New Delhi
9. Walaram, G. Statistics for Behavioral Sciences

C:8-PSYCHOPATHOLOGY

(Credits:6, Theory-4, Practical-2) Lectures:
60 (Theory:40, Practical:20) Max.
Marks:100(Theory:70, Practical:30)

Introduction:

Psychopathology refers to the study of mental illness. This course is designed to expose students to the key concepts in psychopathology as well as the major theories associated with the etiology and treatment of psychological disorders and disabilities. Students will be able to understand the distinction between normal and abnormal and the qualities that are used to differentiate what is typical versus atypical through citations of different disorders.

Learning Objectives:

1. To help students define and understand the basic concepts underlying psychopathology and the perspectives which contributed to the development of modern psychopathology.
2. To help students understand the assessment techniques for identifying and classifying maladaptive behavior and mental disorders.

3. To guide students to gain specific knowledge about different types of mental disorders.

Expected outcomes: Students will be able to

1. Understand the differences between normality and abnormality along with the perspectives explaining them.
2. Know the importance and the use of assessment techniques in identifying different forms of maladaptive behavior.
3. Learn the symptoms, causes and treatment of anxiety disorders, mood disorders and schizophrenia.

UNIT-I: Basics of Pathology

- (i) Concept of abnormality; Perspectives of abnormal behavior- Psychodynamic, Behavioral, Cognitive, Humanistic-Existential, and Sociocultural
- (ii) Classification of maladaptive behavior-DSM-IV; Assessment techniques- Diagnostic tests, Rating scales, History taking interview, Projective tests

UNIT-II: Anxiety and Mood disorder

- (i) Symptoms, causes and treatment of Generalized anxiety disorder, Phobic disorder, Obsessive-Compulsive disorder
- (ii) Depressive disorder Symptoms, causes and treatment of Bipolar affective disorder, and Dysthymia

UNIT-III: Personality Disorders

- (i) Paranoid, Schizoid, Dissociative, Impulsive
- (ii) Borderline, Anxious, Avoidance, Dependent personality

UNIT-IV: Schizophrenia and Therapies

- (i) Characteristics, Major subtypes, Causes and treatment of Schizophrenia
- (ii) Psychodynamic, and Cognitive Behavior therapy.

PRACTICAL

(i) Anxiety: Assessment of Anxiety of a subject by Hamilton Anxiety Rating Scale (HARS)

(ii) Depression: Assessment of Depression Profile of a subject by Becks Depression Inventory (BDI)

Recommended Books

1. Ahuja N. (2011). A Short Textbook of Psychiatry (7th Ed). New Delhi: Jaypee

2. Barlow D.H. and Durand V.M. (2005). Abnormal Psychology: An Integrated Approach (4th Ed.).Wadsworth: New York.
3. Baron, R.A. (1995 Edition)-Psychology- The Essential Science, Pearson Education Company of India Pvt. Ltd.
4. Carson R.C., Butcher J.N., Mineka, S., & Hooley J.M. (2007). Abnormal Psychology (13th Ed.).ND: Pearson Education.
5. Dash, U.N., Dash, A.S., Mishra, H.C., Nanda, G.K. & Jena, N. (2004). Practical Exercises in Psychology: Learning about Yourself and Others. Panchasila, Bhubaneswar
6. Irwin G. Sarason, Barbara Sarason (2005). Abnormal Psychology. New Delhi: Prentice Hall Publication
7. James C. Coleman (1981). Abnormal Psychology and Modern Life. D.B. Taraporevala with Scott, Foresman and Company, Mumbai
8. Kring,A.M.,Johnson,S.L.,Davison G.C. & Neale J.M. (2010). Abnormal Psychology (11th Ed.).NY: John Wiley
9. Mohanty, N. (2008). Psychological Disorders: Text and Cases. New Delhi: Neelkamal Publications Pvt. Ltd.
10. Mohanty, N., Varadwaj, K. & Mishra, H.C. (2014). Explorations of Human Nature and Strength: Practicals in Psychology, DivyaPrakashani, Samantarapur, Bhubaneswar.

C:9-EDUCATIONAL PSYCHOLOGY

(Credits:6, Theory-4, Practical-2) Lectures:
60 (Theory:40, Practical:20) Max.
Marks:100(Theory:70, Practical:30)

Introduction:

This course provides an introduction to concepts, theories, and research in educational psychology. The topics covered include cognitive development during the school years, classroom management, instructional approaches, motivation, assessment, and individual differences.

Learning Objectives:

1. To provide students with an overview of the purposes and uses of educational psychology.
2. To help students understand human development focusing mainly on the years of formal education including those with ability differences
3. To make students understand the ways that educators motivate their students to learn and strive for excellence
4. To make students explore the ways that educators manage learning environments to maximize learning and social cohesion

Expected outcomes: Students will be able to

1. Define educational psychology and give examples of the different topics educational psychologists study.
2. Describe the developmental issues faced by school age children.
3. Describe the challenges presented by children with ability differences.
4. Explain the role of motivation on learning and classroom behavior.
5. Describe classroom management techniques.
6. Identify commonly used standardized tests, their strengths and limitations, and use in school settings.

UNIT-I Foundations of Educational Psychology

- (i) Concepts and principles of educational psychology, The teaching-learning process, Goals of teaching and objectives for learning.
- (ii) Theories of cognitive development-Piaget, Bruner and Vygotsky.

UNIT- II Motivation and Classroom Management

- (i) Meaning of motivation, Intrinsic and extrinsic motivation, Approaches to understand classroom motivation, Motivational techniques in classroom teaching.
- (ii) The goals of classroom management, Creating a positive learning environment, Characteristics of an effective teacher, Teacher expectation and students performance.

UNIT III Creativity and Aptitude

- (i) Nature and characteristics of creativity; Theories of creativity; Fostering creativity among children.
- (ii) Nature and characteristics of aptitude; Types of aptitude; Measurement of aptitude; Utility of aptitude tests.

UNIT -IV Dealing with ability differences and Testing

- (i) Teaching children with mental retardation, learning disability, social class differences, and attention deficit Hyperactive disorder.
- (ii) Types of standardized tests- Achievement test, and aptitude tests, Advantages and limitations of standardized test.

PRACTICAL

- (i) Academic Behavior: To assess the academic attitude and behavior of college students by using Sias Academic Behavior Scale.
- (ii) Academic Stress: To assess the academic stress of two higher Secondary students using Raos Academic Stress Scale.

Recommended Books

1. Agrawal, J.C. (2009). Essentials of Educational Psychology (2ndEdn.) Vikas Publishing House, New Delhi.
2. Dash, U.N., Dash, A.S., Mishra, H.C., Nanda, G.K. & Jena, N. (2004). Practical Exercises in Psychology: Learning about Yourself and Others. Panchasila, Bhubaneswar

3. Gage, N. L., & Berliner, D. C. (2009) Educational psychology (5th ed.). Boston, MA: Houghton Mifflin.
4. Mangal, S.K. (2013). Advanced Educational Psychology (2ndEdn.) PHI Learning Pvt. Ltd., New Delhi
5. Mohanty, N., Varadwaj, K. & Mishra, H.C. (2014). Explorations of Human Nature and Strength: Practicals in Psychology, DivyaPrakashani, Samantarapur, Bhubaneswar.
6. Slavin, Robert E. (2012). Educational Psychology: Theory and Practice. Delhi, Pearson,
7. Woolfolk, A.E. (2004). Educational Psychology (9th Ed.), Allyn & Bacon, London / Boston.

C:10-PSYCHOLOGICAL ASSESSMENT

(Credits:6, Theory-4, Practical-2) Lectures:
60 (Theory:40, Practical:20) Max.
Marks:100(Theory:70, Practical:30)

Introduction:

The course is designed to expose students to a basic understanding about approaches to psychological assessment and develop skill in the administration and interpretation of psychological tests.

Learning Objectives:

1. To train students in various psychological assessment techniques
2. To impart skills necessary for selecting and applying different tests for different purposes such as evaluation, training, rehabilitation etc.

Expected outcomes: Students will be able to

1. Understand the basic facts about psychological assessment.
2. Understand the processes of test construction and standardization.
3. Understand about the assessment of different types of skills and abilities.

UNIT-I Introduction

- (i) Nature and Scope of human assessment;Parameters of assessment.
- (ii) Psychological scaling, Methods of scaling.

UNIT- II Psychological Tests

- (i) Principles of test construction and standardization- Item analysis, reliability, validity and development of norms.
- (ii) Types of psychological tests- Individual, group, performance, verbal, nonverbal.

UNIT III Assessment of Ability

- (i) Assessment of general abilities- Intelligence, interest, interpersonal interaction.
- (ii) Assessment of personality- Use of self report inventories, interview, projective and non-projective tests.

UNIT IV Classroom Assessment

- (i) Classroom as assessment context, Traditional tests, Alternative assessment.
- (ii) Grading and reporting of performance, Computer and assessment.

PRACTICAL

(i) Empathy: To assess the empathy behavior of Five college students using Sprengs Empathy questionnaire.

(ii) Sense of Humor: To assess the Sense of Humor of 4 College Students Using McGhees Scale of Sense of Humor (MSSH).

Recommended Books

1. Baron, R. A. (2002). Psychology (5th Edition), New Delhi, Pearson Education.
2. Berk, L. E. (2010). Child Development (8th Ed.). New Delhi: Prentice Hall.
3. Dash, U.N., Dash, A.S., Mishra, H.C., Nanda, G.K. & Jena, N. (2004). Practical Exercises in Psychology: Learning about Yourself and Others. Panchasila, Bhubaneswar
4. Hurlock, E. Developmental Psychology (1995). IV Edition. New Delhi: Tata McGraw Hill.
5. Mohanty, N., Varadwaj, K. & Mishra, H.C. (2014). Explorations of Human Nature and Strength: Practicals in Psychology, DivyaPrakashani, Samantarapur, Bhubaneswar.
6. Papilia, Diane E., Sally Wendos Olds (2006). Human Development. 9th Edition. New Delhi: Tata McGraw Hill
7. Santrock, J. W. (2008). Child Development (11th Ed.). New Delhi: Tata McGraw Hill.
8. Sigelman, G.K. & Schaffer, D.R. (1995). Life-span Human Development, Brooks / Cole Publishing Co. Pacific Grove, California

GE:6-PSYCHOPATHOLOGY

(Credits:6, Theory-4, Practical-2) Lectures:
60 (Theory:40, Practical:20) Max.
Marks:100(Theory:70, Practical:30)

Introduction:

Psychopathology refers to the study of mental illness. This course is designed to expose students to the key concepts in psychopathology as well as the major theories associated with the etiology and treatment of psychological disorders and disabilities. Students will be able to understand the distinction between normal and abnormal and the qualities that are used to differentiate what is typical versus atypical through citations of different disorders **Learning Objectives:**

1. To help students define and understand the basic concepts underlying psychopathology and the perspectives which contributed to the development of modern psychopathology.
2. To help students understand the assessment techniques for identifying and classifying maladaptive behavior and mental disorders.
3. To guide students to gain specific knowledge about different types of mental disorders.

Expected outcomes: Students will be able to

1. Understand the differences between normality and abnormality along with the perspectives explaining them.
2. Know the importance and the use of assessment techniques in identifying different forms of maladaptive behavior.
3. Learn the symptoms, causes and treatment of anxiety disorders, mood disorders and schizophrenia.

UNIT-I Basics of Pathology

- (i) Concept of abnormality; Perspectives of abnormal behavior- Psychodynamic, Behavioral, Cognitive, Humanistic-Existential, and Sociocultural.
- (ii) Classification of maladaptive behavior-DSM-IV; Assessment techniques- Diagnostic tests, Rating scales, History taking interview, Projective tests.

UNIT- II Anxiety and Mood disorder

- (i) Symptoms, causes and treatment of Generalized anxiety disorder, Phobic disorder, Obsessive-Compulsive disorder.
- (ii) Depressive disorder Symptoms, causes and treatment of Bipolar affective disorder, and Dysthymia.

UNIT III Personality Disorders

- (i) Paranoid, Schizoid, Dissociative, Impulsive. (ii) Borderline, Anxious, Avoidance, Dependent personality.

UNIT IV Schizophrenia and Therapies

- (i) Characteristics, Major subtypes, Causes and treatment of Schizophrenia.
- (ii) Psychodynamic, and Cognitive Behavior therapy.

PRACTICAL

- (i) Anxiety: Assessment of Anxiety of a subject by Hamilton Anxiety Rating Scale (HARS).
- (ii) Depression: Assessment of Depression Profile of a subject by Becks Depression Inventory (BDI).

Recommended Books

1. Ahuja N. (2011). A Short Textbook of Psychiatry (7th Ed). New Delhi: Jaypee.
2. Barlow D.H. and Durand V.M. (2005). Abnormal Psychology: An Integrated Approach (4th Ed.). Wadsworth: New York.
3. Baron, R.A. (1995 Edition)-Psychology- The Essential Science, Pearson Education Company of India Pvt. Ltd.
4. Carson R.C., Butcher J.N., Mineka, S., & Hooley J.M. (2007). Abnormal Psychology (13th Ed.). ND: Pearson Education.
5. Dash, U.N., Dash, A.S., Mishra, H.C., Nanda, G.K. & Jena, N. (2004). Practical Exercises in Psychology: Learning about Yourself and Others. Panchasila, Bhubaneswar.
6. Irwin G. Sarason, Barbara Sarason (2005). Abnormal Psychology. New Delhi: Prentice Hall Publication.
7. James C. Coleman (1981). Abnormal Psychology and Modern Life. D.B. Taraporevala with Scott, Foresman and Company, Mumbai.
8. Kring, A.M., Johnson, S.L., Davison G.C. & Neale J.M. (2010). Abnormal Psychology (11th Ed.). NY: John Wiley.
9. Mohanty, N. (2008). Psychological Disorders: Text and Cases. New Delhi: Neelkamal Publications Pvt. Ltd.

10. Mohanty, N., Varadwaj, K. & Mishra, H.C. (2014). Explorations of Human Nature and Strength: Practicals in Psychology, DivyaPrakashani, Samantarapur, Bhubaneswar.
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SEMESTER-V

C:11-ORGANIZATIONAL BEHAVIOR

(Credits:6, Theory-4, Practical-2) Lectures:
60 (Theory:40, Practical:20) Max.
Marks:100(Theory:70, Practical:30)

Introduction:

The course provides an overview of the main fields of organizational and personnel psychology. It focuses on topics such as organizational system; work behavior, attitudes and motivation as related to organizational set up; management of power and politics in the organizations; and finally development and evaluation of human resources for sustainable growth of an organizations. **Learning Objectives:**

1. To help students able to understand the structure, functions, and designs of different organizations.
2. To make students understand the processes of group decision making and leadership functions in different organizations.
3. To make students understand the theories of work motivation and related issues of power and politics in the organizational set up.
4. To help students demonstrate professional skills in the evaluation, management, and development of human resources in the organizations.

Expected outcomes: Students will be able to

1. Understand different concepts and dynamics related to organizational system, behavior, and management.
2. Identify steps managers can take to motivate employees in the perspectives of the theories of work motivation.
3. Understand the tricks of power and politics management in the organizations.
4. Understand significance of human resource development, evaluation and management for the interest and benefit of the organization.

UNIT-I Historical context of organizational behavior

- (i) Contributions of Taylor, Weber and Fayoll; Challenges, Scope and opportunities for OB.
- (ii) OB perspectives-Open system approach, Human relations perspective, Socio-technical approach, OB model responsive to Indian realities.

UNIT- II Organization System

- (i) Structure and functions of organization, Common organizational designs, Management roles, functions and skills.
- (ii) Group decision making processes in organizations, Organizational leadership and types of leadership in organizations.

UNIT III Work, Power and Politics

(i) Contemporary theories of work motivation- ERG theory, McClelland's theory of needs, Cognitive evaluation theory, Goal-setting theory, Reinforcement theory.

(ii) Defining power in organization, Bases of power, Power tactics, Nature of organizational politics, Impression management, and defensive behavior.

UNIT IV Human resource development and Evaluation

(i) Human Skills and Abilities, Selection Practices for Optimal Use of Human Resources; Training Programs for the Development of Human Resources.

(ii) Performance Evaluation- Purpose, Methods, Potential Problems and methods to overcome them.

PRACTICAL

(i) **Leadership Style:** To measure his basic leadership style of 4 college students by using Green- berg Basic Leadership Style scale.

(ii) **Conflict-Handling:** To measure the conflict-handling style of 4 college students by using Rahims scale to identify their conflict handling style.

Recommended Books

1. Dash, U.N., Dash, A.S., Mishra, H.C., Nanda, G.K. & Jena, N. (2004). Practical Exercises in Psychology: Learning about Yourself and Others. Panchasila, Bhubaneswar.
2. Greenberg, J. & Baron, R.A. (2007). Behaviour in Organizations (9th Ed.). India: Dorling Kindersley.
3. Luthans, F. (2009). Organizational behavior. New Delhi: McGraw Hill.
4. Mohanty, N., Varadwaj, K. & Mishra, H.C. (2014). Explorations of Human Nature and Strength: Practicals in Psychology, DivyaPrakashani, Samantarapur, Bhubaneswar.
5. Pareek, U.(2010). Understanding organizational behaviour. Oxford: Oxford University Press.
6. Robbins, S.P.; Timothy, A.J. & Vohra, N. (2012). Organizational Behavior, 15th Edn. Pearson Education: New Delhi
7. Schultz, D. and Schultz, S.E. (2004). Psychology and Work Today. Delhi: Pearson Inc.
8. Singh, K. (2010). Organizational Behaviour: Texts & Cases. India: Dorling Kindersley.

C:12-HEALTH PSYCHOLOGY

(Credits:6, Theory-4, Practical-2) Lectures:
60 (Theory:40, Practical:20) Max.
Marks:100(Theory:70, Practical:30)

Introduction:

Health psychology is a specialty area that focuses on how biology, psychology, behavior and social factors influence health and illness. This course is designed to provide an introduction to the area of health psychology to help students understand how Health Psychology as a specialty within psychology addresses the role of behavioral factors in health and illness. Basic theories, models and applications are also included.

Learning Objectives:

1. To help the students understand the issues of Health Psychology and how to address them by the bio-psychosocial model of health and illness.
2. To help the students to describe behavioral factors that influence health and illness.
3. To guide the students understand about health enhancing behaviors including coping with illness.

Expected outcomes: Students will be able to

1. Know the basics of health and illness from the Bio-psychosocial perspectives.
2. Understand the significance of behavioral and psychological correlates of health and illness.
3. Understand the significant aspects coping and importance of health enhancing behavior.

UNIT-I Introduction

- (i) Goals of Health Psychology, , Biopsychosocial model of health and illness.
- (ii) Basic nature of stress, Cognitive appraisal of stressors, Some major causes of stress, Management of stress.

UNIT- II Health and Illness

- (i) Behavioral and psychological correlates of illness, Approaches to promoting wellness, Some common health beliefs and their implications.
- (ii) Models of health- The cognition models- The health belief model, The protection motivation model, Leventhals self regulatory model.

UNIT III Health and Coping

- (i) Individual differences in symptom perception, Coping with the crises of illness; Compliance behavior and improving compliance.
- (ii) Health enhancing behavior- Diet management, Yoga and Exercise.

UNIT IV Health Issues

- (i) Children health issues- Malnutrition, Immunization, Autism, ADHD.
- (ii) Health issues of women and elderly:Diabetes,Osteoporosis, Alzheimers Disease, Depression.

PRACTICAL

- (i) **Sleep Quality:** To assess the Sleep quality of 4 college students The Pittsburgh Sleep Quality Index (PSQI).
- (ii) **Coping Strategies:** To assess of the Coping Strategies of 4 college students by Tobins Coping Strategy Inventory (TCSI).

Recommended Books

1. Baron, R.A. (1995 Edition)-Psychology- The Essential Science, Pearson Education Company of India Pvt. Ltd.
2. Brannon and Feist. Health Psychology.
3. Carr, A. (2004). Positive Psychology: The science of happiness and human strength.UK: Routledge.
4. Dash, U.N., Dash, A.S., Mishra, H.C., Nanda, G.K. & Jena, N. (2004). Practical Exercises in Psychology: Learning about Yourself and Others. Panchasila, Bhubaneswar
5. Edward P.Sarafino (1994). Health Psychology. John Wiley and Sons
6. Khatoon, N. (2012). Health Psychology, Dorling Kindersley (India) Pvt. Ltd. New Delhi
7. Mohanty, N., Varadwaj, K. & Mishra, H.C. (2014). Explorations of Human Nature and Strength: Practicals in Psychology, DivyaPrakashani, Samantarapur, Bhubaneswar.
8. Sarafino, E.P. (2002). Health psychology: Bio psychosocial interactions (4th Ed.).NY: Wiley.
9. Snyder, C.R., & Lopez,S.J.(2007).Positive psychology :The scientific and practical explorations of human strengths. Thousand Oaks, CA: Sage.
10. Taylor, S.E. (2006). Health Psychology (6th Ed.). New York: Tata McGraw Hill

DISCIPLINE SPECIFIC ELECTIVES

DSE-1: PSYCHOLOGICAL RESEARCH & MEASUREMENT

(Credits:6, Theory-4, Practical-2) Lectures:
60 (Theory:40, Practical:20) Max.
Marks:100(Theory:70, Practical:30)

Introduction:

The research methods course is among the most frequently required in the psychology and with good reason. It helps the students know about the difference between an experiment and a correlational study, the function of independent and dependent variables, the importance of reliability and validity in psychological measurement, and the need for replication in psychological research. In other words, psychologists research methods are at the very core of their discipline. The course is designed to train the students in psychological research and measurement. **Learning Objectives:**

1. To provide an overview of scientific approaches to psychological research in term of sampling techniques, scientific method, and experimental designs.
2. To acquaint the students with respect to psychometric, projective techniques and non-testing approaches like interview.

Expected outcomes: Students will be able to

UNIT-I Psychological Research

- (i) Assumptions of science, Characteristics of scientific methods, Psychological research: Correlational and experimental.
- (ii) Sampling frame: probability and non-probability samples, sample size, sampling error.

UNIT- II Psychological Scaling and Construction of test

- (i) Purpose of scaling and types of psychological data, Psychological scaling methods: Familiarity with Thurstone, Likert and Guttman scale.
- (ii) Construction of test: Theory of measurement error; Operationalizing a concept, Generating items, Item analysis, Item response theory.

UNIT III Experimental Designs

- (i) Pretest- post-test design, Factorial designs, RandomizedBlock design Standardization of tests.
- (ii) Reliability and validity of tests, Development of norms and interpreting test scores.

UNIT IV Assessment of Personality

- (i) Psychometric and projective techniques, Familiarity with MMPI, Rorachs, WAT, and TAT Interviewing.
- (ii) Principles and procedures of interviewing, gaining cooperation, motivating respondents, training of interviewers, ethics of interviewing.

PRACTICAL

- (i) **TAT**: To administer the TAT on a subject and give summary report.
- (ii) **Word Association test**: To administer the Jung / Kent-Rosanoff list of WAT on a subject and report on his areas of emotional difficulties.

Recommended Books

1. Anastasi, A. (1988). Psychological Testing. New York: MacMillan.
2. Minium, E.W., King, B.M. & Bear, G. (1993). Statistical Reasoning in Psychology and Education. New York: John Willey.
3. Kerlinger, F.N. (1983). Foundations of Behavioral Research. New York: Surjeet Publications.
4. Freeman, F.S. (1972). Theory and Practice of Psychological Testing. New Delhi: Oxford & IBH.

DSE-2: PSYCHOLOGY & SOCIAL ISSUES

(Credits:6, Theory-4, Practical-2) Lectures:
60 (Theory:40, Practical:20) Max.
Marks:100(Theory:70, Practical:30)

Introduction:

Psychologists can play a larger role in the solution of important social problems. Psychology brings two important qualities to the study of social problems: attention to psychological process and rigorous methodology. The key task in the designed course is to define social problems in part as psychological problems.

Learning Objectives:

1. The course will provide social psychological analysis of some major social issues in India.

Expected outcomes: Students will be able to

UNIT-I Understanding Social Systems

- (i) Indian Family System; Social stratification; caste, class, power, Religious ethics Poverty and Deprivation.
- (ii) Theories of poverty, Concomitants of poverty, Sources of deprivation, inequality and social justice.

UNIT- II Health and wellbeing

- (i) Role of behavior in health problems, Shortcomings of the biomedical model, Behavioral sciences in disease prevention and control, India's health scenario.

Political Behavior

- (ii) Development of ideology, Use of small groups in politics, Issues of human and social development, Quality of life and development.

UNIT III Antisocial Behavior

- (i) Corruption and bribery, Juvenile delinquency, terrorism, Crime and criminal behavior, Alcoholism and drug abuse.

(ii) Crime and criminal behavior, Alcoholism and drug abuse, Psychopath.

UNIT IV Social integration

(i) The concept of social integration; Causal factors of social conflicts and prejudices; Psychological strategies for handling the conflicts and prejudices; Measures to achieve social integration.

Violence

(ii) Nature and categories of violence, violence in family and marriage, rape, Collective violence for social change.

PRACTICAL

(i) **Quality of Life:**To assess the quality of life family of 4 families using Beach Center Family Quality of Life Scale.

(ii) **Community Integration:**To assess the community integration of a village by using Community integration questionnaire (CIQ) of Barry Willer.

Recommended Books

1. Banerjee, D. (1998). Poverty, class and health culture in India, Vol. I, Delhi Prachi Prakashan
2. Dube, S.C. (1987) Modernization and Development. ND: Sage
3. Fonseca, M. (1998). Family and Marriage in India. Jaipur: Sachin
4. Mishra, G. (1990). Applied Social Psychology in India. ND: Sage
5. Mishra, G. (1999). Psychological perspectives on stress and Health. New Delhi: Concept
6. Mishra, H.C. and Misra, S. (2009). Psychology of Deviants, Divya Prakashani, Bhubaneswar
7. Mohanty, A .K. and Mishra, G. (Eds.) (2000). Psychology of Poverty and Disadvantage. New Delhi: Concept
8. Sen, A. & Sen A.K. (Eds.). (1998). Challenges of contemporary Realities: A psychological Perspective. New Delhi: New Age International
9. Srinivas, M.N. (1966). Social change in modern India. Bombay: Allied.

SEMESTER-VI

C:13-COUNSELING PSYCHOLOGY

(Credits:6, Theory-4, Practical-2) Lectures:
60 (Theory:40, Practical:20) Max.
Marks:100(Theory:70, Practical:30)

Introduction:

The course is designed to develop entry level counseling psychologists who will be capable of understanding and demonstrating behavior and attitudes in the basic areas of professional counseling.

Learning Objectives:

1. To help students able to understand and integrate current scientific knowledge and theory into counseling practice.
2. To make students learn the history and professional issues related to counseling psychology.
3. To help students integrate and convey information in the core areas of counseling practice.
4. To help students demonstrate professional behavior in their various roles as counseling psy³²⁸

chologists.

Expected outcomes: Students will be able to

1. Understand the purpose of counseling and practice counseling ethically following different approaches.
2. Understand the basics of counseling process and use them for counseling students, families, couples, distressed, and handicaps.

UNIT-I Basics of Counseling

(i) Meaning, scope and purpose of counseling with special reference to India; The counseling process, counseling relationship, counseling interview.

(ii) Characteristics of a good counselor, Ethics and values in counseling; Education and training of the counselor.

UNIT- II Theories and Techniques of Counseling

(i) Psychodynamic approach-Freud and Neo Freudians; Humanistic approach-Existential and Client centered. (ii) Cognitive approach- Rational-emotive and transaction analysis; Behavioral approach- Behavior modification; Indian contribution- yoga and meditation.

UNIT III Counseling Programs

(i) Working in a counseling relationship, transference and counter transference, termination of counseling relationship, Factors influencing counseling.

(ii) Student counseling, Emphases, roles and activities of the school, and college counselor.

UNIT IV Counseling application

(i) Family and Marriage Counseling, Family life and family cycle, Models and methods of family counseling.

(ii) Alcohol and drug abuse counseling; Counseling the persons with Suicidal tendencies, and Victims of Harassment and Violence.

PRACTICAL

(i) **Marital Relationship-** To assess the marital relationship of 2 couples using Lerner's Couple adjustment scale.

(ii) **Case Reporting:** To complete four case studies of high school students with problem behavior in the appropriate case record proforma.

Recommended Books

1. Burnard Philip. (1995). Counselling Skills Training A sourcebook of Activities. New Delhi: Viva Books Private Limited.
2. Dash, U.N., Dash, A.S., Mishra, H.C., Nanda, G.K. & Jena, N. (2004). Practical Exercises in Psychology: Learning about Yourself and Others. Panchasila, Bhubaneswar
3. Feltham, C and Horton, I. (2000). Handbook of Counseling and Psychotherapy. London: Sage.
4. Gibson, R.L & Mitchell M.H. (2003). Introduction to counseling and Guidance. 6th edn. Delhi: Pearson Education
5. Gladding, S.T. (2009). Counselling: A comprehensive profession (6th Ed.). New Delhi: Pearson India
6. Mishra, H.C. & Varadwaj, K. (2009). Counseling Psychology: Theories, Issues and Applications, DivyaPrakashini, Samantarapur, Bhubaneswar, Odisha

7. Misra, G. (Ed) (2010). Psychology in India, Volume 3: Clinical and Health Psychology. New Delhi: Pearson India.
8. Mohanty, N., Varadwaj, K. & Mishra, H.C. (2014). Explorations of Human Nature and Strength: Practicals in Psychology, DivyaPrakashani, Samantarapur, Bhubaneswar.
9. Nelson-Jones. (1995). The theory and practice of counseling. 2ndEdn. London: Holt, Rinehart and Winston Ltd
10. Rao, S. (2002). Counselling and Guidance (2nd Ed.). New Delhi: McGraw Hill.

C:14-POSITIVE PSYCHOLOGY

(Credits:6, Theory-4, Practical-2) Lectures:
60 (Theory:40, Practical:20) Max.
Marks:100(Theory:70, Practical:30)

Introduction:

Positive psychology is the scientific study of optimal human functioning to help people flourish. This is a foundation course in positive psychology to help students not only to understand the core themes of positive psychology, but also to equip them with the helpful positive interventions in various areas of professional psychology, such as clinical, health, education, organization and community.

Learning Objectives:

1. To help students to understand the rationale behind positive psychology.
2. To guide students to identify and analyze the key conceptual and theoretical frameworks underpinning positive psychology.
3. To encourage students to appreciate the contributions of scholars from a range of disciplines and their influence on developing a positive approach to mental health.
4. To make students understand and apply a strengths-based approach to mental health issues.

Expected outcomes: Students will be able to

1. The goal of positive psychology and the basic behavior patterns that result in positive human growth from the point of view of leading positive psychologists
2. The concepts of flow and happiness and the related theories and models explaining happiness behavior and its consequences.
3. All the precursors to positive psychology from character strength and altruism to resilience.

UNIT-I: Foundations

- (i) Historical roots and goals of positive psychology, Positive emotions, Positive Individual traits, and positive subjective experience.
- (ii) Contribution of Martin Seligman, Albert Bandura, Carol Dweck and Abraham Maslow to positive psychology

UNIT-II: Flow and Happiness

- (i) Components of flow, Conditions and mechanisms of flow, Positive and negative consequences of flow experience.
- (ii) Meaning and nature of happiness, Sources of happiness, Theories of happiness- Set-point theory, Life satisfaction and Affective state theories.

UNIT-III: Precursors to Positive Psychology

- (i) Character strength, Altruism, Hope and Optimism, Positive thinking, Resilience
- (ii) Psychology of well-being: Meaning of well-being, The well-being models, Factors affecting well-being, Promoting well-being among people

UNIT-IV: Ways to Positive Psychology

- (i) Discovering strength, Increasing optimism, Self-direction, Purpose, gratitude, Mindfulness, and Activities and experience
- (ii) Effects of exercise, Yoga, meditation and spiritual intelligence on development of positive psychology; Positive psychology in building relationship

PRACTICAL

(i) Happiness: To measure the happiness of 4 adults using Oxford Happiness questionnaire

(ii) Spiritual Intelligence: To measure the spiritual intelligence of 4 adults using Kings Spiritual Intelligence test.

Recommended Books

1. Carr, A. (2004). Positive Psychology: The science of happiness and human strength.UK: Routledge.
2. Dash, U.N., Dash, A.S., Mishra, H.C., Nanda, G.K. & Jena, N. (2004). Practical Exercises in Psychology: Learning about Yourself and Others. Panchasila, Bhubaneswar
3. Mohanty, N., Varadwaj, K. & Mishra, H.C. (2014). Explorations of Human Nature and Strength: Practicals in Psychology, DivyaPrakashani, Samantarapur, Bhubaneswar.
4. Peterson, C. (2006). A Primer in Positive Psychology; Oxford University Press
5. Seligman, M.E. (2002).Authentic Happiness: Using the New Positive Psychology to Realize Your Potential for Lasting Fulfillment: Oxford University Press
6. Seligman, M.E. (2012). Flourish:A Visionary New Understanding of Happiness and Well-being. Oxford University Press
7. Snyder, C.R. & Shane, J.L. (2005). Handbook of Positive Psychology. .Oxford University Press
8. Snyder, C.R., & Lopez,S.J.(2007).Positive psychology :The scientific and practical explorations of human strengths. Thousand Oaks, CA: Sage.

DSE-3: CONTEMPORARY APPLIED PSYCHOLOGY

(Credits:6, Theory-4, Practical-2) Lectures:
60 (Theory:40, Practical:20) Max.
Marks:100(Theory:70, Practical:30)

Introduction:

Applied psychology is the use of psychological principles and theories to overcome problems in real life situations. Mental health,organizational psychology, counseling psychology, clinical psychology, business management, education, and law are just a few of the areas that have been influenced by the application of psychological principles and findings. Some of the current areas of applied psychology include community psychology, Psychology of the disadvantaged, psychology of economic development, population psychology, gender psychology, and defense psychology. The course is designed to help students understand the application of psychology to these new fields.

Learning Objectives:

...

Expected outcomes: Students will be able to

...

UNIT-I: Community Psychology:

- (i) Definition and concept of Community Psychology; Use of small groups in social action, Arousing community consciousness, Effective strategies for social change.
- (ii) **Rehabilitation Psychology:** Primary, secondary, tertiary rehabilitation programs, Rehabilitation of physically, mentally and socially challenged persons including the old persons

UNIT-II:

- (i) **Helping the disadvantaged:** Concept of disadvantaged and deprivation, social, physical, cultural and economic consequences of disadvantaged groups, Educating and motivating the disadvantaged
- (ii) **Psychology and IT:** Psychological consequences of the developments in IT; Role of psychologists in the present scenario of IT

UNIT-III:

- (i) **Psychology in economic development:** Achievement motivation and Economic development; Characteristics of entrepreneurial behavior, Consumer rights and awareness
- (ii) **Population psychology:** Psychological consequences of population explosion and high population density; Psychosocial effects of crowding; motivating for small family norms

UNIT-IV

- (i) **Psychology of Gender:** Issues of discrimination; Glass ceiling effect, Self-fulfilling prophecy, Management of diversity
- (ii) **Defense psychology:** Psychological tests for defense personnel; Promoting positive mental health of defense personnel, Human engineering in defense

PRACTICAL

- (i) To assess the sense of gender equality of 8 college students by using Student Gender equality Questionnaire
- (ii) To assess the attitude and knowledge of 4 women towards family planning using the Family Planning Knowledge Attitude Survey Questionnaire.

Recommended Books

1. Banerjee, D. (1998). Poverty, class and health culture in India, Vol. I, Delhi Prachi Prakashan
2. Dalton, J.H. (2006). Community Psychology: Linking Individuals and Communities: :Oxford University Press
3. Dube, S.C. (1987) Modernization and Development. ND: Sage
4. Fonseca, M. (1998). Family and Marriage in India. Jaipur: Sachin

5. Mishra, G. (1990). Applied Social Psychology in India. ND: Sage
6. Mishra, G. (1999). Psychological perspectives on stress and Health. New Delhi: Concept
7. Mishra, H.C. , Mishra, G.C. & Varadwaj , K. (2014). Fundamentals of Applied Psychology, Divya Prakashani, Bhubaneswar
8. Mishra, H.C. and Misra, S. (2009). Psychology of Deviants, Divya Prakashani, Bhubaneswar
9. Mohanty, A .K. and Mishra, G. (Eds.) (2000). Psychology of Poverty and Disadvantage. New Delhi: Concept
10. Sen, A. & Sen A.K. (Eds.). (1998). Challenges of contemporary Realities: A psychological Perspective. New Delhi: New Age International
11. Srinivas, M.N. (1966). Social change in modern India. Bombay: Allied
12. Swain, S. Applied Psychology

DSE-4: RESEARCH PROJECT

(Credits:6, Theory-4, Practical-2) Lectures:
60 (Theory:40, Practical:20) Max.
Marks:100(Theory:70, Practical:30)

Introduction:

The research experience of students is greatly enriched by early exposure to conducting research. There are numerous benefits of undergraduate students who get involved in research. They are better off in understanding published works, determine an area of interest, can discover their passion for research and may start their career as a researcher. Further students will be able develop ability for scientific inquiry and critical thinking, ability in the knowledge base and communication of psychology. This course is included to promote above mentioned abilities among the students.

Learning Objectives:

1. To help students to learn how to develop scientific research designs in the study of psychology.
2. To guide students to understand the previous research in their field of interest and review them to arrive at a research problem
3. To encourage the students to learn ways to describe and measure human behavior.
4. To help students understand the logic of hypothesis testing and application of appropriate statistical analysis.
5. To make students to learn the methods of writing a research report.

Expected outcomes: Students will be able to

1. Independently prepare a research design to carry out a research project
2. Review the related research papers to find out a research problem and relevant hypotheses
3. Understand the administration, scoring and interpretation of the appropriate instrument for measurement of desired behavior
4. Learn the use of statistical techniques for interpretation of data.
5. Learn the APA style of reporting a research project.

UNIT-I: A student is required to carry out a project on an issue of interest to him / her under the guidance and supervision of a teacher. In order to do so s/he must have the knowledge in research methodology and of steps in planning and conducting a research. The supervisors may help the students to go on field study / study tour relevant to their work. Thirty hours of class may be arranged in the routine to help students understand research methodology, and planning, conduction and reporting on the research. An external examiner with the supervisor as the internal examiner will evaluate the research project on the basis of scientific methodology in writing the report, and presentation skill and performance in the viva.

Format

1. **Abstract** 150 words including problem, method and results.
2. **Introduction** Theoretical considerations leading to the logic and rationale for the present research
3. **Review-** Explaining current knowledge including substantive findings and theoretical and methodological contributions to the topic, objectives and hypotheses of the present research
4. **Method** Design, Sample, Measures, Procedure
5. **Results-** Quantitative analysis of group data (Raw data should not be attached in Appendix) Graphical representation of data wherever required. Qualitative analysis wherever done should indicate the method of qualitative analysis.

6. Discussion

7. References (APA Style) & Appendices

1. Project should be in Soft binding. It should be typed in Times New Roman 14 letter size with 1.5 spacing on one sides of the paper. Total text should not exceed 50 pages (References & Appendices extra).
2. Two copies of the project should be submitted to the College.

3. Project - American Psychological Association (APA) Publication Manual 2006 to be followed for project writing

**SYLLABUS FOR B.A. (HONORS) SANSKRIT UNDER
CHOICE BASED CREDIT SYSTEM OF UTKAL UNIVERSITY,
BHUBANESWAR**

1st YEAR

SEMESTER-I

CC- 1 MORAL TEACHINGS AND BASICS OF SANSKRIT

1. *Hitopodeśa Mitralabha* (From *Kathāmukha* to *Ḡḍhravidalakatha*) 30Marks
2. *Yaksaprasna of Mahabharata*(*Aranyakaparva, ch.313*
from Verses no. 41 to 133) 30Marks
3. *Śabdarupa&Dhaturupa* 20 Marks

('a' karanta, 'i' karanta, 'ī'karanta, 'u'karanta, 'ū' karanta, 'in' bhaganta, *Mātr*, *Pitr*, *Asmad*, *Yusmad*, *Tad*(*sabdarupas*).*Lat*, *Lañ*, *Vidhiliñ*, *Lrt*, *Lot* and *Litlakarar* *Path*, *Ni*, *Kr*, *Sev*, *Han*, *Pā*, *Dā*, *Śru*, *Śī* and *Krīñ* in the form of *Ātmanepada*, *Parasmaipada* or *Ubhayapada* whichever is applicable. (*Dhaturupas*)

- Unit-I & II *Hitopodeśa Mitralabha* (From *Kathamukha* to *Ḡḍhravidalakatha*) 30 Marks
- Long Questions -1 15 Marks
- Short Questions -3 5×3=15 Marks
- Unit-III & IV *Yaksaprasna of Mahabharata* 30 Marks
- Long Questions-1 15 Marks
- Explanation - 1 8 Marks
- Translation of a textual Verse 7 Marks

- Unit-V *Śabdarupa&Dhaturupa* 20 Marks
- Śabdarupa* - 5 2×5= 10 Marks
- Dhaturupa* - 5 2×5= 10 Marks

Books for Reference:

3. *Hitopadesah*(*Mitralabhah*) (Ed.) Kapildev Giri, Chaukhamba Publications, Varanasi.
4. *Hitopadesah* (*Mitralabhah*) (Ed.) N.P. Dash and N.S. Mishra, Kalyani Publishers, New Delhi
5. *Vyakaranadarpana*, The Odisha State Bureau of Text Book Preparation and Production, Bhubaneswar, 2013
6. Critical edition of the *Mahabharata*, (Ed.) V.S. Sukthankar, BORI, Pune
7. *Mahabharata*, Gitapress, Gorakhpur (Prescribed Text)
8. *Yaksaprasna*, T. K. Ramaayiyar, R. S. Vadhyar & Sons. Palkad, Kerala

CC-2 . DRAMA-I & HISTORY OF SANSKRIT LITERATURE - I

1. *Abhijnanasakuntalam* (Act I-IV) 50 Marks
2. *History of Sanskrit Literature-I* 30 Marks

(*Ramayana*, *Mahabharata*, General out lines of *Puranas* and Sanskrit Drama)

1. **Abhijnanasakuntalam (Act I-IV)**

Unit-I	Long Questions -1	14 Marks
Unit- II	Short Questions -2	7×2=14 Marks
	Explanation of Verse- 1	8 Marks
Unit-III	Textual Grammar	14 Marks
	i) <i>Sandhi</i>	1×2= 2 Marks
	ii) <i>Prakṛti- Pratyaya</i>	2×2= 4 Marks
	iii) <i>Karaka&Vibhakti</i>	2×2= 4 Marks
	iv) <i>Samasa</i>	2×2= 4 Marks

2. **History of Sanskrit Literature-I**

30 Marks

Unit- IV *Ramayana & Mahabharata*

Long Questions -1	10 Marks
Short Questions -1	05 Marks

3. **General Outlines of Puranas and Sanskrit Drama**

Unit- V General Outlines of *Puranas* and Sanskrit Drama

(Defination and Classification of *Puranas*, Bhasa, Kalidasa, Sudraka, Visakhadatta, Bhavabhuti, Bhattanarayana)

Long Questions -1	10 Marks
Short Questions -1	05 Marks

Books for Reference:

1. *Abhijnanasakuntalam* (Ed.) R.M. Bose, Modern Book Agency Pvt. Ltd., 10 BankimChatterjee Street, Calcutta
2. *Abhijnanasakuntalam* (Ed.) M.R. Kale, Motilal Banarsidass Publishers Pvt. Ltd., NewDelhi-11007, 8th Reprint-2010
3. *Abhijnanasakuntalam* (Ed.) R.M Mohapatra, Books & Books, Cuttack
4. *Abhijnanasakuntalam* (Ed.) H.K. Satapathy, Students Store, Cuttack
4. *History of Sanskrit literature*, Baladev Upadhyay, Chaukhamba Publications, Varanasi.
5. *Sanskrit Drama*, A.B.Keith, Oxford University Press, London
6. *Samskrta Sahiytara Itihasa*, (Odia) H.K. Satapathy, Kitab Mahal, Cuttack- 753003.

SEMESTER-II

CC - 3 DRAMA - II & DRAMATURGY

1. *Abhijnanasakuntalam* (Acts V-VII) 50 Marks

2. *Dramaturgy* 30 Marks

(*Nandi, Prastavana, Purvaranga, Pancha-arthaprakṛti, Panchasandhi, Pancha-arthopaksepaka, Nataka, Prakarana.*)

1. **Abhijnanasakuntalam (Acts V-VII)**

Unit-I	Long Questions - 1	14 Marks
Unit- II	Short Questions - 2	8×2= 16 Marks
Unit-III	i) Explanation of Verse- 1	8 Marks
	ii) Verse/ Dialogue Translation-1	7 Marks
	iii) Translation from Prakṛit to Sanskrit	5 Marks

2. Dramaturgy (Sahityadarpana, Chapter- VI)	30 Marks
Unit-IV	
Nandi, Prastavana, Purvaranga, Nataka, Prakarana, Pancasandhi	
Short Notes on any three	5×3= 15 Marks
Unit-V	
Panca - arthaprakrti and Panca- arthopaksepaka	
(Short Notes on any three))	5×3= 15Marks

Books for Reference:

4. *Abhijnanasakuntalam* (Ed.) R.M. Bose, Modern Book Agency Pvt. Ltd., 10 BankimChatterjee Street, Calcutta
5. *Abhijnanasakuntalam* (Ed.) M.R. Kale, Motilal Banarsidass Publishers Pvt. Ltd., NewDelhi-11007, 8th Reprint-2010
6. *Abhijnanasakuntalam* (Ed.) R.M.Mohapatra, Books &Books , Cuttack
4. *Abhijnanasakuntalam* (Ed.) H.K. Satapathy, Students Store, Cuttack
4. For Dramaturgy- *Sahitya Darpana* (Ed.) P.V.Kane, Motilal Banarsidass Publishers Pvt. Ltd., New Delhi
5. *Odia Translation of Sahityadarpana* by Narayana Mohapatra, Odisha Sahitya Academy, Bhubaneswar.
6. *Sahitya Darpana* with Laksmi Tika (Sanskrit) and Vimala Tika, (Hindi) (Ed.) K.M.Sastri, Chaukhamba Publications, Varanasi.
7. *Sahityadarpana* evam Chanda (Ed.) Dr. Braja Sundar Mishra, Satyanarayan Book Store, Cuttack
9. *Sahityadarpanao Chanda* (Ed.) Niranjan Pati, Vidyapuri, Cuttack

CC- 4 AN INTRODUCTION TO THE TECHNIQUE OF PANINIAN GRAMMAR & PROSODY

1. **Vocabulary relevant to Sanskrit Grammar and Arrangement of Paninian Grammar** 15 Marks
2. **Samjna-prakaranam** 45 Marks
3. **Chanda** 20 Marks

1. Vocabulary relevant to Sanskrit Grammar and Arrangement of Paninian Grammar

Unit- I 15 Marks

(Astadyayi, Siddhantakaumudi, Ganapatha, Dhatupatha, Dhatu, Antaranga, Bahiranga, Apavada, Agama, Adesa, Nadi, Nistha, Krdanta, Taddhita, Tinanta, Nijanta, Sananta, Yananta, Namadhatu, Vikarana, Luk, Lopa, Sarvadhataka, Ardhadhataka, ti & Upadha = 26)

Short Notes on any – 5 3×5= 15Marks

2. Samjnaprakaranam 45Marks

Unit- II Two Sutras / Vrttis out of 1st 10 Sutras (Upto *tulyasyaprayatnam savarnam*) to be explained. 7½ ×2=15 Marks

Unit- III Two Sutras / Vrttis out of 2nd 10Sutras (From *a a* upto *cadayo'sattve*) to be explained. 7½ ×2= 15 Marks

Unit- IV Two Sutras / Vrttis out of rest Sutras (From *pradayah* upto *dirgham ca*) to be explained. 7½ ×2= 15 Marks

3. Chanda (Prosody)-Srutabodhah

20Marks

Unit- V Definition and Examples of 4 Chandas - out of 7

5×4=20 marks

(Chandas such as -: Arya, Anustubh, Indravajra, Upendravajra, Upajati, Vamsastha, Vasantatilaka, Mandakranta, Malini, Shikharini, Shardula-vikridita, Sragdhara.)

Books for Reference:

1. Siddhanta-kaumudi with Balamanorama and Tattvabodhini, Vol.I (Ed.) Giridhara Sharma Chaturveda, Motilal Banarsidass
2. Siddhanta-kaumudi with Mitabhasini Com., (Ed.) S.R. Ray, Sanskrit Pustak Bhandar, 38 Cornwallis St., Calcutta
3. Siddhanta-kaumudi with Eng Tr. (Ed.), S.C. Basu, Motilal Banarsidass, New Delhi-110007, Rpt-1995
4. Vaiyakarana Siddhanta Kaumudi (Ed.) M.V. Mahashabde, Dadar Book depot, Bombay.
5. Siddhanta-kaumudi (Ed.) Prof. G.K. Dash & Dr(Mrs) K.Dash with Navanita tika, A.K.Mishra Publishers Pvt. Ltd, Cuttack.
6. Siddhanta-kaumudi (Ed.) Minati Mishra, Vidyapuri, Cuttack
7. Siddhanta-kaumudi (Ed.) Dr. Niranjana Pati, Kalyani Publishers, New Delhi
8. Siddhanta-kaumudi (Ed.) P.R.Ray, Sailabala Womens College, (Skt.Deptt.) Cuttack.
9. Vyakaranadarpana, The Odisha State Bureau of Text Book Preparation and Production, Bhubaneswar- 2013
10. Shrutabodha, Hari Prasad Sharma, Nirnaya Sagar Press
11. Sahityadarpana Evam Chhanda (Ed.) Dr. Brajasundar Mishra, Satyanarayana Book Store, Cuttack.

2nd YEAR

SEMESTER-III

CC-5 POETRY & HISTORY OF SANSKRIT LITERATURE- II

1. Meghadutam- (Purvamegha) 50 Marks
 2. History of Sanskrit Literature-II 30 Marks
- (Gitikavyas, Khandakavyas, Gadyakavyas and Kathasahitya)

1. Meghadutam- (Purvamegha) 50 Marks

- Unit-I Long Questions - 1 15 Marks
- Unit- II Short Questions - 2 7 ½ × 2 = 15 Marks
- Unit-III i) Explanation of One Verse 12 Marks
- ii) Translation of One Verse 8 Marks

2. History of Sanskrit Literature-II 30 Marks

- Unit-IV (Gitikavyas & Khandakavyas)
- Long Questions -1 10 Marks
- Short Questions -1 05 Marks
- Unit- V (Gadyakavyas, Kathasahitya)
- Long Questions -1 10 Marks
- Short Questions -1 05 Marks

Books for Reference:

1. *Meghadutam* (Ed.) S.R. Ray, Sanskrit Pustak Bhandar, 38 Cornwallis St., Calcutta
2. *Meghadutam* (Ed.) M.R. Kale, Motilal Banarsidass, Delhi
3. *Meghadutam* (Ed.) Radhamohan Mahapatra, Books and Books, Vinodvihari, Cuttack, 1984
4. *Meghadutam* (Ed.) Dr. Braja Sundar Mishra, Vidyapuri, Cuttack, 1st Edn-1999
5. *Samskrta Sahitya ka Itihasa*, Baladeva Upadhyaya, Choukhamba, Varanasi.
6. *Samskrta Sahitya ka Ruparekha*, Vacaspati Goreilla, Choukhamba Vidyabhavan, Varanasi.
4. *Samskrta Sahitya Itihasa*, H.K. Satapathy, Kitab Mahal, Cuttack
5. *Samskrta Sahitya Itihasa*, Text Book Bureau, Govt. of Odisha, Bhubaneswar

CC-6 META - RULES OF PANINIAN GRAMMAR, POETICS & FIGURES OF SPEECH

1. *Paribhasaprakaranam of Siddhantakaumudi* 30 Marks
2. *Sahityadarpanah(Ch.I &II)* 30 Marks
3. *Sahityadarpanah (Selected Alamkaras from Ch.X)* 20 Marks

1. **Paribhasaprakaranam** 30 Marks
Unit- I Four *Sutras* to be explained. 5×4= 20 Marks
Unit- II Two *Vrttis/ Vartikas* to be explained. 5×2= 10 Marks

2. Poetics

- Unit- III *Sahityadarpana Ch. I*
Long Questions -1 10 Marks
Short Questions -1 05 Marks
- Unit- IV *Sahityadarpana Ch. II (Vakya, Pada, Abhidha, Laksana, Vyanjana)*
Long Questions -1 10 Marks
Short Questions -1 05 Marks

3. Figures of speech (without Sub-division)

- Unit- V *Sahityadarpana(Ch.X)* 5×4= 20 Marks

(Alamkarassuch

as *Anuprasa, Yamaka, Slesa, Upama, Rupaka, Utpreksa, Bhrantiman, Nidarsana, Arthantaranyasa, Aprastuta-prasamsa, Apahnuti, Vyatireka, Vibhavana, Visesukti, Samasukti, Svabhavokti*)

Definition and Examples of **Four Alamkaras** (figures of speech) out of **seven**.

Books for Reference:

1. *Siddhanta-kaumudi with Balamanorama and Tattvabodhini, Vol.I (Ed.) Giridhara Sharma Chaturveda, Motilal Banarsidass*
2. *Siddhanta-kaumudi with Mitabhasini Com., (Ed.) S.R. Ray, Sanskrit Pustak Bhandar, 38 Cornwallis St., Calcutta*
3. *Siddhanta-kaumudi with Eng Tr. (Ed.), S.C. Basu, Motilal Banarsidass, New Delhi-110007, Rpt-1995*
4. *Vaiyakarana Siddhanta Kaumudi (Ed.) M.V. Mahashabde, Dadar Book depot, Bombay.*
5. *Siddhanta-kaumudi (Ed.) Prof. G.K. Dash & Dr(Mrs) K.Dash with Navanita tika, A.K. Mishra Publishers Pvt. Ltd, Cuttack.*

4. Siddhanta-kaumudi (Ed.) Minati Mishra, Vidyapuri, Cuttack
5. Siddhanta-kaumudi (Ed.) Dr. Niranjan Pati, Kalyani Publishers, New Delhi
6. Siddhanta-kaumudi (Ed.) P.R.Ray, Sailabala Womens College,(Skt.Deptt.) Cuttack.
7. Sahitya Darpana (Ed.) P.V. Kane, Motilal Banarsidass Publishers Pvt. Ltd., New Delhi
8. Odia Translation of Sahityadarpana by Narayana Mohapatra, Odisha Sahitya Academy, Bhubaneswar.
9. Sahitya Darpana with Laksmi Tika (Sanskrit) and Vimala Tika, (Hindi) (Ed.) K.M. Sastri, Chaukhamba Publications, Varanasi.
10. Sahityadarpana evam Chhanda (Ed.) Braja Sundar Mishra, Satyanarayan Book Store, Cuttack
11. Sahityadarpana o Chhanda (Ed.) Niranjan Pati, Vidyapuri, Cuttack
12. Samskrta Kavyatattva Vicara, Ketaki Nayak, Odisha Text Book Bureu, Bhubaneswar.

CC-7 CASES AND CASE ENDINGS IN PANINIAN GRAMMAR & TRANSLATION - I

1. *Siddhantakaumudi(Karaka-Vibhakti I-IV)* 50 Marks
2. Translation from Sanskrit unseen passage to Odia/ English 30 Marks

1. *Siddhantakaumudi(Karaka-Vibhakti I-IV)* 50 Marks

- Unit- I & II (*Prathama&Dvitiya*)
 Four *Sutras/ Vrtti/ Vartika* to be explained. 5×4= 20 Marks
- Unit- III (*Trtiya*)
 Two *Sutras/ Vrtti/ Vartika* to be explained 5×2= 10 Marks
- Unit- IV (*Caturthi*)
 Four *Sutras/ Vrtti/ Vartika* to be explained. 5×4= 20 Marks
- Unit -V *Translation from Sanskrit unseen passage into Odia/ English*
 One unseen Sanskrit Passage is to be given for Translation into Odia/ English
 (At least 10 sentences) 10×3= 30 Marks

Books for Reference:

1. Siddhanta-kaumudi with Balamanorama and Tattvabodhini, Vol.I (Ed.) Giridhara Sharma Chaturveda, Motilal Banarsidass
2. Siddhanta-kaumudi with Mitabhasini Com., (Ed.) S.R. Ray, Sanskrit Pustak Bhandar, 38 Cornwallis St., Calcutta
3. Siddhanta-kaumudi with Eng Tr. (Ed.), S.C. Basu, Motilal Banarsidass, New Delhi- 110007, Rpt-1995
4. Vaiyakarana Siddhanta Kaumudi (Ed.) M.V. Mahashabde, Dadar Book depot, Bombay.
5. Siddhanta-kaumudi (Ed.) Prof. G.K. Dash & Dr(Mrs) K.Dash with Navanita tika, A.K. Mishra Publishers Pvt. Ltd, Cuttack.
6. Siddhanta-kaumudi (Ed.) Minati Mishra, Vidyapuri, Cuttack
7. Siddhanta-kaumudi (Ed.) Dr. Niranjan Pati, Kalyani Publishers, New Delhi
8. Siddhanta-kaumudi (Ed.) P.R.Ray, Sailabala Womens College,(Skt.Deptt.) Cuttack.
9. *Vyakaranadarpana*, The Odisha State Bureau of Text Book Preparation and Production, Bhubaneswar- 2013
A Guide to Sanskrit Composition and Translation, M.R.Kale, Motilal Banarsidass, New Delhi
11. *Brhat Anuvada Candrika*, Chakradhara Hamsa Nautial Shastri, Motilal Banarsidass, New Delhi

CC-8 INSCRIPTIONS , UPANISAD&BHAGAVADGITA

1. Inscriptions	30 Marks
2. Kathopanisad(Vallis-I,II&III)	30 Marks
3. Bhagavadgita (Chap.XV)	20 Marks

1. Inscriptions	30 Marks
(Girnar inscription of Rudradaman, Allahabad Stone Pillar Inscription of Samudragupta and Mandasore Inscription of Yasodharman)	
Unit- I Long Questions -1	15 Marks
Unit- II Short Questions -3	5×3= 15 Marks

2. Kathopanisad(Adhyaya I, Vallis-I,II&III)	30 Marks
Unit- III Long Questions -1	15 Marks
Unit- IV i) Explanation - 1 Mantra	08 Marks
ii) Translation- 1 Mantra	07 Marks
3. Bhagavadgita(Ch.XV)	20 Marks
Unit- V Long Questions -1	12 Marks
Translation- 1 Verse	08 Marks

Books for Reference:

1. *Selected Sanskrit Inscriptions* (Ed.) D.B. Pusalkar, Classical Publishers, New Delhi
2. *Abhilekhamala* (Ed.) Sarojini Bhuyan, Cuttack
3. *Abhilekhamala* (Ed.) Sujata Dash, Cuttack
4. *Abhilekhamala* (Ed.) Jayanta Tripathy, Vidyapuri, Cuttack
5. *Isadi Nau Upanisad* with Sankarabhasya - Gita Press, Gorakhpur
6. *Kathopanisad* with *Sankarabhasya*(Ed.) V.K. Sharma, Sahitya Bhandar, SubhasBazar, Meerut
7. *The Message of the Upanisad* , Swami Ranganathananda, Bharatiya VidyaBhavan,K.M. Muni Marg Mumbai.
8. *Shrimad-bhagavad-gita* (Ed.) S. Radhakrishnan, Bharatiya Vidya Bhavan
9. *Shrimad-bhagavad-gita* (Ed.) Gambhirananda, Ramakrishna Mission
10. *Shrimad-bhagavad-gita*, Gita Press, Gorakhpur

CC-9 CASE AND CASE ENDINGS OF PANINIAN GRAMMAR, TRANSLATION- I IAND LEXICON

1. Siddhantakaumudi(Karaka-Vibhakti V-VII)	40 Marks
2. Translation of an unseen Odia/ English passage into Sanskrit	30Marks
3. Amarakosa	10 marks

1. Siddhantakaumudi(Karaka- Vibhakti V-VII)	
Unit-I (CASE-V) Answer any two Sutras/ Vrtti/ Vartika	5×2= 10 Marks
Unit-II (CASE-VI) Answer any four Sutras/ Vrtti/ Vartika	5×4= 20 Marks
Unit-III (CASE-VII) Answer any two Sutras/ Vrtti/ Vartika	5×2= 10 Marks
2. Translation- II	30 Marks
Unit-IV	30 Marks

One unseen Passage of Odia is to be translated into Sanskrit.

(At least Ten sentences)

3. Amarakosa (Devata, Svarga, Visnu, Laksmi, Durga, Surya, Brahma,Siva, Kartikeya, Ganesa, Sarasvati from Svargavarga)

Unit- V Answer any Two Questions s 5×2= 10 Marks

Books for Reference:

1. Siddhanta-kaumudi with Balamanorama and Tattvabodhini, Vol.I (Ed.) Giridhara Sharma Chaturveda, Motilal Banarsidass
2. Siddhanta-kaumudi with Mitabhasini Com., (Ed.) S.R. Ray, Sanskrit Pustak Bhandar, 38 Cornwallis St., Calcutta
3. Siddhanta-kaumudi with Eng Tr. (Ed.), S.C. Basu, Motilal Banarsidass, New Delhi-110007, Rpt-1995
4. Vaiyakarana Siddhanta Kaumudi (Ed.) M.V. Mahashabde, Dadar Book depot, Bombay.
5. Siddhanta-kaumudi (Ed.) Prof. G.K. Dash & Dr(Mrs) K.Dash with Navanita tika, A.K. Mishra Publishers Pvt. Ltd, Cuttack.
6. Siddhanta-kaumudi (Ed.) Minati Mishra, Vidyapuri, Cuttack
7. Siddhanta-kaumudi (Ed.) Dr. Niranjan Pati, Kalyani Publishers, New Delhi
8. Siddhanta-kaumudi (Ed.) P.R.Ray, Sailabala Womens College,(Skt.Deptt.) Cuttack.
9. *Vyakaranadarpana*, The Odisha State Bureau of Text Book Preparation and Production, Bhubaneswar- 2013
10. *A Guide to Sanskrit Composition and Translation*, M.R.Kale, Motilal Banarsidass, New Delhi
11. *Brhat Anuvada Candrika*, Chakradhara Hamsa Nautial Shastri, Motilal Banarsidass, New Delhi
12. *Namalinganuasanam (Amarakosa)*, D.G. Padhye et al. Choukhamba Sanskrit Series, New Delhi
13. *Amarakosa* with Ramasrami tika, Choukhamba Sanskrit Series office, Varanasi

CC-10 ORNATE PROSE & PROSE WRITING

- | | |
|--|-----------------|
| 1. <i>Dasakumaracaritam</i> (<i>Purvapithika, Dvitiya Ucchvasa</i>) | 25 Marks |
| 2. <i>Sukanasopadesa</i> | 25 Marks |
| 2. <i>Essay in Sanskrit</i> | 20 Marks |
| 3. <i>Expansion of Idea in Sanskrit</i> | 10 Marks |
| 1. <i>Dasakumaracaritam</i>(<i>Purvapithika Dvitiya Ucchvasa</i>) | 25 Marks |
| Unit-I Long Questions – 1 | 15 Marks |
| Unit-II Short Questions – 2 | 5×2=10Marks |
| 2. <i>Sukanasopadesa</i> | 25 Marks |
| Unit-III One Long Question | 15 Marks |
| Unit-IV One Explanation | 10Marks |
| 3. <i>Essay in Sanskrit</i> | 20 Marks |
| Unit-V Essay in Sanskrit (One) | 20 Marks |
| 4. <i>Expansion of Idea in Sanskrit</i> | 10 Marks |
| Expansion of Idea in Sanskrit- One | 10 Marks |

Books for Reference:

1. *Dasakumaracarita* (Ed.) M.R. Kale, Motilal Banarsidass, Delhi
2. *Dasakumaracarita*, Chaukhamba Publications, Varanasi.
3. *Samskrta-nibandha-shatakam*, Kapila Dev Dvivedi
4. *Brhat Anuvada Shiksha*. Chakradhara Hansa Nautiyal, MLBD, Delhi
5. *Samskrta-nibandhadarshah*, Ramamurti Sharma, Sahitya Niketan, Kanpur
6. *Sukanasopadesa*, (Ed.) Ramakanta Jha, Choukhamba Vidyabhavan, Varanasi
7. *Sukanasopadesa* (Ed.) Nimal Sundar Mishra, Kalyani Publishers, New Delhi
8. *Kadambari (Purvardham)* with the Com. of Bhanuchandra Siddhanjani, MLBD, New Delhi

3rd YEAR**SEMESTER-V****CC-11 ORNATE POETRY IN SANSKRIT & HISTORY OF SANSKRIT LITERATURE -III**

1. <i>Sisupalabadham</i> (Canto-I Verses 01-48)	30 Marks
2. <i>Kiratarjuniyam</i> (Canto-I)	30 Marks
3. History of Sanskrit literature- III (<i>Mahakavya and Campu</i>).	20 Marks
1. <i>Sisupalabadham</i> (Canto-I Verses 01-48)	30 Marks
Unit-I Long Questions -1	15 Marks
Unit- II i) Explanation of One Verse	10 Marks
ii) Translation of One Verse	05 Marks
2. <i>Kiratarjuniyam</i> (Canto-I)	30 Marks
Unit-III Long Questions -1	15 Marks
Unit- IV i) Explanation of One Verse	10 Marks
ii) Translation of One Verse	05 Marks
3. <i>History of Sanskrit literature- III (Mahakavya and Campu)</i>	20 Marks
Unit- V i) Long Questions -1	12 Marks
ii) Short Notes- 2	4×2= 8 Marks

Books for Reference:

1. *Sisupalabadham* (Ed.) S.R. Ray/ Vallabhatika, Bharatiya Vidya Prakashan, New Delhi.
2. *Sisupalabadham - Canto-I* (Ed.), Devanarayan Mishra, (With *Sarvankasa-tika* of Mallinatha) Sahitya Bhandar, Meerut
3. *Kiratarjuniyam* (Cantos I-III) (Ed.) M.R. Kale, Motilal Banarsidass Publishers Pvt. Ltd., Delhi, 4th Edn-1966, Rpt-1993
4. *Kiratarjuniyam* (Canto- I) (Ed.) Niranjan Pati, Vidyapuri, Cuttack.
4. *History of Sanskrit Literature*, H.R. Agarwal, Mohanlal Munsiram, Delhi
5. *History of Indian Literature* (Vol. III) M. Winternitz, Motilal Banarsidass Publishers Pvt. Ltd.

CC- 12 VEDA,VEDIC GRAMMAR & HISTORY OF VEDIC LITERATURE

1. **Vaidika Suktas** 30 Marks
2. **Vedic Grammar** 20 Marks
3. **History of Vedic Literature** 30 Marks

1. Veda 30 Marks

Vedic Suktas from different Samhitas

Agni (RV- I.1), Indra (RV- II.12) , Savitr (RV- I.35), Usas (RV- I.48), Purusa-sukta (YV XXXI.1.16), Siva-samkalpa (YV-XXX.1.6), Samjnana(RV X.191), Vak(RV X.125)

- Unit-I i) Long Questions -1 12 Marks
i) Explanation - 1 Mantra 08 Marks
Unit- II i) Translation -1 Mantra 05 Marks
ii) Grammar from the text- 2 Questions $2^{1/2} \times 2 = 05$ Marks

2. Vedic Grammar 20 Marks

The following Sutras are to be taught:

Chandasi pare'pi, Vyavahitasca, Caturthyarthe bahulam chandasi, Chandasi lun-lan-litah, Linarthe let,Leto'datau, Sibbahulam leti, Itasca lopah parasmaipadesu, Sa uttamasya, Ata ai, Vaito'nyatra, Hr-grahor bhaschandasi, Chandasi ubhayatha, Tumarthe se-sen-ase-asen- kse-kasen-adhyai-adhyain-kadhyai-kadhyain-shadhyai-shadhyain-tavai-taven-tavenah, Va chandasi, Ses chandasi bahulam, Prakrtya'ntapadam avyapare, Nipatasya ca, Supam suluk purva-savarnac che-ya-da-dya- ya-jalah, Idanto masi, Ajjaserasuk, Dirghadati samanapade

- Unit- III Two sutras to be explained $5 \times 2 = 10$ Marks
Two sadhanas to be done $5 \times 2 = 10$ Marks

3. History of Vedic Literature 30 Marks

(Samhita, Brahmana, Aranyaka, Upanisad)

- Unit-IV Long Questions -1 15 Marks
Unit- V Short Questions - 2 $7 \frac{1}{2} \times 2 = 15$ Marks

Books for Reference:

1. *New Vedic Selection* (Part-I) (Ed.) Telang and Chaubey, Bharatiya Vidya Prakashan, NewDelhi
2. *Veda O Vaidika Prakarana*,(Ed) Niranjan Pati, Vidyapuri, Cuttack.
3. *History of Indian Literature* Vol. I, M.Winternitz, MLBD, New Delhi
4. *Vaidika Sahitya aur Samskrti*, Baladeva Upadhyaya, Chaukhamba, Varanasi
5. *Vaidik sahyaki Ruparekha*, Umashankar Sharma Rsi, Chawkhamba Vidyaprakashan, Varanasi
6. *Vaidika sahyta o Samskrti* , A.C. Das, Grantha Mandira, Cuttack
7. *Vaidika Sahitya O Samskrti*, Bholanath Rout, Chitrotpala Publication, Salipur

SEMESTER-VI

CC-13 ARTHASASTRA, DHARMASASTRA AND AYURVEDA

1. **Arthasastra (Vinayadhikarana Ch., II - VIII)** 30 Marks
from Vidyasamuddesa to Amatyotpatti.
2. **Manusmṛti** (Chap- II. Verses from 1 to 52) 30 Marks
3. **Ayurveda (Carakasamhita, Dirghamjivitiyadhyaya-Verses 53-103)** 20 Marks
1. **Arthasastra (Adhikarana I. II-VIII)** 30 Marks

Unit I & Unit- II **Arthasastra** from the beginning up to **Vinayadhikarana, Adhikarana** I.1-4
Short Notes-4 $7 \frac{1}{2} \times 4 = 30$ Marks

2. Manusmṛti (Chap- II. Verses from 1 to 52)	30 Marks
Unit- III & IV <i>Manusmṛti Chap.II, Verses 1-52</i>	
Short Notes-4	7½ ×4=30 Marks
3.Ayurveda(Carakasamhita, Dirghajivitiyadhyaya-Verses 53-103)	20 marks
Unit- V Long Questions -1	10 Marks
Short Questions -2	5 ×2= 10 Marks

Books for reference:

1. *Kautilya Arthashastra*, (Ed. &Trans.) R.P. Kangle, 3 Vols., Motilal Banarsidass, New Delhi
2. *TheArthashastra*. (Ed.& Trans),L.N. Rangarajan, Penguin Classics, India, 1992
3. *TheArthashastra*. (Ed.) N.P. Unni, Bharatiya Vidya Prakashan, New Delhi
4. *Arthashastra* (Odia Trans.) Anantarma Kar, Odisha Sahitya Academy, Bhubaneswar
 - *Manu's Code of Law: A Critical Edition and Translation of the Mānava-Dharmaśāstra*.(Ed. Olivelle, Patrick, Oxford: Oxford University Press
 - *Kautilya Arthashastra*, (Ed.) Vachaspati Gairala, Chaukhamba publication,Varansi
7. *Manusmṛti*, (Ed.) Braja Kishor Swain, Sadgrantha Niketan, Srimandira,Puri
8. *The Charaka Samhita*, (Trans.) A.C. Kaviratna and P. Sharma, 5 Vols., Indian Medical Science Series, Sri Sadguru Publications, a division of Indian Books Centre, Delhi 81
9. *Caraka-Samhitā: Agniveśa's Treatise Refined and annotated byCaraka and Redactedby Drdhabala* (text with English translation), Sharma, P. V. , Chaukhambha Orientalia, 1981--1994.
10. *Agniveśa's Caraka Samhitā* (Text with English Translation & Critical Exposition Based on Cakrapāṇi Datta's Āyurveda Dīpikā), R.K. Sharma & Bhagwan Dash, Chowkhamba Sanskrit Series Office, 1976--2002. Another good English translation of the whole text, with paraphrases of the commentary of Cakrapānidatta.

CC – 14 TECHNICAL LITERATURE IN SANSKRIT (JYOYISA & VASTU)

1. Jyotisa (Jyotihsara-ratnavali, Chap I)	40 Marks
<i>(Graha-naksatra-paricaya-prakaranam)</i>	
2. Vastu (Vasturatnakara, Chap-I)	40 Marks
<i>(Bhuparigraha-prakaranam)</i>	
1. Jyotisa	40 Marks
Unit-I,II& III Four Questions	10×4= 40 Marks
2. Vastu	40 Marks
Unit-IV & V Four Questions	10 ×4= 40 Marks

Books for Reference:

1. *Jyotihsara-ratnavali*(Part-I) (Ed.) Pandit Baikoli Mahapatra, Radhakrishna Pustakalaya, Satyanarayan Temple Road, Berhampur,Ganjam,Odisha
2. *Vasturatnakar* (Ed.) Vindhreshwari Prasad Dwivedi, Chowkhamba Krishnadas Academy, Varanasi

DETAILS OF ABILITY ENHANCEMENT COMPULSORY COURSE (AECC)

50 Marks /02 Credits each

SEMESTER-II

AECC-2 M.I.L.(SANSKRIT) (10 Mid+40 End) 02 Credits

M.I.L. (ALTERNATIVE SANSKRIT) 40 Marks 3 Credits

UNIT- I : SANSKRIT PROSE

10 Marks

- Shri-bhojarajasya rajyapraaptih* from the text *Bhojaprabandhah, Samskrta Pravesa*, Utkal University
- Yasya bhavah tasya devah* from the text *Madhurah kathah*, Samskrtabharati, Bangaluru
- Ambarisha-charitam, Samskrta pravesa*, Utkal University

2 Questions to be answered out of 4 asked

5 ×2= 10 Marks

UNIT-II: SANSKRIT POEMS (The following Poems)

10 Marks

1. *Canakyanitih* 3rd Chapter from the text *Chanakya-niti-darpanah*, Swami JagadishaParananda Saraswati, Vijaya Kumar Govindaram Ashananda, 4408, Newsadak, Delhi- 110006, 2014. (Prescribed Text)
2. *Raksa raksa bharamam* by Prof. Srinivasa Rath from the Anthology *Tadeva gaganam saiva dhara*, Rashtriya Sanskruta Samsthan, New Delhi, 1995
3. *Samyogah* by Prof. Radhavallabh Tripathi, from the Anthology *Kavyagodavari*, (Ed.)P.K. Mishra, Rashtriya Sanskrit Sansthan, New Delhi, 2011
4. *Krusakasyakatha (Verses 1-15)* by Prof. Prafulla Kumar Mishra from the anthology *Kavita bhuvanesvari*, P.G. Dept. of Sanskrit, Utkal University, Vanivihar, Bhubaneswar
5. *Jangama-dura-bhasini* by Sri Sundararaja from the anthology *Kavita bhuvanesvari*, P.G. Dept. of Sanskrit, Utkal University, Vanivihar, Bhubaneswar
6. *Dhanurbhanga* by Sri Bhubaneswar Kar, from the anthology *Kavya-vaitarani*, Vidyapuri, Cuttack
7. *Arunapranamah (Verses 10-21 of Kargil Kavyam)* by Dr. Braja Sundar Mishra, Adisaila Publications, Kendrapada, 2008.

2 Questions to be answered out of 4 asked

5×2= 10 Marks

UNIT-III : TRANSLATION

20 Marks

Translation from Odia/ English to Sanskrit

5 sentences to be translated out of 8 asked

4 × 5 =20 Marks

DETAILS OF SKILL ENHANCEMENT COURSES (50 Marks /02 Credits each) (A Students has to choose any two Papers out of these four groups namely P, Q, R & S)
Group- P YOGA (10 Mid +40 End)

(Patanjalayogasutram ch.I sutra 1-25)

Unit-I& II (Sutra 1-15)	03 Questions	8×3= 24 Marks
Unit-III (Sutra 16-25)	02 Questions	8×2= 16 Marks

Books for References

1. *Pātañjalayogadarśanam* (Ed.) Narayana Mishra, Choukhamba Prakashan, NewDelhi
2. *Yogasūtra of Patañjali*, (Ed.) M.R. Yardi, BORI, Poona
3. *Pātañjalayogadarśana* (Odia Tr.) Priyabratya Das, Arya samaj, Bhubaneswar

Group- Q PRIESTLY TRAINING IN SANSKRIT LITERATURE (KARMAKĀṆḌA)
(10 Mid +40 End)

Unit-I <i>Ācamanavidhi, Saṁkalpa, Snāna, Tarpaṇa, Aṅganyāsa</i> and <i>Karanyāsa</i>	4'2= 8 Marks
<u>Two</u> Questions s <i>Sandhyā (Gāyatrī, Prāṇāyāma), Dhyāna, mantras</i> of Gaṇeśa, Viṣṇu, Śiva, Bhāskara, Durgā, Sarasvatī and Lakṣmī	4*2= 8 Marks
<u>Two</u> Questions s	4*2= 8 Marks
Unit-II <i>Ṣoḍaśopacārapūjā</i>	
<u>Two</u> Questions <i>Vivāhapaddhati</i> from <i>Biharilal Karmakāṇḍa</i> –topics such as <i>Vivāha-bheda</i> (Verse 378), <i>Vivāha-lakṣaṇa</i> (416), <i>Svikaraṇavidhi</i> (417), <i>Varunapuja</i> (419)	4*2= 8 Marks
<u>Two</u> Questions	4*2= 8 Marks
Unit-III <i>Vivāhapaddhati</i> from <i>Biharilal Karmakāṇḍa</i> - <i>Mahāvākya</i> (422), <i>Kanyādāṇa</i> (442) <i>Hastagranthi</i> (443), <i>Lajāhoma</i> (461) and <i>Saptapadi</i> (465) <u>Two</u> Questions	

Books for References

1. *Nityakarma-pujā-prakasa*, Sriramabhabanji Mishra and Lalbihariji Mishra, Gitapress, Gorakhpur
2. *Ṣoḍaśa-upacāra*, Gitapress, Gorakhpur
3. *Biharilal Karmakāṇḍa*, Dharmagrantha Store, Cuttack

Group- R VASTU (VASTU RATNAKAR) (10 Mid +40 End)

(*Vastupurusa, Vastuyantra, Subhasubhavrksanirupana, Grhacchadanavyavasta, Prakosthasthananirupana, Jalasayakhodana*)

Unit-I & II(<i>Vastupurusa, Vastuyantra, Subhasubhavrksanirupana, Grhacchadanavyavasta</i>)	03 Questions.	8×3=2 4 Marks
Unit-III (<i>Prakosthasthananirupana, Jalasayakhodana</i>)	02 Questions.	8×2=16 Marks

Books for References

1. *Vasturatnakar* (Ed.) Vindhreshwari Prasad Dwivedi, Chowkhamba KrishnadasAcademy, Varanasi
2. *Brhatsamhita* varahmihira,(Ed.) N. Chidambaram Iyer, Divine Books, New Delhi.

Group- S TRANSLATION AND EDITING SKILL

(10 Mid +40 End)

- Unit-I Anuvada Kala- 10 Marks
Translation of one Odia/ English Paragraph in to Sanskrit
- Unit-II Precises Writing- 10 Marks
One Sanskrit Paragraph is to be precised in 1/3rd words and a suitable title is to be suggested.
- Unit-III Proof Correction and Transliteration 20 Marks
i. Proof Correction-
Two wrongly printed Sanskrit Verses from the Prescribe text are to set for necessary Proof Correction- 5*2= 10 Marks
ii. Two Sanskrit Verses from Prescribe text are to be written in Roman/ Italic script with diacritical marks. 5*2= 10 Marks

Books for References

1. Samskrta Vyakaranadarpana, Odisha Text Book Bureau, Bhubaneswar

DETAILS OF THE DSE COURSES (80 Term-end + 20 Mid-Term)

(A Student has to choose two DSE Papers in 5th Semester and two DSE Papers in 6th Semester including one Project work)

SEMESTER-V (A Student has to opt two DSE papers out of Groups- A, B, C & D)

Group- A

THE SCIENCE OF VĀSTU AND VṚKṢĀ

80+20 = 100

1. Vāstuvidyā in Bṛhatsamhitā (Chap-53) 50 Marks
 2. Vṛkṣāyurveda in Bṛhatsamhitā (Chap- 52) 30 Marks
- Units I, II & III – (Vāstuvidyā in Bṛhatsamhitā) Five Questions 10*5= 50 Marks
2. Vṛkṣāyurveda in Bṛhatsamhitā (Chap- 52) 30 Marks
- Units IV & V - Three Questions 10*3= 30 Marks

Books for References

1. Bṛhatsamhitā of Varāhamihira, (Ed.) N. Chidambaram Iyer, Divine Books, New Delhi
2. Bṛhatsamhitā with Vattapaliya vivrti (Ed.) Sudhakar Dwivedi and (re-edited by) Krushnachandra Dwivedi, Sampurnananda Samskrta Viswavidyalaya, Varanasi
3. Bṛhatsamhitā (Hindi Trans.), Achyutananda Jha, Choukhamba Prakashan, Varanasi
4. Vṛkṣāyurveda in Ancient India (with original text and translation), Lallanji Gopal, Sandeep Prakashan, New Delhi
5. Vṛkṣāyurveda of Bṛhatsamhitā, (Ed.), N.P. Dash, Vidyapuri, Cuttack

Group- B

SOCIO-POLITICAL THOUGHT IN ANCIENT INDIA

80+20 = 100

1. *Yājñavalkyasmṛti* (Vyavahārādhyāya verses 1-65) 40 marks
2. *Manusmṛti* (Chap- VII Verses 1-60) 40 marks
- Units- I & II - *Yājñavalkyasmṛti* Five Short Questions 7'5= 35 marks
- Units III & IV - *Manusmṛti* Five Short Questions 7'5=35 marks
- Unit- V Translation of Two verses from the above Units 5'2= 10 marks

Books for References

1. *Yājñavalkyasmṛti*, (Ed.) M.N. Dutta, Parimal Publications, New Delhi
2. *Yājñavalkyasmṛti* (Vyavahārādhyāya), (Ed.) Kishore Chandra Mahapara, Jageswarilane, Balighat, Puri
3. *Manusmṛti*, (Ed.) Braja Kishore Swain, Sadgrantha Niketana, Puri
4. *Manu's Code of Law: A Critical Edition and Translation of the Mānava Dharmasāstra*, (Ed.) Ollivele, Patrick, Oxford University Press

Group- C

YOGA : THEORY AND PRACTICE

80+20 = 100 MARKS

1. *Pātañjalayogadarśana* (Chap-I upto Iswara) 40marks
2. *Haṭhayogapradīpikā* of Svātmārāma (Chap-II) 40marks

1. *Aṣṭāṅgayoga*

Unit-I One Long Questions 15 marks

Unit-II Two Short Questions 7.5'2= 15 marks

2. *Haṭhayogapradīpikā*

Unit-III One Long Questions 15 marks

Unit-IV Two Short Questions 7.5'2= 15 marks

Unit-V Demonstration of Two *Yogāsanas* 10'2= 20 marks

Books for References

1. *Pātañjalayogadarśanam* (Ed.) Narayana Mishra, Choukhamba Prakashan, NewDelhi
2. *Yogasūtra of Patañjali*, (Ed.) M.R. Yardi, BORI, Poona
3. *Pātañjalayogadarśana* (Odia Tr.) Priyabratya Das, Arya samaj, Bhubaneswar.
4. *Hathayogapradipika*, with *jyotsna Vyakhya*, chowkhamba Sanskrit series office, Varanasi.

Group- D

TRENDS OF INDIAN PHILPSOPHY

80+20 = 100 Marks

1. *Āstikas* 45 marks
2. *Nāstikas* 35 marks

1. *Astikas*

45 marks

Unit-I *Sāṃkhya* and *Yoga*

Twenty-five elements of *Sāṃkhya* and *Aṣṭāṅgayoga* of *Yogadarśana*

Two Short Questions s

7.5'2= 15 marks

Unit-II *Nyāya-Vaiśeṣika*
Asatkāryavāda, Saptapadārthas
Two Short Questions s

7.5*2= 15 marks

Unit-III *Vedānta* and *Mīmāṃsā*
Śaktidvaya of *Māyā* in *Vedānta* and *Karma* in *Mīmāṃsā*
Two Short Questions s

7.5*2= 15 marks

2. *Nāstikas*

35 marks

Unit-IV *Nāstikas* : *Cārvāk* and *Jaina*

Yadrcchāvāda and *Nairātmyavāda* of *Cārvāka*, *Sapta-bhaṅga-nyāya* of *Jaina*

Two Short Questions s

7.5*2= 15 marks

Unit-V *Bauddhadarśana Āryasatyas*

and Eight Noble-paths

Four Short Questions s

5*4= 20 marks

Books for References

1. *History of Indian Philosophy*, S.N. Dasgupta, MLBD, New Delhi
2. *Indian Philosophy*, S. Radhakrishnan, George Allen and Unwin Ltd., New York
3. *A Critical Survey of Indian Philosophy*, MLBD, New Delhi
4. *Outlines of Indian Philosophy*, M. Hiriyana, MLBD, New Delhi
5. *Bharatiya Darshana* (Odia), Gouranga Charan nayak, The Odisha State Bureau of Text Book Preparation and Production, Bhubaneswar

SEMESTER-VI (A Student has to opt one DSE paper out of Groups- E, F, G and one project work of 100 marks)

Group- E

ETHICAL LITERATURE IN SANSKRIT

80+20 = 100 Marks

1. *Cāṅkyaṇīti* (Chaps- I, II and III from *Cāṅkyaṇītidarpaṇa*) 30 marks
 2. *Nītiśataka* of *Bhartrhari* (Verses 1-30) 30 marks
 3. *Viduranīti* (Ch.I Verse 20-60) 20 marks
- Units-I & II *Cāṅkyaṇīti* -Four Verses are to be explained - 7^{1/2}*4= 30 marks
- Units -III & IV *Nītiśataka* -Four Verses are to be explained - 7^{1/2}*4= 30 marks
- Unit-V *Viduranīti* Short Questions - 4 5x4= 20 marks

Books for References

1. *Cāṅkyaṇītidarpaṇa* (Ed.) Gunjeswar Choudhury, Choukhamba SurabharatiPrakashan, Varanasi
2. *Nītiśataka* (Ed.) M.R. Kale, MLBD, New Delhi(Text)
3. *Nītiśataka* (Ed.) Naresh Jha, Choukhamba Prakashan, New Delhi
4. *Viduranīti*, Gunjeswar Choudhury, Chawkhamba Surabharati Prakashan, Varanasi
5. *Viduranīti*, Gitapress, Gorakh Pur, *Bhartrhari Satakattrayam*, B. S. Mishra, Vidyapuri, Cuttack.

Group- F**SCIENTIFIC LITERATURE IN SANSKRIT****80+20 = 100 Marks**

Unit- I	(i) <i>Bhūmidevyāḥkimivayaḥ</i> by A.R. Vasudevamurty (ii) <i>Bhāratasya vaijñāniketiḥāsaḥ</i> by M.M. Joshi <u>One</u> long Questions	15 marks
Unit-II	(iii) <i>Mahābhārata vaijñānikaḥamśaḥ</i> by A.R. Vasudevamurti (iv) <i>Vaidika-saṁskṛteḥ jagadvyāpyatvam</i> by M.R. Rao <u>One</u> long Questions	15 marks
Unit-III	(v) <i>Vṛkṣāyurvedaḥ -I</i> by Aurobindo Ghose (vi) <i>Vṛkṣāyurvedaḥ -I I</i> by V. Nagraj <u>One</u> long Questions	15 marks
Unit-IV	(vii) <i>Pūrvajaiḥparigaṇitam āsīt paramāṇoḥ parimāṇam</i> by A.R. Vasudevamurti (viii) <i>Prācīnaṁ rasāyanaśāstram</i> by K. Venkatesha Murty <u>One</u> long Questions	15 marks
Unit-V	<u>Four</u> short Questions s from the above four units -	5*4= 20 marks

Books for References

1. *Bhāratasya vaijñānika-paramparā*, V. Nagraj & others, Samskratabharati, MataManira Gali, Jhandewalan, New Delhi, 110055
2. *Ancient Indian Science and its Relevance to the Modern World*, (Eds.) K.E.Govindan & Others, Rashtriya Sanskrit Vidyapitha, Tirupati- 517507
3. *Scientific Knowledge in the Vedas*, P.V. Vartak, Dharam Hinduja International Centre of Indic Research, Delhi, Nag Publishers, 11 A/UA, Jawahar Nagar, Delhi-110007
4. *Science in Sanskrit*, Samskratabharati, Mata Manira Gali, Jhandewalan, New Delhi,110055
5. *Saṁskṛta-vijñāna-Dīpikā*, Nirmal Trikha, Eastern Book Linkers, 5825, NewChandrabala, Jawahar Nagar, Delhi- 110007

Group- G**GENERAL LINGISTICS AND PHILOLOGY****80+20 = 100 Marks**

Unit-I	Bhāṣā-lakṣaṇa, Bhāṣā-svarūpa, bhāṣā-prakārabheda, Bhaṣoṭpatti One long Questions	15 marks
Unit-II	Bhāṣā-vijñānasya mukhyāṅgāni, Gauṇāṅgāni, Dhvanivijñānam, Rūpavijñānam, Vākyavijñānam, Arthavijñānam One long Questions	15 marks
Unit-III	Dhvaniparivattanasya karaṇāni, Dhanivijñānasya prasiddha-niyamāḥ, Arthaparivarttanasya prakārah, Arthaparivarttanasya karaṇāni One Long Questions	15 marks

Unit-IV Bhāṣāṇām vargīkaraṇam- Parivārika, Rūpagata, Vividha-bhāṣā-parivārāḥ One long Questions

15 marks

Unit-V Bharopīya-bhāṣāparivārānam sāmānya-paricayaḥ, Āryabhāṣā-parivārasya bhedadvayam- bhāratīya-īrānīyau, Vaidika-laukika-saṁskṛtam, Avesta

Four short Questions

5*4= 20 marks

Books for References

1. Elements of Science of Language, I.J.S. Taraporewalla, Samskrta Pustaka Bhandara, Kolkata
2. An Introduction to Comparative Philology, Chapters-I, II and III, P.D. Gune,
3. Bhāṣāvijñāna o bhāṣāsastra, Kapildev Dwivedi, Vishvavidyalaya Prakashan, Varanasi, Fourth Edn 1994
4. Linguistic Introduction to Sanskrit Chaps I, II & IV, B.K. Ghosh
5. Dhvanivijñāna, G.B. Dhal, The Odisha State Bureau of Text Book Preparation and Production, Bhubaneswar

DETAILS OF THE GENERIC ELECTIVE (G E) COURSES (80 Term - End + 20

Mid-Term) SEMESTER - I GE - I (A student has to opt one paper from group H & I)

Group: H Grammar, History of Sanskrit Literature, Drama & Prose - 100 Marks

(Mid Term 20 Marks + End Term 80 Marks)

Unit I-Śabdarūpa & Dhāturūpa-10 Marks

Śabda :Bālaka, Kavi, Bhānu, Piṭṛ, Latā, Mati, Nadī, Dhenū, Vadhū, Mātr, Phala, Karman, Vāri, Madhū, Marut, Ātman, Guṇin, Vāk, Sarit, Sarva, Tad, Etad, Yad, Idam, Jagat, Asmad and Yuṣmad.

Dhātu :Bhū, Paṭh, pac, Kṛ, As, Ad, Han, Śī Cur, Sev, Śī, Kri, Bhī, Dīś, Vad.

Form of 5 Śabda 5 Marks

Form of 5 Dhātu 5 Marks

Unit II- History of Sanskrit Literature (Rāmāyaṇa&Mahābhārata) - 20 Marks

One Long Questions 12 Marks

Two Short Questions 08 Marks

Unit III- Hitopadeśa Mitralābha 20 Marks

Hitopadeśa Mitralābha : Kathāmukha with the following Stories :

Vṛddhavyāghra pathika kathā, Mṛga kāka śṛgāla kathā, Gṛdhra mārjāra kathā,

Ati lobhi śṛgāla kathā, Hastī dhūrtta śṛgāla Kathā

One Long Questions 12 Marks

One Explanation

08 Marks

Unit IV & V - Abhijñānaśākuntalam (Act 1- 4) - 30 Marks

Unit IV - One Long Questions - 12 Marks

One Explanation - 06 Marks

Unit V - Two Short Questions 12

Marks

Books Recommended :

1. Vyākaraṇadarpaṇa, Published by Odisha State Bureau of Text Book Preparation and production, Pustak Bhavan, Bhubaneswar, 2013.
2. History of Indian Literature (Vol.III), M. Winternitz, MLBD, Delhi.
3. History of Classical Sanskrit Literature, M. Krishnamachariar, MLBD, Delhi.
4. Saṁskṛta Sāhitya kā Itihāsa, Baladev Upadhyaya, Sarada Niketan, Varanasi.
5. Saṁskṛta Sāhitya Itihāsa, Prof. Harekrushna Satapathy, Kitab Mahal, Cuttack.
6. Hitopadeśa of Nārāyaṇa, M.R. Kale, Motilal Banarsidass, Delhi.
7. Hitopadeśa Mitralābha, Kapil Dev Giri, Chowkhamba Publications, Varanasi, 1988.
8. Hitopadeśa Mitralābha, Dr. Braja Sundar Mishra, Vidyapuri, Cuttack.
9. Abhijñānaśākuntalam, M.R. Kale, MLBD, New Delhi.
10. Abhijñānaśākuntalam, R.M. Bose, Modern Book Agency Private Limited, Calcutta - 12, 1976.
11. Abhijñānaśākuntalam, Dr. Ganga Sagar Rai, Chowkhamba Sanskrit Bhawan, Varanasi, 2000.
11. Abhijñānaśākuntalam, Prof. Hare Krushna Satpathy, Kitab Mahal, Cuttack.

Group: I

Mastering Sanskrit Language - 100 Marks

(Mid Term 20 Marks + End Term 80 Marks)

Unit I : History of Sanskrit Literature (Mahākāvya & Gītikāvya)- 20 Marks

Origin and development of Sanskrit *Mahākāvyas* and *Gītikāvyas* with special reference to the following :

Mahākāvya: *Kumārasambhava, Raghuvamśa, Kirātārjunīya, Śīsupālavadhā* and *Naiṣadhīyacarita*.

Gītikāvya : *Meghadūta, Ṛtusamhāra, Nitiśataka, Śṛṅgāraśataka, Vairāgyaśataka, Caṇḍīśataka, Sūryaśataka, Amaruśataka, Mohamudgara* and *Gītagovinda*.

One Long Questions from <i>Mahākāvya</i> -	12 Marks
Two short Questions from <i>Gītikāvya</i> -	08 Marks
Unit II- Śukanāśopadeśa from Kādambarī-	20 Marks
One Long Questions -	12 Marks
One Explanation	08
Marks	
Unit III & IV - Abhijñānaśākuntalam (Act5- 7) - 30 Marks	
Unit III - One Long Questions	12 Marks
One Explanation	06 Marks
Unit IV - Two Short Questions	12 Marks
Unit V - Dramaturgy -	10 Marks
The following Portions to be studied from Sāhityadarpaṇa Chapter VI:	
<i>Nāṭaka , Prakaraṇa , Prastāvanā , Pūrvaraṅga , Nāndī and Pañca sandhi.</i>	
Two Short Notes -	2 X 5= 10 Marks

Books Recommended :

11. History of Indian Literature (Vol.III), M. Winternitz, MLBD, Delhi.
12. History of Classical Sanskrit Literature, M. Krishnamachariar, MLBD, Delhi.
13. Saṁskṛta Sāhitya kā Itihāsa, Baladev Upadhyaya, Sarada Niketan, Varanasi.
14. Saṁskṛta Sāhitya Itihāsa, Prof. Harekrushna Satapathy, Kitab Mahal, Cuttack.
15. Śukanāśopadeśaḥ, Mohandev Panth and Harishcandra Vidyalamkara, Motilal Banarsidass, Delhi, 2010.
16. Kādambarī - Śukanāśopadeśaḥ, Ramakanta Jha and Harihara Jha, Chowkhamba Vidya Bhavan, Varanasi, 2011.
17. Śukanāśopadeśaḥ, Dr. Nirmal Sundar Mishra, Kalyani Publishers, New Delhi.
18. Abhijñānaśākuntalam, M.R. Kale, MLBD, New Delhi.
19. Abhijñānaśākuntalam, R.M. Bose, Modern Book Agency Private Limited, Calcutta - 12, 1976.
20. Abhijñānaśākuntalam, Dr. Ganga Sagar Rai, Chowkhamba Sanskrit Bhawan, Varanasi, 2000.
21. Abhijñānaśākuntalam, Prof. Hare Krushna Satpathy, Kitab Mahal, Cuttack.
22. Sāhityadarpaṇa, Sheshraja Sharma Regmi, Chowkhamba Krishnadasa Academy, Varanasi.
23. Sāhityadarpaṇa, Odisha Sahitya Akademi, Bhubaneswar.

14. Sāhityadarpaṇa evaṁ Chanda, Dr. Braja Sundar Mishra, Satyanarayan BookStore, Binod Behari, Cuttack -2.

SEMESTER – II GE - 2 (A student has to opt one paper from group J & K)

Group: J Functional Sanskrit– 100 Marks

(Mid Term 20 Marks + End Term 80 Marks)

Unit I - Sanskrit conversation - 20 Marks

A Specific incident/ Occurrence will be given in the Questions Paper (in Sanskrit) and the students will be asked to present that in Sanskrit with Conversation style.

Unit II - General idea about Vācya. The divisions of Vācya like Karttṛvācya, Karma Vācya and Bhāvavācya. - 20 Marks

The students will be asked to change the voice (Vācya) of any 10 sentences as directed. 10 x 2 = 20 Marks

Unit III - Saṁjñā Prakaraṇam from Laghu Siddhānta kaumudī- 20 Marks

Four Sūtras. 4 x 5 = 20 Marks

Unit IV & V - Nītiśataka of Bhartṛhari (Verses 1 - 20) - 20

Marks Four Short Questions

4 x 5 = 20 Marks

Books Recommended :

1. Functional Sanskrit: Its Communicative Aspect, Dr. Narendra, Sri Aurovindo Ashram, Pondicherry.
2. Vyākaraṇadarpaṇa, Published by Odisha State Bureau of Text Book Preparation and production, Pustak Bhavan, Bhubaneswar, 2013.
3. Laghu Siddhānta Kaumudī , Sridharananda Sashtri , MLBD , New Delhi.
4. Laghu Siddhānta Kaumudī, Isvara Chandra, Samskrta Granthagara, New Delhi, 2007.
5. Laghu Siddhānta Kaumudī , Sadasiva Shastri, Chowkhamba Sanskrit Office, Varanasi.
6. The Nīti and Vairāgya Śataka of Bhartṛhari, M.R. Kale, MLBD, New Delhi.
7. Śatakatraya , Dr. Braja Sundar Mishra, Vidya puri, Cutack , 2010.

Group: K History of Sanskrit Literature, Poetry, Philosophy and Poetics. - 100 Marks

(Mid Term 20 Marks + End Term 80 Marks)

Unit I & II - History of Sanskrit Literature - 20 Marks

(Gadyakāvya, Fairy Tales & Fables, Campū)

Unit I - One Long Questions - 12 Marks

Unit II - Two Short Notes - 08 Marks

Unit III - Meghadūta :Pūrvamegha(Verses 1 - 39) - 20 Marks

One Long Questions - 12 Marks

Two Short Questions - 08 Marks

Unit IV - Śrīmad Bhagavad Gītā : (Chapter XV)- 20 Marks

One Long Questions - 12 Marks

Two Short Questions - 08 Marks

Unit V - Alamkāra (FromSāhityadarpaṇaCh -x) - 20 Marks

Anuprāsa, Yamaka, Śleṣa, Upamā, Rūpaka, Utprekṣā, Apahnuti, Samāsokti, Vyājastuti and Arthāntaranyāsa.

Lakṣa-lakṣaṇa-samanvaya of any four. 4x5 = 20 Marks

Books Recommended :

1. History of Indian Literature (Vol.III), M. Winternitz, MLBD, Delhi.
2. History of Classical Sanskrit Literature, M. Krishnamachariar, MLBD, Delhi.
3. Saṁskṛta Sāhitya kā Itihāsa, Baladev Upadhyaya, Sarada Niketan, Varanasi.
4. Saṁskṛta Sāhitya Itihāsa, Prof. Harekrushna Satapathy, Kitab Mahal, Cuttack.
5. Meghadūta of Kālidasa , M.R. Kale, MLBD, New Delhi.
6. Meghasandēśa, N. P. Unni, Bharatiya Vidya Prakashan, New Delhi.
7. Meghadūta, Dr. Braja Sundar Mishra, Vidyapuri, Cuttack.
8. Śrīmad Bhagavad Gītā (With Sāṅkara Bhāṣya), Gita Press, Gorakh Pur.
9. Sāhityadarpaṇa evaṁ Chanda, Dr. Braja Sundar Mishra, Satyanarayan Book Store, Binod Behari, Cuttack.
10. Sāhityadarpaṇa , P. V. Kane , MLBD , New Delhi.

SEMESTER - III GE - 3 (A student has to opt one paper from group L & M)

Group: L Poetry, Grammar and Composition - 10 Marks

(Mid Term 20 Marks + End Term 80 Marks)

Unit I -Kirātārjunīyam : Canto I- 20

Marks

One Long Questions - 12 Marks

One Explanation - 08 Marks

Unit II - Vibhaktyartha Prakaraṇa from Laghu Siddhāntakaumudī- 15Marks

Three *Sūtras*. 3 X 5 = 15 Marks

Unit III - Essay in Sanskrit - 20 Marks

Unit IV - Translation from Odia/ English to Sanskrit-15 Marks

Unit V - Retranslation from Sanskrit to Odia/ English - 10 Marks

Books Recommended :

1. Kirātārjunīyam (Canto - I- III), M.R.Kale, MLBD, Delhi.
2. Kirātārjunīyam (Canto - I) Kanta Bhatia and Amaldhari Singh, Bharatiya Vidya Prakashan, Delhi.
3. Kirātārjunīyam O Nātyatattava, Dr. Niranjan Pati, Kalyani Publishers, New Delhi.
4. Laghu Siddhānta Kaumudī , Sridharananda Sashtri , MLBD , New Delhi.
5. Laghu Siddhānta Kaumudī, Isvara Chandra, Samskrta Granthagara, New Delhi, 2007.
6. Laghu Siddhānta Kaumudī , Sadasiva Shastri, Chowkhamba Sanskrit Office, Varanasi.
7. Laghusiddhanta Kaumudi, Ghanashyama Dora, A.K.Mishra Agency, Cuttack.
8. Vyākaraṇadarpaṇa, Published by Odisha State Bureau of Text Book Preparation and production, Pustak Bhavan, Bhubaneswar, 2013.
9. Saṃskṛta nibandhaśatakam, Kapildev Dwivedi.

Group: M Darśana, Prosody and Poetics - 100 Marks

(Mid Term 20 Marks + End Term 80 Marks)

Unit I - Pātañjala Yogadarśana- 20 Marks

The following *sūtras* from *Samādhipāda* :

*Atha yogānusāsanam (1), Yogaścittavṛtti-nirodhaḥ (2), Pratyakṣānumānāgamāḥ
pramāṇāni (7), Anubhūtaṅvīkṣayāsāṃpramoṣaḥ smṛtiḥ (11),
Abhyāsavairāgyābhyām tannirodhaḥ (12), dīpānuśravikaviśayavitrṣṇasya
vaśīkārasamjñā vairāgyam (15), tatparam puruṣakhyāter guṇavairṣṇyam (16) and
kleśakarmavipākāśayair aparāmiṣṭaḥ puruṣaviśeṣa īśvaraḥ (24).*

Four Sutras to be explained. 4 X 5 = 20 Marks

Unit II - Prosody - 20 Marks

The following Chandas from *Śrutabodha*.

*Āryā, Śloka, Indravajrā, Upendra vajrā, Upajāti, Varṣastha, Vasanta tilakā,
Mālinī, sikhariṇī and Mandākrāntā.*

4 Chandas to be explained with exmpals. 4 X 5 = 20 Marks

Unit III - General idea about *Kāvya prayojana, Kāvyalakṣaṇa,*

Kāvya hetu and Kāvya bheda from *Sāhityadarpaṇa* - 10 Marks

Two Short Notes - 2 X 5 = 10 Marks

Unit IV - General idea about *Abhidhā,*

Lakṣaṇā and Vyañjanā from *Sāhityadarpaṇa* -10

Marks

Two Short Notes - 2 X 5 = 10

Marks Unit V - Comprehension - 20 Marks

One Sanskrit passage will be given and the students will be asked to answer five Questions in Sanskrit that follow the passage. 5 X 4 = 20

Marks

Books Recommended :

- Pātañjala yogasutratīṭh, Vimala Karnataka, Krishnadas Academy, Varanasi.
- Siddhāntakaumudī, Dr. Minati Mishra, Vidyapuri, Cuttack.
- Siddhāntakaumudī, Dr. Gopal Krishna Dash & Dr. Kadambini Dash, A.K.Mishra Agency, Cuttack.
- Sāhityadarpaṇa, P.V.Kane, MLBD, New Delhi.
- Sāhityadarpaṇa evaṃ Chanda, Dr. Braja Sundar Mishra, Satyanarayan Book Store, Binod Behari, Cuttack.
- Vyākaraṇadarpaṇa, Published by Odisha State Bureau of Text Book Preparation and production, Pustak Bhavan, Bhubaneswar, 2013.

SEMESTER – IV GE - 4 (A student has to opt one paper from group N & O)

Group: N SOCIO-POLITICAL THOUGHT IN ANCIENT INDIA	80+20 = 100
1. <i>Yājñavalkyasmṛti</i> (Vyavahārādhyāya verses 1-65)	40 marks
2. <i>Manusmṛti</i> (Chap- VII Verses 1-60)	40 marks
Units- I & II - <i>Yājñavalkyasmṛti</i> Five Short Questions	7*5= 35 marks
Units III & IV - <i>Manusmṛti</i> Five Short Questions	7*5= 35 marks
Unit- V Translation of <u>Two</u> verses from the above Units	5*2= 10 marks

Books for References

- D. *Yājñavalkyasmṛti*, (Ed.) M.N. Dutta, Parimal Publications, New Delhi
- E. *Yājñavalkyasmṛti* (Vyavahārādhyāya), (Ed.) Kishore Chandra Mahapara, Jageswari lane, Balighat, Puri
- F. *Manusmṛti*, (Ed.) Braja Kishore Swain, Sadgrantha Niketana, Puri
- G. *Manu's Code of Law: A Critical Edition and Translation of the Mānava Dharmaśāstra*, (Ed.) Ollivele, Patrick, Oxford University Press

Group: O ETHICAL LITERATURE IN SANSKRIT

1. *Cāṇakyanīti* (Chaps- I, II and III from *Cāṇakyanītidarpaṇa*) 30 marks
 2. *Vairagyaśataka* of Bhartrhari (Verses 1-30) 30 marks
 3. *Viduranīti* (Ch.I Verse 20-60)
- Units-I & II *Cāṇakyanīti*-Four Verses are to be explained - $7^{1/2} \cdot 4 = 30$ marks Units –
- III & IV *Nītiśataka*-Four Verses are to be explained - $7^{1/2} \cdot 4 = 30$ marks Unit-V Short
- Questions - 4 5x4= 20 marks

Books for References

- M. *Cāṇakyanītidarpaṇa* (Ed.) Gunjeswar Choudhury, Choukhamba Surabharati Prakashan, Varanasi
- N. *Vairagyaśataka* (Ed.) M.R. Kale, MLBD, New Delhi (Text)
- O. *Viduranīti*, Gunjeswar Choudhury, Chawkhamba Surabharati Prakashan, Varanasi
- P. *Viduranīti*, Gitapress, Gorakh Pur
- Q. *Bhartrhari Satakātrayam* B.S. Mishra, Vidyapuri, Cuttack.

**SYLLABUS FOR B.A. (HONORS) SOCIOLOGY UNDER CHOICE
BASED CREDIT SYSTEM OF UTKAL UNIVERSITY,
BHUBANESWAR**

CORE PAPERS

(SOC-1) Introduction to Sociology

This introductory paper intends to acquaint the students with Sociology as a social science and the basic concepts used in the discipline. It also focuses on the social processes and the social institutions that man encounters as a member of the society.

Objectives: After studying these two papers, the student can

- Can get to know the convergence and divergence of Sociology with other social science disciplines in terms of the subject matter, nature and scope of the discipline and its approach.
- Develop knowledge about its historicity.
- Can get acquainted with the basic concepts used in the subject.
- Can generate ideas about the social processes and social institutions man encounters as a member of the society.

Learning Outcomes: This paper is expected to clarify and broaden the student's notion about the subject, the basic concepts used and some universal societal processes. This will provide a wholesome picture about what the subject is all about.

Unit-1: Sociology: Definition and Subject matter, Nature and Scope, Emergence of Sociology, Sociology and its relationship with Anthropology, Political Science, Economics, and History

Unit-2: Basic Concepts: Society, Culture, Community, Institutions, Association, Social Structure, Status and Role, Norms and Values, Folkways and Mores, Associative and Dissociative processes – Cooperation, Assimilation, Accommodation, Competition, and conflict

Unit-3 : Individual and Society : Individual and society, Socialization, Stages and Agencies of Socialization, Development of Self – Contributions of George Herbert Mead, C.H. Cooley's Looking Glass Self The Concept of Group : Types of Groups – Primary and Secondary groups, In-Group and Out-group, Reference Group

Unit-4: Social Stratification: Meaning and definition, Dimensions of Stratification, Theories of Stratification – Functionalist, Marxist, Weberian. Social mobility and its determinants.

Unit-5: Social Control: Meaning and types, Formal and Informal social control, Agencies of Social control

Essential readings:

1. Bottommore. T.B. 1972, Sociology: A guide to problems and literature. Bombay :George Allen and Unwin (India)
2. Harlambos, M.1998. Sociology: Themes and perspectives. New Delhi Oxford University Press
3. Inkeles, Alex, 1987. What is Skociology? New Delhi: Prentice-Hall of India
4. Jaaram, No. 1988 . What is Sociology .Madras:Macmillan, India :
5. Johnson, Harry M. 1995. Sociology: A Systematic Introduction. New Delhi , Allied Publishers
- 6.Schaefer, Richard T. and Robert P. Lamm. 1999 Sociology. New Delhi Tata-Mac Graw Hill.

(SOC-2) Indian Society

Every society has its own peculiar structure and there are some institutions universal to every society, but with their unique manifestations in each society. There are some change agents and initiatives that enable the society to change with the passage of time. This paper focuses on the structure of the Indian society and the changing aspects with the processes operating, change agents and initiatives.

Objectives: After studying these two papers on Indian society, the student can

- Get an impression about the basic composition of Indian society, its historical moorings, basic philosophical foundations of the society and the institutions.
- Learn about the changing institutions, the processes, the agents and the interventions that bring about change in the Indian society.

Learning Outcomes: This paper is expected to bring familiarity in a student about Indian society. It will present a comprehensive, integrated and empirically –based profile of Indian society. It is hoped that the structure and processes operative in the society, the change agents operating in Indian society presented in this course will also enable students to gain a better understanding of their own situation and region.

Unit-1 : Composition of Indian Society : Caste, Tribe, Religion, Language. Unity in Diversities, Threats to national integration

Unit-2 Hindu Social Organisation: Bases of Hindu Social Organization, Varna, Ashrama and Purushartha. Doctrine of Karma.

Unit-3 : Marriage and Family in India: Hindu marriage as Sacrament, Forms of Hindu Marriage. The Hindu joint family:Patriarchal and Matriarchal systems. Marriage and family among the Muslims. Changes in the institutions of Marriage and Family.

Unit-4 : The Caste system in India: Origin, Features and Functions. Caste and Class, The Dominant Caste,Changes in Caste system, Caste and Politics in India Constitutional and legal provisions for the Scheduled Castes, Scheduled Tribes.

Unit-5 : Social Change in Modern India : Sanskritization, Westernization, Secularization, and Modernization

Essential readings:

1. Bose, N.K. 1967, Culture and Society in India. Bombay : Asia Publishing House
2. Bose, N.K. 1975, Structure of Hindu Society. New Delhi
3. Dube, S.C. 1990, Society in India.(New Delhi: National Book Trust.)
4. Dube, S.C. 1995, Indian Village (London : Routledge)
5. Dube, S.C. 1958: India's changing Villages (London: Routledge and Kegan Paul).
6. Karve, Irawati, 1961 : Hindu Society : An Interpretation(Poona : Deccan-College) :: Lannoy,
7. Mandelbaum, D.G. 1970 : Society in India (Bombay: Popular Prakashan)
8. Srinivas, M.N. 1980 : India: Social Structure (New Delhi: Hindustan - Publishing Corporation)
9. Srinivas, M.N. 1963: Social Change in Modern India (California, Berkeley: University of California Press).
10. Singh, Yogendra, 1973: Modernization of Indian Tradition (Delhi: Thomson Press).

(SOC-3) Sociological Thought

Sociology originated as an intellectual response to the crisis confronting the mid nineteenth century European society. Its development over two centuries has been influenced by a variety of socio-economic and political conditions. It is now established as a multi-paradigmatic academic discipline, with its body of theoretical knowledge enriched and its methodological techniques and procedures systemized. This paper is intended to familiarize the students with the social, political, economic and intellectual contexts in which sociology emerged as a distinctive discipline. It deals with the contributions of the forerunners of the discipline and with the contributions of the founders who gave a systematic shape to the subject.

Objectives: After going through these two papers, the student can

- Gain an understanding of some of the classical contributions in Sociology, and their contemporary relevance.
- Learn about the methodological shift in the discipline over the years.

Learning Outcomes: This paper is expected to clarify and broaden the student's knowledge about the theoretical and methodological contributions of the classical contributors to the subject and the contemporary relevance of these theories.

Unit-1 : Auguste Comte : Law of the Three Stages, Hierarchy of Sciences, Positivism

Unit-2 : Herbert Spencer : Organismic Analogy, Theory of Social Evolution

Unit-3 : Karl Marx : Dialectical Materialism, Class struggle, Alienation, Sociology of Capitalism

Unit-4 : Emile Durkheim : Division of Labour in Society, Rules of Sociological Method, Theory of Suicide.

Unit-5 : Max Weber : Social Action, Protestant ethic and the spirit of capitalism, Ideal type, Bureaucracy, Authority

Essential readings:

1. Aron, Ramond. 1967(1982 reprint) Main currents in sociological thoughts (2 volumes). Harmondsworth, Middlesex: Penguin Books
2. Barnes, H.E. 1959. Introduction to the history to the sociology The University of Chicago press
3. Coser, Lewis A. 1979. Masters of Sociological Thought. New York : Harcourt Brance Jovanovich
4. Fletcher, Ronald. 1994.The Making of Sociology (2 volumes) Jaipur-Rawat
5. Morrison, Ken.1995 Marx, Durkheim, Weber: Formation of Modern Social Thought. London; sage
6. Ritzer, George. 1996. Sociological Theory New Delhi. Tata-McGraw Hill
7. Singh, Yogendra. 1986 Indian Sociology: social conditioning and emerging Trends. New Delhi: Vistaar
8. Zeitlin, Irving.1998 (Indian Edition). Rethiking Sociology: A critique of Contemporary Theory. Jiapur: Rawat.

(SOC-4) Social Change and Development

Change is the law of nature and every society is subject to change. Social change has always been a central concern of Sociological study. Change takes different forms. Change has its pattern which is spelt out by various theories. Change is often propelled by various factors. This paper is designed to provide some ideas to the student about such process, theories and factors.

Objectives: After going through this paper, the student can

- Derive knowledge about the meaning, nature, forms and patterns of change.
- Get an idea about the theories that explain change and their adequacy in explaining so.
- Get an impression about the factors that propel change in the society.

Learning Outcomes: This paper is expected to provide a wholesome idea to the students about the process of social change. They can relate their experience with the theoretical explanations.

Unit-1 : Social Change : Meaning and nature. Social Progress, Evolutuion and Development.

Unit-2 : Theories of Social Change : Evolutionary theory, Cyclical theory, Conflict Theory, Functionalist theory.

Unit-3 : Factors of Social Change: Cultural, Economic, Technological, Ideological, Demographic

Unit-4 : Economic Growth and Social Development : Indicators of Social Development, Human Development Index, Gender Development Index

Unit-5 : Models of Development : Capitalist, Socialist, and Gandhian.

Essential readings:

1. Moore, W.E. 1965 Social Change, Prentice-Hall of India. New Delhi
2. Gandhi M.K., Hind Swaraj
3. Schumacher, E.F., Small is Beautiful
4. Narain, Shreeman, Principles of Gandhian Planning
5. Mishra, B., Capitalism, Socialism and Planning.
6. UNDP, Human Development Report

(SOC-5) Research Methodology

Since the days of August Comte, a debate and a deliberate attempt has been initiated to provide a scientific character to social sciences. In this attempt empirical research has been introduced as an integral part of observing social reality and generalising it objectively without any subjective predisposition. Gradually, research methods have been developed and introduced in social sciences to bring it in par with scientific observations. The essence of this paper lies in introducing the students with these methods of research to ensure objectivity as far as practicable in social research.

Objectives: By going through this paper, the student can

- Get an understanding of the nature of scientific methods, nature of social Phenomena and the way of attaining value neutrality.
- Have a grip over the basic steps involved in social research and the types of social research with their applicability
- Develop an insight into the need and types of research design and the use of sampling method for attaining objectivity and scientific study.

Learning Outcomes: This paper is designed and incorporated to acquaint the students with the scientific ways of studying social phenomena. This provides them with a research insight that will enable them to capture the most relevant data in an objective manner. The market demand of this paper will be very high as the students well versed with this paper will be highly demanded in academics, fundamental research, and policy research undertaken both by Government and Non- Government agencies.

Unit-1 : Meaning and Significance of Social Research, Nature of scientific Method, Applicability of scientific method to the study of social phenomena, Major steps in social research.

Unit-2 : Research Design, Types of Research Design: Exploratory, Diagnostic, Descriptive, and Experimental research Design.

Unit-3 : Hypothesis: Meaning, Characteristics, Types and sources of Hypothesis, Role of Hypothesis in Social Research

Sampling: Meaning, and characteristics, Types: Probability and Non-Probability

Sampling. Role of Sampling in Social Research

Unit-4 : Qualitative social Research : Observation, Case Study, Content Analysis

Unit-5 : Quantitative methods in Social Research: Survey research, Questionnaires,

Recommended Readings:

1. Bajaj and Gupta 1972 Elements of Statistics. New Delhi: R.Chand and Co., New Delhi
2. Beteille, A. and T.N. Madan 1975 Encounter and experience: Personal Accounts of Fieldwork. Vikas Publishing House, New Delhi
3. Bryman, Alan 1988 Quality and Quantity in Social Research Unwin Hyman, London
4. Jayram, N. 1989. Sociology: Methods and Theory. Madras: MacMillan, Madras
5. Kothari, C.R. Research Methodology : Methods and Techniques, Bangalore, Wiley Eastern.
6. Punch, Keith. 1996. Introduction to Social Research, Sage, London
7. Shipman, Martin, 1988 The Limitations of Social Research Sage, London
8. Young, P.V. 1988 Scientific Social Survey and Research Prentice Hall, New Delhi

(SOC-6) Gender and Society

The biological basis to the differences between the sexes does not explain the inequalities faced by the sex groups in the society. In the society variations are marked in the roles, responsibilities, rights of and relations between sex groups depending on the social prescriptions relating to sex affiliations. The differences, inequalities and the division of labour between men and women are often simply treated as consequences of 'natural' differences between male and female humans. But, in reality the social norms, institutions, societal expectations play a significant role in deciding and dictating the behaviour of each sex group. This is the fundamental of the study of Gender and Society.

Objectives: After studying this paper, the student can

- Conceptualize what is "Gender" and what is "Sex" and draw a line of distinction between the two.
- Note the difference in gender roles, responsibilities, rights and relations.
- Trace out the evolution and institutionalization of the institution of "Patriarchy".
- Get to know the theories of Feminism that brought women issues and demands to the forefront.
- Assess the initiatives undertaken for gender development with the paradigm shift from time to time.

Learning Outcomes: This paper is expected to generate ideas and sensitivity about gender in a student which he/she can put into practice in daily life. This will lead to change the prevalent biases and gender practices and create a gender neutral social world where both men and women can enjoy their basic rights and cherish to achieve their dreams.

Unit-1 : Social Construction of Gender : Sex and Gender, Gender stereotyping and socialization, Gender Role and Identity. Gender stratification and Inequality, Gender discrimination and Patriarchy.

Unit-2 : Feminism: Meaning, origin and growth of Feminist Theories. Theories of Feminism : Liberal, Radical, Socialist, and Eco-Feminism.

Unit-3 : Gender and Development: History and Approaches, WID,WAD and GAD. Women Empowerment: Meaning and Dimensions. World Conference of Women, Mexico, Copenhagen, Nairobi and Beijing. Gender- Related Development Index (GDI) and Gender Empowerment Index (GEM).

Unit-4: Status of Women in India : Ancient and Medieval period, women in pre-independence India, Social Reform movements, The Nationalist movement, Women in Independent India.

Unit-5 : Major Challenges and Issues Affecting Women in India: Women and Education, Women and Health, Women and Work. Policy provisions for women.

Recommended Readings:

1. Bhasin, Kamla, 2003 Understanding Gender, Kali for Women
2. Bhasin, Kamala , 1986 Khanv, Said Nighat Some Questions on Feminism and Its Relevance in Sourth Asia, Kali for Women, New Delhi
3. Chaudhuri, Maitrayee 2004 Feminism in India: Issues in Contemporary Indian Feminism Kali for Women, New Delhi
4. Kabeer, Naila 1994 Reversed Realities: Gender Hierarchies in Development Thought: Gender Hierarchies in Development
5. Srivastava Gouri, 2005 Women Education in India Issues and Dimensions, Academic Excellence Publishers & Distributors
6. Agarwal, S.P 2001 Women's Education in India, Concept Publishing Company
7. **Satia, J, Misra, M, Arora, R, Neogi, S**, ed. Innovations in Maternal Health - Case studies from India. New Delhi, India: SAGE Publications Pvt. Ltd.
8. Dube, Leela 1990 Structures and Strategies –Women, Work and Family, SAGE Publications, New Delhi
9. Kalia, Anil 1998 “Women Workers: Invisible and Unprotected”, Social Welfare, Vol.45, No.1, April
10. Cahwala, Monioca 2006 Gender Justice: Women and Law in India, Deep and Deep Publications

(SOC-7) Rural Sociology

Rural Sociology is a specialized branch of Sociology describing the society of villages and rural areas. As the rural areas or the villages mark the beginning of human civilization, this paper is designed to bring out the distinct features of the rural society with their typologies and typicalities. In the present paper an attempt is made to introduce the student with the development of this branch overtime with its focus on the typicality of Indian villages, their structures, changing features and social problems faced by the rural people.

Objectives: After studying this paper, the student can

- Get an impression about the emergence of the sub discipline Rural Sociology and the forces contributing for its origin.

- Learn about the nature of this branch of knowledge, its subject matter and significance.
- Collect information and knowledge about the mooring of the sub discipline in the Indian context.
- Generate an idea about the typicalities of the rural society and the institutions operating therein and their dynamics.
- Derive ideas about rural social problems of the country.

LearningOutcomes: India thrives in her villages. By going through this paper, the student can have a grip on the grass roots of Indian society. This will enable the student to understand the society in a better manner, to note the heterogeneities in culture, institutions and their functions, changes, the contrasts found between the rural urban societies and the problems faced by the people.

Unit-1 : Origin and Scope of Rural Sociology., Nature and Importance of Rural Sociology.

Unit-2 : Rural social Structure: Village Community, Agrarian Economy, Caste System, Mobility and Migration. Rural-Urban Contrast and Continuum

Unit-3: Rural Social problems: Poverty, Unemployment, , Food Security, Landlessness, Indebtedness, Health care and Sanitation

Unit-4 : History and Evolution: Community Development Programme, Land Reforms, Green Revolution. Cooperative Movement, Panchayati Raj Institutions- Constitutional provisions and Structure. Role of Panchayats in Rural Development

Unit-5 Rural Development Programmes: MGNREGA, SGSY, Indira Awas Yojana, Livelihood Mission, Health Mission

Recommended Books:

1. Doshi S.L. & P.C. Jain 2002 Rural Sociology, Jaipur, Rawat
2. Desai A.R. Rural Sociology in India 1997 Bombay Popular Prakasan
3. Dhanagare D.N. 1988 Peasant movements in India, New Delhi, Oxford
4. Gupta D.N. 2001 Rural development System New Delhi Books India International
5. Dube, S.C. 1988 India's changing Village: Human Factor in Community Development Himalayan Publishing House, Bombay
6. Maheshwari, S.R. 1985 Rural Development In India, Sage Publication, New Delhi
7. Vivek, R.& Bhattacharya 1985 The New Strategies of Development in Village India, Metropolitan
8. Jain, Gopal Lal 1985 Rural development Mangaldeep Publication, Jaipur
9. Joshi R P., and S. Narawam 1985 Panchayat Raj in India : Emerging Trends across the States Rawat, Jaipur
10. Singh, Katar 1995 Rural development: Principle policies and Management Sage, New Delhi

(SOC-8) Globalization and Society

Globalisation is the dominant process of social change in the contemporary world. It has resulted in the sinking of time and space and collapse of borders. It is a new coinage for an old process. It has its own dimensions, distinct features and impacts on society. It has given birth to new role players. All these are the focal points of discussion of this paper.

Objectives: Bygoing through this paper, the student can

- Collect information about the meaning and nature of this process, its historical mooring.
- Amass knowledge about its dimensions and impacts, both positive and negative.
- Get introduced to the agencies that manage the process.

Expected Outcomes: This paper is expected to acquaint the student with an ongoing social process bringing tremendous changes in the nations.

Unit-1 : Meaning and characteristics of Globalization. Historical context, Liberalization, Privatization and Globalization.

Unit-2: Dimensions of Contemporary Globalization: Economic, Technological, Political and Cultural.

Unit-3: Consequences of Globalization: Rising Inequality, Environmental impact, Consumerism, Health and Security. Emergence of Anti-Globalization movements.

Unit-4 Globalisation and Indian Society: Understanding the concepts of liberalization, privatization and globalization in the Indian context; Growth of information technology and communication and its impact manifested in everyday life

Unit-5 Impact of globalisation on Religion, Culture, Education, Family, Marriage, Women, Tribes

Essential Readings:

1. Appadurai, Arjun 1996, Modernity at Large, University of Minnesota Press
2. Applebaum, R. and Robinson, W., 2005, Critical Global Studies, Routledge, New York.
3. Bremen, Yan, 1993, Footlose Labour, Cambridge University Press, Cambridge
4. Browning, Halcli, Webster(ed), 1996, Understanding contemporary society: Theories of the present, SAGE Publications, London
5. Cohen Robin and Shirin M.(ed), Global Social Movements, The Athlone Press, London
6. Dubhashi P.R., 2002, Peoples Movement against Global Capitalism : EPW Feb.9

7. Giddens, Anthony, 2000, Runaway World : How globalization is reshaping our lives, Routledge, New York.
8. Jha, Avinash, 2000, Background to Globalization, Centre for Education and Documentation, Mumbai
9. Chander Sekhran Bal krishnana - Impact of Globalization on developing countries and India.
10. C, Rangarajan, 2002 Globalization and its impact

(SOC-9) Marriage, Family and Kinship

This course provides a brief account of the classical approaches to the study of family and kinship. It exposes the students to the distinct aspects of these three interrelated institutions in the Indian context. Finally, it discusses some contemporary issues that pose a challenge to the normative model of these institutions.

Objectives:Bygoing through this paper, the student can

- Understand the three institutions that are the foundations of the society.
- Comprehend the theoretical perspectives on these institutions.
- Get to know the rules governing these institutions.
- Estimate the changes coming over these institutions with the process of social change.

Expected Outcomes:This paper is expected to instill knowledge about the foundational institutions, their governing principles and the continuity and change features of these institutions.

Unit-1: Theoretical Perspectives:Overview of theoretical developments Descent theory ,Alliance theory ,Recent theorizations and their implications

Unit-2: Marriage: Marriage as social Institutions, Functions of Marriage. Rules of Marriage: Endogamy, Exogamy; Monogamy and Polygamy; Levirate and Sororate; Hypogamy and Hypergamy. Dowry and Bride Price.

Unit-3: The Family: Types of Family on the basis of Rules of Authority, Descent and Residence. Functions of Family. Contemporary changes and problems: Divorce and Family Disintegration.

Unit-4:Contemporary Issues: Changing demographic patterns Migration, Diasporas and Impact on Family Implications of new reproductive technologies Domestic violence Challenges to the normative model of family

Unit-5 : The Kinship and Clan System: Meaning and Definition of Kinship and Clan. Types. Clan, Family, Lineage and Totemism and Taboos.

Essential Readings:

- 1.Fox Robin 1967 Kinship and Marriage: An Anthropological Perspective, Pelican.
- 2.Parkin, Robert 1997 Kinship: An Introduction to Basic Concepts, Blackwell, Oxford.
- 3.Parkin, Robert and Linda Stone(ed.) (2004) Kinship and Family : An

Anthropological Reader, Blackwell Publishing, USA.

4. Patel, Tulsi (ed.) (2005) The Family in India : Structure and Practice, Sage Publications, New Delhi.

5. Uberoi, Patricia(ed.) (1993) Family, Kinship and Marriage in India, Oxford University Press, Delhi

(SOC-10) Social Disorganization and Deviance

No society is fully organized in character. Disorganization is apt to occur from time to time. Disorganization is a manifestation of the deviant behavior found among some individuals. This deviance occurs when the individuals feel that the normative order of the society and its institutions are not need fulfilling in character. This present paper makes an attempt to provide an impression about the scenario of disorganization, its forms, causes and consequences with the theories explaining the situation.

Objectives: After going through this paper, the student can

- Understand the meaning, causes, consequences and forms of social disorganization.
- Learn about the theories explaining the disorganization situations.
- Comprehend the concept of crime and the existing theories of punishment.

Learning Outcomes: This paper is designed with an expectation to impress upon a student the concept of deviant behavior leading to social disorganization, forms, theoretical foundations and criminal activities which he encounters in real life situations.

Unit-1 : Social Disorganization: Meaning and Nature. Family Disorganization and Personality Disorganization Causes and Consequences.

Unit- 2: Theories of Deviant Behaviour : Contributions of Durkheim and Merton. Ecological theory, Delinquent Sub-Culture theory, Differential Association theory, Differential Opportunity theory.

Unit- 3 : Crime and Punishment : Concepts of Crime and Delinquency. Causes and consequences. Theories of Punishment: Retributive, Deterrant,Reformative.

Unit-4: Social Problems: Poverty, Unemployment, Alcholism, Indebtedness,Terrorism

Unit-5 Atrocities against women, Domestic violence, Dowry, Divorce

Essential Readings:

1. Mamoria, C.B.,1981 Social Problems and Social Disorganization in India
2. Carrabine;Eamonn,Iganski,Paul,Lee ,Maggy,Plummer Ken,South,Nigel(2004)[Criminology: A Sociological Introduction](#)
3. [Sutherland](#), Edwin Hardin Sutherland(1949) White Collar Crime, Dryden Press
4. Ahuja, Ram(2012) Social problems in India,Rawat
5. Chakraborty, Dipangshu(1999) Atrocities on Indian Women, APH

(SOC-11) Political Sociology

Polity constitutes a vital part of every society. It helps in the system of governance. But the social variables to a great extent determine the course of polity. They decide and detect the system of governance, distribution of power, political institutions like parties and pressure groups, nature of political participation, political socialization. In the same vein, the political institutions, political processes, political culture influence the society and the course of its progress. The present paper highlights the close nexus between society and polity and how dynamism in one brings dynamism in the other.

Objectives: After going through this paper, the student can

- Comprehend the existing forms of states and their relative merits and demerits.
- Differentiate between power, authority and influence which guide and govern the political processes.
- Get to know about the political processes, participation types and determinants and the political institutions.

Learning Outcomes: The very aim of this paper is to generate an insight in the student about the political institutions, political processes, political culture he/she encounters in his/her daily life as a member of the society.

Unit-1 State: Characteristics, Aristotle's classification of types of state: Theological, Monarchical, Aristocratic, Democratic and Totalitarian forms.

Unit-2 Influence, Power and Authority: Meaning and types of influence, characteristics of Power, distribution of power: the Constant sum and the Variable sum approach to power, theories of political elites, authority: Weberian classification of authority, different ways of acquiring legitimacy.

Unit-3 Political culture and political socialization: Meaning and dimensions of political culture, meaning and types of political socialization agencies of political socialization and their role.

Unit-4 Political participation: meaning and types of political participation, political apathy – reasons for political apathy, Determinants of political participation – psychological, social and political.

Unit-5 Political parties and pressure groups: Political parties – features and functions, structures of political parties; meaning of pressure groups and their relationship with political parties, types of pressure groups and their role.

Reference:

1. A.K. Mukhopadhyay 1980 Political Sociology, K.P. Begchi & Company. Calcutta, 1980
2. Ali Ashaf and Sharma B.N. 2001 Political Sociology, University Press, Hyderabad
3. Bhattacharya, D.C. Political Sociology
4. Baral, J.K. Political Sociology
5. T. Bottomore, Political Sociology, Blackie & Sons, Bombay, 1975
6. Lipset S.M. Modern Political Analysis, Printice Hall, New Delhi 1983
7. Dhal, Robert A, Who Governs

(SOC-12)Environment and Society

Environment and society are in constant interaction with each other. It is the environment which sustains life in society and it is the society that is responsible for the preservation and the degradation of the environment. In the recent years environmental challenges have posed a threat to the lives on the planet. Keeping this in view, the present paper tries to create awareness among the students about the major environmental issues and the efforts geared to tackle them.

Objectives: After going through this paper, the student can

- Derive knowledge about the close interaction between society and environment.
- Gain substantial idea about the environmental issues and their repercussions on humanity.
- Accumulate ideas about the ideological currents, issues that drive environment movements.
- Get aware about the global and national efforts to conserve environment.

Learning Outcomes:The very aim of this paper is to disseminate knowledge about the significance of environment for society, to change the practices that can protect and preserve the environment and to make the students participate in the mission to preserve, protect and promote the cause of environment.

UNIT – I Environment and its Concepts: Ecology, Eco-system, Environment and Society – their inter-relations; Eco-Feminism

UNIT – 2 Environmental Issues: Sustainable Development, Industrialization and Development, Urbanization and Development, Environmental Degradation

UNIT – 3 Environmental Movements: Chipko Movement, Narmada Bachao Andolan, Ganga Bachao Abhiyan; The Silent valley movement, Forest Rights.

UNIT – 4 Contemporary Environmental Problems: Problems of Water, Deforestation, Urban Wastes, Slums, Global-Warming and Climate Change.

Unit-5 Environment protection efforts at the global level and the national level in India.

Essential Readings:

1. Albrow, Martin & Elizabeth King (Ed.)1990, Globalisation, Knowledge and Society, Sage: London
2. Baviskar. Amita 1995, In the Valley of the River: Tribal Conflict over Development in the Narmada Valley, Delhi: OUP.
3. Bhatt, Anil 1989 Development and Social Justice: Micro Action by Weaker Section, Sage: New Delhi.
4. Chauhan, I.S 1998, Environmental Degradation, Delhi: Rawat Publications.
5. Desh Bandhu and Garg, R.K.(eds) 1986 Social Forestry and Tribal Development, Dehradun: Natraj Publishers.
6. Dubey, S.M. and Murdia, Ratno(ed)1980 Land Alienation and Restoration in Tribal Communities in India, Bombay: Himalaya Publishing House.
7. Gadgil, Madhav & Ram Chandra. Guha 1996 Ecology and Equity: The use and Abuse of Nature in contemporary India:: New Delhi: OUP.
8. Ghai, Dharam (ed) 1994 Development and Environment: Sustaining People

and Nature. UNRISD: Blackwell Publication.

9. Giddens, Anthony 1996 "Global Problems and Ecological Crisis", 2nd edition New York:W.W.Norton and Co.
10. Guha, Ramechandra 1995 The Unquiet Woods: Ecological Change and Peasant Resistance in the Himalaya, OUP: Delhi.
11. Mehta S.R. (ed) 1997 Poverty, Population and Sustainable Development, New Delhi: Rawat Publications.
12. Plumwood, Val 1992 Gender and Ecology: Feminism and Making of Nature, London: Routledge.

(SOC-13)Urban Sociology

Urbanisation is an important social process that changed the face of human civilization. It was initiated with the process of modernization, transport revolution, coming up of river valley civilizations, establishment of trade links and industrial revolution. Urbanisation has brought both prosperity and problems. It is one of the earnest tasks of Sociology to trace out the evolution of the process, social; problems associated with it and policy planning and measures undertaken to overcome these challenges. This paper Urban Sociology concentrates upon these tasks.

Objectives: After going through this paper, the student can

- Understand the specific traits of urban areas, its historical patterns of growth.
- Develop knowledge about urban social institutions and problems
- Gain insight into urban development plans, programmes and efforts.

Learning Outcomes:The very aim of this paper is to acquaint the students with the process of urbanization, to give an impression about the pattern of evolution of cities, urban institutions, their contrasts with rural institutions, urban problems and the responses developed to arrest them.

Unit-1 Meaning, Nature, Scope and importance of Urban Sociology, Rural Urban Differences: Specific traits of rural world vs. urban world- Socio-cultural differences ,urbanization,Urbanism as a way of life.

Unit-2 Theories of patterns of city growth: Concentric zone theory- Sector model- Multiple nuclei theory.

Unit-3 Social institutions of Indian urban communities: Family, marriage and kinships in urban India – Caste in urban India – Urban politics and urban economy

Unit-4 Urban social problems: Crime and Juvenile delinquency, Slums, Beggary , Prostitution

Unit-5 Urban development in Indian plans, Urban development programmes, Slum development programmes, Urban Basic Services

Essential readings:

1. Lin, Jan and Mele Christopher (edt.)2012The Urban Sociology Reader,

- Routledge
2. Flanagan, W.,1993 *Contemporary Urban Sociology* Cambridge: University of Cambridge
 3. Patel Sujata and Deb, Kushal(edt.) *Urban Studies*
 4. Rao,M.S.A.1992*Urban Sociology in India*
 5. Ramachandran,R 1997 Oxford University Press
 6. Jayapalan, N 2002 *Urban Sociology*,Atlantic Publishers
 7. Wilson, Robert,A Schultz,David, A1978 *Urban Sociology*, prentice Hall

(SOC-14)

Practical: Field Work and Dissertation

(Dissertation: 80 marks and Viva-voce: 20 marks)

- Dissertation may be written on any social institution, problem or may be an evaluative study.
- It should be based on empirical study.
- Size of the dissertation should be around 5000 words.
- Dissertation paper will be examined jointly by one Internal and one External Examiner to be appointed by the University. Marks will be awarded jointly by the Internal and External Examiners on the basis of the written Dissertation and Viva-voce.

(SOC-DSE-1)

Sociology of Movements

Movements reflect the voices raised against the prevailing practices of a society. Every society witnesses social movement in some form or the other. Movements bring social change and transformation. It is a collective effort that is driven by particular issues and brings forth changes. The present paper tries to provide a rudimentary impression to the students about the concept, nature and types of movements with a thrust on the movements witnessed by Indian society.

Objectives:

- To introduce to the students with the concept of social movements and their dynamics.
- To introduce the students to the role of social movements in social transformation .
- To help them understand the various approaches to the study of social movements.

Learning Outcomes:The very aim of this paper is to disseminate knowledge about the concept of social movements and its process and change making role in the society.

**Unit:1Social Movements:Nature, Definitions, Characteristics of social movement ,types: Revolutionary, Reform, Revival, Counter movements
Basis of social movements: Leadership, ideology, resource**

**Unit-2 Religious movements in India: The SNDP Movements in Kerala
The Brahmo Samaj and The Arya Samaj**

**Unit-3 Peasants Movements in India: The Champaran Satyagraha
(1917), The Kheda Peasant Struggle, The Bardoli Movement in Gujarat.
The Peasant Revolt in Telangana ,The Tebhaga Movement in Bengal.**

**Unit-4 Backward Class Movements in India: Mahar Movement in
Maharashtra, Dalit Movement in Tamil Nadu, The Non Brahmin
Movement in Tamil Nadu**

**Unit-5 Women's Movements in India: In the Pre independence era and
the post independence period**

Essential readings:

1. Foweraker Joe, 1995 Theorising Social Movements, Pluto Press, London,
2. Buechler, S. 1997 'New Social Movement Theories' in Buechler, S. and Cylke, F.K., Jr. (eds.) Social Movements: Perspectives and Issues. Mountain View: Mayfield Publishing Company
3. Rao, M.S.A. ed. 1979 Social Movements in India Vol. I and II, Manohar, New Delhi
4. Dhanagare, D.N. 1983 Peasant Movements in India 1920-1950, OUP, Delhi, 1983
5. Kaur, Manmohan, 1968 "Role of Women in the Freedom Movement 1857-1947", Sterling, New Delhi
6. Basu, Aparna, 1976 "Role of Women in the Freedom Movement", in B.R. Nanda, ed, Indian Women From Purdah to Modernity, Vikas, Delhi.
7. Chattopadhyaya, Kamaladevi, 1983 "Indian Women's Battle for Freedom", Abhinav Publications, New Delhi

(SOC-DSE-2)

Industrial Sociology

Industrialisation as a social process has changed the face of humanity over the years. Industrialisation in its wake has brought several social problems and changes in social institutions, practices. The aim of this paper is to analyse the structure and process of industrial organisations from the sociological perspective. It also deals with the social effects of industrialization on Indian Social Systems and institutions.

Objectives: After going through this paper, the student can

- Understand the nature and scope of industrial sociology as a branch of Sociology.
- The developmental stages of industry.
- The organizational structure of industries and employee and employer relations in the industry.

Learning Outcomes:The very aim of this paper is to impress upon the students of sociology the role they can play in creating effective industrial relations with their knowledge of sociology.

Unit-I Introduction:

Meaning and definition of Industrial sociology. Nature and scope of Industrial Sociology. Significance of Industrial Sociology in India.

Unit-2 Social – industrial Thought:

A. Classical Theories: Adam Smith, Karl Marx, Max Weber, Durkheim and Mayo

B. Sociological Theories: Likert, Herzberg, Maslow, McClelland.

Unit-3 The Development of Industry:

The Manorial system, the Guild system, Domestic system, the Factory system. Industrial evolution in India.

Unit-4 Industrial Organisation:

Formal Organisation: Its nature and features, problems build-in in the formal organization Informal Organisation: Origin and function of informal organization. Informal Organisation of Management.

Unit-5 Industrial and Labour Relations:

Industrial Relations, International Labour Organisation, Labour Legislation, Industrial Relations in India. Industrial Disputes/conflicts.

Workers' participation in Management (WPM): Industrial Democracy: Levels of participation of WPM: Objectives, WPM Models in India.

Reference:

1. Gisbert, Pascal, 1972 Fundamentals of Industrial Sociology, New Delhi, Tata McGraw Hill
2. Davis, Keith, 1984 Human Behaviour at work, New Delhi, McGraw Hill
3. Ramaswamy, E.A. 1978 Industrial Relations in India, Delhi, MacMillan
4. Schneider, Eugene 1971 Industrial Sociology, McGraw Hill- London

(SOC-DSE-3)

Population Studies

Demography is both an index and instrument of development and change. India as a country is plagued by population explosion which retards, the economy and blocks social progress. Irrespective of several positive attempts undertaken by the government, India has failed to control its population problem. This paper is designed to provide an idea to the students about population dynamics and its impact on society.

Objectives: After going through this paper, the student can

- Understand the various facets of population studies and the theories that depict population change.
- Develop specific idea on Indian population structure, policies adopted and programmes launched in the country to check population.
- Assess the role of various agencies in population control.

Learning Outcomes:The very aim of this paper is to acquaint the students with a perennial problem of the Indian society that is population growth and the measures introduced to control it.

Fertility, Mortality and Migration

UNIT – 2 Population Theories: Malthusian, Demographic Transition and Optimum

Population Theory

UNIT – 3 Population Compositions in India: Age Structure, Sex-Ratio, Rural-Urban Composition, Literacy in India

UNIT – 4 Population Planning and Policies: Needs and Objectives; Population Policy of India, National Rural Health Mission

Unit-5 Population Control: Role of technology, women's empowerment, voluntary organisations

Essential Readings:

1. Agarwal, S.N. 1989 Population Studies with Special Reference to India, New Delhi: Lok Surjeet Publication.
2. Bose, Ashish 1991 Demographic Diversity in India, Delhi: B.R.Publishing Corporation.
3. Banarjee, D. 1985 Health and Family Planning Services in India, New Delhi: Lok Parkshan.
4. Chandrasekhar, S. (ed.) 1974 Infant Mortality, Population Growth and Family Planning in India, London: George Alen and Unwin Ltd.
5. Dubey, Surendra Nath 2001 Population of India, Delhi: Authors Press.
6. Kohli, S. 1977 Family Planning in India, New Delhi.
7. Malthus, T.R. 1986 An Essay on the Principle of Population, London: William Pickering.
8. Premi, M.K. 2004 Social Demography, Delhi: Jawahar Publishers and Distributors.
9. Sharma, Rajendra 1997 Demography and Population Problems, New Delhi: Atlantic Publishers.
10. Srivastava, O.S. 1998 Demography and Population Studies, New Delhi: Vikas Publishing House.
11. National Rural Health Mission 2006 Govt. of India, New Delhi.

(SOC-DSE-4)

Sociology of Social Institutions

Social institutions play a significant role in the functioning of a society by regulating the activities of the individuals and fulfilling their needs. Though they are universal to every society, they are not uniform in their characteristics and in terms of the norms they prescribe. They vary from society to society and across cultures. The present paper is designed to introduce to the students the basic social institutions which are fundamental to the lives of the people and significant to the functioning of the society.

Objectives: After going through this paper, the student can

- Understand the basic institutions which are vital to the functioning of the society.
- Learn the variations in the structure and functioning of these institutions across time and societies.
- Get an idea about the emerging features of these institutions.

Learning Outcomes: The very aim of this paper is to impress upon the students the vital role played by the institutions in social life, their typologies and changing features and functions.

Unit-1 Community, Groups, Institutions and Organizations.

Unit-2 Family, Marriage and Kinship: Key concepts; Different forms of family and marriage; Changes in family pattern worldwide; Importance of Kinship.

Unit-3 Religion : Defining religion; Varieties of religion; Theories of religion.

Unit-4 Education : The development of literacy and schooling; Gender and the education system; Education and ethnicity; Theories of schooling; Education and cultural reproduction; Education and inequality

Unit-5 Economy : Importance of work; Organisation of work; Work and technology; Formal Economy and Informal Economy; Market and Society.

Polity: Modern State; Concepts of Power and Authority; Forms of social distribution of power : Marxist, Elitist, Pluralist

Essential readings:

1. Ken Browne : An Introduction to Sociology ,Polity, 3rd ed.
2. Anthony Giddens : Sociology (4th ed) : Human Societies
3. Bilton and others : Introductory Sociology ,Macmillan
4. G. Rocher : A General Introduction to Sociology
5. P. Worsely : New Introducing Sociology
6. Smelser, Neil.J Sociology
7. S.K.Pramanik & R.Ganguly(eds) : Globalization in India ,PHI Learning

(SOC-GE-1)

Introduction to Sociology

This introductory paper intends to acquaint the students with Sociology as a social science and the basic concepts used in the discipline. It also focuses on the social processes and the social institutions that man encounters as a member of the society.

Objectives: After studying these two papers, the student can

- Can get to know the convergence and divergence of Sociology with other social science disciplines in terms of the subject matter, nature and scope of the discipline and its approach.
- Develop knowledge about its historicity.
- Can get acquainted with the basic concepts used in the subject.
- Can generate ideas about the social processes and social institutions man encounters as a member of the society.

Learning Outcomes: This paper is expected to clarify and broaden the student's notion about the subject, the basic concepts used and some universal societal processes. This will provide a wholesome picture about what the subject is all about.

Unit-1: Sociology: Definition and Subject matter, Nature and Scope, Emergence of Sociology, Sociology and its relationship with Anthropology, Political Science, Economics, and History

Unit-2: Basic Concepts: Society, Culture, Community, Institutions, Association, Social Structure, Status and Role, Norms and Values, Folkways and Mores, Associative and Dissociative processes – Cooperation, Assimilation, Accommodation, Competition, and conflict

Unit-3 : Individual and Society : Individual and society, Socialization, Stages and Agencies of Socialization, Development of Self – Contributions of George Herbert Mead, C.H. Cooley's Looking Glass Self The Concept of Group : Types of Groups – Primary and Secondary groups, In-Group and Out-group, Reference Group

Unit-4: Social Stratification: Meaning and definition, Dimensions of Stratification, Theories of Stratification – Functionalist, Marxist, Weberian. Social mobility and its determinants.

Unit-5: Social Control: Meaning and types, Formal and Informal social control, Agencies of Social control

Essential readings:

1. Bottomore. T.B. 1972, Sociology: A guide to problems and literature. Bombay :George Allen and Unwin (India)
2. Harlambos, M.1998. Sociology: Themes and perspectives. New Delhi Oxford University Press
3. Inkeles, Alex, 1987. What is Sociology? New Delhi: Prentice-Hall of India
4. Jaikam, No. 1988 . What is Sociology .Madras:Macmillan, India :
5. Johnson, Harry M. 1995. Sociology: A Systematic Introduction. New Delhi , Allied Publishers
6. Schaefer, Richard T. and Robert P. Lamm. 1999 Sociology. New Delhi Tata-Mac Graw Hill.

(SOC-GE-2) Indian Society

Every society has its own peculiar structure and there are some institutions universal to every society, but with their unique manifestations in each society. There are some change agents and initiatives that enable the society to change with the passage of time. This paper focuses on the structure of the Indian society and the changing aspects with the processes operating, change agents and initiatives.

Objectives: After studying these two papers on Indian society, the student can

- Get an impression about the basic composition of Indian society, its historical moorings, basic philosophical foundations of the society and the institutions.
- Learn about the changing institutions, the processes, the agents and the interventions that bring about change in the Indian society.

Learning Outcomes: This paper is expected to bring familiarity in a student about Indian society. It will present a comprehensive, integrated and empirically –based profile of Indian society. It is hoped that the structure and processes operative in the society, the change agents operating in Indian society presented in this course will also enable students to gain a better understanding of their own situation and region.

Unit-1 : Composition of Indian Society : Caste, Tribe, Religion, Language. Unity in Diversities, Threats to national integration

Unit-2 Hindu Social Organisation: Bases of Hindu Social Organization, Varna, Ashrama and Purushartha. Doctrine of Karma.

Unit-3 : Marriage and Family in India: Hindu marriage as Sacrament, Forms of Hindu Marriage. The Hindu joint family: Patriarchal and Matriarchal systems. Marriage and family among the Muslims. Changes in the institutions of Marriage and Family.

Unit-4 : The Caste system in India: Origin, Features and Functions. Caste and Class, The Dominant Caste, Changes in Caste system, Caste and Politics in India Constitutional and legal provisions for the Scheduled Castes, Scheduled Tribes.

**Unit-5 : Social Change in Modern India :
Sanskritization, Westernization, Secularization,
and Modernization**

Essential readings:

11. Bose, N.K. 1967, Culture and Society in India. Bombay :

Asia Publishing House

12. Bose, N.K. 1975, Structure of Hindu Society. New Delhi
13. Dube, S.C. 1990, Society in India.(New Delhi: National Book Trust.)
14. Dube, S.C. 1995, Indian Village (London : Routledge)
15. Dube, S.C. 1958: India's changing Villages (London: Routledge and Kegan Paul).
16. Karve, Irawati, 1961 : Hindu Society : An Interpretation(Poona : Deccan- College) :: Lannoy,
17. Mandelbaum, D.G. 1970 : Society in India (Bombay: Popular Prakashan)
18. Srinivas, M.N. 1980 : India: Social Structure (New Delhi: Hindustan - Publishing Corporation)
19. Srinivas, M.N. 1963: Social Change in Modern India (California, Berkeley: University of California Press).
20. Singh, Yogendra, 1973: Modernization of Indian Tradition (Delhi: Thomson Press).

(SOC-GE-3)

Sociological Thought

Sociology originated as an intellectual response to the crisis confronting the mid nineteenth century European society. Its development over two centuries has been influenced by a variety of socio-economic and political conditions. It is now established as a multi-paradigmatic academic discipline, with its body of theoretical knowledge enriched and its methodological techniques and procedures systemized. This paper is intended to familiarize the students with the social, political, economic and intellectual contexts in which sociology emerged as a distinctive discipline. It deals with the contributions of the forerunners of the discipline and with the contributions of the founders who gave a systematic shape to the subject.

Objectives: After going through these two papers, the student can

- Gain an understanding of some of the classical contributions in Sociology, and their contemporary relevance.
- Learn about the methodological shift in the discipline over the years.

Learning Outcomes:This paper is expected to clarify and broaden the student's knowledge about the theoretical and methodological contributions of the classical contributors to the subject and the contemporary relevance of these theories.

Unit-1 : Auguste Comte : Law of the Three Stages, Hierarchy of

Sciences, Positivism Unit-2 : Herbert Spencer : Organismic

Analogy, Theory of Social Evolution

Unit-3 : Karl Marx : Dialectical Materialism, Class struggle, Alienation, Sociology of Capitalism

Unit-4 : Emile Durkheim : Division of Labour in Society, Rules of Sociological Method, Theory of Suicide.

Unit-5 : Max Weber : Social Action, Protestant ethic and the spirit of capitalism, Ideal type, Bureaucracy, Authority

Essential readings:

1. Aron, Ramond. 1967(1982 reprint) Main currents in sociological thoughts (2 volumes). Harmondsworth, Middlesex: Penguin Books
2. Barnes, H.E. 1959. Introduction to the history to the sociology The University of Chicago press
3. Coser, Lewis A. 1979. Masters of Sociological Thought. New York : Harcourt Brance Jovanovich
4. Fletcher, Ronald. 1994.The Making of Sociology (2 volumes) Jaipur-Rawat
5. Morrison, Ken.1995 Marx, Durkheim, Weber: Formation of Modern Social Thought. London; sage
6. Ritzer, George. 1996. Sociological Theory New Delhi. Tata-McGraw Hill
7. Singh, Yogendra. 1986 Indian Sociology: social conditioning and emerging Trends. New Delhi: Vistaar
8. Zeitlin, Irving.1998 (Indian Edition). Rethinking Sociology: A critique of Contemporary Theory. Jaipur: Rawat.

(SOC-GE-4)

Social Change and Development

Change is the law of nature and every society is subject to change. Social change has always been a central concern of Sociological study. Change takes different forms. Change has its pattern which is spelt out by various theories. Change is often propelled by various factors. This paper is designed to provide some ideas to the student about such process, theories and factors.

Objectives: After going through this paper, the student can

- Derive knowledge about the meaning, nature, forms and patterns of

change.

- Get an idea about the theories that explain change and their adequacy in explaining so.
- Get an impression about the factors that propel change in the society.

Learning Outcomes: This paper is expected to provide a wholesome idea to the students about the process of social change. They can relate their experience with the theoretical explanations.

Unit-1 : Social Change : Meaning and nature. Social Progress, Evolution and Development.

Unit-2 : Theories of Social Change : Evolutionary theory, Cyclical theory, Conflict Theory, Functionalist theory.

Unit-3 : Factors of Social Change: Cultural, Economic, Technological, Ideological, Demographic

Unit-4 : Economic Growth and Social Development : Indicators of Social Development, Human Development Index, Gender Development Index

Unit-5 : Models of Development : Capitalist, Socialist, and Gandhian.

Essential readings:

1. Moore, W.E. 1965 Social Change, Prentice-Hall of India. New Delhi
2. Gandhi M.K., Hind Swaraj
3. Schumacher, E.F., Small is Beautiful
4. Narain, Shreeman, Principles of Gandhian Planning
5. Mishra, B., Capitalism, Socialism and Planning.
6. UNDP, Human Development Report

	Skill Development
	Employability
	Entrepreneurship
	All the three
	Skill Development and Employability
	Skill Development and Entrepreneurship
	Employability and Entrepreneurship

SYLLABUS FOR B.COM HONS.						
B.Com. Hons. (CBCS) for the Academic Year 2015-16						
	Course Structure	Category	Marks			Credits
	Semester I		Theory	Practical /Internal	Total	
BCH-1.1	Environmental Science	AECC-1	80	20 (I)	100	4
BCH-1.2	Financial Accounting	Core -1	80	20 (I)	100	6
BCH-1.3	Business Law	Core -2	80	20 (I)	100	6
BCH-1.4	Micro Economics	GE-1	80	20 (I)	100	6
Total			320	80	400	22
	Semester-II					
BCH-2.1	English Communication	AECC-2	80	20 (I)	100	4
BCH-2.2	Corporate Accounting	Core -3	80	20 (I)	100	6
BCH-2.3	Corporate Laws	Core -4	80	20 (I)	100	6
BCH-2.4	Macro Economics	GE-2	80	20 (I)	100	6
Total			400	100	400	26
	Semester III					
BCH-3.1	Human Resource Management	Core-5	80	20 (I)	100	6
BCH-3.2	Income-tax Law and Practice	Core -6	80	20 (I)	100	6
BCH-3.3	Management Principles and Application	Core -7	80	20 (I)	100	6
BCH-3.4	Business Statistics	GE-3	80	20 (I)	100	6
BCH-3.5	E-Commerce(Compulsory)	SEC-2	80	20 (I)	100	4
Total			400	100	500	28
	Semester IV					
BCH-4.1	Cost and Management Accounting	Core -8	80	20 (I)	100	6
BCH-4.2	Business Mathematics	Core -9	80	20 (I)	100	6

BCH-4.3	Computer Applications in Business	Core -10	80	20 (I)	100	6
BCH-4.4	Indian Economy - Performance and Policies	GE-4	80	20 (I)	100	6
BCH-4.5	Entrepreneurship(Compulsory)	SEC-3	80	20 (I)	100	4
	Total		400	100	500	28

	Course Structure		Category	Theory	Practical / Internal	Total	Credits
	Semester V						
BCH-5.1	Principles of Marketing		Core -11	80	20 (I)	100	6
BCH-5.2	Fundamentals of Financial Management		Core -12	80	20 (I)	100	6
BCH-5.3	DSE-1 (Any one of the following)		DSE-1	80	20 (I)	100	6
	A. Accounting and Finance	Financial Markets , Institution and Services					
	B. Banking and Insurance	Indian Banking and Insurance System					
	C. Financial Markets	Indian Financial System					
BCH-5.4	DSE-2 (Any one of the following)		DSE-2	80	20 (I)	100	6
	A. Accounting and Finance	Financial Statement Analysis and Reporting					
	B. Banking and Insurance	Merchant Banking and Financial Services					
	C. Financial Markets	Financial Institutions and Services					
	Total			320	80	400	24
	Semester VI						
BCH-6.1	Auditing and Corporate Governance		Core -13	80	20 (I)	100	6
BCH-6.2	Indirect Tax Law		Core-14	80	20 (I)	100	6
BCH-6.3	DSE-3 (Any one of the following)		DSE-3	80	20 (I)	100	6
	A. Accounting and Finance	Corporate Tax Planning					
	B. Banking and Insurance	Fundamentals of Investment					
	C. Financial Markets	Financial Market Operations					
BCH-6.4	Business Research Methods and Project Work*		DSE-4	50	50(I)	100	6
	Total			290	110	400	24

Grand Total				2600 (Min)	148 (Min)
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B.Com. (Hons.): Semester - I
**Paper BCH-1.1: Environmental
Science**

Duration: 3 hrs.

Marks: 100 (80+20)

Lectures: 65

Objectives: To provide information on environmental science, its resources and Management.

Contents:

Unit - I

The Environment: The Atmosphere, Hydrosphere, Lithosphere, Biosphere, Ecology, Ecosystem, Biogeochemical Cycle (Carbon Cycle, Nitrogen Cycle).

Unit – II

Environment Pollution: Air Pollution, Water Pollution, Soil Pollution, Noise Pollution, Thermal Pollution, Radiation Pollution, Natural Disasters and their Management.

Unit – III

Population Ecology: Individuals, Species, Pollution, Community, Control Methods of Population, Urbanization and its effects on Society, Communicable Diseases and its Transmission, Non-Communicable Diseases.

Unit- IV

Environmental Movements in India: Grass root Environmental movements in India, Role of women, Environmental Movements in Odisha, State Pollution Control Board, Central Pollution Control Board.

Unit – V

Natural Resources: Conservation of Natural Resources, Management and Conservation of Wildlife, Soil Erosion and Conservation, Environmental Laws: Water Act, 1974, Air Act, 1981, The Wildlife (Protection) Act, 1972, Environment Protection, 1986.

Learning Outcomes: After completion of this paper, students would be able to analyze the ways in which the natural environment and the society impact the establishment and continuation of business. Along with that, they would also gain knowledge about the ways and means of managing the natural resources for the benefit of both i.e. the business and the society thereby creating a win-win situation.

BOOKS FOR REFERENCE:

- ✓ *Text Book of Environmental Studies, D.K.Asthana, DrMeeraAsthana, S.Chand*
- ✓ *Environmental Studies – Sanjay Ku. Batra / KanchanBatra/ H.K.Kaur / Parul Pant – Taxmann Pub.*
- ✓ *Principles of Environmental Studies–P. C. Manoharachary & P. J. Reddy B. S. Pub., 2004*
- ✓ *Introduction to an Environmental Science–Y. Anjaneyulu, B. S. Pub. 2004.*
- ✓ *Ecology–Subramanyam & Sambamurty, Narosa Pub. House, 2000.*
- ✓ *A Text Book in Environmental Science–V. Subramaniam, Narosa Pub. House, 2000*
- ✓ *Managing Industrial Pollution –S. C. Bhatia, Mac Millan, 2003.*
- ✓ *Man and Environment–Dash and Mishra, Mac Millan*
- ✓ *Environment and Society–Mishra and Dash, Mac Millan*
- ✓ *Text Book of Environmental Science–Panigrahi and Sahu, Sadgranth Mandir.*
- ✓ *Environment and Ecology, De and De, S.Chand*
- ✓ *Environmental Management, G.N.Pandey, Vikash Publishing*

B.Com. (Hons.): Semester - I **Paper BCH 1.2: Financial** **Accounting**

Duration: 3 hrs.

Marks: 100 (80+20)

Lectures: 65

Objectives: The objective of this paper is to help students to acquire conceptual knowledge of financial accounting and to impart skills for recording various kinds of business transactions.

Contents

Unit 1. (a) Theoretical Framework

- i. Accounting as the language of business and an information system, the users of financial accounting information and their needs. Qualitative characteristics of accounting information. Functions, advantages and limitations of accounting. Branches of accounting. Bases of accounting; cash basis and accrual basis.
- ii. The nature of financial accounting principles – Basic concepts and conventions: entity, money measurement, going concern, cost, realization, accruals, periodicity, consistency, prudence (conservatism), materiality and full disclosures and Accounting Equation.

(b) Accounting Process

From recording of business transactions to the preparation of trial balance including adjustments: journal, sub-division of journal, ledger accounts, trial balance

Unit 2. Business Income

- i. Measurement of business income-Net income: the accounting period, the continuity

doctrine and matching concept. Objectives of measurement and revenue recognition.

ii. Depreciation Accounting: The accounting concept of depreciation. Factors in the measurement of depreciation. Methods of computing depreciation: straight line method and

diminishing balance method; Disposal of depreciable assets-change of method. Salient features of Accounting Standard 6 (AS- 6) issued by ICAI

iii. Inventory Accounting: Meaning. Significance of inventory valuation. Inventory Record Systems: periodic and perpetual. Methods: FIFO, LIFO and Weighted Average. Salient features of Accounting Standard 2 (AS- 2) issued by ICAI

Unit 3. Final Accounts

Capital and revenue expenditures and receipts: general introduction only. Preparation of financial statements of Sole Trade and Partnership Business with adjustments

Unit 4. Hire Purchase and Installment Systems and Accounting for Branch & Department

- i. Concepts of operating and financial lease (theory only)
- ii. Departmental Accounting and Branch Accounting including foreign branch (Theory and Problem)

Unit 5. Accounting for Partnership Firm

Accounting of Admission of partner, Retirement and Death of partner and Dissolution of the Partnership Firm Including Insolvency of partners

Learning Outcomes: The course structure of this paper would equip the students to get in-depth knowledge of financial accounting along with its practical application thereby giving an opportunity to gain easy access to this competitive business world.

Suggested Readings:

1. Anthony, R.N. Hawkins, and Merchant, *Accounting: Text and Cases*. McGraw-Hill Education.
2. Bal Ranjan Kumar, *Financial Accounting* – S. Chand
3. Bansal.K.M - *Financial Accounting* – Taxman Publication
4. Deepak Sehgal, *Financial Accounting* – Vikash Publication
5. Horngren, *Introduction to Financial Accounting*, Pearson Education.
6. Monga, J.R. *Financial Accounting: Concepts and Applications*. Mayoor Paper Backs, New Delhi.
7. Shukla, M.C., T.S. Grewal and S.C.Gupta. *Advanced Accounts. Vol.-I*. S. Chand & Co., New Delhi.
8. Maheshwari, S.N. and. S. K. Maheshwari. *Financial Accounting*. Vikas Publishing House, New Delhi.
9. Sehgal, Ashok, and Deepak Sehgal. *Advanced Accounting. Part –I*.Taxmann Applied Services, New Delhi.
10. Bhushan Kumar Goyal and HN Tiwari, *Financial Accounting*, International Book House
11. Goldwin, Alderman and Sanyal, *Financial Accounting*, Cengage Learning.
12. Tulsian, P.C. *Financial Accounting*, **S. Chand**.
8. Jain, S.P. and K.L. Narang. *Financial Accounting*, Kalyani Publishers, New Delhi

9. Gupta, Nirmal. *Financial Accounting*, Sahitya Bhawan, Agra.

10. *Compendium of Statements and Standards of Accounting*. The Institute of Chartered Accountants of India, New Delhi

B.Com. (Hons.):
Semester - I Paper BCH
1.3: Business Law

Duration: 3 hrs.

Marks: 100 (80+20)

Lectures: 65

Objective: The objective of the course is to impart basic knowledge of the important business laws along with relevant case laws.

Contents:

Unit I: The Indian Contract Act, 1872: General Principle of Law of Contract

- a) Contract – meaning, characteristics and kinds
- b) Essentials of valid contract - Offer and acceptance, consideration, contractual capacity, free consent, legality of objects.
- c) Void agreements
- d) Discharge of contract – modes of discharge including breach and its remedies.
- e) Contingent contracts
- f) Quasi - contracts

Unit II: The Indian Contract Act, 1872: Specific Contracts

- a) Contract of Indemnity and Guarantee
- b) Contract of Bailment
- c) Contract of Agency

Unit III: The Sale of Goods Act, 1930

- a) Contract of sale, meaning and difference between sale and agreement to sell.
- b) Conditions and warranties
- c) Transfer of ownership in goods including sale by non-owners
- d) Performance of contract of sale
- e) Unpaid seller – meaning and rights of an unpaid seller against the goods and the buyer.

Unit IV: Partnership Laws

The Partnership Act, 1932

- a. Nature and Characteristics of Partnership
- b. Registration of Firms
- c. Types of Partners
- d. Rights and Duties of Partners
- e. Implied Authority of a Partner
- f. Incoming and outgoing Partners
- g. Mode of Dissolution of Partnership

Unit V: The Negotiable Instruments Act 1881

- a) Meaning and Characteristics of Negotiable Instruments : Promissory Note, Bill of Exchange, Cheque

- b) Holder and Holder in due Course, Privileges of Holder in Due Course.
- c) Negotiation: Types of Endorsements

- d) Crossing of Cheque
- e) Bouncing of Cheque

Learning Outcomes: The students would be able to deal with the legal aspect of different business situations.

Suggested Readings:

1. Arora Sushma – Business Law – Taxmann Publication
2. Kuchhal, M.C. and Vivek Kuchhal, *Business Law*, Vikas Publishing House, New Delhi.
3. Tulsian, P.C, Business Law, S.Chand
4. Gogna P.P.S, Business & Industrial Law, S.Chand
5. Singh, Avtar, *Business Law*, Eastern Book Company, Lucknow.
6. Maheshwari & Maheshwari, *Business Law*, National Publishing House, New Delhi.
7. Chadha, P. R., *Business Law* Galgotia Publishing Company, New Delhi.
8. Aggarwal S K, Business Law, Galgotia Publishers Company, New Delhi.
9. GoyalBhushan Kumar and Jain Kinneri, Business Laws, International Book House
10. Ravinder Kumar, Legal Aspects of Business, Cengage Learning

B.Com. (Hons.): Semester - I Paper BCH-1.4: Micro Economics

Duration: 3 hrs.

Marks: 100 (80+20)

Lectures: 65

Objective: Objective of the course is to acquaint the students with the concepts of micro-economics dealing with consumer behaviour. The course also makes the student understand the supply side of the market through the production and cost behaviour of firms.

Contents:

Unit I: Demand and Consumer Behaviour

Concepts of revenue: Marginal and Average: Revenue under conditions of Perfect and imperfect competition, Elasticity of demand: price, income and cross. Consumer Behaviour: Indifference curve analysis of consumer behavior; Consumer's equilibrium, Price elasticity and price consumption curve, income consumption curve and Engel curve, price change and income and substitution effects.

Unit II: Production and Cost

Production iso-quants, marginal rate of technical substitution, economic region of production, optimal combination of resources, the expansion path, returns to scale using iso-quants
Cost of Production: Social and private costs of production, long run and short run costs of production.

Unit III: Perfect Competition

Perfect competition: Assumptions, Equilibrium of the firm and the industry in the short and the long-run, including industry's long run supply curve. Measuring producer surplus under perfect competition

Unit IV: Monopoly

Monopoly: Monopoly short run and long run equilibrium. Shifts in demand curve and the absence of the supply curve. Measurement of monopoly power and the rule of thumb for pricing, Horizontal and vertical integration of firms

Unit V: Imperfect Competition

Monopolistic Competition and Oligopoly: Monopolistic competition price and output decision-equilibrium. Monopolistic Competition and economic efficiency Oligopoly and Interdependence

Learning Outcomes: The students would be able to apply tools of consumer behaviour and firm theory to business situations.

Suggested Readings:

1. Ahuja, H.L, Micro Economics, S.Chand
2. Dwivedi, D.N. Micro Economics, Vikash Publication
3. Mehta P.K, Singh M. – Micro Economics – Taxmann Publication
4. Pindyck, R.S., D. L. Rubinfeld and P. L. Mehta; *Microeconomics*, Pearson Education.
5. N. Gregory Mankiw, Principles of Micro Economics, Cengage Learning
6. Browning, E.K. and J.M. Browning; *Microeconomic Theory and Applications*, Kalyani Publishers, New Delhi.
7. Gould, J.P. and E.P. Lazear; *Microeconomic Theory*, All India Traveller Bookseller, New Delhi.
8. Lipsey, R.G. and K.A. Chrystal; *Economics*, Oxford University Press.
9. Maddala G.S. and E. Miller; *Microeconomics: Theory and Applications*, McGraw-Hill International.
10. Salvatore, D. *Schaum's Outline of Theory and Problems of Microeconomic Theory*, McGraw-Hill, International Edition.
11. Bilas, Richard A. *Microeconomic Theory: A Graphical Analysis*, McGraw-Hill Book Co. Kogakusha Co. Ltd.
12. Amit Sachdeva, *Micro Economics*, KusumLata Publishers.

B.Com. (Hons.): Semester - II

Paper BCH-2.1: English

Communication

Skill Enhancement Compulsory Course for Commerce

Duration: 3hrs.

Marks: 100 (80+20)

Lectures: 65

Paper: 1

The purpose of this course is twofold: to train students in communication skills and to help develop in them a facility for communicative English.

Since language it is which binds society together and serves as a crucial medium of interaction as well as interchange of ideas and thoughts, it is important that students develop a capacity for clear and effective communication, spoken and written, at a relatively young age. The need has become even more urgent in an era of globalization and the increasing social and cultural diversity that comes with it.

English, being a global language par excellence, it is important that any course in communication is tied to an English proficiency programme. The present course will seek to create academic and social English competencies in speaking, listening, arguing, enunciation, reading, writing and interpreting, grammar and usage, vocabulary, syntax, and rhetorical patterns.

Students, at the end of the course, should be able to unlock the communicator in them by using English appropriately and with confidence for further studies or in professional spheres where English is the indispensable tool of communication.

Unit 1

[20]

Introduction

1. What is communication?

2. Types of communication

- Horizontal
- Vertical
- Interpersonal
- Grapevine

3. Uses of Communication

Prescribed Reading: Chapter 1 *Applying Communication Theory for Professional Life: A Practical Introduction* by Dainton and Zelle

<http://tsime.uz.ac.zw/claroline/backends/download.php?url=L0ludHJvX3RvX2NvbW11bmljYXRpb25fVGh1b3J5LnBkZg%3D%3D&cidReset=true&cidReq=MBA563>

Unit-2

[20]

Language of Communication

1. Verbal: spoken and written

2. Non-verbal

- Proxemics
- Kinesics
- Haptics
- Chronemics

- Paralinguistics

3. Barriers to communication

4. Communicative English

Unit-3

[20]

Reading Comprehension

- Locate and remember the most important points in the reading
- Interpret and evaluate events, ideas, and information
- Read “between the lines” to understand underlying meanings
- Connect information to what they already know

Unit 4

Writing

[20]

1. Expanding an Idea
2. Writing a Memo
3. Report Writing
4. Creative Writing
5. News Story
6. Setting in Creative Writing
7. Writing a Business Letter
8. Letters to the Editor
9. Précis Writing
10. CV & Resume Writing
11. Dialog writing
12. Covering Letter
13. Writing Formal Email
14. Elements of Story Writing
15. Note Making
16. Information Transfer
17. Interviewing for news papers

Unit-5

[20]

Language functions in listening and conversation

1. Discussion on a given topic in pairs
2. Speaking on a given topic individually
3. Group Discussion
4. Interview
5. Dialogue

(Practice to be given using speaking activities from the prescribed textbook)

Grammar and Usage

1. Simple and Compound Sentences
2. Complex Sentences
3. Noun Clause
4. Adjective Clause
5. Adverb Clause
6. The Conditionals in English
7. The Second Conditional
8. The Third Conditional
9. Words and their features
10. Phrasal Verbs
11. Collocation
12. Using Modals
13. Use of Passives
14. Use of Prepositions
15. Subject-verb Agreement
16. Sentence as a system
17. Common Errors in English Usage

Examination pattern

Each reading and writing question will invite a 200 word response.

Midterm test

[20 marks]

Unit 1 (preferably short questions on types and uses of

communication) Total

20 marks

Final Semester Examination

Unit 2	One long question with choice Two short notes with choice	01x 10 qns= 10 marks 02x 05 qns= 10 marks
Unit 3	Reading: 04 questions (2 prose and 2 poetry questions)	04 x 05 qns= 20 marks
Unit 4	Writing: 02 questions	02x 10 qns = 20 marks
Unit 5	Grammar & Usage	02x10 qns = 20 marks
Total		= 80 marks

Grammar questions must be set in contexts; not as isolated sentences as used for practice in the prescribed textbook.

Book Prescribed:

Vistas and Visions: An Anthology of Prose and Poetry. (Ed.) Kalyani Samantray, Himansu S.

Texts to be studied

Prose

- The Last Leaf
- Ecology and Society
- How Wealth Accumulates and Men Decay
- The Open Window

B.Com. (Hons.): Semester - II

Paper BCH-2.2: Corporate Accounting

Duration: 3 hrs.

Marks: 100(80+20)

Lectures: 65

Objectives: To help the students to acquire the conceptual knowledge of the corporate accounting and to learn the techniques of preparing the financial statements.

Contents:

Unit 1. Accounting for Share Capital & Debentures

Issue of shares, forfeiture and reissue of forfeited shares- concept & process of book building, Issue of rights and bonus shares; Buy back of shares, Redemption of preference shares. Issue and Redemption of Debentures

Unit 2 Final Accounts

Preparation of profit and loss account and balance sheet of corporate entities (excluding calculation of managerial remuneration) Disposal of company profits

Unit 3. Valuation of Goodwill and Valuation of Shares

Concepts and calculation - simple problem only

Unit 4 Amalgamation of Companies

Concepts and accounting treatment as per Accounting Standard: 14 (ICAI) (excluding intercompany holdings). Internal reconstruction: concepts and Accounting treatment excluding scheme of reconstruction

Unit 5 Liquidation of Company

Meaning of liquidation, modes of winding up, consequences of winding up, statement of affairs, liquidator's final statement of account, list 'B' contributories

Learning Outcomes: This paper can provide conceptual clarity about the techniques to prepare financial statements of companies along with accounting treatment of various situations viz. floating of shares, amalgamation and liquidation of companies.

Suggested Readings:

1. Monga, J.R. *Fundamentals of Corporate Accounting*. Mayur Paper Backs, New Delhi.
2. Tulsian, P.C, *Corporate Accounting*, S. Chand
3. Shukla, M.C., T.S. Grewal, and S.C. Gupta. *Advanced Accounts*. Vol.-II. S. Chand & Co., New Delhi.
4. Maheshwari, S.N. and S. K. Maheshwari. *Corporate Accounting*. Vikas Publishing House, New Delhi.
5. Sehgal, Ashok and Deepak Sehgal. *Corporate Accounting*. Taxman Publication, New Delhi.
6. Gupta, Nirmal. *Corporate Accounting*. Sahitya Bhawan, Agra.
7. Jain, S.P. and K.L. Narang. *Corporate Accounting*. Kalyani Publishers, New Delhi.
8. Compendium of Statements and Standards of Accounting. The Institute of Chartered Accountants of India, New Delhi.

9. Bhushan Kumar Goyal, *Fundamentals of Corporate Accounting*, International Book House

B.Com. (Hons.): Semester - II Paper BCH-2.3: Corporate Laws

Duration: 3 hrs.

Marks: 100 (80+20)

Lectures: 65

Objectives: *The objective of the course is to impart basic knowledge of the provisions of the Companies Act, 2013 and the Depositories Act, 1996. Case studies involving issues in corporate laws are required to be discussed.*

Contents:

UNIT I Introduction

Administration of Company Law [including National Company Law Tribunal (NCLT), National Company Law Appellate Tribunal (NCLAT), Special Courts]; Characteristics of a company; types of companies including one person company, small company, dormant company and producer company; association not for profit; formation of company, on-line filing of documents, promoters, their legal position. **(As per companies Act, 2013)**

UNIT II Documents

Memorandum of association, articles of association, GDR; book building; issue, allotment and forfeiture of share, transmission of shares, buyback and provisions regarding buyback; issue of bonus shares**(As per companies Act, 2013)**

UNIT III Management

Classification of directors, women directors, independent director, disqualifications, director identity number (DIN); appointment; Legal positions, powers and duties; removal of directors; managing director, meetings of shareholders and board; types of meeting, meeting through video conferencing, e-voting. Audit Committee, Nomination and Remuneration Committee, Stakeholders Relationship Committee, Corporate Social Responsibility Committee. **(As per companies Act, 2013)**

UNIT IV Dividends, Accounts, Audit–

Provisions relating to payment of Dividend, Provisions relating to Books of Account, Provisions relating to Audit, Auditors' Appointment, Rotation of Auditors, Auditors' Report.

Winding Up - Concept and modes of Winding Up.

Insider Trading, Whistle Blowing – Insider trading; meaning & legal provisions; Whistle blowing: Concept and Mechanism.

UNIT V Depositories Law:

The Depositories Act 1996 – Definitions; rights and obligations of depositories; participants issuers and beneficial owners; inquiry and inspections, penalty

Learning Outcomes: Students would acquire knowledge about the legal framework and the ways and means to deal with the legal aspect of different situations of corporate sector.

Suggested Readings:

1. Arora & Banshal, Corporate Law – Vikash Publication
2. Gogna, P.P.S – Company Law, S. Chand
3. MC Kuchhal *Corporate Laws*, Shri Mahaveer Book Depot. (Publishers).
4. GK Kapoor & Sanjay Dhamija, *Company Law*, Bharat Law House.
5. Reena Chadha and Sumant Chadha, *Corporate Laws*, Scholar Tech Press.
6. Gowar, LCB, *Principles of Modern company Law*, Stevens & Sons, London.
7. Ramaiya, *A Guide to Companies Act*, LexisNexis, Wadhwa and Butters worth.
8. *A Compendium of Companies Act 2013, along with Rules*, by Taxmann Publications.
9. Avtar Singh, *Introduction to company Law*, Eastern Book Company

B.Com. (Hons.): Semester - II Paper BCH-2.4: Macro Economics

Duration: 3 hrs.

Marks: 100(80+20)

Lectures: 65

Objectives: *The course aims at providing the student with knowledge of basic concepts of the macro economics. The modern tools of macro-economic analysis are discussed and the policy framework is elaborated, including the open economy.*

Contents:

Unit I

Introduction – concepts and variables of macro-economics, income, expenditure and the circular flow, components of expenditure. Static macro economic analysis short and the long run – determination of supply, determination of demand, and conditions of equilibrium

Unit II

Economy in the short run – IS–LM framework, fiscal and monetary policy, determination of aggregate demand, shifts in aggregate demand, aggregate supply in the short and long run, and aggregate demand- aggregate supply analysis.

Unit III

Inflation, causes of rising and falling inflation, inflation and interest rates, social costs of inflation. Unemployment – natural rate of unemployment, frictional and wait unemployment. The trade-off between inflation and unemployment

Unit IV

Open economy – flows of goods and capital, saving and investment in a small and a large open economy, exchange rates, Mundell – Fleming model with fixed and flexible prices in a small open economy with fixed and with flexible exchange rates, interest-rate differentials case of a large economy.

Unit V

Behavioral Foundations - Investment –determinants of business fixed investment, effect of tax, determinants of residential investment and inventory investment. Demand for Money – Portfolio and transactions theories of demand for real balances, interest and income elasticity of demand for real balances, Supply of money.

Learning Outcomes: Students would be able to apply the modern tools of macro-economic analysis so as to minimize the adverse impact of macro-economic factors on business.

Suggested Readings

1. Ahuja H.L – Macro Economics – S.Chand
2. Mankiw, N. Gregory. Principles *Macroeconomics*. Cengage Learning
3. Dornbusch, Rudiger, and Stanley. Fischer, *Macroeconomics*. McGraw-Hill.
4. Dornbusch, Rudiger., Stanley. Fischer and Richard Startz, *Macroeconomics*. Irwin/McGraw-Hill.
5. Deepashree, *Macro Economics*, Scholar Tech. New Delhi.
6. Barro, Robert, J. *Macroeconomics*, MIT Press, Cambridge MA.
7. Burda, Michael, and Wyplosz. *Macroeconomics A European Text*. Oxford University Press, Oxford.
8. Vaish – Macro Economics – Vikash Publication
9. Salvatore, Dominick. *International Economics*. John Wiley & Sons Singapore.
8. Branson, William H. *Macroeconomic Theory and Policy*. HarperCollins India Pvt. Ltd.

B.Com. (Hons.): Semester - II

Paper BCH-2.5: Computerized Accounting

Duration: 3 hrs.

Marks: 100(80+20)

Lectures: 65

Objectives: To help the students to understand accounting as an information system for the generation of accounting information and preparation of accounting reports.

Contents:

Unit I – Introduction to Computer and Accounting Information System

Introduction to Computer (Elements, Capabilities, Limitations of Computer System), Introduction to Operating software, utility software and application software, Introduction to Accounting Information System (AIS) as a part of MIS

Unit II Overview of Computerized Accounting System

Introduction: Application in Accounting; Features of Computerized Accounting System, Structure

of CAS, Software Packages: Generic, Specific; Tailored.

Unit III Accounting Application of Electronic Spreadsheet

Concept of electronic Spread-sheet, Features offered by electronic spread-sheet; Application in generating accounting information – Bank reconciliation statement; asset accounting; loan, repayment of loan schedule, ratio analysis, Data representation – graphs, charts and diagrams.

Unit IV Using Computerized Accounting System

Computerised Accounting Systems: Computerized Accounts by using any popular accounting software: Creating a Company; Configure and Features settings; Creating Accounting Ledgers and Groups; Creating Stock Items and Groups; Vouchers Entry; Generating Reports - Cash Book, Ledger Accounts, Trial Balance, Profit and Loss Account, Balance Sheet, Funds Flow Statement, Cash Flow Statement Selecting and shutting a Company; Backup and Restore data of a Company

Unit V Database Management System (DBMS)

Concept and features of DBMS; DBMS in Business Application; Generating Accounting Information – Payroll.

Learning Outcome: After reading this subject the students will be able to define a computerized accounting system; distinguish between a manual and computerized accounting system; highlight the advantages and limitations of computerized accounting system and state the sourcing of a computerized accounting system.

Suggested Readings

1. Nanda Dhameja, Financial Accounting for Managerial Competitiveness – S.Chand
2. Maheswari S.N. - Introduction to Accounting – Vikash Publication

B.Com. (Hons.): Semester - III

Paper BCH-3.1: Human Resource Management

Duration: 3 hrs.

Marks: 100(80+20)

Lectures: 65

Objective: The objective of the course is to acquaint students with the techniques and principles to manage human resource of an organization.

Contents:

Unit I:

Human Resource Management: Concept and Functions, Role, Status and competencies of HR Manager, HR Policies, Evolution of HRM. Emerging Challenges of Human Resource Management;

workforce diversity, empowerment, Downsizing; VRS; Human Resource Information System;

Unit II

Acquisition of Human Resource: Human Resource Planning- Quantitative and Qualitative dimensions; job analysis – job description and job specification; Recruitment – Concept and sources; Selection – Concept and process; test and interview; placement induction.

Unit III

Training and Development; Concept and Importance; Identifying Training and Development Needs; Designing Training Programmes; Role Specific and Competency Based Training; Evaluating Training Effectiveness; Training Process Outsourcing; Management Development; Career Development.

Unit IV

Performance appraisal; nature and objectives; Modern Techniques of performance appraisal; potential appraisal and employee counseling; job changes - transfers and promotions. Compensation: concept and policies; job evaluation; methods of wage payments and incentive plans; fringe benefits; performance linked compensation.

Unit V

Maintenance: employee health and safety; employee welfare; social security; Employer Employee relations- an overview. Grievance handling and redressal Industrial Disputes causes and settlement machinery.

Learning Outcomes: This paper can enhance the capability of the students to manage the most important assets of organization i.e. human beings which is much needed to ensure growth of that organization.

Suggested Readings:

1. Bohlander and Snell, Principles of *Human Resource Management*, Cengage Learning
2. Chhabra, T.N. *Essentials of Human Resource Management*. Sun India Publication New Delhi.
3. DeCenzo, D.A. and S.P. Robbins, "*Personnel/Human Resource Management*", Prentice Hall of India, New Delhi.
4. Khanka S.S. *Human Resource Management*. S Chand.
5. Rao V.S.P - *Human Resource Management*. Vikash Publication
6. SanghiSeema, *Human Resource Management* – Vikash Publication
7. Ivancevich, John M. *Human Resource Management*. McGraw Hill.
8. Wreather and Davis. *Human Resource Management*. Pearson Education.
9. Robert L. Mathis and John H. Jackson. *Human Resource Management*. Cengage Learning.

B.Com. (Hons.): Semester - III

Paper BCH-3.2: Income Tax Law and Practice

Duration: 3 hrs.

Marks: 100(80+20)

Lectures: 65

Objective: To provide basic knowledge and equip students with the application of principles and provisions of Income Tax Act 1961.

Contents:

Unit I

Basic concept: Income, agricultural income, person, assessee, assessment year, previous year, gross total income, total income, Maximum marginal rate of tax. Permanent Account Number (PAN), Residential status; Scope of total income on the basis of residential Status Exempted income under section 10

Unit II Computation of income under different heads

- Salaries
- Income from house property

Unit III Computation of income under different heads

- Profits and gains of business or profession
- Capital gains
- Income from other sources

Unit IV Total income and tax computation

Income of other persons included in assessee's total income- Aggregation of income and set-off and carry forward of losses Deductions from gross total income, Rebates and reliefs

- Computation of total income of individuals and firms
- Tax liability of an individual and firm
- Five leading cases of Supreme Court

Unit V Preparation of return of income:

- Manually On-line filing of Returns of Income & TDS.
- Provision & Procedures of Compulsory On-Line filing of returns for specified assesses.

Learning Outcomes: This paper would provide the understanding of various provisions of Income Tax Act as well as equip the students to make practical applications of the provisions for taxation purpose.

Suggested readings:

1. Singhania, Vinod K. and Monica Singhania. *Students' Guide to Income Tax, University Edition*. Taxmann Publications Pvt. Ltd., New Delhi.
2. Ahuja, Girish and Ravi Gupta. *Systematic Approach to Income Tax*. Bharat Law House, Delhi.
3. Pagare, Dinkar. *Law and Practice of Income Tax*. Sultan Chand and Sons, New Delhi.
4. Lal, B.B. *Income Tax Law and Practice*. Konark Publications, New Delhi.

Journals

1. *Income Tax Reports*. Company Law Institute of India Pvt. Ltd., Chennai.
2. *Taxman*. Taxman Allied Services Pvt. Ltd., New Delhi.
3. *Current Tax Reporter*. Current Tax Reporter, Jodhpur.

Software

1. Dr. Vinod Kumar Singhania, *e-filing of Income Tax Returns and Computation of Tax*, Taxmann Publication Pvt. Ltd, New Delhi. Latest version
2. Excel Utility available at incometaxindiaefiling.gov.in

B.Com. (Hons.): Semester - III

Paper BCH-3.3: Management Principles & Applications

Duration: 3 hrs.

Marks: 100(80+20)

Lectures: 65

Objective: The objective of the course is to provide the student with an understanding of basic management concepts, principles and practices.

Unit 1: Introduction

Concept: Need for Study, Managerial Functions – An overview; Co-ordination: Essence of Managership, Evolution of the Management Thought, Classical Approach – Taylor, Fayol, Neo-Classical and Human Relations Approaches – Mayo, Hawthorne Experiments, Behavioural Approach, Systems Approach, Contingency Approach – Lawrence & Lorsch, MBO - Peter F. Drucker

Unit 2: Planning

- a. Types of Plan – An overview to highlight the differences b. Strategic planning – Concept, process, Importance and limitations c. Environmental Analysis and diagnosis (Internal and external environment) –Definition, Importance and Techniques (SWOT/TOWS/WOTS- UP, BCG Matrix, Competitor Analysis), Business environment; Concept and Components d. Decision-making – concept, importance

Unit 3: Organising

Concept and process of organising – An overview, Span of management, Different types of authority (line, staff and functional), Decentralisation, Delegation of authority Formal and Informal Structure; Principles of Organising; Network Organisation Structure

Unit 4: Staffing and Leading

a. *Staffing*: Concept of staffing, staffing process b. *Motivation*: Concept, Importance, extrinsic and intrinsic motivation; Major Motivation theories - Maslow's Need-Hierarchy Theory; Herzberg's Two-factor Theory, Vroom's Expectation Theory. c. *Leadership*: Concept, Importance, Major theories of Leadership (Likert's scale theory, Blake and Mouten's Managerial Grid theory) d. *Communication*: Concept, purpose, process; Oral and written communication; Formal and informal communication networks, Barriers to communication, Overcoming barriers to communication.

Unit 5: Control

a. *Control*: Concept, Process, Limitations, Principles of Effective Control, Major Techniques of control - Ratio Analysis, ROI, Budgetary Control, EVA, PERT/CPM.
b. Emerging issues in Management

Learning Outcomes: Students would be able to make use of different management principles in the course of decision making in different forms of business organizations.

Suggested Readings:

1. Chandan J.S – *Management Concepts of Strategy* – Vikash Publication
2. Pillai RSN – *Principles & Practice of Management* – S. Chand
3. Harold Koontz and Heinz Weihrich, *Essentials of Management: An International and Leadership Perspective*, McGraw Hill Education.
4. Stephen P Robbins and Madhushree Nanda Agrawal, *Fundamentals of Management: Essential Concepts and Applications*, Pearson Education.
5. George Terry, *Principles of Management*, Richard D. Irwin
6. Newman, Summer, and Gilbert, *Management*, PHI
7. James H. Donnelly, *Fundamentals of Management*, Pearson Education.
8. B.P. Singh and A.K.Singh, *Essentials of Management*, Excel Books
9. Griffin, *Management Principles and Application*, Cengage Learning
10. Robert Kreitner, *Management Theory and Application*, Cengage Learning
11. TN Chhabra, *Management Concepts and Practice*, DhanpatRai & Co. (Pvt. Ltd.), New Delhi
12. Peter F Drucker, *Practice of Management*, Mercury Books, London
13. Gupta R.N - *Principles & Practice of Management* – S. Chand

B.Com. (Hons.): Semester - III Paper 3.4: Business Statistics

Duration: 3 hrs.

Marks: 100 (80+20)

Lectures: 65

Objective: *The objective of this course is to familiarize students with the basic statistical tools used for managerial decision-making.*

Contents:

Unit 1 Statistical Data and Descriptive Statistics

Nature and Classification of data: univariate, bivariate and multivariate data; time-series and cross-sectional data

Measures of Central Tendency

a) Mathematical averages including arithmetic mean, geometric mean and harmonic mean.

Properties and applications.

b) Positional Averages

Mode and Median (and other partition values including quartiles, deciles, and percentiles)

(including graphic determination)

Unit 2

Measures of Variation: absolute and relative. Range, quartile deviation, mean deviation, standard deviation, and their coefficients, Properties of standard deviation/variance Skewness: Meaning, Measurement using Karl Pearson and Bowley's measures; Concept of Kurtosis

Probability and Probability Distributions

Theory of Probability: Approaches to the calculation of probability, Calculation of event probabilities. Addition and multiplication laws of probability (Proof not required) Conditional probability and Bayes' Theorem (Proof not required)

Unit 3 Simple Correlation and Regression Analysis

Correlation Analysis: Meaning of Correlation: simple, multiple and partial; linear and non-linear, Correlation and Causation, Scatter diagram, Pearson's co-efficient of correlation; calculation and properties (proofs not required). Correlation and Probable error; Rank Correlation

Regression Analysis: Principle of least squares and regression lines, Regression equations and estimation; Properties of regression coefficients; Relationship between Correlation and Regression coefficients; Standard Error of Estimate

Unit 4 Index Numbers

Meaning and uses of index numbers: Construction of index numbers: fixed and chain base: univariate and composite. Aggregative and average of relatives – simple and weighted

Tests of adequacy of index numbers, Base shifting, splicing and deflating. Problems in the construction of index numbers

Construction of consumer price indices, important share price indices

Unit 5 Time Series Analysis

Components of time series, Additive and multiplicative models Trend analysis, Fitting of trend line using principle of least squares – linear, second degree parabola and exponential. Conversion of annual linear trend equation to quarterly/monthly basis and vice-versa; Moving averages Seasonal variations- Calculation of Seasonal Indices using Simple averages, Ratio-to-trend, and Ratio-to-moving averages methods. Uses of Seasonal Indices

Learning Outcomes: Students would be armed with the knowledge of using different statistical tools very much required in the decision making process in any business as well as business research.

Suggested Readings:

1. Sharma J K, Fundamentals of Business Statistics – Vikash Publication
2. Levin, Richard, David S. Rubin, Rastogi, and Siddiqui. *Statistics for Management*. 7th Edition. Pearson Education.
3. Berenson and Levine. *Basic Business Statistics: Concepts and Applications*. Pearson Education.
4. Siegel Andrew F. *Practical Business Statistics*. McGraw Hill.
5. Hazarika P. Business Statistics – S. Chand
6. Vohra N. D., *Business Statistics*, McGraw Hill.
7. Spiegel M.D. *Theory and Problems of Statistics*. Schaum's Outlines Series. McGraw Hill Publishing Co.
8. Gupta, S.P., and Archana Gupta. *Statistical Methods*. Sultan Chand and Sons, New Delhi.
9. Gupta, S.C. *Fundamentals of Statistics*. Himalaya Publishing House.
10. Arora – Business Statistics – S.Chand

B.Com. (Hons.): Semester - III Paper 3.5: E- Commerce

Duration: 3 hrs.

Marks: 100 (80+20)

Lectures: 65

Objectives: To enable the student to become familiar with the mechanism for conducting business transactions through electronic means.

Contents

Unit-1

Unit I: Introduction: Meaning, nature, concepts, advantages and reasons for transacting online, categories of E-Commerce, Supply Chain Management, Customer Relations Management

Unit 2:

Planning Online-Business: Nature and dynamics of the internet, pure online vs. brick and click business; assessing requirement for an online business designing, developing and deploying the system, one to one enterprise.

Unit 3 Technology for Online-Business:

Internet, IT Infrastructure, Middle ware contents: Text and Integrating E-business applications.

Unit 4: Mechanism of making payment through internet:

Online-payment mechanism; Electronic Payment systems; payment Gateways; Visitors to website; tools for promoting websites; Plastic Money: Debit Card, Credit Card;

Unit 5: Applications in E-Commerce:

E-commerce applications in manufacturing, Wholesale, retail and service sector.

Security and Legal Aspects of E-Commerce:

Threats in E-Commerce, Security of Clients and Service-Provider; Cyber Law - Information Technology Act 2000: An overview of major provisions

Learning Outcomes: This paper would enhance the technical skills of the students to get into the business ventures using electronic means thereby providing the opportunity to gain access to a larger customer base.

Suggested Readings:

1. Pandey U.S – E.Commerce& Mobile Commerce Technology – S. Chand

B.Com. (Hons.): Semester – IV

Paper BCH- 4.1: COST AND MANAGEMENT ACCOUNTING

Duration: 3 hrs.

Marks: 100 (80 + 20)

Lectures: 65

Objective: To acquaint the students with basic concepts used in cost accounting, various methods involved in cost ascertainment.

CONTENTS:

Unit 1: Introduction

Meaning, objectives and advantages of cost accounting; Difference between cost accounting and financial accounting; Cost concepts and classifications; Elements of cost

Materials: Material/inventory control- concept and techniques, Accounting and control of purchases, storage and issue of materials. Methods of pricing of materials issues – FIFO, LIFO and Average

Unit 2: Labour and Overhead

Labour: Accounting and Control of labour cost. Time keeping and time booking. Concept and treatment of idle time, over time, labour turnover and fringe benefits. Methods of wage payment and the Incentive schemes- Halsey, Rowan, Taylor's Differential piece wage.

Overhead: Classification, allocation, apportionment and absorption of overhead. Under- and over-absorption

Unit 3: Methods of Costing

Methods of Costing: Unit costing, Job costing, Contract Costing, Process costing (excluding process losses, valuation of work in progress, joint and by-products)

Unit 4: Budgeting and Standard Costing

Budgeting and budgetary control: Concept of budget and budgetary control, objectives, merits, and limitations, Budget administration, Functional budgets, Fixed and flexible budgets, Zero base budget

Standard costing and variance analysis: Meaning of standard cost and standard costing: advantages, limitations and applications, Variance analysis – material, labour and overhead

Unit 5: Marginal Costing

Absorption versus variable costing: Distinctive features and income determination. Cost-Volume-Profit Analysis: Break-even analysis-algebraic and graphic methods. Contribution, Margin of safety and Angle of incidence

Learning Outcome: After the completion of this paper, the students will be able to have confidence in managing cost issues and also to keep a check on cost control and taking managerial decisions.

Suggested Reading:

1. Horngreen, Charles T., George Foster and Srikant M. Dattar. *Cost Accounting: A Managerial Emphasis*. Prentice Hall of India Ltd., New Delhi.
2. Horngreen, Charles T., Gary L. Sundem. *Introduction to Management Accounting*. Prentice Hall.
3. Jain, S.P. and K.L. Narang. *Cost Accounting: Principles and Methods*. Kalyani Publishers, Jalandhar.
4. Lal, Jawahar. *Cost Accounting*. Tata McGraw Hill Publishing Co., New Delhi.
5. Nigam, B.M. Lall and I.C. Jain. *Cost Accounting: Principles and Practice*. Prentice Hall of India, New Delhi.
6. Arora, M.N. *Cost Accounting – Principles and Practice*. Vikas Publishing House, New Delhi.
7. Maheshwari, S.N. and S.N. Mittal. *Cost Accounting: Theory and Problems*. Shri Mahabir Book Depot, New Delhi.
8. Singh, S. K. and Gupta Lovleen. *Management Accounting – Theory and Practice*. Pinnacle Publishing House.
9. Ustry, Milton E. and Lawrence H. Hammer. *Cost Accounting: Planning and Control*. South Western Publishing Co.

10. Barfield, Jesset T., Cecily A. Raibarn and Michael R. Kinney. *Cost Accounting: Traditions and Innovations*. Thomson Learning.

11. Lucey, T. Costing. ELST, London.
12. Garrison H., Ray and Eric W. Noreen. *Managerial Accounting*. McGraw Hill.
13. Drury, Colin. *Management and Cost Accounting*. Cengage Learning.
14. Lal, Jawahar. *Advanced Management Accounting Text and Cases*. S. Chand & Co., New Delhi.
15. Khan, M.Y. and P.K. Jain. *Management Accounting*. Tata McGraw Hill, Publishing Co., New Delhi.
16. Hansen, *Managerial Accounting*, Cengage Learning

B.Com. (Hons.): Semester - IV

Paper BCH-4.2: BUSINESS MATHEMATICS

Duration: 3 hrs.

Marks: 100 (80 + 20)

(Lectures: 65)

Objective: The objective of this course is to familiarize the students with the basic mathematical tools with emphasis on applications to business and economic situations.

Contents:

Unit 1. Matrices and Determinant

Algebra of matrices, Inverse of a matrix, Matrix Operation – Business Application Solution of system of linear equations (having unique solution and involving not more than three variables) using matrix inversion Method and Cremer's Rule.

Unit 2. Calculus I

Mathematical functions and their types- linear, quadratic, polynomial, exponential, logarithmic and logistic function. Concepts of limit, and continuity of a function, Concept and rules of differentiation, Maxima and Minima involving second order

Unit 3. Calculus II

Integration: Standard forms, Methods of integration – by substitution, by parts and by use of partial fractions, definite integration, finding areas in simple cases

Unit 4. Mathematics of Finance

Compounding and discounting of a sum using different types of rates. Types of annuities, like ordinary, due, deferred, continuous, perpetual, and their future and present values using different types of rates of interest, Depreciation of Assets. (*General annuities to be excluded*)

Unit 5. Linear Programming

Formulation of linear programming problems (LPP): Graphical solution to LPPs. Cases of unique and multiple optimal solutions, Unbounded solutions and infeasibility, and redundant constraints, Solution to LPPs using Simplex method – maximization and minimization cases.

Learning Outcome: After reading this subject the students will be able to understand basic concepts in the areas of business calculus and financial mathematics and to connect acquired knowledge with practical problems in economic practice.

Suggested Readings:

1. Arora P.N. Business Mathematics – S.Chand
2. Anthony, M. and N. Biggs. *Mathematics for Economics and Finance*. Cambridge University Press.
3. Arora S.R & Gupta K. – Business Mathematics – Taxmann Publication
4. Ayres, Frank Jr. *Theory and Problems of Mathematics of Finance*. Schaum's Outlines Series. McGraw Hill Publishing Co.
5. Budnick, P. *Applied Mathematics*. McGraw Hill Publishing Co.
6. Dowling, E.T. *Mathematics for Economics*, Schaum's Outlines Series. McGraw Hill Publishing Co.
7. Mizrahi and John Sullivan. *Mathematics for Business and Social Sciences*. Wiley and Sons.
8. Zamirudeen & Bhambri – Business Statistics – Vikash Publication
9. Wikes, F.M. *Mathematics for Business, Finance and Economics*. Thomson Learning.
10. Prasad, Bindra and P.K. Mittal. *Fundamentals of Business Mathematics*. Har-Anand Publications.
11. Thukral, J.K. *Mathematics for Business Studies*. Mayur Publications.
12. Vohra, N.D. *Quantitative Techniques in Management*. Tata McGraw Hill Publishing Company.
13. Soni, R.S. *Business Mathematics*. Pitambar Publishing House.
14. Singh J. K. *Business Mathematics*. Himalaya Publishing House
15. Hazarika P. Business Mathematics – S.Chand

B.Com. (Hons.): Semester - IV

Paper – BCH 4.3: COMPUTER APPLICATIONS IN BUSINESS

**Duration: 3 hrs.
65)**

Marks: 100(80+20)

(Lectures:

Objectives: To provide computer skills and knowledge for commerce students and to enhance the student understands of usefulness of information technology tools for business operations.

Contents:

Unit 1. Word Processing

Introduction to word Processing, Word processing concepts, Use of Templates, Working with word document: (Opening an existing document/creating a new document, Saving, Selecting text, Editing text, Finding and replacing text, Closing, Formatting, Checking and correcting spellings)Bullets and numbering, Tabs, Paragraph Formatting, Indent, Page Formatting, Header and footer, Mail Merge including linking with Access Database, Tables: Formatting the table, Inserting filling and formatting a table Creating Documents in the areas: Mail Merge including linking with Access Database, Handling Tables, Inserting Pictures and Video

Unit 2. Preparing Presentations:

Basics of presentations: Slides, Fonts, Drawing, Editing; Inserting: Tables, Images, texts, Symbols, Media; Design; Transition; Animation; and Slideshow

Unit 3. Spreadsheet and its Business Applications

Spreadsheet concepts, Creating a work book, Saving a work book, Editing a workbook, Inserting, deleting work sheets, Entering data in a cell, Formula Copying, Moving data from selected cells, Handling operators in formula, Rearranging Worksheet, Project involving multiple spreadsheets, Organizing Charts and graphs, Printing worksheet, Generally used Spread sheet functions: Mathematical, Statistical, Financial, Logical, Date and Time, Lookup and reference, Text functions.

Unit 4. Creating spreadsheet in the following areas:

Loan & Lease statement ;Ratio Analysis ;Payroll statements ;Capital Budgeting ;Depreciation Accounting; Graphical representation of data; Frequency distribution and its statistical parameters Correlation and Regression

Unit 5. Database Management System

Creating Data Tables, Editing a Database using Forms, Performing queries, Generating Reports Creating DBMS in the areas of Accounting, Employees, Suppliers and Customer

Learning Outcome: The completion of this paper will enhance students' computer abilities and skills to compete with the present technology driven business market.

NOTE:

- There shall be a practical examination of 100 Marks (Practical-80 Marks, Viva-10 Marks and Work Book- 10 Marks) and duration of Examination shall be 3 Hrs.
- Teaching arrangement need to be made in the computer Lab
- There shall be four lectures per class and 4 Practical Lab periods per batch to be thought in computer Lab.

Suggested Readings:

1. Saxena& Chopra – Computer Application in Management – Vikash Publication
2. Nagpal – Computer Fundamental – S.Chand

B.Com. (Hons.): Semester - IV

Paper BCH 4.4: INDIAN ECONOMY – PERFORMANCE AND POLICIES

Duration: 3 hrs.

Marks: 100(80+20)

Lectures: 65

Objective: This course seeks to enable the student to grasp the major economic problems in India and their solution.

Contents:

Unit 1: Basic Issues in Economic Development:

Concept and Measure of Development and Underdevelopment; Human Development

Unit 2: Basic Features of the Indian Economy at Independence:

Composition of national income and occupational structure, the agrarian scene and industrial structure

Unit 3: Policy Regimes:

- a) The evolution of planning and import substituting industrialization, (b) Economic reform and liberalization

Unit 4: Growth, Development and Structural Change:

- a) The experience of Growth, Development and Structural Change in different phases of growth and policy regimes across sectors and regions.
- b) The Institutional Framework: Patterns of assets ownership in agriculture and industry; Policies for restructuring agrarian relations and for regulating concentration of economic power;
- c) Changes in policy perspectives on the role of institutional framework after 1991.
- d) Growth and Distribution; Unemployment and Poverty; Human Development; Environmental concerns.
- e) Demographic Constraints: Interaction between population change and economic development.

Unit 5: Sectoral Trends and Issues:

- a) Agriculture: Agrarian growth and performance in different phases of policy regimes i.e. pre green revolution and the two phases of green revolution; Factors influencing productivity and growth; the role of technology and institutions; price policy, the public distribution system and food security.
- b) Industry and Services: Phases of Industrializations – the rate and pattern of industrial growth across alternative policy regimes; Public sector – its role, performance and reforms; The small scale sector; Role of Foreign capital.
- c) The Financial Sector: Structure, Performance and Reforms. Foreign Trade and balance of Payments: Structural Changes and Performance of India's Foreign Trade and Balance of Payments; Trade Policy Debate; Export policies and performance; Macro Economic Stabilization and Structural Adjustment; India and the WTO.

Learning Outcome: After the completion of this paper, the student will able to identify the key performance indicators and policies of the present economic environment of the country.

Readings:

1. Gaurav Dutt and KPM Sundarum, *Indian Economy*, S. Chand & Company.
2. Gopalji, Suman & Anisha Bakhri – *Indian Economy*, Vikash Publication
3. Mishra and Puri, *Indian Economics*, Himalaya Publishing House
4. Deepashree, "*Indian Economy, Performance and Polices*", Scholar Tech. New Delhi
5. Bettelheim. Charles *India Independent*. Chapters 1, 2 and 3.
6. Bhagwati, J. and Desai, P. *India: Planning for industrialization*, OUP, Ch 2.
7. Patnaik, Prabhat. *Some Indian Debates on Planning*. T. J. Byres (ed.). *The Indian Economy: Major Debates since Independence*, OUP.
8. Ahluwalia, MontekS. *State-level Performance under Economic Reforms in India* in A. O. Krueger. (ed.). *Economic Policy Reforms and the Indian Economy*, The University of Chicago Press.

9. Nagaraj, R. *Indian Economy since 1980: Vitrious Growth or Polarisation?* Economic and Political Weekly. pp. 2831-39.
10. Ray, S. K. *Land Systems and its Reforms In India. Sections II & III*, Indian Journal of Agricultural Economics. Vol. 51. Nos. 1 & 2.
11. Visaria, Pravin. *Demographic Aspects of Development: The Indian Experience*. Indian Journal of Social Sciences. Vol. 6. No. 3.
12. Dreze, Jean and Amartya Sen. *Economic Development and Social Opportunity*. Ch. 2. OUP.
13. Vaidyanathan, A. *India's Agricultural Development Policy*. Economic and Political Weekly.
14. Sawant, S. D. and C. V. Achuthan. *Agricultural Growth across Crops and Regions: Emerging Trends and Patterns*. Economic and Political Weekly. Vol. 30 A2-A13.
15. Krishnaji, N. *Agricultural Price Policy: A Survey with Reference to Indian Foodgrain Economy*. Economic and Political Weekly. Vol. 25. No. 26.
16. Chaudhuri, Sudip. *Debates on Industrialisation*. in T.J. Byres (ed.). *The Indian Economy: Major Debates since Independence*, OUP.
17. Chandra, Nirmal K. *Growth of Foreign Capital and its Importance in Indian Manufacturing*. Economic and Political Weekly. Vol. 26. No. 11.
18. Khanna, Sushil. *Financial Reforms and Industrial Sector in India*. Economic and Political Weekly. Vol. 34. No. 45.
19. Vaidyanathan, A. *Poverty and Development Policy*. Economic and Political Weekly.
20. Deaton, A and Jean Dreze. *Poverty and Inequality in India*. Economic and Political Weekly.
21. Planning Commission, *Task Force on Employment Opportunities*. Ch 1 and 2
22. Uma Kapila (ed), "*Indian Economy since Independence*", Relevant articles.
23. Rangarajan, C. and N. Jadhav. *Issues in Financial Sector Reform*. BimalJalan. (ed). *The Indian Economy*. Oxford University Press, New Delhi.
24. Chakravarty, Sukhamoy. *Development Planning – The Indian Experience*. Oxford University Press, Delhi.

B.Com. (Hons.): Semester - IV

Paper BCH 4.5: Entrepreneurship

Duration: 3 hrs.

Marks: 100 (80+20)

Lectures: 65

Objective: The purpose of the paper is to orient the learner toward entrepreneurship as a career option and creative thinking and behavior for effectiveness at work and in life.

Contents:

Unit 1

Meaning, elements, determinants and importance of entrepreneurship and creative behavior
 Entrepreneurship and creative response to the society' problems and at work, Dimensions of entrepreneurship: intra-preneurship, techno-preneurship, cultural entrepreneurship, international entrepreneurship, net-preneurship, eco-preneurship, and social entrepreneurship.

Unit 2

Entrepreneurship and Micro, Small and Medium Enterprises:

Concept of business groups and role of business houses and family business in India, The contemporary role models in Indian business: their values, business philosophy and behavioral orientations. Conflict in family business and its resolution

Unit 3

Public and private system of stimulation, support and sustainability of entrepreneurship, Requirement, availability and access to finance, marketing assistance, technology, and industrial accommodation, Role of industries/entrepreneur's associations and self-help groups. The concept, role and functions of business incubators, angel investors, venture capital and private equity fund.

Unit 4

Sources of business ideas and tests of feasibility:

Significance of writing the business plan/ project proposal, Contents of business plan/ project proposal. Designing business processes, location, layout, operation, planning & control; preparation of project report (various aspects of the project report such as size of investment, nature of product, market potential may be covered). Project submission/ presentation and appraisal thereof by external agencies, such as financial/non-financial institutions

Unit 5

Mobilizing resources for start-up, Accommodation and utilities, Preliminary contracts with the vendors, suppliers, bankers, principal customers; Contract management: Basic start-up problems.

Learning outcome: After the completion of this paper, student will have the entrepreneurial temper with conceptual input and practical insight as how to be an entrepreneur.

Suggested Readings:

1. SS Khanka, Entrepreneurial Development, S. Chand & Co, Delhi.
2. Kuratko and Rao, *Entrepreneurship: A South Asian Perspective*, Cengage Learning.
3. Rao, V.S.P – Business Entrepreneurship & Management – Vikash Publication
4. Desai, Vasant. *Dynamics of Entrepreneurial Development and Management*. Mumbai, Himalaya Publishing House.
5. Dollinger, Mare J. *Entrepreneurship: Strategies and Resources*. Illinois, Irwin.
6. Holt, David H. *Entrepreneurship: New Venture Creation*. Prentice-Hall of India, New Delhi.
7. Jain, Arun Kumar. *Competitive Excellence: Critical Success Factors*. New Delhi: Viva Books Limited. ISBN-81-7649-272-8.
6. Panda, ShibaCharan. *Entrepreneurship Development*. New Delhi, Anmol Publications. (Latest Editions)
7. Plsek, Paul E. *Creativity, Innovation and Quality*. (Eastern Economic Edition), New Delhi: Prentice-Hall of India. ISBN-81-203-1690-8.
8. SIDBI Reports on Small Scale Industries Sector.
9. Singh, Nagendra P. *Emerging Trends in Entrepreneurship Development*. New Delhi: ASEED.

B.Com. (Hons.): Semester - IV

Paper BCH 4.6: Personal Selling and Salesmanship (Optional-II)

Duration: 3 hrs.

Marks: 100 (80+20)

Lectures: 65

Objective: The purpose of this course is to familiarize the students with the fundamentals of personal selling and the selling process. They will be able to understand selling as a career and what it takes to be a successful salesman

Unit 1:

Introduction to Personal Selling: Nature and importance of personal selling, myths of selling, Difference between Personal Selling, Salesmanship and Sales Management, Characteristics of a good salesman, types of selling situations, types of salespersons, Career opportunities in selling, Measures for making selling an attractive career.

Unit- II

Buying Motives: Concept of motivation, Maslow's theory of need hierarchy; Dynamic nature of motivation; Buying motives and their uses in personal selling

Unit- III

Selling Process: Prospecting and qualifying; Pre-approach; Approach; Presentation

Unit- IV

and demonstration; handling of objections; Closing the sale; Post sales activities.

Sales Reports: reports and documents; sales manual, Order Book, Cash Memo; Tour Diary, Daily and Periodical Reports; Ethical aspects of Selling.

Unit V

Advertising: Meaning, Importance and Features, Modes of advertisements and their respective merits and demerits.

Learning outcome: After the completion of this paper, the students will able to identify an understand the psychology of selling and different factors that shape the buying behaviour of customers.

Suggested Readings:

1. Davar R.S – Salesmanship and Publicity – Vikash Publication
2. Sahu P.K & Rout K.C – Salesmanship & Sales Management – S.Chand
3. *Spiro, Stanton, and Rich, Management of the Sales force*, McGraw Hill.
4. Rusell, F. A. Beach and Richard H. Buskirk, *Selling: Principles and Practices*, McGraw Hill
5. Futrell, Charles, *Sales Management: Behaviour, Practices and Cases*, The Dryden Press.
6. Still, Richard R., Edward W. Cundiff and Norman A. P. Govoni, *Sales Management: Decision*
7. *Strategies and Cases*, Prentice Hall of India Ltd., New Delhi,
8. Johnson, Kurtz and Schueing, *Sales Management*, McGraw Hill
9. KapoorNeeru, *Advertising and personal Selling*, Pinnacle, New Delhi.

B.Com. (Hons.): Semester – V

Paper BCH 5.1: PRINCIPLES OF MARKETING

Duration: 3 hrs.

Marks: 100(80+20)

Lectures: 65

Objective: The objective of this course is to provide basic knowledge of concepts, principles, tools and techniques of marketing.

Contents:

Unit-1

Introduction: Nature, scope and importance marketing; Evolution of marketing concepts; Marketing mix, Marketing environment.

Consumer Behavior – An Overview: Consumer buying process; Factors influencing consumer buying decisions.

Unit-2

Market Selection: Market segmentation – concept, importance and bases; Target market selection; Positioning concept, importance and bases; Product differentiation vs. market segmentation;

Product: Meaning and importance. Product classifications; Concept of product mix; Branding, packaging and labeling; Product-Support; Product life-cycle; New Product Development

Unit-3

Pricing: Significance, Factors affecting price of a product; Pricing Policies and strategies;

Promotion: Nature and importance of promotion; Communication process; Types of promotion: advertising, personal selling, public relations & sales promotion, and their distinctive characteristics; Promotion mix and factors affecting promotion mix decisions.

Unit-4

Distribution: Channels of distribution - meaning and importance; Types of distribution channels; Wholesaling and retailing; Factors affecting choice of distribution channel; Physical Distribution.

Retailing: Types of retailing – store based and non-store based retailing, chain stores, specialty stores, supermarkets, retail vending machines, mail order houses, retail cooperatives; Management of retailing operations: an overview; Retailing in India: changing scenario.

Unit-5

Rural marketing: Growing Importance; Distinguishing characteristics of rural markets; Understanding rural consumers and rural markets; Marketing mix planning for rural markets.

Recent developments in marketing: Social marketing, on line marketing, direct marketing, services marketing, green marketing,

Learning outcome: After the completion of this paper, the students will be able to identify marketing components and fit them in the value chain along with the various marketing strategies.

Suggested Readings:

1. Kotler, Philip, Gary Armstrong, Prafulla Agnihotri and Ahsan UIHaque. *Principles of Marketing*. 13th edition. Pearson Education.
2. Mahajan & Mahajan – Principles of Marketing – Vikash Publication.
3. Michael, J. Etzel, Bruce J. Walker, William J. Stanton and Ajay Pandit. *Marketing Concepts and Cases*. (Special Indian Edition).
4. Rudani R.B – *Basics of Marketing Management* – S. Chand
5. McCarthy, E. Jerome., and William D. Perreault. *Basic Marketing*. Richard D. Irwin.
6. Lamb, Charles W., Joseph F. Hair, Dheeraj Sharma and Carl McDaniel. *Marketing: A South Asian Perspective*. Cengage Learning.
7. Pride, William M., and D.C. Ferrell. *Marketing: Planning, Implementation & Control*. Cengage Learning.
8. Majaro, Simon. *The Essence of Marketing*. Prentice Hall, New Delhi.
9. Zikmund William G. and Michael D'Amico. *Marketing; Creating and Keeping Customers in an E-Commerce World*. Thomson Learning.
10. Chhabra, T.N., and S. K. Grover. *Marketing Management*. Fourth Edition. Dhanpat Rai & Company.
11. The Consumer Protection Act 1986.
12. Iacobucci and Kapoor, *Marketing Management: A South Asian Perspective*. Cengage Learning.
13. Arun Kumar – Marketing management – Vikash Publication

B.Com. (Hons.): Semester – V

Paper BCH 5.2: FUNDAMENTALS OF FINANCIAL MANAGEMENT

Duration: 3 hrs.

Marks: 100(80+20)

Lectures: 65

Objective: To familiarize the students with the principles and practices of financial management.

Contents:

Unit-1

Introduction to Financial Management: Scope and objective, Time value of money, Risk and return, Valuation of securities – Bonds and Equities

Unit-2

Long Term Investment Decisions: The Capital Budgeting Process, Cash flow Estimation, Payback Period Method, Accounting Rate of Return, Net Present Value (NPV), Net Terminal Value, Internal Rate of Return (IRR), Profitability Index

Unit-3

Financing Decisions: Sources of long-term financing, Estimation of components of cost of capital. Methods for Calculating cost of equity capital, Cost of Retained Earnings, Cost of Debt and Cost of

Preference Capital, Weighted Average cost of capital (WACC) and Marginal cost of capital. Capital structure –Theories of Capital Structure (Net Income, Net Operating Income, MM Hypothesis, Traditional Approach). Operating and financial leverage, Determinants of capital

structure

Unit-4

Dividend Decisions: Theories for Relevance and irrelevance of dividend decision for corporate valuation. Cash and stock dividends, Dividend policies in practice

Unit-5

Working Capital Decisions: Concepts of working capital, the risk-return trade off, sources of short-term finance, working capital estimation, cash management, receivables management, Inventory management and payables management

Learning Outcome: After the completion of this paper, students will be able to understand finance in a better way along with giving them insight to practical management of long and short finance for real business houses.

Suggested Readings

1. Bhalla V.K – Financial Management – S.Chand
2. Horne, J.C. Van and Wackowich. *Fundamentals of Financial Management*. 9thed. New Delhi Prentice Hall of India.
3. Johnson, R.W. *Financial Management*. Boston Allyn and Bacon.
4. Joy, O.M. *Introduction to Financial Management*. Homewood: Irwin.
5. Khan and Jain. *Financial Management text and problems*. 2nd ed. Tata McGraw Hill New Delhi.
6. Pandey, I.M. *Financial Management*. Vikas Publications.
7. Chandra, P. *Financial Management- Theory and Practice*. (Tata McGraw Hill).
8. Rustagi, R.P. *Fundamentals of Financial Management*. Taxmann Publication Pvt. Ltd.
8. Singh, J.K. *Financial Management- text and Problems*. 2nd Ed. DhanpatRai and Company, Delhi.
9. Singh, Surender and Kaur, Rajeev. *Fundamentals of Financial Management*. Book Bank International.
10. Brigham and Houston, *Fundamentals of Financial Management*, 13th Ed., Cengage Learning

B.Com. (Hons.): Semester – V

Paper BCH-DSE 5.3(A): Financial Markets, Institutions and Services

Duration: 3 hrs.

Marks: 100(80+20)

Lectures:

65

Objective: To provide the student a basic knowledge of financial markets and institutions and to familiarize them with major financial services in India.

Contents

Unit-1

An Introduction to Financial System, its Components – financial markets and institutions, financial intermediation, Flow of funds matrix, financial system and economic development, an overview of Indian financial system

Unit-2

Financial Markets: Money market – functions, organization and instruments. Role of central bank in money market; Indian money market – An overview

Capital Markets – functions, organization and instruments. Indian debt market; Indian equity market – primary and secondary markets; Role of stock exchanges in India

Unit-3

Financial Institutions: Commercial banking – introduction, its role in project finance and working capital finance, Development Financial institutions (DFIs) – An overview and role in Indian economy, Life and non-life insurance companies in India; Mutual Funds – Introduction and their role in capital market development. Non-banking financial companies (NBFCs)

Unit-4

Overview of financial services industry: Merchant banking – pre and post issue management, underwriting. Regulatory framework relating to merchant banking in India

Unit-5

Leasing and Hire–purchase: Consumer and housing finance; Venture capital; Factoring services, bank guarantees and letter of credit; Credit rating; Counseling.

Learning Outcome: After the completion of this paper, the student will acquire financial literacy skill particularly by giving information about the financial system, markets, services and regulatory bodies in India.

Suggested Readings:

1. Bhole, L.M. *Financial Markets and Institutions*. Tata McGraw-Hill Publishing Company.
2. Pandian P. – *Financial Service and Markets*. Vikas Publishing House.
3. Dhanekar. *Pricing of Securities*. New Delhi: Bharat Publishing House.
4. Nibasaiya Sapna – *Indian Financial System* – S.Chand
5. Prasanna, Chandra. *Financial Management: Theory and Practice*. Tata McGraw Hill \ Publishing Company Ltd., New Delhi.
6. Simha, S.L.N. *Development Banking in India*. Madras: Institute of Financial Management and Research
7. Khan and Jain. *Financial Services*. 2nd ed. Tata McGraw Hill
8. Singh, J.K. *Venture Capital Financing in India*. Dhanpat Rai and Company, New Delhi.
9. Annual Reports of Major Financial Institutions in India

B.Com. (Hons.): Semester – V

Paper BCH-DSE 5.3 (B): BANKING AND INSURANCE SYSTEM

Duration: 3 hrs.

Marks: 100(80+20)

Lectures: 65

Objectives: To enable the students to acquire knowledge about basics of banking and insurance.

Unit-1

Concept of Bank and Banking: Historical Evolution of Banking: Origin and Development of Banking - Structure of Banking in India – Banks and Economic Development –Functions of Commercial banks (conventional and innovative functions) – Central Bank – RBI – functions – Emerging trends in Banking.

Unit-2

Types of Customers and Account holders: Procedure and practice in opening and operating the accounts of customers - individuals including minors - joint account holders -Partnership firms - joint stock companies - executors and trustees-clubs and associations

Unit-3

Introduction to insurance: Purpose and need of insurance, insurance as a social security tool - insurance and economic development - Principles of insurance -various kinds of insurance - life, marine, fire, medical, general insurance - features.

Unit-4

Life Insurance - Law relating to life Insurance; General Principles of Life Insurance Contract; Proposal and policy; assignment and nomination; title and claims; General Insurance - Law relating to general insurance; different types of general insurance; general insurance Vs life insurance – Insurance business in India.

Unit-5

Fundamentals of Agency Law: Definition of an agent; Agents regulations; Insurance intermediaries; Agents' compensation. Procedure for Becoming an Agent: Pre-requisite for obtaining a license; Duration of license; Cancellation of license; Revocation or suspension/termination of agent appointment; Code of conduct; Unfair practices. Functions of the Agent: Proposal form and other forms for grant of cover; Financial and medical underwriting; Material information; Nomination and assignment; Procedure regarding settlement of policy claims.

Learning Outcome: After the completion of this paper, the student will acquired practical knowledge of working mechanism of banking and insurance industries in India.

Reference Books:

1. Mishra S. *Banking Law and Practice – S Chand*
2. Sheldon H.P :*Practice and Law of Banking.*
3. Bedi. H.L :*Theory and Practice of Banking.*
4. Maheshwari. S.N. :*Banking Law and Practice.*
5. Shekar. K.C :*Banking Theory Law and Practice.*
6. Pannandikar&Mithami': *Banking in India.*
7. Radhaswamy&Vasudevan: *Text Book of Banking.*
8. Indian Institute of Bankers (Pub) *Commercial Banking Vol-I/Vol-II (part I&II) Vol- III.*
9. Varshaney: *Banking Law and Practice.*
10. Dr. P. Periasamy: Principles and Practice of Insurance
11. Himalaya Publishing House, Delhi.
12. Inderjit Singh, RakeshKatyal& Sanjay Arora: Insurance Principles and Practices
13. Kalyani Publishers, Chennai.
14. M.N. Mishra: Insurance Principles and Practice, S. Chand & Company Ltd, Delhi.
15. G. Krishnaswamy : Principles & Practice of Life Insurance
16. Kothari &Bahl : Principles and Pratices of Insurance.
17. Prasad – Banking Insurance – Vikash Publication

B.Com. (Hons.): Semester – V

Paper 5.3BCH-DSE 5.3 (C): INDIAN FINANCIAL SYSTEM

Duration: 3 hrs.

Marks: 100(80+20)

Lectures: 65

Objectives: *To enable the students to understand the basic knowledge about the structure, organization and working of financial system in India.*

Unit-1

Financial System: Meaning and Significance-Functions of the financial system -Financial Assets- Financial markets- Classification-Financial instruments-weakness of Indian Financial System.

Unit-2

Money market: Definition-Features-Objectives-Features of a developed money market-Importance of Money market-Composition of Money market-Operations and Participants-Money market Instruments-features of Indian money market-Recent developments.

Unit-3

Primary, Secondary and Capital Markets: New issue market-meaning-functions-methods floating new issue - intermediaries in the new issue market-merchants bankers and their functions -Recent trends in new issue market - Stock Exchanges-Functions-Structure of stock exchanges-BSE-NSE- listing of securities-Advantages of listing-methods of trading in stock exchanges-on line trading-stock indices

Unit-4

Financial Institutions: commercial banks- development financial institutions- Nonbanking financial corporation's-Mutual Funds, insurance companies – Objectives and functions (only a brief outline).

Unit-5

Regulatory Institutions: RBI – Role and Functions. The Securities and Exchange Board of India-objectives-function-powers-SEBI guidelines for primary and secondary market

Learning Outcome: After completion of this paper, the student will be able to understand the structure and role of financial system, financial intermediaries and regulators in the Indian economy.

Reference Books:

1. Kohn, Meir: *Financial Institutions and Markets*, Tata McGraw Hill.
2. Bhole L.M: *Financial Institutions and Markets*, Tata McGraw Hill.

3. Desai, Vasantha: *The Indian Financial System*, Himalaya Publishing House.
4. Machiraju.R.H: *Indian Financial System*, Vikas Publishing House.

5. Khan M.Y: *Indian Financial System*, Tata McGraw Hill.
6. Varshney, P.N., & D K Mittal, D.K.: *Indian Financial System*, Sulthan Chand & Sons
7. Gordon E. &Natarajan K.: *Financial Markets & Services*, Himalaya Publishing House.
8. Pathak, V. Bharati: *Indian Financial System*, Pearson Education.

B.Com. (Hons.): Semester – V

Paper BCH-DSE 5.4 (A): FINANCIAL STATEMENT ANALYSIS & REPORTING

Duration: 3 hrs.

Marks: 100 (80+20)

Lectures: 65

Objectives: To enable the students to understand the basic knowledge about the financial statement analysis and reporting for economic decision making.

Unit-1

Introduction Concepts of financial statements – Nature of financial statements – Objectives of financial statements – Different types of financial statements: income statement, balance sheet, statement of retained earnings, fund flow statement, cash flow statement, schedules – Limitations of financial statements.

Unit-2

Analysis & Interpretation of Financial Statements: Traditional Approaches Vs. Modern Approaches to financial statement analysis – Classification of financial statement analysis: based on modus operandi and based on materials used – Techniques of financial statement analysis: Comparative Statements, Common-size Statements, Trend Ratios and Ratio Analysis – Problems encountered in financial statement analysis.

Unit-3

Ratio Analysis: Classification of ratios – Ratio formation – Ratio interpretation – Practical methods of ratio analysis: Time Series (intra firm) Analysis, Cross Sectional (inter firm) Analysis, Residual Analysis and Multivariate Analysis.

Unit-4

Multivariate Ratio Analysis: Concept, objectives, uses and limitations – Univariate analysis Vs. Multivariate ratio analysis – Application of statistical tools in financial statement analysis.

Unit-5

Corporate Reporting: Cash Flow statement Analysis (AS 3) and Statutory and Non Statutory Reports, Integrated Reporting

Learning Outcome: After the completion of this paper, the students will be able to prepare the end result of a business houses by preparation through financial statement analysis and reporting.

Suggested Readings:

1. Foster, G.: Financial Statement Analysis, Englewood Cliffs, NJ, Prentice Hall.
2. Sahaf M.A – Management Accounting – Principles & Practice – Vikash Publication
3. Foulke, R.A.: Practical Financial Statement Analysis, New York, McGraw-Hill.
4. Hendriksen, E.S.: Accounting Theory, New Delhi, Khosla Publishing House.
5. Kaveri, V.S.: Financial Ratios as Predictors of Borrowers' Health, New Delhi, Sultan Chand.
6. Lev, B.: Financial Statement Analysis – A New Approach, Englewood Cliffs, NJ, Prentice Hall.
7. Maheswari, S.N.: Management Accounting & Financial Control, New Delhi, Sultan Chand.
8. Myer, J.N.: Financial Statement Analysis, NJ, Prentice Hall. 8. Porwal, L.S.: Accounting Theory – An Introduction, New Delhi, Tata-McGraw-Hill

B.Com. (Hons.): Semester – V

Paper 5.4 (B): MERCHANT BANKING AND FINANCIAL SERVICES

Duration: 3 hrs.

Marks: 100 (80+20)

Lectures: 65

Objectives: *To enable the students to understand the basic knowledge about the financial services available in India.*

Unit-1

Merchant Banking: Nature and scope of Merchant Banking - Regulation of Merchant Banking Activity - overview of current Indian Merchant Banking scene - structure of Merchant Banking industry - primary Markets in India and Abroad - professional Ethics and code of conduct - current Development

Unit-2

Financial Services: Meaning and Definition, Role of Financial Services in a financial system. Leasing: Meaning and features. Introduction to equipment leasing: Types of Leases, Evolution of Indian Leasing Industry. Legal Aspects of Leasing: present Legislative Framework. Hire purchase: concept and characteristics of Hire purchase. Difference between hire purchase and leasing

Unit-3

Factoring: concept, nature and scope of Factoring - Forms of Factoring - Factoring vis-à-vis Bills Discounting - Factoring vis-à-vis credit Insurance Factoring vis-à-vis Forfeiting- Evaluation of a Factor - Evaluation of Factoring - Factoring in India current Developments.

Unit-4

Securitization / Mortgages: Meaning, nature and scope of securitization, securitization as a Funding Mechanism, securitization of Residential Real Estate - whole Loans - Mortgages - Graduated-payment. **Depository:** Meaning, Evolution, Merits and Demerits of Depository. **Process of Dematerialization and Dematerialization,** Brief description of NSDL and CDSL

Unit-5

Security Brokerage: Meaning of Brokerage, types of brokers. Difference between broker and jobber, SEBI Regulations relating to brokerage business in India.

Learning Outcome: After the completion of this course, the student will be able to understand the structure and function of mercantile banking and various financial services available in the present business world.

Suggested Readings:

1. M.Y.Khan, Financial Services, Tata McGraw-Hill, 11th Edition, 2008
2. Gopal C.R – Management Financial Service – S.Chand
3. NaliniPravaTripathy, Financial Services, PHI Learning, 2008
4. Machiraju, Indian Financial System, Vikas Publishing House, 2nd Edition, 2002.
5. J.C.Verma, A Manual of Merchant Banking, Bharath Publishing House, New Delhi.
6. Varshney P.N. & Mittal D.K., Indian Financial System, Sultan Chand & Sons, New Delhi.
7. Sasidharan, Financial Services and System, Tata Mcgraw Hill, New Delhi, 1st Edition, 2008.
8. Website of SEBI

B.Com. (Hons.): Semester – V

Paper 5.4 (C): FINANCIAL INSTITUTIONS AND SERVICES

Duration: 3 hrs.

Marks: 100 (80+20)

Lectures: 65

Objectives: *To enable the students to understand the financial institutions operating in India and services provided by them.*

Unit-1

Basic Theoretical Framework: The financial system and its technology; The factors affecting the stability of the financial system; Development finance vs. universal banking; Financial intermediaries and Financial Innovation; RBI-Central Banking.

Unit-2

Financial Institutions: A brief historical perspective. An update on the performance of IDBI, ICICI, IFCI and SFCs, LIC & GIC. The banking Institutions: Commercial banks - the public and the private sectors - structure and comparative performance. The problems of competition; interest rates, spreads, and NPAs. Bank capital - adequacy norms and capital market support.

Unit-3

Non-banking financial institutions: Evolution, control by RBI and SEBI. A perspective on future role, Unit Trust of India and Mutual Funds, Reserve bank of India Framework for/Regulation of Bank Credit . Commercial paper: Features and advantages, Framework of Indian CP Market, effective cost/interest yield.

Unit-4

Financial services: Asset/fund based Financial services - lease finance, consumer credit and hire purchase finance, factoring definition, functions, advantages, evaluation and forfeiting, bills discounting, housing finance, venture capital financing. Fee-based / Advisory services: Stock broking, credit rating.

Unit-5

Operations: Financial Assets/ Instruments Rights issues, issue of Debentures, issue of Equity shares - pre-issue activity, post-issue activities. The regulatory framework: SEBI and Regulation of Primary and Secondary Markets, Company Law provisions.

Learning Outcome: *After completion of this paper, the students will be able to understand the role and benefits of financial institution and services.*

Book References

1. M.Y.Khan, Financial Services, Tata McGraw-Hill, New Delhi, 2004.
2. Harsh V.Verma, Marketing of Services, Global Business Press, 2002
3. Sames L .Heskett, Managing In the Service Economy, Harvard Business School Press, Boston, 2001.
4. M.Y.Khan, Indian Financial System, 4/eTataMcGraw-Hill, New Delhi, 2004
5. Frank.J.Fabozzi& Franco Modigliani, Foundations of Financial Markets and Institutions, 3/e, Pearson Education Asia, 2002.
6. H.R Machiraju, Indian Financial Systems, Vikas Publishing House Pvt. Ltd.2002.
7. Meir Kohn, Financial Institutions and Markets, Tata McGraw-Hill, New Delhi, 2003.
8. Pathak: Indian Financial Systems Pearson Education
9. NibasaiyaSapna – Indian Financial System – S. Chand

B.Com. (Hons.): Semester - VI

Paper BCH 6.1: AUDITING AND CORPORATE GOVERNANCE

Duration: 3 hrs.

Marks: 100 (80+20)

Lectures: 65

Objective: *To provide knowledge of auditing principles, procedures and techniques in accordance with current legal requirements and professional standards and to give an overview of the principles of Corporate Governance and Corporate Social Responsibility*

Unit-1

Auditing: Introduction, Meaning, Objects, Basic Principles and Techniques; Classification of Audit, Audit Planning, Internal Control – Internal Check and Internal Audit; Audit Procedure – Vouching and verification of Assets & Liabilities

Unit-2

Audit of Limited Companies: Company Auditor- Qualifications and disqualifications, Appointment, Rotation, Removal, Remuneration, Rights and Duties Auditor's Report-Contents and Types. Liabilities of Statutory Auditors under the Companies Act 2013

Unit-3

Special Areas of Audit: Special features of Cost audit, Tax audit, and Management audit; Recent Trends in Auditing: Basic considerations of audit in EDP Environment; Standard on Auditing(SA); Relevant Case Studies/Problems;

Unit-4

Corporate Governance: Conceptual framework of Corporate Governance, Corporate Governance Reforms. Major Corporate Scandals in India and Abroad: Common Governance Problems Noticed in various Corporate Failures. Codes & Standards on Corporate Governance

Unit-5

Corporate Social Responsibility (CSR): Strategic Planning and Corporate Social Responsibility; Corporate Philanthropy, Meaning of CSR, CSR and CR, CSR and Corporate Sustainability, CSR and Business Ethics, CSR and Corporate Governance, Environmental Aspect of CSR, CSR provision under the Companies Act 2013, CSR Committees

Learning Outcome: At the end of the paper student will have detail knowledge about principles and techniques of audit in accordance with current legal requirement and as per the guidelines of different statutory authorities.

Suggested Readings:

1. Gupta, Kamal and Ashok Arora. *Fundamentals of Auditing*. Tata Mc-Graw Hill Publishing Co. Ltd., New Delhi.
2. Gadada Siddheswar T & Rachchh Gunvantrai – Introduction to Auditing – Vikash
3. Jha, Aruna. *Auditing*. Taxmann.
4. Tandon, B. N., S. Sudharsanam and S. Sundharabahu. *A Handbook of Practical Auditing*. S. Chand and Co. Ltd., New Delhi.
5. Ghatalia, S.V. *Practical Auditing*. Allied Publishers Private Ltd., New Delhi.
6. Singh, A. K. and Gupta Lovleen. *Auditing Theory and Practice*. Galgotia Publishing Company.
7. Alvin Arens and James Loebbecke, *Auditing: an Integrated Approach*
7. Ravinder Kumar and Virender Sharma, *Auditing Principles and Practice*, PHI Learning
Christine A Mallin, *Corporate Governance (Indian Edition)*, Oxford University Press, New Delhi.
8. Bob Tricker, *Corporate Governance-Principles, Policies, and Practice* (Indian Edition), Oxford University Press, New Delhi.
9. The Companies Act 2013 (Relevant Sections)
10. MC Kuchhal *Corporate Laws*, Shri Mahaveer Book Depot. (Publishers). (Relevant Chapters)
11. Relevant Publications of ICAI on *Auditing (CARO)*.
12. Khanka – Business Ethics & Corporate Governance – Vikash Publication

B. Com.: Semester VI

Paper BCH 6.2: INDIRECT TAXES

Duration: 3 hrs.

Marks: 100 (80+20)

Lectures: 65

Objective: To provide basic knowledge and equip students with application of principles and provisions of Service Tax, VAT, Central Excise, and Customs Laws.

Contents:

Unit-1

Service tax – concepts and general principles, Charge of service tax and taxable services, Valuation of taxable services, Payment of service tax and filing of returns, Penalties, CENVAT Credit.

Unit-2

VAT – concepts and general principles, Calculation of VAT Liability including input Tax Credits, Small Dealers and Composition Scheme, VAT Procedures

Unit-3

Central Excise Law in brief – Goods, Excisable goods, Manufacture and Manufacturer, Valuation, CENVAT, Basic procedures, Export, SSI, Job Work

Unit-4

Basic concepts of customs law, Territorial waters, high seas, Types of custom duties – Basic, Countervailing & Anti- Dumping Duty, Safeguard Duty, Valuation, Customs Procedures, Import and Export Procedures, Baggage, Exemptions

Unit V

Emerging Issues in Indirect Taxes: Goods and Services Tax (GST) – Scope of GST, Modalities of GST

Learning outcome: After completion of this paper, the students will have an insight to the taxation on production and distribution of goods and provision of services along taxation mechanism of international trade.

Suggested Readings:

1. Singhania Vinod K. and Monica Singhania, *Students' Guide to Indirect Taxes*, Taxmann Publications Pvt. Ltd., Delhi.
2. V.S. Datey. *Indirect Tax Law and practice*, Taxmann Publications Pvt. Ltd., Delhi, Latest edition.
3. Sanjeev Kumar. *Systematic Approach to Indirect Taxes*, Latest edition.
4. S. S. Gupta. *Service Tax -How to meet your obligation* Taxmann Publications Pvt. Ltd., Delhi, Latest edition.

5. GrishAhuja& Dr. Ravi Gupta, Indirect Taxes, Flair Publication Pvt. Ltd.

B.Com. (Hons.): Semester - VI
Paper BCH-DSE 6.3 (A): CORPORATE TAX PLANNING

Duration: 3 hrs.

Marks: 100 (80+20)

Lectures: 65

Objective: To provide Basic knowledge of corporate tax planning and its impact on decision-making.

Contents:

Unit-1

Tax planning, tax management, tax evasion, tax avoidance, corporate tax in India, Types of companies, Residential status of companies and tax incidence, Tax liability and minimum alternate tax, Tax on distributed profits

Unit-2

Tax planning with reference to setting up of a new business; Locational aspect, nature of business, form of organization; Tax planning with reference to financial management decision; Capital structure, dividend including deemed dividend and bonus shares; Tax planning with reference to sale of scientific research assets

Unit-3

Tax planning with reference to specific management decisions; Make or buy; own or lease; repair or replace; Tax planning with reference to employees' remuneration; Tax planning with reference to receipt of insurance compensation; Tax planning with reference to distribution of assets at the time of liquidation.

Unit-4

Special provisions relating to non-residents; double taxation relief; Provisions regulating transfer pricing; Advance rulings; Advance pricing agreement

Unit-5

Tax planning with reference to business restructuring: - Amalgamation, Demerger, Slump sale, Conversion of sole proprietary concern/partnership firm into company, Conversion of company into LLP, Transfer of assets between holding and subsidiary companies.

Learning outcome: After learning the subject, the students will be able to understand the taxation of the corporate house.

Suggested Readings:

1. Singhania, Vinod K. and Monica Singhania. *Corporate Tax Planning*. Taxmann Publications Pvt. Ltd., New Delhi.
2. Ahuja, Girish. and Ravi Gupta. *Corporate Tax Planning and Management*. Bharat Law House, Delhi.

3. Acharya, Shuklendra and M.G. Gurha. *Tax Planning under Direct Taxes*. Modern Law Publication, Allahabad.
4. Mittal, D.P. *Law of Transfer Pricing*. Taxmann Publications Pvt. Ltd., New Delhi.
5. IAS – 12 and AS – 22.

B.Com. (Hons.): Semester - VI

Paper BCH-DSE 6.4: BUSINESS RESEARCH METHODS AND PROJECT WORK

Duration: 3 hrs.

Marks: 100(50+50)

Lectures: 65

Objective: *This course aims at providing the general understanding of business research and the methods of business research. The course will impart learning about how to collect, analyze, present and interpret data.*

Section A: Business Research Methods

50 Marks

Unit-1

Introduction: Meaning of research; Scope of Business Research; Purpose of Research –Exploration, Description, Explanation; Unit of Analysis – Individual, Organization, Groups, and Data Series; Conception, Construct, Attributes, Variables, and Hypotheses.

Unit-2

Research Process: An Overview; Problem Identification and Definition; Selection of Basic Research Methods- Field Study, Laboratory Study, Survey Method, Observational Method Existing Data Based Research, Longitudinal Studies, Panel Studies

Unit-3

Measurement: Definition; Designing and writing items; Uni-dimensional and Multi-dimensional scales; Measurement Scales- Nominal, Ordinal, Interval, Ratio; Ratings and Ranking Scale, Thurstone, Likert and Semantic Differential scaling, Paired Comparison; Sampling –Steps, Types, Sample Size Decision; Secondary data sources

Hypothesis Testing: Tests concerning means and proportions; ANOVA, Chi-square test and other Non-parametric tests; Testing the assumptions of Classical Normal Linear Regression.

Section B – Project Report

Marks

50

Unit-4

Report Preparation: Meaning, types and layout of research report; Steps in report writing; Citations, Bibliography and Annexure in report; JEL Classification

Note:

1. There shall be a written examination of 50% Marks on the basis of Unit I to III.
2. The student will write a project report under the supervision of a faculty member assigned by the college/institution based on field work. The Project Report carries 50% Marks and will be evaluated by University appointed examiners.

Learning Outcome: After completion of this paper, the students will be able to assess and apply a range of research method on a practical project.

Suggested Readings:

1. Chawla Deepak – Research Methodology – Vikash Publication
2. Upagade&Shende – Research Methodology – S.Chand

B.Com. (Hons.): Semester - VI
Paper 6.4 (B): FUNDAMENTALS OF INVESTMENT

Duration: 3 hrs.

Marks: 100 (80+20)

Lectures: 65

Objective: To familiarize the students with different investment alternatives, introduce them to the framework of their analysis and valuation and highlight the role of investor protection.

Contents

Unit-I:

The Investment Environment - The investment decision process, Types of Investments – Commodities, Real Estate and Financial Assets, the Indian securities market, the market participants and trading of securities, security market indices, sources of financial information, Concept of return and risk, Impact of Taxes and Inflation on return.

Unit-II:

Fixed Income Securities - Bond features, types of bonds, estimating bond yields, Bond Valuation types of bond risks, default risk and credit rating.

Unit-III:

Approaches to Equity Analysis: Introductions to Fundamental Analysis, Technical Analysis and Efficient Market Hypothesis, dividend capitalization models, and price-earnings multiple approach to equity valuation.

Unit-IV:

Portfolio Analysis and Financial Derivatives: (a) Portfolio and Diversification, Portfolio Risk and Return. (b) Mutual Funds. (c) Introduction to Financial Derivatives, Financial Derivatives Markets in India.

Unit-V:

Investor Protection – Role of SEBI and stock exchanges in investor protection; Investor grievances and their redressal system, insider trading, investors' awareness and activism.

Learning outcome: After completion of this paper, this paper will educate the students about various aspect of investment in detail along with understandability of stock market operation, focusing on need for common investor protection.

Suggested Readings

1. Bhalla – Fundamentals of Investment – S.Chand
2. Pandian P. – Security Analysis & Portfolio Management – Vikash Publication

3. Jones, C.P., *“Investments Analysis and Management”*, Wiley, 8thed.

4. Prasanna, Chandra., *“Investment Analysis and Portfolio Management”*, Tata McGraw Hill.
5. Rustogi, R.P., *Fundamentals of Investment*, Sultan Chand & Sons, New Delhi.
6. Vohra, N.D., and B.R. Bagri, *“Futures and Options”*, McGraw Hill Publishing
7. Mayo, *An Introduction to Investment*, Cengage Learning.

B.Com. (Hons.): Semester - VI
Paper 6.4 (C): FINANCIAL MARKET OPERATIONS

Duration: 3 hrs.

Marks: 100 (80+20)

Lectures: 65

Objective: This course aims at acquainting the students with the working of Financial Markets in India.

Unit-1

An overview of financial markets in India: Money Markets: Indian money markets composition and structure; (a) Acceptance houses, (b) Discount houses, and (c) Call money markets; Recent trends in India money markets.

Unit-2

Capital Market: Security market – (a) New issue market. (b) Secondary market: Functions and role of stock exchange: listing procedure and legal requirements: Public Issue – pricing and marketing: Stock exchanges – National Stock Exchange and over-the-counter exchanges.

Unit-3

Securities Contract and Regulations Act: Main provisions. Investors Protections: Grievances concerning stock exchange dealing and their removal: Grievances cells in stock exchanges: SEBI: Company Law Board: Press: Remedy through courts.

Unit-4

Functionaries on Stock Exchanges: Brokers, Sub brokers, market makers, jobbers, and NRIS.

Unit-4

Financial Services: Concept, functions, and types. Financial Services: Meaning and Definition, Role of Financial Services in a financial system. Leasing: Meaning and features. Introduction to equipment leasing: Types of Leases, Evolution of Indian Leasing Industry. Legal Aspects of Leasing: present Legislative Framework. Hire purchase: concept and characteristics of Hire purchase. Difference between hire purchase and leasing, SEBI guidelines: Credit rating

Learning Outcome: After completion of this paper, the student will be able to understand the nature and role of the main financial markets within the domestic and global environment.

Suggested Readings:

1. Chandler M. V. and Goldfeld S. M: Economics of Money and Banking: Harper and Row, New York.
2. Vaish M.C – Monetary Theory – Vikash Publication
3. Gupta Suraj B: Monetary Economics: S. Chand and Co., New Delhi
4. Gupta Suraj B: Monetary Planning in India: Oxford, Delhi.
5. Bhole I. M.: financial Markets and Instructional: Tata

 Skill Development
 Employability
 Entrepreneurship
 All the three
 Skill Development and Employability
 Skill Development and Entrepreneurship
 Employability and Entrepreneurship

UTKAL UNIVERSITY

REGULATIONS & SYLLABUS UNDER GRADUATE PROGRAMME IN BACHELOR OF SCIENCE

(HONOURS & PASS)- CBCS PATTERN Effective from Admission Batch: 2015 - 2016

(Applicable to Autonomous Colleges)

REGULATIONS

1. Eligibility

- 1.1 Higher Secondary/+2/ Senior Secondary or any other equivalent examination passed from any Board/Council established by the Govt. of India or any State Govt. or any other equivalent examination recognized by Central Board of Secondary Education/Council of Higher Secondary Education, Govt. of Odisha/Dept of Higher Education/Dept. of Industry or any other Dept of Govt. of Odisha or Utkal University. Those joining B.Sc. Programme must have passed the above examination under the faculty of Science/Technology/Engineering/Pharmacy etc. There shall be no such restriction for joining BA/ B.Com stream.
- 1.2 Students ordinarily may be selected for admission through Entrance Test, Group Discussion and Personal Interview and/or a combination of these with due weighage to career to bedecided by the Autonomous College or Director, Higher Education. DDCE would admit students on first come first serve basis. The Govt. of Odisha may lay down admission process forcolleges under its control.
- 1.3 Admission Policy would be decided by the Academic Council of the respective Autonomous Colleges and for affiliated colleges Government will decide the admission policy.
- 1.4. Directorate of Distance & Continuing Education would decide its own admission policy.

2. Duration

- 2.1 At least three years of six semesters in toto. In case of professional courses the duration may be more as per the direction of regulatory bodies established under Law.
- 2.2 Odd semester is from June to December (i.e., Sem.-I, Sem.-III & Sem.-V semester). The examination shall be held normally in the month of November - December.
- 2.3 Even semester is from January to June (i.e., Sem.-II, Sem.-IV & Sem.-VI semester). The examination shall be held normally in the month of May - June. However the FinalSemester shall be conducted in April and result shall be published by end of May.
- 2.4 A student would be required to complete the course within six academic years from the date of admission.
- 2.5 A student may opt for fast track of completing all the six semesters in two years provided she/he has at least 2(two) years industry/organizational experience after +2. Such permission would be granted at the discretion of the Principal of the Autonomous Colleges and DDCE. This clause shall not be applicable to affiliated, non autonomous colleges.

3. Compulsory Registration in Semester-I

- 3.1 Registration for Semester-I is compulsory. A candidate admitted to +3 Courses but not registered for 1st semester examination, his/her admission will be automaticallycancelled.
- 3.2 A candidate may take a blank Semester: A blank Semester has to be clubbed with next Odd or Even Semester as the case may be i.e. Sem.-II, Sem.-IV and Sem.-VI/Sem.-I, Sem.-III and Sem.-V. The Hostel policy for blank semester is to be decided by colleges as per their suitability. Hostel accommodation cannot be claimed as a right for a blank semester. (Blank semester is not to be confused as repetition due to failure).
- 3.3 75% attendance for non DDCE students is a requirement for being eligible to appear at

Examination Up to 15% waiver may be granted by the College Principal at discretion on Health Ground or participation in sports, cultural activities, NCC and NSS activities etc.

3.4 A student may clear backlog papers within 6 years. Improvement if any has to be completed within 4 years.

3.5 A student may register for extra credit i.e. register for additional papers under the same faculty or outside the faculty under an autonomous college or DDCE provided they are in a position to facilitate such teaching.

4. Weightage Distribution (Percentage) for Evaluation

• Theory Subjects

Mid Term Test-I	Mid Term Test-II	End Term Test	Total
10	10	80	100

• Subjects with Practical

Unit Test-I	Unit Test-II	End Term Test	Total
		A-Theory B-Practical	
10	10	A-50 B-30(20+10-Record)	100

• Dissertation/Project Work

Identification of problem	Review of Literature	Methodology	Findings	Analysis	Viva-Voce	Total
10	10	10	25	25	20	100

Note: For the DDCE unit tests, quizzes, presentation, seminar etc. may not be introduced immediately.

5. Grading System

5.1

<u>Grade</u>		<u>Marks secured out of 100</u>	<u>Grade points</u>
Outstanding	^J O ^J	90 – 100	10
Excellent	^J A ⁺ ^J	80 – 89	9
Very Good	^J A ^J	70 – 79	8
Good	^J B ⁺ ^J	60 – 69	7
Above average	<i>B</i>	50 – 59	6
Fair	^J C ^J	40 – 49	5
Pass	^J D ^J	30 – 39	4
Failed	^J F ^J	Below 30	0

NOTE:

- A Candidate has to secure 30% or above to pass in each of the Papers.

- The candidate obtaining Grade-*F* is considered failed and will be required to clear the back paper(s) in the subsequent examinations within the stipulated time.
- The candidate securing Grade-*B* and above in Core/Honours papers in aggregate will be awarded Honours.
- The candidate securing Grade-*B +* and above in aggregate in first appearance will be awarded Honours with Distinction/Distinction(for pass/regular course).
- Any candidate filling the forms for appearing in back papers/improvement shall not be awarded Distinction.

5.2 A transitory letter Grade-I (carrying points 2) shall be introduced for cases where the results are incomplete. This grade shall automatically be converted into appropriate grade(s) as and when the results are complete.

5.3 A student's level of competence shall be categorized by a **GRADE POINT AVERAGE**

to be specified as:

SGPA: Semester Grade Point Average CGPA:

Cumulative Grade Point Average

- (a) **POINT:** Integer equivalent of each letter grade.
- (b) **CREDIT:** Integer signifying the relative emphasis of individual course item(s) in a semester as indicated by the Course structure and syllabus.
CREDIT POINT: $(b) \times (a)$ for each course item.
CREDIT INDEX: \sum CREDIT POINT of course items.

$$\text{GRADE POINT AVERAGE: } \frac{\text{CREDIT INDEX}}{\sum \text{CREDIT}} \quad \frac{\text{CREDIT INDEX for a semester}}{\sum \text{CREDIT}}$$

SEMESTER GRADE POINT AVERAGE(SGPA)=

CUMULATIVE GRADE POINT AVERAGE(CGPA)

$$= \frac{\text{CREDIT INDEX of all previous Semester up to the 6th semester}}{\sum \text{CREDIT}}.$$

5.4 In addition to the points marks/ percentage would also be awarded and shall also be reflected in the Mark Sheet.

5.5 The details of grading system shall be printed on the backside of University Mark-sheet.

6. Repeat Examination

6.1 A student has to clear back papers (i.e., in the paper/papers one has failed) by appearing at subsequent semester examinations within six years from the date of admission.

6.2 A student may appear improvement (repeat) in any number of papers in the immediate subsequent examination. The higher marks shall be retained.

6.3 Improvement has to be completed with 4-yrs. from the date of admission.

7. Hard case Rule

7.1 2% of grace mark on the aggregate mark subject to maximum of 5(five) marks in single paper shall be given. This shall be applicable in each semester.

7.2 0.5(point five percent) grace mark can be given for award of B Grade in each semester provided grace mark under 7.1 has not been awarded.

8. Examination Question Pattern(Suggestive)

8.1 The end semester examination will be of three hours irrespective of marks.

8.2 **For subject without having practical** full marks are 100 per paper out of which 20 marks is allotted for Mid-Semester Examination (Internal) and 80 marks for end semester examination. The question papers shall be divided into two parts such as Group-A & Group-B. Group-A will carry 10 short questions of two marks each. The answer should be within two sentences.

There shall be 5 long type questions in Group B with one alternative each have to be attempted and all questions shall be of equal value (12 marks ×5).

For subject with practical full marks are 100 per paper out of which 20 marks is allotted for Mid-Semester Examination, 50 is for End Semester Examination and 30 is for practical.

The question papers shall be divided into two parts such as Group-A & Group-B.

Group-A will carry 10 short questions of one mark each. The answer should be within two sentences.

There shall be 5 long-type questions with one alternative each have to be attempted for subjects having practical. The questions shall be of equal value (8 Marks ×5).

Practical will carry 30 marks out of which 10 will be for records.

8.3 Model answers for long questions should be between 700 – 1000 words.

9. Each Department shall have a designated Teacher in-charge of Examination to be decided by the Principal in addition to the Controller of Examinations of the College (applicable to autonomous colleges).
10. The Internal Evaluation would be the sole responsibility of Teacher offering the course.
11. Suitable modifications may be made by the Autonomous Colleges keeping in view the UGC guideline for Autonomous Colleges, University guidelines from time to time and State Govt. guidelines from time to time.

12. Broad Principles of Credit Transfer

There should be a small group to consider all cases of credit transfer. The group should consist of the following:

Chairman: Chairman P.G Council (for University affiliated colleges)/Director, DDCE for DDCE/Principals of the Autonomous College/Controller of Examinations, Utkal University.

Convener: Dy. Controller of Examinations for University affiliated colleges/Faculty member of DDCE for DDCE/Controller of Examinations of respective Autonomous colleges for Autonomous colleges.

Members: Four teachers to be nominated by the Chairman, P.G. Council/Director, DDCE/Principal of Autonomous Colleges as the case may be.

Waiver for courses covered under other colleges notwithstanding differences in detailed course can be granted. Papers which one has not studied even though they are prescribed for earlier semesters can be covered by the students.

Other Broad Principles: Student transferred after Semester-I examination cannot be given position or medal under autonomous colleges. Students who have failed/remained absent/appeared for improvement shall not be eligible for University Gold medal or Rank. Students who have been granted credit waiver under credit transfer system cannot be awarded Gold medal or position.

DETAILS OF COURSES UNDER BACHELOR OF SCIENCE(HONOURS)

Course	Theory+Practical	Theory + Tutorial
I. Core Course (6 Credits) (14 Papers)	$14 \times 4 = 56$	$14 \times 5 = 70$
Core Course Practical / Tutorial* (14 Papers)	$14 \times 2 = 28$	$14 \times 1 = 14$
II. Elective Course (6 Credits) (8 Papers)		
A.1. Discipline Specific Elective (4 Papers)	$4 \times 4 = 16$	$4 \times 5 = 20$
A.2. Discipline Specific Elective (4 Papers) Practical/ Tutorial*	$4 \times 2 = 8$	$4 \times 1 = 4$
Disciplinary (4 Papers) Tutorials*(4)		
B.1. Generic Elective/Interdis- Papers)	$4 \times 4 = 16$	$4 \times 5 = 20$
B.2. Generic Elective, Practical/	$4 \times 2 = 8$	$4 \times 1 = 4$
• Optional Dissertation or Project Work in place of one Discipline Specific elective paper (6 credits) in Semester-VI.		
III. Ability Enhancement Courses		
1. Ability Enhancement Compulsory Courses(AECC) (2 Papers of 4 credit each)	$2 \times 4 = 8$	$2 \times 4 = 8$
Environmental Science/English/ Hindi/MIL Communication		
2. Skill Enhancement Courses(SEC) (Min.2)(2 Papers of 4 credit each)	$2 \times 4 = 8$	$2 \times 4 = 8$
Total Credit	148	148

- Institute should evolve a system/policy about ECA/General Interest/Hobby/Sports NCC/NSS/related courses on its own.
- Wherever there is a practical there will be no tutorial and vice-versa.
- For Generic Elective, there shall be two subjects other than the Core subject having two papers each.

SCHEME FOR CHOICE BASED CREDIT SYSTEM BACHELOR OF SCIENCE(HONOURS)

Semester	Core Course(14)	Ability Enhancement Compulsory Course (AECC)(2)	Skill Enhancement Course (SEC)(2)	Discipline Specific Elective (DSE)(4)	Generic Elective (GE)(4)
I	C-1 C-2	Environmental Science			GE-1A
II	C-3 C-4	MIL Communication (Oriya/Hindi)			GE-2A
III	C-5 C-6 C-7		SEC-1(English Communication)		GE-1B
IV	C-8 C-9 C-10		SEC-2		GE-2B
V	C-11 C-12		DSE-1 DSE-2		
VI	C-13 C-14		DSE-3 DSE-4		

DETAILS OF COURSES UNDER BACHELOR OF SCIENCE(REGULAR/PASS)








Course	Theory+Practical	Theory + Tutorial
I. Core Course (6 Credits)		
(12 Papers)	$12 \times 4 = 48$	$12 \times 5 = 60$
(4 Courses from each of the 3 Disciplines of choice)		
Core Course Practical / Tutorial*		
(12 Practical/Tutorials*)	$12 \times 2 = 24$	$12 \times 1 = 12$
(4 Courses from each of the 3 Disciplines of choice)		
II. Elective Course (6 Credits)		
(6 Papers)	$6 \times 4 = 24$	$6 \times 5 = 30$
(Two papers from each discipline of choice including paper of interdisciplinary nature)		
Elective Course Practical/Tutorials*		
(6 Practical/Tutorials*)	$6 \times 2 = 12$	$6 \times 1 = 6$
(Two Papers from each Disciplines of choice including paper of interdisciplinary nature)		
<ul style="list-style-type: none"> • Optional Dissertation/Project Work in place of one Discipline elective paper (6 credits) in Semester-VI. 		
III. Ability Enhancement Courses		
1. Ability Enhancement Compulsory Courses(AECC)		
(2 Papers of 4 credit each)	$2 \times 4 = 8$	$2 \times 4 = 8$
Environmental Science/English/ Hindi/MIL Communication		
2. Skill Enhancement Courses(SEC)		
(4 Papers of 4 credit each)	$4 \times 4 = 16$	$4 \times 4 = 16$
<hr/>		
Total Credit	132	132

- Institute should evolve a system/policy about ECA/General Interest/Hobby/Sports NCC/NSS/related courses on its own.
- Wherever there is a practical, there will be no tutorial and vice-versa.

**SCHEME FOR CHOICE BASED CREDIT SYSTEM BACHELOR OF SCIENCE
(REGULAR/ PASS)**

Semester	Core Course(12)	Ability Enhancement Compulsory Course (AECC)(2)	Skill Enhancement Course (SEC)(2)	Discipline Specific Elective (DSE)(6)
I	DSC-1A DSC-2A DSC-3A	Environmental Science		
II	DSC-1B DSC-2B DSC-3B	MIL Communication (Oriya/Hindi)		
III	DSC-1C DSC-2C DSC-3C		SEC-1(English Communication)	
IV	DSC-1D DSC-2D DSC-3D		SEC-2	
V			SEC-3	DSE-1A DSE-2A DSE-3A
VI			SEC-4	DSE-1B DSE-2B DSE-3B

**COLOUR SCHEME OF MAPPING THE SYLLABI FOR ENTREPRENEURSHIP,
EMPLOYABILITY AND SKILL DEVELOPMENT**

 Skill Development
 Employability
 Entrepreneurship
 All the three
 Skill Development and Employability
 Skill Development and Entrepreneurship
 Employability and Entrepreneurship

**ABILITY ENHANCEMENT COMPULSORY
COURSES (AECC)
(For all Subjects)**

SEMESTER-I

AECC-I: Environmental Science

Max. Marks:100 (End-Sem.:80 Marks, Mid-Sem.: 20 Marks)

UNIT-I

The Environment: The Atmosphere, Hydrosphere, Lithosphere, Biosphere, Ecology, Ecosystem, Biogeochemical Cycle (Carbon Cycle, Nitrogen Cycle).

UNIT-II

Environment Pollution: Air Pollution, Water Pollution, Soil Pollution, Noise Pollution, Thermal Pollution, Radiation Pollution, Natural Disasters and their Management.

UNIT-III

Population Ecology: Individuals, Species, Pollution, Community, Control Methods of Population, Urbanization and its effects on Society, Communicable Diseases and its Transmission, Non-Communicable Diseases.

UNIT-IV

Environmental Movements in India: Grassroot Environmental movements in India, Role of women, Environmental Movements in Odisha, State Pollution Control Board, Central Pollution Control Board.

UNIT-V

Natural Resources: Conservation of Natural Resources, Management and Conservation of Wildlife, Soil Erosion and Conservation, Environmental Laws: Water Act, 1974, Air Act, 1981, The Wildlife (Protection) Act, 1972, Environment Protection, 1986.

SEMESTER-II

AECC-II: MIL Communication (Odia/Sanskrit/Alt. Eng.)

Max. Marks:100 (End-Sem.:80 Marks, Mid-Sem.: 20 Marks)

(Detailed syllabus for this paper is available in MIL Odia/Sanskrit/Alt. Eng Communication syllabus).

BOTANY(HONOURS)

SEMESTER-I

C-I: MICROBIOLOGY & PHYCOLOGY

(Credits-6: Theory-4, Practical-2)-Max. Marks: 100

THEORY (Each class 1 hr.): Marks-70 PRACTICAL

(Each class 2 hrs.): Marks-30 Lectures: 60 (40

Theory + 20 Practical classes)

Unit-I

Introduction to microbial world, microbial nutrition, growth and metabolism. (2 lectures)

Unit-II

Bacteria: Discovery, general characteristics, types-archaebacteria, eubacteria, wall-less forms (mycoplasma and spheroplasts), cell structure, nutritional types, reproduction-vegetative, asexual and recombina-

tion (conjugation, transformation and transduction). Economic importance of bacteria with reference to their role in agriculture and industry (fermentation and medicine). (5 lectures)

Unit-III

Algae:- General characteristics; Ecology and distribution; range of thallus organization; Cell structure and components; cell wall, pigment system, reserve food (of only groups represented in the syllabus), flagella; and methods of reproduction, classification; criteria, system of Fritsch, and evolutionary classification of Lee (only upto groups); significant contributions of important phycologists (F.E. Fritsch, G.M. Smith, R.N. Singh, T.V. Desikachary, H.D. Kumar, M.O.P. Iyengar). Role of algae in the environment, agriculture, biotechnology and industry. (6 lectures)

Unit-IV

Cyanophyta:- Ecology and occurrence, range of thallus organization, cell structure, heterocyst, reproduction. economic importance; role in biotechnology. Morphology and life-cycle of Nostoc.(5 lectures)

Chlorophyta:- General characteristics, occurrence, range of thallus organization, cell structure and reproduction. Morphology and life-cycles of Chlamydomonas, Volvox, Oedogonium, Coleochaete. Evolutionary significance of Prochloron. (5 lectures)

Unit-V

Charophyta:- General characteristics; occurrence, morphology, cell structure and life-cycle of Chara; evolutionary significance.(2 lectures)

Xanthophyta:- General characteristics; range of thallus organization; Occurrence, morphology and life-cycle of Vaucheria.(3 lectures)

Phaeophyta:- Characteristics, occurrence, range of thallus organization, cell structure and reproduction. Morphology and life-cycles of Ectocarpus and Fucus.(3 lectures)

Rhodophyta:- General characteristics, occurrence, range of thallus organization, cell structure and reproduction. Morphology and life-cycle of Polysiphonia.(4 lectures)

PRACTICAL

Microbiology:

1. Electron micrographs/Models of viruses T-Phage and TMV, Line drawings/ Photographs of Lytic and Lysogenic Cycle.
2. Types of Bacteria to be observed from temporary/permanent slides/photographs. Electron micrographs of bacteria, binary fission, endospore, conjugation, root Nodule.
3. Gram staining.
4. Endospore staining with malachite green using the (endospores taken from soil bacteria).

Phycology:

Study of vegetative and reproductive structures of Nostoc, Chlamydomonas (electron micrographs), Volvox, Oedogonium, Coleochaete, Chara, Vaucheria, Ectocarpus, Fucus and Polysiphonia, Prochloron through electron micrographs, temporary preparations and permanent slides.

Suggested Readings:

1. Lee, R.E. (2008). Phycology, Cambridge University Press, Cambridge. 4th edition.
2. Prescott, L.M., Harley J.P., Klein D. A. (2005). Microbiology, McGraw Hill, India. 6th edition.
3. Kumar, H.D. (1999). Introductory Phycology. Affiliated East-West Press, Delhi.
4. Sahoo, D. (2000). Farming the ocean: seaweeds cultivation and utilization. Aravali International, New Delhi.
5. Campbell, N.A., Reece J.B., Urry L.A., Cain M.L., Wasserman S.A. Minorsky P.V., Jackson R.B. (2008). Biology, Pearson Benjamin Cummings, USA. 8th edition.
6. Pelczar, M.J. (2001) Microbiology, 5th edition, Tata McGraw-Hill Co, New Delhi.

C-2: BIOMOLECULES & CELL BIOLOGY

(Credits-6: Theory-4, Practical-2)-Max. Marks: 100

THEORY (Each class 1 hr.): Marks-70 PRACTICAL

(Each class 2 hrs.): Marks-30 Lectures: 60 (40

Theory + 20 Practical classes)

Unit-I

Biomolecules: Types and significance of chemical bonds; Structure and properties of water; pH and buffers. (2 lectures)

Carbohydrates: Nomenclature and classification; Role of monosaccharides (glucose, fructose, sugar alcohols mannitol and sorbitol); Disaccharides (sucrose, maltose, lactose), Oligosaccharides and polysaccharides (structural-cellulose, hemicelluloses, pectin, chitin, mucilage; storage, starch, insulin) (3 lectures)

Lipids: Definition and major classes of storage and structural lipids. Storage lipids. Fatty acids

structure and functions. Essential fatty acids. Triacyl glycerols structure, functions and properties. (2 lectures)

Proteins: Structure of amino acids; Peptide bonds; Levels of protein structure-primary, secondary, tertiary and quaternary; Isoelectric point; Protein denaturation and biological roles of proteins. (2 lectures)

Nucleic acids: Structure of nitrogenous bases; Structure and function of nucleotides; Types of nucleic acids; Structure of A, B, Z types of DNA; Types of RNA; Structure of tRNA. (4 lectures) **Unit-II**

Bioenergetics: Laws of thermodynamics, concept of free energy, endergonic and exergonic reactions, coupled reactions, redox reactions. ATP: structure, its role as a energy currency molecule. (3 lectures)

Enzymes: Structure of enzyme: holoenzyme, apoenzyme, cofactors, coenzymes and prosthetic group; Classification of enzymes; Features of active site, substrate specificity, mechanism of action (activation energy, lock and key hypothesis, induced - fit theory), Michaelis Menten equation, enzyme inhibition and factors affecting enzyme activity. (4 lectures)

Unit-III

The cell: Cell as a unit of structure and function; Characteristics of prokaryotic and eukaryotic cells; Origin of eukaryotic cell (Endosymbiotic theory). (2 lectures)

Cell wall and plasma membrane: Chemistry, structure and function of Plant Cell Wall. Overview of membrane function; fluid mosaic model; Chemical composition of membranes; Membrane transport Passive, active and facilitated transport, endocytosis and exocytosis. (3 lectures)

Unit-IV

Cell organelles: Nucleus; Structure-nuclear envelope, nuclear pore complex, nuclear lamina, molecular organization of chromatin; nucleolus. (3 lectures)

Cytoskeleton: Role and structure of microtubules, microfilaments and intermediary filament. (2 lectures)

Chloroplast, mitochondria and peroxisomes: Structural organization; Function; Semiautonomous nature of mitochondria and chloroplast. (2 lectures)

Endoplasmic Reticulum, Golgi Apparatus, Lysosomes (2 lectures)

Unit-V

Cell division: Eukaryotic cell cycle, different stages of mitosis and meiosis. Cell cycle, Regulation of cell cycle. (6 lectures)

PRACTICAL

1. Qualitative tests for carbohydrates, reducing sugars, non-reducing sugars, lipids and proteins.
2. Study of plant cell structure with the help of epidermal peel mount of Onion/Rhoeo/Crinum.
3. Demonstration of the phenomenon of protoplasmic streaming in Hydrilla leaf.
4. Measurement of cell size by the technique of micrometry.
5. Counting the cells per unit volume with the help of haemocytometer. (Yeast/pollen grains).
6. Study of cell and its organelles with the help of electron micrographs.
7. Study the phenomenon of plasmolysis and deplasmolysis.
8. Study different stages of mitosis and meiosis using aceto carmine and aceto orcin method.

Suggested Readings:

1. Campbell, MK (2012) Biochemistry, 7th ed., Published by Cengage Learning.
2. Campbell, PN and Smith AD (2011) Biochemistry Illustrated, 4th ed., Published by Churchill

Livingstone.

3. Tymoczko JL, Berg JM and Stryer L (2012) Biochemistry: A short course, 2nd ed., W.H. Freeman
4. Berg JM, Tymoczko JL and Stryer L (2011) Biochemistry, W.H. Freeman and Company
5. Nelson DL and Cox MM (2008) Lehninger Principles of Biochemistry, 5th Edition., W.H. Freeman and Company.
6. Karp, G. (2010). Cell Biology, John Wiley & Sons, U.S.A. 6th edition.
7. Hardin, J., Becker, G., Skliensmith, L.J. (2012). Beckers World of the Cell, Pearson Education Inc. U.S.A. 8th edition.
8. Cooper, G.M. and Hausman, R.E. 2009 The Cell: A Molecular Approach. 5th edition. ASM Press & Sunderland, Washington, D.C.; Sinauer Associates, MA.
9. Becker, W.M., Kleinsmith, L.J., Hardin. J. and Bertoni, G. P. 2009 The World of the Cell. 7th edition. Pearson Benjamin Cummings Publishing, San Francisco

SEMESTER-II

C-3: MYCOLOGY & PHYTOPATHOLOGY

(Credits-6: Theory-4, Practical-2)-Max. Marks: 100

THEORY (Each class 1 hr.): Marks-70 PRACTICAL

(Each class 2 hrs.): Marks-30 Lectures: 60 (40

Theory + 20 Practical classes)

Unit-I

Introduction to true fungi: Definition, **General characteristics**; Affinities with plants and animals; Thallus organization; Cell wall composition; Nutrition; Classification.

Chytridiomycetes: **General account** (5 lectures)

Zygomycota: **General characteristics**; Ecology; Thallus organisation; Life cycle with reference to Rhizopus. (4 lectures)

Ascomycota: **General characteristics** (asexual and sexual fruiting bodies); Ecology; Life cycle, Heterokaryosis and parasexuality; life cycle and classification with reference to Saccharomyces, Aspergillus, Penicillium, Alternaria and Neurospora, Peziza. (5 lectures)

Unit-II

Basidiomycota: **General characteristics**; Ecology; Life cycle and Classification with reference to black stem rust on wheat Puccinia (Physiological Specialization), loose and covered smut (symptoms only), Agaricus; Bioluminescence, Fairy Rings and Mushroom Cultivation. (5 lectures)

Allied Fungi: **General characteristics**; Status of Slime molds, Classification; Occurrence; Types of plasmodia; Types of fruiting bodies. (3 lectures)

Oomycota: **General characteristic**; Ecology; Life cycle and classification with reference to Phytophthora, Albugo. (4 lectures)

Unit-III

Symbiotic associations: Lichen Occurrence; **General characteristics**; Growth forms and range of thallus organization; Nature of associations of algal and fungal partners; Reproduction. **Mycorrhiza-Ectomycorrhiza, Endomycorrhiza and their significance.** (4 lectures)

Unit-IV

Applied Mycology: **Role of fungi in biotechnology, Application of fungi in food industry (Flavour &**

texture, Fermentation, Baking, Organic acids, Enzymes, Mycoproteins); Secondary metabolites (Pharmaceutical preparations); Agriculture (Biofertilizers); Mycotoxins; Biological control (Mycofungicides, Mycoherbicides, Mycoinsecticides, Myconematicides); Medical mycology. (5 Lectures)

Unit-V

Phytopathology: Terms and concepts; General symptoms; Geographical distribution of diseases; etiology; symptomology; Host-Pathogen relationships; disease cycle and environmental relation; prevention and control of plant diseases, and role of quarantine. Bacterial diseases Citrus canker and angular leaf spot disease of Cotton. Viral diseases Tobacco Mosaic viruses, vein clearing. Fungal diseases Early blight of potato, Black stem rust of wheat, white rust of crucifers. (5 lectures)

PRACTICAL

1. Introduction to the world of fungi (Unicellular, coenocytic/septate mycelium, ascocarps & basidiocarps).
2. Rhizopus: study of asexual stage from temporary mounts and sexual structures through permanent slides.
3. Aspergillus and Penicillium: study of asexual stage from temporary mounts. Study of Sexual stage from permanent slides/photographs.
4. Peziza: sectioning through ascocarp.
5. Alternaria: Specimens/photographs and temporary mounts.
6. Puccinia: Herbarium specimens of Black Stem Rust of Wheat and infected Barberry leaves; sections/ mounts of spores on wheat and permanent slides of both the hosts.
7. Agaricus: Specimens of button stage and full grown mushroom; sectioning of gills of Agaricus, fairy rings and bioluminescent mushrooms to be shown.
8. Albugo: Study of symptoms of plants infected with Albugo; asexual phase study through section/temporary mounts and sexual structures through permanent slides.
9. Lichens: Study of growth forms of lichens (crustose, foliose and fruticose) on different substrates. Study of thallus and reproductive structures (soredia and apothecium) through permanent slides. Mycorrhizae: ectomycorrhiza and endo mycorrhiza (Photographs)
10. Phytopathology: Herbarium specimens of bacterial diseases; Citrus Canker; Viral diseases: TMV, Fungal diseases: Early blight of potato, and White rust of crucifers.

Suggested Readings:

1. Agrios, G.N. 1997 Plant Pathology, 4th edition, Academic Press, U.K.
2. Alexopoulos, C.J., Mims, C.W., Blackwell, M. (1996). Introductory Mycology, John Wiley & Sons (Asia) Singapore. 4th edition.
3. Webster, J. and Weber, R. (2007). Introduction to Fungi, Cambridge University Press, Cambridge. 3rd edition.
4. Sethi, I.K. and Walia, S.K. (2011). Text book of Fungi and Their Allies, Macmillan Publishers India Ltd.
5. Sharma, P.D. (2011). Plant Pathology, Rastogi Publication, Meerut, India.

C-4: ARCHEGONIATE

(Credits-6: Theory-4, Practical-2)-Max. Marks: 100

THEORY (Each class 1 hr.): Marks-70 PRACTICAL

(Each class 2 hrs.): Marks-30 Lectures: 60 (40

Theory + 20 Practical classes)

Unit-I

Introduction: **Unifying features of archegoniates**; Transition to land habit; Alternation of generations. (2 lectures)

Unit-II

Bryophytes: **General characteristics**; Adaptations to land habit; Classification; Range of thallus organization. Classification (up to family). Riccia, Marchantia, Pellia, Porella, Anthoceros, Sphagnum and Funaria; Reproduction and evolutionary trends in Riccia, Marchantia, Anthoceros and Funaria (developmental stages not included). **Ecological and economic importance of bryophytes with special reference to Sphagnum.** (12 lectures)

Unit-III

Pteridophytes: **General characteristics**, classification. Classification (up to family), morphology, anatomy and reproduction of Psilotum, Selaginella, Equisetum and Pteris. (Developmental details not to be included). Apogamy, and apospory, heterospory and seed habit, telome theory, stellar evolution. **Ecological and economic importance.** (10 lectures)

Unit-IV

Gymnosperms: **General characteristics**, classification (up to family), morphology, anatomy and reproduction of Cycas, Pinus, Ginkgo and Gnetum. (Developmental details not to be included). **Ecological and economic importance.** (8 lectures)

Unit-V

Fossils: Geographical time scale, fossils and fossilization process. **Morphology, anatomy and affinities of Rhynia, Calamites, Lepidodendron, Lyginopteris and Cycadeoidea.** (8 lectures)

PRACTICAL

1. Riccia Morphology of thallus.
2. Marchantia- Morphology of thallus, whole mount of rhizoids & Scales, vertical section of thallus through Gemma cup, whole mount of Gemmae (all temporary slides), vertical section of Antheridiophore, Archegoniophore, longitudinal section of Sporophyte (all permanent slides).
3. Anthoceros- Morphology of thallus, dissection of sporophyte (to show stomata, spores, pseudoelaters, columella) (temporary slide), vertical section of thallus (permanent slide).
4. Pellia, Porella- Permanent slides.
5. Sphagnum- Morphology of plant, whole mount of leaf (permanent slide only).
6. Funaria- Morphology, whole mount of leaf, rhizoids, operculum, peristome, annulus, spores (temporary slides); permanent slides showing antheridial and archegonial heads, longitudinal section of capsule and protonema.
7. Psilotum- Study of specimen, transverse section of synangium (permanent slide).
8. Selaginella- Morphology, whole mount of leaf with ligule, transverse section of stem, whole mount of strobilus, whole mount of microsporophyll and megasporophyll (temporary slides), longitudinal section of strobilus (permanent slide).

9. Equisetum- Morphology, transverse section of internode, longitudinal section of strobilus, transverse section of strobilus, whole mount of sporangiophore, whole mount of spores (wet and dry) (temporary slide), transverse section of rhizome (permanent slide).
10. Pteris- Morphology, transverse section of rachis, vertical section of sporophyll, whole mount of sporangium, whole mount of spores (temporary slides), transverse section of rhizome, whole mount of prothallus with sex organs and young sporophyte (permanent slide).
11. Cycas- Morphology (coralloid roots, bulbil, leaf), whole mount of microsporophyll, transverse section of coralloid root, transverse section of rachis, vertical section of leaflet, vertical section of microsporophyll, whole mount of spores (temporary slides), longitudinal section of ovule, transverse section of root (permanent slide).
12. Pinus- Morphology (long and dwarf shoots, whole mount of dwarf shoot, male and female cones), transverse section of Needle, transverse section of stem, longitudinal section of transverse section of male cone, whole mount of microsporophyll, whole mount of Microspores (temporary slides), longitudinal section of female cone, tangential longitudinal section & radial longitudinal sections stem (permanent slide).
13. Gnetum- Morphology (stem, male & female cones), transverse section of stem, vertical section of ovule (permanent slide)
14. Botanical excursion.

Suggested Readings:

1. Vashista, P.C., Sinha, A.K., Kumar, A. (2010). Pteridophyta. S. Chand. Delhi, India.
2. Bhatnagar, S.P. & Moitra, A. (1996). Gymnosperms. New Age International (P) Ltd Publishers, New Delhi, India.
3. Parihar, N.S. (1991). An introduction to Embryophyta: Vol. I. Bryophyta. Central Book Depot. Allahabad.
4. Raven, P.H., Johnson, G.B., Losos, J.B., Singer, S.R. (2005). Biology. Tata McGraw Hill, Delhi.
5. Vander-Poorteri 2009 Introduction to Bryophytes. COP.

SEMESTER-III

C-5: ANATOMY OF ANGIOSPERMS

(Credits-6: Theory-4, Practical-2)-Max. Marks: 100

THEORY (Each class 1 hr.): Marks-70 PRACTICAL

(Each class 2 hrs.): Marks-30 Lectures: 60 (40

Theory + 20 Practical classes)

Unit-I

Introduction and scope of Plant Anatomy: Applications in systematics, forensics and pharmacognosy. (2 Lectures)

Tissues: Classification of tissues; Simple and complex tissues (no phylogeny); cytodifferentiation of tracheary elements and sieve elements; Pits and plasmodesmata; Wall ingrowths and transfer cells, adcrustation and incrustation, Ergastic substances. (5 Lectures)

Unit-II

Stem: Organization of shoot apex (Apical cell theory, Histogen theory, Tunica Corpus theory, continuing meristematic residue, cytohistological zonation); Types of vascular bundles; Structure of dicot

and monocot stem. (5 Lectures)

Leaf: Structure of dicot and monocot leaf, Kranz anatomy. (4 Lectures)

Root: Organization of root apex (Apical cell theory, Histogen theory, Korper-Kappe theory); Quiescent centre; Root cap; Structure of dicot and monocot root; Endodermis, exodermis and origin of lateral root. (4 Lectures)

Unit-III

Vascular Cambium: Structure, function and seasonal activity of cambium; Secondary growth in root and stem. (4 Lectures)

Wood: Axially and radially oriented elements; Types of rays and axial parenchyma; Cyclic aspects and reaction wood; Sapwood and heartwood; Ring and diffuse porous wood; Early and late wood, tyloses; Dendrochronology. (5 Lectures)

Periderm: Development and composition of periderm, rhytidome and lenticels. (3 Lectures)

Unit-IV

Adaptive and Protective Systems Epidermal tissue system, cuticle, epicuticular waxes, trichomes (uni- and multicellular, glandular and nonglandular, two examples of each), stomata (classification); Adcrustation and incrustation; Anatomical adaptations of xerophytes and hydrophytes. (5 Lectures)

Unit-V

Secretory System: Hydathodes, cavities, lithocysts and laticifers. (3 Lectures)

PRACTICAL

1. Study of anatomical details through permanent slides/temporary stain mounts/macerations/museum specimens with the help of suitable examples.
2. Apical meristem of root, shoot and vascular cambium.
3. Distribution and types of parenchyma, collenchyma and sclerenchyma.
4. Xylem: Tracheary elements-tracheids, vessel elements; thickenings; perforation plates; xylem fibres.
5. Wood: ring porous; diffuse porous; tyloses; heart- and sapwood.
6. Phloem: Sieve tubes-sieve plates; companion cells; phloem fibres.
7. Epidermal system: cell types, stomata types; trichomes: non-glandular and glandular.
8. Root: monocot, dicot, secondary growth.
9. Stem: monocot, dicot - primary and secondary growth; periderm; lenticels.
10. Leaf: isobilateral, dorsiventral, C4 leaves (Kranz anatomy).
11. Adaptive Anatomy: xerophytes, hydrophytes.
12. Secretory tissues: cavities, lithocysts and laticifers.

Suggested Readings:

1. Dickison, W.C. (2000). Integrative Plant Anatomy. Harcourt Academic Press, USA.
2. Fahn, A. (1974). Plant Anatomy. Pergmon Press, USA.
3. Mauseth, J.D. (1988). Plant Anatomy. The Benjamin/Cummings Publisher, USA.
4. Esau, K. (1977). Anatomy of Seed Plants. John Wiley & Sons, Inc., Delhi.

C-6: ECONOMIC BOTANY

(Credits-6: Theory-4, Practical-2)-Max. Marks: 100

THEORY (Each class 1 hr.): Marks-70 PRACTICAL

(Each class 2 hrs.): Marks-30 Lectures: 60 (40

Theory + 20 Practical classes)

Unit-I

Origin of Cultivated Plants: Concept of Centres of Origin, their importance with reference to Vavilovs work. Examples of major plant introductions; Crop domestication and loss of genetic diversity; evolution of new crops/varieties, importance of germplasm diversity. (3 Lectures)

Unit-II

Cereals : Wheat and Rice (origin, morphology, processing & uses), brief account of millets. (3 lectures)

Legumes: General account, importance to man and ecosystem. (3 Lectures)

Sugars & Starches: Morphology and processing of sugarcane, products and by-products of sugarcane industry. Potato morphology, propagation & uses. (3 lectures)

Unit-III

Spices:Listing of important spices, their family and part used, economic importance with special reference to fennel, saffron, clove and black pepper (4 Lectures)

Beverages: Tea, Coffee (morphology, processing & uses)(4 lectures) Drug-yielding plants: Therapeutic and habit-forming drugs with special reference to Cinchona, Digitalis, Papaver and Cannabis. (4 Lectures)

Tobacco: Tobacco (Morphology, processing, uses and health hazards) (2Lectures)

Unit-IV

Oils & Fats: General description, classification, extraction, their uses and health implications groundnut, coconut, linseed and Brassica and Coconut (Botanical name, family & uses) (4 lectures) Essential

Oils: General account, extraction methods, comparison with fatty oils & their uses. (4 Lectures)

Unit-V

Natural Rubber: Para-rubber: tapping, processing and uses. (2 Lectures)

Timber plants: General account with special reference to teak and pine. (2 Lectures)

Fibres: Classification based on the origin of fibres, Cotton and Jute (morphology, extraction and uses). (2 Lectures)

PRACTICAL

1. Cereals: Rice (habit sketch, study of paddy and grain, starch grains, micro-chemical tests).
2. Legumes: Soya bean, Groundnut, (habit, fruit, seed structure, micro-chemical tests).
3. Sugars & Starches: Sugarcane (habit sketch; cane juice- micro-chemical tests), Potato(habit sketch, tuber morphology, T.S. tuber to show localization of starch grains, w.m. starch grains, micro-chemical tests).
4. Spices: Black pepper, Fennel and Clove (habit and sections).

5. Beverages: Tea (plant specimen, tea leaves), Coffee (plant specimen, beans).
6. Oils & Fats: Coconut- T.S. nut, Mustard plant specimen, seeds; tests for fats in crushed seeds.
7. Essential oil-yielding plants: Habit sketch of Rosa, Vetiveria, Santalum and Eucalyptus (specimens/photographs).
8. Rubber: specimen, photograph/model of tapping, samples of rubber products.
9. Drug-yielding plants: Specimens of Digitalis, Papaver and Cannabis.
10. Tobacco: specimen and products of Tobacco.
11. Woods: Tectona, Pinus: Specimen, Section of young stem.
12. Fibre-yielding plants: Cotton (specimen, whole mount of seed to show lint and fuzz; whole mount of fibre and test for cellulose), Jute (specimen, transverse section of stem, test for lignin on transverse section of stem and fibre).

Suggested Readings:

1. Kochhar, S.L. (2012). Economic Botany in Tropics, MacMillan & Co. New Delhi, India.
2. Wickens, G.E. (2001). Economic Botany: Principles & Practices. Kluwer Academic Publishers, The Netherlands.
3. Chrispeels, M.J. and Sadava, D.E. (2003). Plants, Genes and Agriculture. Jones & Bartlett Publishers.

C-7: GENETICS

(Credits-6: Theory-4, Practical-2)-Max. Marks: 100
 THEORY (Each class 1 hr.): Marks-70 PRACTICAL
 (Each class 2 hrs.): Marks-30 Lectures: 60 (40
 Theory + 20 Practical classes)

Unit-I

Mendelian genetics and its extension Mendelism: History; Principles of inheritance; Chromosome theory of inheritance; Autosomes and sex chromosomes; Probability and pedigree analysis; Incomplete dominance and codominance; Multiple alleles, Lethal alleles, Epistasis, Pleiotropy, Recessive and Dominant traits, Penetrance and Expressivity, Numericals; Polygenic inheritance. (16 lectures)

Unit-II

Extrachromosomal Inheritance: Chloroplast mutation: Variegation in Four o'clock plant; Mitochondrial mutations in yeast; Maternal effects-shell coiling in snail; Infective heredity- Kappa particles in Paramecium. (6 lectures)

Unit-III

Linkage, crossing over and chromosome mapping: Linkage and crossing over-Cytological basis of crossing over; Recombination frequency, two factor and three factor crosses; Interference and coincidence; Numericals based on gene mapping; Sex Linkage. (12 lectures)

Unit-IV

Variation in chromosome number and structure: Deletion, Duplication, Inversion, Translocation, Position effect, Euploidy and Aneuploidy (8 lectures)

Gene mutations: Types of mutations; Molecular basis of Mutations; Mutagens physical and chemical (Base analogs, deaminating, alkylating and intercalating agents); Detection of mutations: CIB method. Role of Transposons in mutation. DNA repair mechanisms. (6 lectures)

Unit-V

Fine structure of gene: Classical vs molecular concepts of gene; Cis-Trans complementation test for functional allelism; Structure of Phage T4, rII Locus. (6 lectures)

Population and Evolutionary Genetics: Allele frequencies, Genotype frequencies, Hardy-Weinberg Law, role of natural selection, mutation, genetic drift. Genetic variation and Speciation. (6 lectures)

PRACTICAL

1. Meiosis through temporary squash preparation.
2. Mendel's laws through seed ratios. Laboratory exercises in probability and chi-square analysis.
3. Chromosome mapping using test cross data.
4. Pedigree analysis for dominant and recessive autosomal and sex linked traits with floral chart.
5. Incomplete dominance and gene interaction through seed ratios (9:7, 9:6:1, 13:3, 15:1, 12:3:1, 9:3:4).
6. Blood Typing: ABO groups & Rh factor.
7. Study of aneuploidy: Down's, Klinefelter's and Turner's syndromes.
8. Photographs/Permanent Slides showing Translocation Ring, Laggard's and Inversion Bridge.

Suggested Readings:

1. Gardner, E.J., Simmons, M.J., Snustad, D.P. (1991). Principles of Genetics, John Wiley & sons, India. 8th edition.
2. Snustad, D.P. and Simmons, M.J. (2010). Principles of Genetics, John Wiley & Sons Inc., India. 5th edition.
3. Klug, W.S., Cummings, M.R., Spencer, C.A. (2012). Concepts of Genetics. Benjamin Cummings, U.S.A. 10th edition.
4. Griffiths, A.J.F., Wessler, S.R., Carroll, S.B., Doebley, J. (2010). Introduction to Genetic Analysis. W. H. Freeman and Co., U.S.A. 10th edition.

SEMESTER-IV

C-8: MOLECULAR BIOLOGY

(Credits-6: Theory-4, Practical-2)-Max. Marks: 100

THEORY (Each class 1 hr.): Marks-70 PRACTICAL

(Each class 2 hrs.): Marks-30 Lectures: 60 (40

Theory + 20 Practical classes)

Unit-I

Nucleic acids : Carriers of genetic information: Historical perspective; DNA as the carrier of genetic information (Griffiths, Hershey & Chase, Avery, McLeod & McCarty, Fraenkel-Conrats experiment. (4 lectures)

Unit-II

The Structures of DNA and RNA / Genetic Material: DNA Structure: Miescher to Watson and Crick-historic perspective, DNA structure, Salient features of double helix, Types of DNA, Types of genetic material, denaturation and renaturation, cot curves; Organization of DNA Prokaryotes, Viruses, Eukaryotes. RNA Structure- Organelle DNA - mitochondria and chloroplast DNA. The Nucleosome - Chromatin structure- Euchromatin, Heterochromatin- Constitutive and Facultative heterochromatin. (8 lectures)

The replication of DNA: Chemistry of DNA synthesis (Kornbergs discovery); General principles bidirectional, semi-conservative and semi discontinuous replication, RNA priming; Various models of DNA replication, including rolling circle, (theta) mode of replication, replication of linear ds-DNA, replication of the 5' end of linear chromosome; Enzymes involved in DNA replication. (6 lectures)

Unit-III

Central dogma and genetic code: Key experiments establishing-The Central Dogma (Adaptor hypothesis and discovery of mRNA template), Genetic code (deciphering & salient features) (2 lectures)

Mechanism of Transcription: Transcription in prokaryotes; Transcription in eukaryotes (4 lectures)

Processing and modification of RNA: Split genes-concept of introns and exons, removal of introns, spliceosome machinery, splicing pathways, group I & group II intron splicing, alternative splicing eukaryotic mRNA processing(5' cap, 3' polyA tail); Ribozymes, exon shuffling; RNA editing and mRNA transport. (5 lectures)

Unit-IV

Translation (Prokaryotes and eukaryotes): Ribosome structure and assembly, mRNA; Charging of tRNA, aminoacyl tRNA synthetases; Various steps in protein synthesis, proteins involved in initiation, elongation and termination of polypeptides; Fidelity of translation; Inhibitors of protein synthesis; Post-translational modifications of proteins. (6 lectures)

Unit-V

Regulation of transcription in prokaryotes and eukaryotes: Principles of transcriptional regulation; Prokaryotes: Regulation of lactose metabolism and tryptophan synthesis in E.coli. Eukaryotes: transcription factors, heat shock proteins, steroids and peptide hormones; Gene silencing. (5 lectures)

PRACTICAL

1. Preparation of LB medium and raising E.Coli.
2. Isolation of genomic DNA from E.Coli.

3. DNA isolation and RNA estimation by orcinol method.

4. DNA estimation by diphenylamine reagent/UV Spectrophotometry.

5. Study of DNA replication mechanisms through photographs (Rolling circle, Theta replication and semi-discontinuous replication).

6. Study of structures of prokaryotic RNA polymerase and eukaryotic RNA polymerase II through photographs.

7. Photographs establishing nucleic acid as genetic material (Messelson and Stahls, Avery et al, Griffiths, Hershey & Chases and Fraenkel & Conrats experiments)

8. Study of the following through photographs: Assembly of Spliceosome machinery; Splicing mechanism in group I & group II introns; Ribozyme and Alternative splicing.

Suggested Readings:

1. Watson J.D., Baker, T.A., Bell, S.P., Gann, A., Levine, M., Losick, R. (2007). Molecular Biology of the Gene, Pearson Benjamin Cummings, CSHL Press, New York, U.S.A. 6th edition.

2. Snustad, D.P. and Simmons, M.J. (2010). Principles of Genetics. John Wiley and Sons Inc., U.S.A. 5th edition.

3. Klug, W.S., Cummings, M.R., Spencer, C.A. (2009). Concepts of Genetics. Benjamin Cummings. U.S.A. 9th edition.

4. Russell, P.J. (2010). iGenetics- A Molecular Approach. Benjamin Cummings, U.S.A. 3rd edition.

5. Griffiths, A.J.F., Wessler, S.R., Carroll, S.B., Doebley, J. (2010). Introduction to Genetic Analysis. W. H. Freeman and Co., U.S.A. 10th edition.

C-9: PLANT ECOLOGY & PHYTOGEOGRAPHY

(Credits-6: Theory-4, Practical-2)-Max. Marks: 100

THEORY (Each class 1 hr.): Marks-70 PRACTICAL

(Each class 2 hrs.): Marks-30 Lectures: 60 (40

Theory + 20 Practical classes)

Unit-I

Introduction Concept of ecology, Autoecology, Synecology, system ecology, Levels of organization. Inter-relationships between the living world and the environment, the components of environmental, concept of hydrosphere and lithosphere and dynamism, homeostasis. (2 lectures)

Unit-II

Soil: Importance; Origin; Formation; Composition; Physical; Chemical and Biological components; Soil profile; Role of climate in soil development. (5 lectures)

Water: Importance: States of water in the environment; Atmospheric moisture; Precipitation types (rain, fog, snow, hail, dew); Hydrological Cycle; Water in soil; Water table. (2 lectures)

Light, temperature, wind and fire: Variations; adaptations of plants to their variation. (4 lectures)

Unit-III

Biotic interactions: 2 lectures Population ecology: Characteristics and Dynamics .Ecological Speciation 4 lectures Plant communities: Concept of ecological amplitude; Habitat and niche; Characters: analytical and synthetic; Ecotone and edge effect; Dynamics: succession processes, types; climax concepts. (4 lectures)

Unit-IV

Ecological pyramids. (4 lectures)

Functional aspects of ecosystem: Principles and models of energy flow; Production and productivity; Ecological efficiencies; Biogeochemical cycles; Cycling of Carbon, Nitrogen and Phosphorus.(5 lectures)

Unit-V

Phytogeography: Principles; Continental drift; Theory of tolerance; Endemism; Brief description of major terrestrial biomes (one each from tropical, temperate & tundra); Phytogeographical division of India; Local Vegetation. (8 lectures)

PRACTICAL

1. Study of instruments used to measure microclimatic variables: Soil thermometer, maximum and minimum thermometer, anemometer, psychrometer/hygrometer, rain gauge and luxmeter.
2. Determination of pH of various soil and water samples (pH meter, universal indicator/Lovibond comparator and pH paper)
3. Analysis for carbonates, chlorides, nitrates, sulphates, organic matter and base deficiency from two soil samples by rapid field tests.
4. Determination of organic matter of different soil samples by Walkley & Black rapid titration method.
5. Comparison of bulk density, porosity and rate of infiltration of water in soils of three habitats.
6. Determination of dissolved oxygen of water samples from polluted and unpolluted sources.
7. (a) Study of morphological adaptations of hydrophytes and xerophytes (four each). (b) Study of biotic interactions of the following: Stem parasite (Cuscuta), Root parasite (Orobancha) Epiphytes, Predation (Insectivorous plants).
8. Determination of minimal quadrat size for the study of herbaceous vegetation in the college campus, by species area curve method (species to be listed).
9. Quantitative analysis of herbaceous vegetation in the college campus for frequency and comparison with Raunkiaers frequency distribution law.
10. Quantitative analysis of herbaceous vegetation for density and abundance in the college campus.

11. Field visit to familiarise students with ecology of different sites.

Suggested Readings:

1. Odum, E.P. (2005). Fundamentals of ecology. Cengage Learning India Pvt. Ltd., New Delhi. 5th edition.
2. Singh, J.S., Singh, S.P., Gupta, S. (2006). Ecology Environment and Resource Conservation. Anamaya Publications, New Delhi, India.
3. Sharma, P.D. (2010). Ecology and Environment. Rastogi Publications, Meerut, India. 8th edition.
4. Wilkinson, D.M. (2007). Fundamental Processes in Ecology: An Earth Systems Approach. Oxford University Press. U.S.A.
5. Kormondy, E.J. (1996). Concepts of ecology. PHI Learning Pvt. Ltd., Delhi, India. 4th edition.

C-10: PLANT SYSTEMATICS

(Credits-6: Theory-4, Practical-2)-Max. Marks: 100
THEORY (Each class 1 hr.): Marks-70 PRACTICAL
(Each class 2 hrs.): Marks-30 Lectures: 60 (40
Theory + 20 Practical classes)

Unit-I

Plant identification, Classification, Nomenclature; Biosystematics. (2 lectures)

Identification: Field inventory; Functions of Herbarium; Important herbaria and botanical gardens of the world and India; Virtual herbarium; E-flora; Documentation: Flora, Monographs, Journals; Keys: Single access and Multi-access. (5 lectures)

Unit-II

Taxonomic hierarchy: Concept of taxa (family, genus, species); Categories and taxonomic hierarchy; Species concept (taxonomic, biological, evolutionary). (5 lectures)

Botanical nomenclature: Principles and rules (ICN); Ranks and names; Typification, author citation, valid publication, rejection of names, principle of priority and its limitations; Names of hybrids. (5 lectures)

Unit-III

Systematics-an interdisciplinary science: Evidence from palynology, cytology, phytochemistry and molecular data. (6 lectures)

Systems of classification: Major contributions of Theophrastus, Bauhin, Tournefort, Linnaeus, Adanson, de Candolle, Bessey, Hutchinson, Takhtajan and Cronquist; Classification systems of Bentham and Hooker (upto series) and Engler and Prantl (upto series); Brief reference of Angiosperm Phylogeny Group (APG III) classification. (6 lectures)

Unit-IV

Biometrics, numerical taxonomy and cladistics: Characters; Variations; OTUs, character weighting and coding; cluster analysis; Phenograms, cladograms (definitions and differences). (4 lectures)

Unit-V

Phylogeny of Angiosperms: Terms and concepts (primitive and advanced, homology and analogy, parallelism and convergence, monophyly, Paraphyly, polyphyly and clades). origin & evolution of angiosperms; coevolution of angiosperms and animals; methods of illustrating evolutionary relationship (phylogenetic tree, cladogram). (7 lectures)

PRACTICAL

1. **Study of vegetative and floral characters of the following families** (Description, V.S. flower, section of ovary, floral diagram/s, floral formula/e and systematic position according to Bentham & Hookers system of classification):
Ranunculaceae - Ranunculus, Delphinium
Brassicaceae - Brassica, Alyssum / Iberis
Myrtaceae - Eucalyptus, Callistemon
Umbelliferae - Coriandrum /Anethum / Foeniculum
Asteraceae - Sonchus/Launaea, Vernonia/Ageratum, Eclipta/Tridax
Solanaceae - Solanum nigrum/Withania
Lamiaceae - Salvia/Ocimum
Euphorbiaceae - Euphorbia hirta/E.milii, Jatropha
Liliaceae - Asphodelus/Lilium/Allium
Poaceae - Triticum/Hordeum/Avena
2. **Field visit** (local) Subject to grant of funds from the university.
3. Mounting of a properly dried and pressed specimen of any wild plant with herbarium label (to be submitted in the record book)

Suggested Readings:

1. Singh, G. (2012). Plant Systematics: Theory and Practice. Oxford & IBH Pvt. Ltd., New Delhi. 3rd edition.
2. Jeffrey, C. (1982). An Introduction to Plant Taxonomy. Cambridge University Press, Cambridge.
3. Judd, W.S., Campbell, C.S., Kellogg, E.A., Stevens, P.F. (2002). Plant Systematics-A Phylogenetic Approach. Sinauer Associates Inc., U.S.A. 2nd edition.
4. Maheshwari, J.K. (1963). Flora of Delhi. CSIR, New Delhi.
5. Radford, A.E. (1986). Fundamentals of Plant Systematics. Harper and Row, New York.

SEMESTER-V

C-11: REPRODUCTIVE BIOLOGY OF ANGIOSPERMS

(Credits-6: Theory-4, Practical-2)-Max. Marks: 100

THEORY (Each class 1 hr.): Marks-70 PRACTICAL

(Each class 2 hrs.): Marks-30 Lectures: 60 (40

Theory + 20 Practical classes)

Unit-I

Introduction: History (contributions of G.B. Amici, W. Hofmeister, E. Strasburger, S.G. Nawaschin, P. Maheshwari, B.M. Johri, W.A. Jensen, J. Heslop-Harrison) and scope. (2 lectures)

Unit-II

Anther: Anther wall: Structure and functions, microsporogenesis, callose deposition and its significance. (2 lectures)

Pollen biology: Microgametogenesis; Pollen wall structure, MGU (male germ unit) structure, NPC system; Palynology and scope (a brief account); Pollen wall proteins; Pollen viability, storage and germination; Abnormal features: Pseudomonads, polyads, massulae, pollinia. (5 lectures)

Unit-III

Ovule: Structure; Types; Special structures: endothelium, obturator, aril, caruncle and hypostase; Female gametophyte megasporogenesis (monosporic, bisporic and tetrasporic) and megagametogenesis (details of Polygonum type); Organization and ultrastructure of mature embryo sac. (5 lectures)

Endosperm: Types, development, structure and functions.(3 lectures)

Embryo: Six types of embryogeny; General pattern of development of dicot and monocot embryo; Suspensor: structure and functions; Embryoendosperm relationship; Nutrition of embryo; Unusual features; Embryo development in Paeonia. (6 lectures)

Unit-IV

Pollination and fertilization: Pollination types and significance; adaptations; structure of stigma and style; path of pollen tube in pistil; double fertilization. (4 lectures)

Self incompatibility: Basic concepts (interspecific, intraspecific, homomorphic, heteromorphic, GSI and SSI); Methods to overcome selfincompatibility: mixed pollination, bud pollination, stub pollination; Intraovarian and in vitro pollination; Modification of stigma surface, parasexual hybridization; Cybrids, in vitro fertilization. (5 lectures)

Unit-V

Seed: Structure, importance and dispersal mechanisms (3 lectures)

Polyembryony and apomixes: Introduction; Classification; Causes and applications. (4 lectures)

Germline transformation: Pollen grain and ovules through pollen tube pathway method/ Agrobacterium/ electrofusion/floral dip/biolistic. (4 lectures)

PRACTICAL

1. Anther: Wall and its ontogeny; Tapetum (amoeboid and glandular); MMC, spore tetrads, uninucleate, bicelled and dehisced anther stages through slides/micrographs, male germ unit (MGU) through photographs and schematic representation.
2. Pollen grains: Fresh and acetolyzed showing ornamentation and aperture, pseudomonads, polyads, pollinia (slides/photographs, fresh material), ultrastructure of pollen wall(micrograph); Pollen viability: Tetrazolium test.germination: Calculation of percentage germination in different media using hanging drop method.
3. Ovule: Types-anatropous, orthotropous, amphitropous/campylotropous, circinotropous, unitegmic,

bitegmic; Tenuinucellate and crassinucellate; Special structures: Endothelium, obturator, hypostase, caruncle and aril (permanent slides/specimens/photographs).

4. Female gametophyte through permanent slides/ photographs: Types, ultrastructure of mature egg apparatus.
5. Intra-ovarian pollination; Test tube pollination through photographs.
6. Endosperm: Dissections of developing seeds for endosperm with free-nuclear haustoria.
7. Embryogenesis: Study of development of dicot embryo through permanent slides; dissection of developing seeds for embryos at various developmental stages; Study of suspensor through electron micrographs.

Suggested Readings:

1. Bhojwani, S.S. and Bhatnagar, S.P. (2011). The Embryology of Angiosperms, Vikas Publishing House. Delhi. 5th edition.
2. Shivanna, K.R. (2003). Pollen Biology and Biotechnology. Oxford and IBH Publishing Co. Pvt. Ltd. Delhi.
3. Raghavan, V. (2000). Developmental Biology of Flowering plants, Springer, Netherlands.
4. Johri, B.M. I (1984). Embryology of Angiosperms, Springer-Verlag, Netherlands.

C-12: PLANT PHYSIOLOGY

(Credits-6: Theory-4, Practical-2)-Max. Marks: 100
THEORY (Each class 1 hr.): Marks-70 PRACTICAL
(Each class 2 hrs.): Marks-30 Lectures: 60 (40
Theory + 20 Practical classes)

Unit-I

Plant water relationship: Water Potential and its components, water absorption by roots, aquaporins, pathway of water movement, symplast, apoplast, transmembrane pathways, root pressure, guttation. Ascent of sap cohesion-tension theory. Transpiration and factors affecting transpiration, antitranspirants, mechanism of stomatal movement. (6 lectures)

Translocation in the phloem: Experimental evidence in support of phloem as the site of sugar translocation. Pressure Flow Model; Phloem loading and unloading; Source-sink relationship. (5 lectures)

Unit-II

Mineral nutrition: Essential and beneficial elements, macro and micronutrients, methods of study and use of nutrient solutions, criteria for essentiality, mineral deficiency symptoms, roles of essential elements, chelating agents. (5 lectures)

Unit-III

Nutrient Uptake: Soil as a nutrient reservoir, transport of ions across cell membrane, passive absorption, electrochemical gradient, facilitated diffusion, active absorption, role of ATP, carrier systems, proton ATPase pump and ion flux, uniport, co-transport, symport, antiport. (5 lectures)

Unit-IV

Plant growth regulators: Discovery, chemical nature (basic structure), bioassay and physiological roles of Auxin, Gibberellins, Cytokinin, Abscisic acid, Ethylene, Brassinosteroids and Jasmonic acid. (10 lectures)

Unit-V

Physiology of flowering: Photoperiodism, flowering stimulus, florigen concept, vernalization, seed dormancy. (4 lectures)

Phytochrome: Discovery, chemical nature, role of phytochrome in photomorphogenesis, low energy responses (LER) and high irradiance responses (HIR), mode of action. (5 lectures)

PRACTICAL

1. Determination of osmotic potential of plant cell sap by plasmolytic method.
2. Determination of water potential of given tissue (potato tuber) by weight method.
3. Study of the effect of wind velocity and light on the rate of transpiration in excised twig/leaf.
4. Calculation of stomatal index and stomatal frequency from the two surfaces of leaves of a mesophyte and xerophyte.
5. To calculate the area of an open stoma and percentage of leaf area open through stomata in a mesophyte and xerophyte (both surfaces).
6. To study the phenomenon of seed germination (effect of light).
7. To study the induction of amylase activity in germinating barley grains.

Demonstration experiments:

(a) To demonstrate suction due to transpiration. (b) Fruit ripening/Rooting from cuttings (Demonstration). (c) Bolting experiment/Avena coleoptile bioassay (demonstration).

Suggested Readings:

1. Hopkins, W.G. and Huner, A. (2008). Introduction to Plant Physiology. John Wiley and Sons. U.S.A. 4th edition.
2. Taiz, L., Zeiger, E., Mller, I.M. and Murphy, A (2015). Plant Physiology and Development. Sinauer Associates Inc. USA. 6th edition.
3. Bajracharya D. (1999). Experiments in Plant Physiology-A Laboratory Manual. Narosa Publishing House, New Delhi.

SEMESTER-VI

C-13: PLANT METABOLISM

(Credits-6: Theory-4, Practical-2)-Max. Marks: 100
THEORY (Each class 1 hr.): Marks-70 PRACTICAL
(Each class 2 hrs.): Marks-30 Lectures: 60 (40
Theory + 20 Practical classes)

Unit-I

Concept of metabolism: Introduction, anabolic and catabolic pathways, regulation of metabolism, role of regulatory enzymes (allosteric, covalent modulation and Isozymes). (5 lectures) Carbohydrate metabolism: Synthesis and catabolism of sucrose and starch. (1 lectures)

Unit-II

Carbon assimilation: Historical background, photosynthetic pigments, role of photosynthetic pigments (chlorophylls and accessory pigments), antenna molecules and reaction centres, photochemical reactions, photosynthetic electron transport, PSI, PSII, Q cycle, CO_2 reduction, photorespiration, C4 pathways; Crassulacean acid metabolism; Factors affecting CO_2 reduction. (10 lectures)

Unit-III

Carbon Oxidation: Glycolysis, fate of pyruvate, regulation of glycolysis, oxidative pentose phosphate pathway, oxidative decarboxylation of pyruvate, regulation of PDH, NADH shuttle; TCA cycle, amphibolic role, anaplerotic reactions, regulation of the cycle, mitochondrial electron transport, oxidative phosphorylation, cyanide resistant respiration, factors affecting respiration. (6 lectures)

ATP-Synthesis: Mechanism of ATP synthesis, substrate level phosphorylation, chemiosmotic mechanism (oxidative and photophosphorylation), ATP synthase, Boyers conformational model, Racker's experiment, Jagendorf's experiment; role of uncouplers. (4 lectures)

Unit-IV

Lipid metabolism: Synthesis and breakdown of triglycerides, β -oxidation, glyoxylate cycle, gluconeogenesis and its role in mobilisation of lipids during seed germination, α oxidation. (5 lectures)

Unit-V

Nitrogen metabolism: Nitrate assimilation, biological nitrogen fixation (examples of legumes and non-legumes); Physiology and biochemistry of nitrogen fixation; Ammonia assimilation and transamination. (5 lectures)

Mechanisms of signal transduction: Calcium, phospholipids, cGMP, NO. (4 lectures)

PRACTICAL

1. Chemical separation of photosynthetic pigments.
2. Experimental demonstration of Hill's reaction.
3. To study the effect of light intensity on the rate of photosynthesis.
4. Effect of carbon dioxide on the rate of photosynthesis.
5. To compare the rate of respiration in different parts of a plant.
6. To demonstrate activity of Nitrate Reductase in germinating leaves of different plant sources.
7. To study the activity of lipases in germinating oilseeds and demonstrate mobilization of lipids during germination.
8. Demonstration of fluorescence by isolated chlorophyll pigments.
9. Demonstration of absorption spectrum of photosynthetic pigments.

Suggested Readings:

1. Hopkins, W.G. and Huner, A. (2008). Introduction to Plant Physiology. John Wiley and Sons. U.S.A. 4th edition.
2. Taiz, L., Zeiger, E., Miller, I.M. and Murphy, A (2015). Plant Physiology and Development. Sinauer Associates Inc. USA. 6th edition.
3. Harborne, J.B. (1973). Phytochemical Methods. John Wiley & Sons. New York.

C-14: PLANT BIO-TECHNOLOGY

(Credits-6: Theory-4, Practical-2)-Max. Marks: 100

THEORY (Each class 1 hr.): Marks-70 PRACTICAL

(Each class 2 hrs.): Marks-30 Lectures: 60 (40

Theory + 20 Practical classes)

Unit-I

Plant Tissue Culture: Historical perspective; Aseptic tissue culture techniques, Composition of media; Nutrient and hormone requirements (role of vitamins and hormones). (3 lectures)

Unit-II

Totipotency; Organogenesis; Embryogenesis (somatic and zygotic); Protoplast isolation, culture and fusion; Tissue culture applications (micropropagation, androgenesis, virus elimination, secondary metabolite production, haploids, triploids and hybrids; Cryopreservation; Germplasm Conservation). (7 lectures)

Unit-III

Recombinant DNA technology-I: Restriction Endonucleases (History, Types I-IV, biological role and application); Restriction Mapping (Linear and Circular); Cloning Vectors: Prokaryotic (pUC 18 and pUC19, pBR322, Ti plasmid, BAC); Lambda phage, M13 phagemid, Cosmid, Shuttle vector; Eukaryotic Vectors (YAC and briefly PAC, MAC, HAC). Gene Cloning (Recombinant DNA, Bacterial Transformation and selection of recombinant clones, PCR-mediated gene cloning). (10 lectures) **Unit-IV**

Recombinant DNA technology-II: Gene Construct; construction of genomic and cDNA libraries, screening DNA libraries to obtain gene of interest by genetic selection; complementation, colony hybridization; Probes-oligonucleotide, heterologous, PCR; Methods of gene transfer-Agrobacterium-mediated, Direct gene transfer by Electroporation, Microinjection, Microprojectile bombardment; Selection of transgenics selectable marker and reporter genes (Luciferase, GUS, GFP). (10 lectures)

Unit-V

Applications of Biotechnology: Pest resistant (Bt-cotton); herbicide resistant plants (RoundUp Ready soybean); Transgenic crops with improved quality traits (Flavr Savr tomato, Golden rice); Improved horticultural varieties (Moondust carnations); Role of transgenics in bioremediation (Su- perbug); edible vaccines; Industrial enzymes (Aspergillase, Protease, Lipase); Genetically Engineered Products Human Growth Hormone; Humulin; Biosafety concerns. (10 lectures)

PRACTICAL

1. (a) Preparation of MS medium.
(b) Demonstration of in vitro sterilization and inoculation methods using leaf and nodal explants of tobacco, Datura, Brassica etc.
2. Study of anther, embryo and endosperm culture, micropropagation, somatic embryogenesis & artificial seeds through photographs.
3. Isolation of protoplasts.
4. Construction of restriction map of circular and linear DNA from the data provided.

5. Study of methods of gene transfer through photographs: Agrobacterium-mediated, direct gene transfer by electroporation, microinjection, microprojectile bombardment.
6. Study of steps of genetic engineering for production of Bt cotton, Golden rice, Flavr Savr tomato through photographs.
7. Isolation of plasmid DNA.
8. Restriction digestion and gel electrophoresis of plasmid DNA.

Suggested Readings:

1. Bhojwani, S.S. and Razdan, M.K., (1996). Plant Tissue Culture: Theory and Practice. Elsevier Science Amsterdam. The Netherlands.
2. Glick, B.R., Pasternak, J.J. (2003). Molecular Biotechnology- Principles and Applications of recombinant DNA. ASM Press, Washington.
3. Bhojwani, S.S. and Bhatnagar, S.P. (2011). The Embryology of Angiosperms. Vikas Publication House Pvt. Ltd., New Delhi. 5th edition.
4. Snustad, D.P. and Simmons, M.J. (2010). Principles of Genetics. John Wiley and Sons, U.K. 5th edition.
5. Stewart, C.N. Jr. (2008). Plant Biotechnology & Genetics: Principles, Techniques and Applications. John Wiley & Sons Inc. U.S.A.
6. Chawla, H.S. (2010). Introduction to Plant Biotechnology. Oxford & IBH Publishing Co. Pvt. Ltd., New Delhi.
7. Singh, B. D. (2010) Biotechnology: Expanding Horizon. Kalyani Publishers. New Delhi.

DISCIPLINE SPECIFIC ELECTIVE COURSES

DSE-1A: ANALYTICAL TECHNIQUES IN PLANT SCIENCES

(Credits-6: Theory-4, Practical-2)-Max. Marks: 100

THEORY (Each class 1 hr.): Marks-70 PRACTICAL

(Each class 2 hrs.): Marks-30 Lectures: 60 (40

Theory + 20 Practical classes)

UNIT-I: Imaging and related techniques: Principles of microscopy; Light microscopy; Fluorescence microscopy; Confocal microscopy; Use of fluorochromes: (a) Flow cytometry (FACS); (b) Applications of fluorescence microscopy: Chromosome banding, FISH, chromosome painting; Transmission and Scanning electron microscopy sample preparation for electron microscopy, cryofixation, negative staining, shadow casting, freeze fracture, freeze etching. (10 lectures)

UNIT-II: Cell fractionation: Centrifugation: Differential and density gradient centrifugation, sucrose density gradient, CsCl₂ gradient, analytical centrifugation, ultracentrifugation, marker enzymes. (5 lectures)

UNIT-III: Radioisotopes: Use in biological research, auto-radiography, pulse chase experiment. (3 lectures)

Spectrophotometry: Principle and its application in biological research. 3 lectures Chromatography: Principle; Paper chromatography; Column chromatography, TLC, GLC, HPLC, Ion-exchange chromatography; Molecular sieve chromatography; Affinity chromatography. (6 lectures)

UNIT-IV: Characterization of proteins and nucleic acids: Mass spectrometry; X-ray diffraction; X-ray crystallography; Characterization of proteins and nucleic acids; Electrophoresis: AGE, PAGE, SDS-PAGE (5 lectures)

UNIT-V: Biostatistics: Statistics, data, population, samples, parameters; Representation of Data: Tabular, Graphical; Measures of central tendency: Arithmetic mean, mode, median; Measures of dispersion: Range, mean deviation, variation, standard deviation; Chi-square test for goodness of fit. (8 lectures)

PRACTICAL

1. Study of Blotting techniques: Southern, Northern and Western, DNA fingerprinting, DNA sequencing, PCR through photographs.
2. Demonstration of ELISA.
3. To separate nitrogenous bases by paper chromatography.
4. To separate sugars by thin layer chromatography.
5. Isolation of chloroplasts by differential centrifugation.
6. To separate chloroplast pigments by column chromatography.
7. To estimate protein concentration through Lowry's methods.

8. To separate proteins using PAGE.
9. To separation DNA (marker) using AGE.
10. Study of different microscopic techniques using photographs/micrographs (freeze fracture, freeze etching, negative staining, positive staining, fluorescence and FISH).
11. Preparation of permanent slides (double staining).
12. Estimation of plant pigments.

Suggested Readings:

1. Plummer, D.T. (1996). An Introduction to Practical Biochemistry. Tata McGraw-Hill Publishing Co. Ltd. New Delhi. 3rd edition.
2. Ruzin, S.E. (1999). Plant Microtechnique and Microscopy, Oxford University Press, New York. U.S.A.
3. Ausubel, F., Brent, R., Kingston, R. E., Moore, D.D., Seidman, J.G., Smith, J.A., Struhl, K. (1995). Short Protocols in Molecular Biology. John Wiley & Sons. 3rd edition.
4. Zar, J.H. (2012). Biostatistical Analysis. Pearson Publication. U.S.A. 4th ed

DSE-1B: BIO-INFORMATICS

(Credits-6: Theory-4, Practical-2)-Max. Marks: 100

THEORY (Each class 1 hr.): Marks-70 PRACTICAL

(Each class 2 hrs.): Marks-30 Lectures: 60 (40

Theory + 20 Practical classes)

UNIT-I: Introduction to Bioinformatics: Introduction, Branches of Bioinformatics, Aim, Scope and Research areas of Bioinformatics. (3 Lectures)

Databases in Bioinformatics: Introduction, Biological Databases, Classification format of Biological Databases, Biological Database Retrieval System. (4 Lectures)

UNIT-II: Biological Sequence Databases: National Center for Biotechnology Information (NCBI): Tools and Databases of NCBI, Database Retrieval Tool, Sequence Submission to NCBI, Basic local alignment search tool (BLAST), Nucleotide Database, Protein Database, Gene Expression Database. EMBL Nucleotide Sequence Database (EMBL-Bank): Introduction, Sequence Retrieval, Sequence Submission to EMBL, Sequence analysis tools. DNA Data Bank of Japan (DDBJ): Introduction, Resources at DDBJ, Data Submission at DDBJ. Protein Information Resource (PIR): About PIR, Resources of PIR, Databases of PIR, Data Retrieval in PIR. Swiss-Prot: Introduction and Salient Features. (15 Lectures)

UNIT-III: Sequence Alignments: Introduction, Concept of Alignment, Multiple Sequence Alignment (MSA), MSA by CLUSTALW, Scoring Matrices, Percent Accepted Mutation (PAM), Blocks of Amino Acid Substitution Matrix (BLOSUM). (8 Lectures)

UNIT-IV: Molecular Phylogeny: Methods of Phylogeny, Software for Phylogenetic Analyses, Consistency of Molecular Phylogenetic Prediction. (5 Lectures)

UNIT-V: Applications of Bioinformatics: Structural Bioinformatics in Drug Discovery, Quantitative structure-activity relationship (QSAR) techniques in Drug Design, Microbial genome applications, Crop improvement. (5 Lectures)

PRACTICAL

1. Nucleic acid and protein databases.
2. Sequence retrieval from databases.

3. Sequence alignment.
4. Sequence homology and Gene annotation.
5. Construction of phylogenetic tree.

Suggested Readings:

1. Ghosh Z. and Bibekanand M. (2008) Bioinformatics: Principles and Applications. Oxford University Press.
2. Pevsner J. (2009) Bioinformatics and Functional Genomics. II Edition. Wiley-Blackwell.
3. Campbell A. M., Heyer L. J. (2006) Discovering Genomics, Proteomics and Bioinformatics-II Edition. Benjamin Cummings.

DSE-2A: PLANT BREEDING

(Credits-6: Theory-4, Practical-2)-Max. Marks: 100
 THEORY (Each class 1 hr.): Marks-70 PRACTICAL
 (Each class 2 hrs.): Marks-30 Lectures: 60 (40
 Theory + 20 Practical classes)

UNIT-I: Plant Breeding: Introduction and objectives. Breeding systems: modes of reproduction in crop plants. Important achievements and undesirable consequences of plant breeding. (6 lectures)

UNIT-II; Methods of crop improvement: Introduction: Centres of origin and domestication of crop plants, plant genetic resources; Acclimatization; Selection methods: For self pollinated, cross pollinated and vegetatively propagated plants; Hybridization: For self, cross and vegetatively propagated plants Procedure, advantages and limitations. (15 lectures)

UNIT-III: Quantitative inheritance: Concept, mechanism, examples of inheritance of Kernel colour in wheat, Skin colour in human beings. Monogenic vs polygenic Inheritance. (6 lectures)

UNIT-IV: Inbreeding depression and heterosis: History, genetic basis of inbreeding depression and heterosis; Applications. (6 lectures)

UNIT-V: Crop improvement and breeding: Role of mutations; Polyploidy; Distant hybridization and role of biotechnology in crop improvement. (7 lectures)

PRACTICAL

Practical related to theory.

Suggested Readings:

1. Singh, B.D. (2005). Plant Breeding: Principles and Methods. Kalyani Publishers. 7th edition.
2. Chaudhari, H.K. (1984). Elementary Principles of Plant Breeding. Oxford IBH. 2nd edition.
3. Acquaah, G. (2007). Principles of Plant Genetics & Breeding. Blackwell Publishers.

DSE-2B: NATURAL RESOURCE MANAGEMENT

(Credits-6: Theory-4, Practical-2)-Max. Marks: 100
 THEORY (Each class 1 hr.): Marks-70 PRACTICAL
 (Each class 2 hrs.): Marks-30 Lectures: 60 (40
 Theory + 20 Practical classes)

UNIT-I: Natural resources: Definition and types. 2 lectures Sustainable utilization: Concept, approaches (economic, ecological and socio-cultural). (5 lectures)

UNIT-II: Land: Utilization (agricultural, pastoral, horticultural, silvicultural); Soil degradation and management. (5 lectures)

Water: Fresh water (rivers, lakes, groundwater, aquifers, watershed); Marine; Estuarine; Wetlands; Threats and management strategies. (4 lectures)

UNIT-III: Biological Resources: Biodiversity-definition and types; Significance; Threats; Management strategies; Bioprospecting; IPR; CBD; National Biodiversity Action Plan). (8 lectures) Forests: Definition, Cover and its significance (with special reference to India); Major and minor forest products; Depletion; Management. (4 lectures)

UNIT-IV: Energy: Renewable and non-renewable sources of energy 4 lectures Contemporary practices in resource management: EIA, GIS, Participatory Resource Appraisal, Ecological Footprint with emphasis on carbon footprint. (6 lectures)

UNIT-V: Resource Accounting; Waste management. National and international efforts in resource management and conservation (4 lectures)

PRACTICAL

1. Estimation of solid waste generated by a domestic system (biodegradable and nonbiodegradable) and its impact on land degradation.
2. Collection of data on forest cover of specific area.
3. Measurement of dominance of woody species by DBH (diameter at breast height) method.
4. Calculation and analysis of ecological footprint.
5. Ecological modeling.

Suggested Readings:

1. Vasudevan, N. (2006). Essentials of Environmental Science. Narosa Publishing House, New Delhi.
2. Singh, J. S., Singh, S.P. and Gupta, S. (2006). Ecology, Environment and Resource Conservation. Anamaya Publications, New Delhi.
3. Rogers, P.P., Jalal, K.F. and Boyd, J.A. (2008). An Introduction to Sustainable Development. Prentice Hall of India Private Limited, New Delhi.

DSE-2C: BIO-STATISTICS

(Credits-6: Theory-4, Practical-2)-Max. Marks: 100

THEORY (Each class 1 hr.): Marks-70 PRACTICAL

(Each class 2 hrs.): Marks-30 Lectures: 60 (40

Theory + 20 Practical classes)

UNIT-I: Biostatistics - definition - statistical methods - basic principles. Variables - measurements, functions, limitations and uses of statistics. (8 lectures)

Unit-II: Collection of data primary and secondary - types and methods of data collection procedures - merits and demerits. Classification - tabulation and presentation of data sampling methods. (8 lectures)

Unit-III: Measures of central tendency - mean, median, mode, geometric mean - merits & demerits. Measures of dispersion - range, standard deviation, mean deviation, quartile deviation - merits and demerits; Co-efficient of variations. (10 lectures)

Unit-IV: Correlation - types and methods of correlation, regression, simple regression equation, fitting prediction, similarities and dissimilarities of correlation and regression. (8 lectures)

Unit-V: Statistical inference - hypothesis - simple hypothesis - student 't' test - chi square test. (6 lectures)

PRACTICAL

1. Calculation of mean, standard deviation and standard error
2. Calculation of correlation coefficient values and finding out the probability
3. Calculation of F value and finding out the probability value for the Fvalue.

Suggested Readings:

1. Biostatistic, Danniell, W.W., 1987. New York, John Wiley Sons.
2. An introduction to Biostatistics, 3rd edition, Sundarrao, P.S.S and Richards, J. Christian Medical College, Vellore
3. Statistical Analysis of epidemiological data, Selvin, S., 1991. New York University Press.
4. Statistics for Biology, Boston, Bishop, O.N. Houghton, Mifflin.
5. The Principles of scientific research, Freedman, P. New York, Pergamon Press.
6. Statistics for Biologists, Campbell, R.C., 1998. Cambridge University Press.

DSE-3A: STRESS BIOLOGY

(Credits-6: Theory-4, Practical-2)-Max. Marks: 100
THEORY (Each class 1 hr.): Marks-70 PRACTICAL
(Each class 2 hrs.): Marks-30 Lectures: 60 (40
Theory + 20 Practical classes)

UNIT-I: Defining plant stress: Acclimation and adaptation. (2 lectures)

UNIT-II: Environmental factors: Water stress; Salinity stress, High light stress; Temperature stress; Hypersensitive reaction; Pathogenesis related (PR) proteins; Systemic acquired resistance; Mediation of insect and disease resistance by jasmonates. (12 lectures)

UNIT-III: Stress sensing mechanisms in plants: Role of nitric oxide. Calcium modulation, Phospholipid signaling (12 lectures)

UNIT-IV: Developmental and physiological mechanisms that protect plants against environmental stress: Adaptation in plants; Changes in root: shoot ratio; Aerenchyna development; Osmotic adjustment; Compatible solute production. (10 lectures)

UNIT-V: Reactive oxygen species Production and scavenging mechanisms. (4 lectures)

PRACTICAL

1. Quantitative estimation of peroxidase activity in the seedlings in the absence and presence of salt stress.
2. Superoxide activity in seedlings in the absence and presence of salt stress.
3. Assay of Ascorbate
4. Assay of peroxidase.

5. Assay of superoxide dismutase activity.
6. Quantitative estimation and analysis of catalase.

Suggested Readings:

1. Hopkins, W.G. and Huner, A. (2008). Introduction to Plant Physiology. John Wiley and Sons. U.S.A. 4th edition.
2. Taiz, L., Zeiger, E., Miller, I.M. and Murphy, A (2015). Plant Physiology and Development. Sinauer Associates Inc. USA. 6th edition.

DSE-3B: HORTICULTURAL PRACTICES & POST-HARVEST TECHNOLOGY

(Credits-6: Theory-4, Practical-2)-Max. Marks: 100

THEORY (Each class 1 hr.): Marks-70 PRACTICAL

(Each class 2 hrs.): Marks-30 Lectures: 60 (40

Theory + 20 Practical classes)

UNIT-I: Introduction: Scope and importance, Branches of horticulture; Role in rural economy and employment generation; Importance in food and nutritional security; Urban horticulture and ecotourism. (2 lectures)

Ornamental plants: Types, classification (annuals, perennials, climbers and trees); Identification and salient features of some ornamental plants [rose, marigold, gladiolus, carnations, orchids, poppies, gerberas, tuberose, sages, cacti and succulents (opuntia, agave and spurges)] Ornamental flowering trees (Indian laburnum, gulmohar, Jacaranda, Lagerstroemia, fishtail and areca palms, semul, Coral tree). (3 lectures)

UNIT-II: Fruit and vegetable crops: Production, origin and distribution; Description of plants and their economic products; Management and marketing of vegetable and fruit crops; Identification of some fruits and vegetable varieties (citrus, banana, mango, chillies and cucurbits). (4 lectures) Horticultural techniques: Application of manure, fertilizers, nutrients and PGRs; Weed control; Biofertilizers, biopesticides; Irrigation methods (drip irrigation, surface irrigation, furrow and border irrigation); Hydroponics; Propagation Methods: asexual (grafting, cutting, layering, budding), sexual (seed propagation), Scope and limitations. (6 lectures)

UNIT-III: Landscaping and garden design : Planning and layout (parks and avenues); gardening traditions - Ancient Indian, European, Mughal and Japanese Gardens; Urban forestry; policies and practices. (4 lectures)

Floriculture: Cut flowers, bonsai, commerce (market demand and supply); Importance of flower shows and exhibitions. (4 lectures)

UNIT-IV: Post-harvest technology: Importance of post harvest technology in horticultural crops; Evaluation of quality traits; Harvesting and handling of fruits, vegetables and cut flowers; Principles, methods of preservation and processing; Methods of minimizing losses during storage and transportation; Food irradiation - advantages and disadvantages; food safety. (6 lectures)

Disease control and management : Field and post-harvest diseases; Identification of deficiency symptoms; remedial measures and nutritional management practices; Crop sanitation; IPM strategies (genetic, biological and chemical methods for pest control); Quarantine practices; Identification of common diseases and pests of ornamentals, fruits and vegetable crops. (5 lectures)

UNIT-V: Horticultural crops - conservation and management: Documentation and conservation of germplasm; Role of micropropagation and tissue culture techniques; Varieties and cultivars of various horticultural crops; IPR issues; National, international and professional societies and sources of information on horticulture. (6 lectures)

Field Trip: Field visits to gardens, standing crop sites, nurseries, vegetable gardens and horticultural fields at IARI or other suitable locations.

PRACTICAL

Practical related to theory.

Suggested Readings:

1. Singh, D. & Manivannan, S. (2009). Genetic Resources of Horticultural Crops. Ridhi International, Delhi, India.
2. Swaminathan, M.S. and Kochhar, S.L. (2007). Groves of Beauty and Plenty: An Atlas of Major Flowering Trees in India. Macmillan Publishers, India.
3. NIIR Board (2005). Cultivation of Fruits, Vegetables and Floriculture. National Institute of Industrial Research Board, Delhi.
4. Kader, A.A. (2002). Post-Harvest Technology of Horticultural Crops. UCANR Publications, USA.
5. Capon, B. (2010). Botany for Gardeners. 3rd Edition. Timber Press, Portland, Oregon.

DSE-3C: RESEARCH METHODOLOGY

(Credits-6: Theory-4, Practical-2)-Max. Marks: 100

THEORY (Each class 1 hr.): Marks-70 PRACTICAL

(Each class 2 hrs.): Marks-30 Lectures: 60 (40

Theory + 20 Practical classes)

UNIT-I: Basic concepts of research :Research-definition and types of research (Descriptive vs analytical; applied vs fundamental; quantitative vs qualitative; conceptual vs empirical).Research methods vs methodology.Literature-review and its consolidation; Library research; field research; laboratory research. (6 lectures) General laboratory practices: Common calculations in botany laboratories. Understanding the details on the label of reagent bottles. Molarity and normality of common acids and bases.Preparation of solutions. Dilutions. Percentage solutions. Molar, molal and normal solutions.Technique of handling micropipettes; Knowledge about common toxic chemicals and safety measures in their handling. (8 lectures)

UNIT-II: Data collection and documentation of observations: Maintaining a laboratory record; Tabulation and generation of graphs. Imaging of tissuespecimens and application of scale bars. The art of field photography. (4 lectures)

Overview of Biological Problems : History; Key biology research areas, Model organisms in biology (A Brief overview): Genetics, Physiology, Biochemistry, Molecular Biology, Cell Biology,Genomics, Proteomics- Transcriptional regulatory network. (4 lectures)

UNIT-III: Methods to study plant cell/tissue structure: Whole mounts, peel mounts, squash preparations, clearing, maceration and sectioning; Tissue preparation: living vs fixed, physical vs chemical fixation, coagulating fixatives, noncoagulant fixatives; tissue dehydration using graded solvent series; Paraffin and plastic infiltration; Preparation of thin and ultrathin sections. (4 lectures)

UNIT-IV: Plant microtechniques : Staining procedures, classification and chemistry of stains. Staining equipment. Reactive dyes and fluorochromes (including genetically engineered protein labeling with GFP and other tags). Cytogenetic techniques with squashed plant materials. (8 lectures)

UNIT-V: The art of scientific writing and its presentation : Numbers, units, abbreviations and nomenclature used in scientific writing. Writing references. Power point presentation. Poster pre-

sentation. Scientific writing and ethics, Introduction to copyright-academic misconduct/plagiarism. (6 lectures)

PRACTICAL

1. Experiments based on chemical calculations.
2. Plant microtechnique experiments.
3. The art of imaging of samples through microphotography and field photography.
4. Poster presentation on defined topics.
5. Technical writing on topics assigned.

Suggested Readings:

1. Dawson, C. (2002). Practical research methods. UBS Publishers, New Delhi.
2. Stapleton, P., Yondeowei, A., Mukanyange, J., Houten, H. (1995). Scientific writing for agricultural research scientists a training reference manual. West Africa Rice Development Association, Hong Kong.
3. Ruzin, S.E. (1999). Plant microtechnique and microscopy. Oxford University Press, New York, U.S.

DSE-3D: INDUSTRIAL & ENVIRONMENTAL MICROBIOLOGY

(Credits-6: Theory-4, Practical-2)-Max. Marks: 100

THEORY (Each class 1 hr.): Marks-70 PRACTICAL

(Each class 2 hrs.): Marks-30 Lectures: 60 (40

Theory + 20 Practical classes)

UNIT-I: Scope of microbes in industry and environment: (2 lectures)

Bioreactors/Fermenters and fermentation processes: Solid-state and liquid-state (stationary and submerged) fermentations; Batch and continuous fermentations. Components of a typical bioreactor, Types of bioreactors laboratory, pilot scale and production fermenters; Constantly stirred tank fermenter, tower fermenter, fixed bed and fluidized bed bioreactors and airlift fermenter. A visit to any educational institute/ industry to see an industrial fermenter, and other downstream processing operations. (8 lectures)

UNIT-II: Microbial production of industrial products: Microorganisms involved, media, fermentation conditions, downstream processing and uses; Filtration, centrifugation, cell disruption, solvent extraction, precipitation and ultrafiltration, lyophilization, spray drying; Hands on microbial fermentations for the production and estimation (qualitative and quantitative) of Enzyme: amylase or lipase activity, Organic acid (citric acid or glutamic acid), alcohol (Ethanol) and antibiotic (Penicillin) (8 lectures)

Microbial enzymes of industrial interest and enzyme immobilization: Microorganisms for industrial applications and hands on screening microorganisms for casein hydrolysis; starch hydrolysis; cellulose hydrolysis. Methods of immobilization, advantages and applications of immobilization, large scale applications of immobilized enzymes (glucose isomerase and penicillin acylase). (6 lectures)

UNIT-III: Microbes and quality of environment: Distribution of microbes in air; Isolation of microorganisms from soil, air and water. (4 lectures)

UNIT-IV: Microbial flora of water: Water pollution, role of microbes in sewage and domestic waste

water treatment systems. Determination of BOD, COD, TDS and TOC of water samples; Microorganisms as indicators of water quality, check coliform and fecal coliform in water samples. (6 lectures)

UNIT-V: Microbes in agriculture and remediation of contaminated soils: Biological fixation; Mycorrhizae; Bioremediation of contaminated soils. Isolation of root nodulating bacteria, arbuscular mycorrhizal colonization in plant roots. (6 lectures)

PRACTICAL

1. Principles and functioning of instruments in microbiology laboratory
2. Hands on sterilization techniques and preparation of culture media.

Suggested Readings:

1. Pelzar, M.J. Jr., Chen E.C. S., Krieg, N.R. (2010). Microbiology: An application based approach. Tata McGraw Hill Education Pvt. Ltd., Delhi.
2. Tortora, G.J., Funke, B.R., Case. C.L. (2007). Microbiology. Pearson Benjamin Cummings, San Francisco, U.S.A. 9th edition.

GENERIC ELECTIVE COURSES

GE-1A: BIODIVERSITY

(Credits-6: Theory-4, Practical-2)-Max. Marks: 100
THEORY (Each class 1 hr.): Marks-70 PRACTICAL
(Each class 2 hrs.): Marks-30 Lectures: 60 (40
Theory + 20 Practical classes)

UNIT-I: Microbes : Viruses Discovery, general structure, replication (general account), DNA virus (T-phage); Lytic and lysogenic cycle, RNA virus (TMV); **Economic importance**; Bacteria Discovery, General characteristics and cell structure; Reproduction vegetative, asexual and recombination (conjugation, transformation and transduction); **Economic importance**. (8 lectures)

UNIT-II: Algae: General characteristics; Ecology and distribution; Range of thallus organization and reproduction; Classification of algae; Morphology and lifecycles of the following: *Nostoc*, *Chlamydomonas*, *Oedogonium*, *Vaucheria*, *Fucus*, *Polysiphonia*. **Economic importance of algae**. (10 lectures)

Fungi : Introduction- General characteristics, **ecology and significance**, range of thallus organization, cell wall composition, nutrition, reproduction and classification; True Fungi- General characteristics, **ecology and significance**, life cycle of *Rhizopus* (Zygomycota) *Penicillium*, *Alternaria* (Ascomycota), *Puccinia*, *Agaricus* (Basidiomycota); Symbiotic Associations-**Lichens**: (6 lectures)

UNIT-III: Introduction to Archegoniate : Unifying features of archegoniates, Transition to land habit, Alternation of generations. (2 lectures)

Bryophytes : General characteristics, adaptations to land habit, Classification, Range of thallus organization. Classification (up to family), morphology, anatomy and reproduction of *Marchantia* and *Funaria*. (Developmental details not to be included). **Ecology and economic importance of bryophytes with special mention of Sphagnum**. (6 lectures)

UNIT-IV: Pteridophytes : General characteristics, classification, Early land plants (*Cooksonia* and

Rhynia). Classification (up to family), morphology, anatomy and reproduction of Selaginella, Equisetum and Pteris. (Developmental details not to be included). Heterospory and seed habit, stellar evolution. **Ecological and economical importance of Pteridophytes**. (5 lectures)

UNIT-V: Gymnosperms: General characteristics, classification. Classification (up to family), morphology, anatomy and reproduction of Cycas and Pinus. (Developmental details not to be included). **Ecological and economical importance**. (6 lectures)

PRACTICAL

1. EMs/Models of viruses T-Phage and TMV, Line drawing/Photograph of Lytic and Lysogenic Cycle.
2. Types of Bacteria from temporary/permanent slides/photographs; EM bacterium; Binary Fission; Conjugation; Structure of root nodule.
3. Gram staining.
4. Study of vegetative and reproductive structures of Nostoc, Chlamydomonas (electron micrographs), Oedogonium, Vaucheria, Fucus* and Polysiphonia through temporary preparations and permanent slides. (*: Fucus - Specimen and permanent slides)
5. Rhizopus and Penicillium: Asexual stage from temporary mounts and sexual structures through permanent slides.
6. Alternaria: Specimens/photographs and tease mounts.
7. Puccinia: Herbarium specimens of Black Stem Rust of Wheat and infected Barberry leaves; section/tease mounts of spores on Wheat and permanent slides of both the hosts.
8. Agaricus: Specimens of button stage and full grown mushroom; Sectioning of gills of Agaricus.
9. Lichens: Study of growth forms of lichens (crustose, foliose and fruticose)
10. Mycorrhiza: ecto mycorrhiza and endo mycorrhiza (Photographs)
11. Marchantia- morphology of thallus, w.m. rhizoids and scales, v.s. thallus through gemma cup, w.m. gemmae (all temporary slides), v.s. antheridiophore, archegoniophore, l.s. sporophyte (all permanent slides).
12. Funaria- morphology, w.m. leaf, rhizoids, operculum, peristome, annulus, spores (temporary slides); permanent slides showing antheridial and archegonial heads, l.s. capsule and protonema.
13. Selaginella- morphology, w.m. leaf with ligule, t.s. stem, w.m. strobilus, w.m. microsporophyll and megasporophyll (temporary slides), l.s. strobilus (permanent slide).
14. Equisetum- morphology, t.s. internode, l.s. strobilus, t.s. strobilus, w.m. sporangiophore, w.m. spores (wet and dry) (temporary slides); t.s. rhizome (permanent slide).
15. Pteris- morphology, t.s. rachis, v.s. sporophyll, w.m. sporangium, w.m. spores (temporary slides), t.s. rhizome, w.m. prothallus with sex organs and young sporophyte (permanent slide).
16. Cycas- morphology (coralloid roots, bulbil, leaf), t.s. coralloid root, t.s. rachis, v.s. leaflet, v.s. microsporophyll, w.m. spores (temporary slides), l.s. ovule, t.s. root (permanent slide).
17. Pinus- morphology (long and dwarf shoots, w.m. dwarf shoot, male and female), w.m. dwarf

shoot, t.s. needle, t.s. stem, , l.s./t.s. male cone, w.m. microsporophyll, w.m. microspores (temporary slides), l.s. female cone, t.l.s. & r.l.s. stem (permanent slide).

Suggested Readings:

1. Kumar, H.D. (1999). Introductory Phycology. Affiliated East-West. Press Pvt. Ltd. Delhi. 2nd edition.
2. Tortora, G.J., Funke, B.R., Case, C.L. (2010). Microbiology: An Introduction, Pearson Benjamin Cummings, U.S.A. 10th edition.
3. . Sethi, I.K. and Walia, S.K. (2011). Text book of Fungi & Their Allies, MacMillan Publishers Pvt. Ltd., Delhi.
4. Alexopoulos, C.J., Mims, C.W., Blackwell, M. (1996). Introductory Mycology, John Wiley and Sons (Asia), Singapore. 4th edition.
5. Raven, P.H., Johnson, G.B., Losos, J.B., Singer, S.R., (2005). Biology. Tata McGraw Hill, Delhi, India.
6. Vashishta, P.C., Sinha, A.K., Kumar, A., (2010). Pteridophyta, S. Chand. Delhi, India.
7. Bhatnagar, S.P. and Moitra, A. (1996). Gymnosperms. New Age International (P) Ltd Publishers, New Delhi, India.
8. Parihar, N.S. (1991). An introduction to Embryophyta. Vol. I. Bryophyta. Central Book Depot, Allahabad.

GE-1B: PLANT ECOLOGY & TAXONOMY

(Credits-6: Theory-4, Practical-2)-Max. Marks: 100

THEORY (Each class 1 hr.): Marks-70 PRACTICAL

(Each class 2 hrs.): Marks-30 Lectures: 60 (40

Theory + 20 Practical classes)

UNIT-I: Introduction: (2 lectures)

Ecological factors : Soil: Origin, formation, composition, soil profile. Water: States of water in the environment, precipitation types. Light and temperature: Variation Optimal and limiting factors; Shelford law of tolerance. Adaptation of hydrophytes and xerophytes (6 lectures)

Plant communities : Characters; Ecotone and edge effect; Succession; Processes and types (3 lectures)

UNIT-II: Ecosystem : Structure; Biotic and abiotic components, energy flow trophic organisation; Food chains and food webs, Ecological pyramids production and productivity; Biogeochemical cycling; Cycling of carbon, nitrogen and Phosphorous (6 lectures)

Phytogeography : Principle biogeographical zones; Endemism (2 lectures)

UNIT-III: Introduction to plant taxonomy: Identification, Classification, Nomenclature. (2 lectures)

Identification : Functions of Herbarium, important herbaria and botanical gardens of the world and India; Documentation: Flora, Keys: single access and multi-access (3 lectures)

UNIT-IV: Taxonomic evidences from palynology, cytology, phytochemistry and molecular Data: (4 lectures)

Taxonomic hierarchy: Ranks, categories and taxonomic groups 2 lectures Biometrics, numerical taxonomy and cladistics: Characters; variations; OTUs, character weighting and coding; cluster analysis; phenograms, cladograms (definitions and differences). (5 lectures)

UNIT-V: Botanical nomenclature: Principles and rules (ICN); ranks and names; binominal system, typification, author citation, valid publication, rejection of names, principle of priority and its limitations. (4 lectures)

Classification: Types of classification-artificial, natural and phylogenetic. Bentham and Hooker (upto series), Engler and Prantl (upto series). (5 lectures)

PRACTICAL

1. Study of instruments used to measure microclimatic variables: Soil thermometer, maximum and minimum thermometer, anemometer, psychrometer/hygrometer, rain gauge and luxmeter.
2. Determination of pH, and analysis of two soil samples for carbonates, chlorides, nitrates, sulphates, organic matter and base deficiency by rapid field test.
3. Comparison of bulk density, porosity and rate of infiltration of water in soil of three habitats.
4. (a) Study of morphological adaptations of hydrophytes and xerophytes (four each). (b) Study of biotic interactions of the following: Stem parasite (*Cuscuta*), Root parasite (*Orobancha*), Epiphytes, Predation (Insectivorous plants).
5. Determination of minimal quadrat size for the study of herbaceous vegetation in the college campus by species area curve method. (species to be listed)
6. Quantitative analysis of herbaceous vegetation in the college campus for frequency and comparison with Raunkiaers frequency distribution law
7. Study of vegetative and floral characters of the following families (Description, V.S. flower, section of ovary, floral diagram/s, floral formula/e and systematic position according to Bentham & Hookers system of classification): Brassicaceae - Brassica, Alyssum / Iberis; Asteraceae - Sonchus/Launaea, Vernonia/Ageratum, Eclipta/Tridax; Solanaceae - Solanum nigrum, Withania; Lamiaceae - Salvia, Ocimum; Liliaceae - Asphodelus / Liliium / Allium.
8. Mounting of a properly dried and pressed specimen of any wild plant with herbarium label (to be submitted in the record book).

Suggested Readings:

1. Kormondy, E.J. (1996). Concepts of Ecology. Prentice Hall, U.S.A. 4th edition.
2. Sharma, P.D. (2010) Ecology and Environment. Rastogi Publications, Meerut, India. 8th edition.
3. Simpson, M.G. (2006). Plant Systematics. Elsevier Academic Press, San Diego, CA, U.S.A.

4. Singh, G. (2012). Plant Systematics: Theory and Practice. Oxford & IBH Pvt. Ltd., New Delhi. 3rd edition.

GE-2: ECONOMIC PLANT ANATOMY & EMBRYOLOGY

(Credits-6: Theory-4, Practical-2)-Max. Marks: 100

THEORY (Each class 1 hr.): Marks-70 PRACTICAL

(Each class 2 hrs.): Marks-30 Lectures: 60 (40

Theory + 20 Practical classes)

UNIT-I: Introduction: (2 lectures)

Meristematic and permanent tissues: Root and shoot apical meristems; Simple and complex tissues (5 lectures)

Organs: Structure of dicot and monocot root stem and leaf. (3 lectures)

UNIT-II: Secondary Growth: Vascular cambium structure and function, seasonal activity. Secondary growth in root and stem, Wood (heartwood and sapwood) (6 lectures)

Adaptive and protective systems: Epidermis, cuticle, stomata; General account of adaptations in xerophytes and hydrophytes. (5 lectures)

UNIT-III: Structural organization of flower: Structure of anther and pollen; Structure and types of ovules; Types of embryo sacs, organization and ultrastructure of mature embryo sac. (5 lectures)

Pollination and fertilization: Pollination mechanisms and adaptations; Double fertilization; Seed-structure appendages and dispersal mechanisms. (6 lectures)

UNIT-IV: Embryo and endosperm: Endosperm types, structure and functions; Dicot and monocot embryo; Embryo endosperm relationship (5 lectures)

UNIT-V: Apomixis and polyembryony: Definition, types and Practical applications. (5 lectures)

PRACTICAL

1. Study of meristems through permanent slides and photographs.
2. Tissues (parenchyma, collenchyma and sclerenchyma); Macerated xylary elements, Phloem (Permanent slides, photographs)
3. Stem: Monocot: Zea mays; Dicot: Helianthus; Secondary: Helianthus (only Permanent slides).
4. Root: Monocot: Zea mays; Dicot: Helianthus; Secondary: Helianthus (only Permanent slides).
5. Leaf: Dicot and Monocot leaf (only Permanent slides).
6. Adaptive anatomy: Xerophyte (Nerium leaf); Hydrophyte (Hydrilla stem).
7. Structure of anther (young and mature), tapetum (amoeboid and secretory) (Permanent slides).
8. Types of ovules: anatropous, orthotropous, circinotropous, amphitropous/ campylotropous.
9. Female gametophyte: Polygonum (monosporic) type of Embryo sac Development (Permanent slides/photographs).
10. Ultrastructure of mature egg apparatus cells through electron micrographs.
11. Pollination types and seed dispersal mechanisms (including appendages, aril, caruncle) (Photographs and specimens).
12. Dissection of embryo/endosperm from developing seeds.

13. Calculation of percentage of germinated pollen in a given medium.

Suggested Readings:

1. Bhojwani, S.S. & Bhatnagar, S.P. (2011). Embryology of Angiosperms. Vikas Publication House Pvt. Ltd. New Delhi. 5th edition.
2. Mauseth, J.D. (1988). Plant Anatomy. The Benjamin/Cummings Publisher, USA.

GE-4A: PLANT PHYSIOLOGY & METABOLISM

(Credits-6: Theory-4, Practical-2)-Max. Marks: 100

THEORY (Each class 1 hr.): Marks-70 PRACTICAL

(Each class 2 hrs.): Marks-30 Lectures: 60 (40

Theory + 20 Practical classes)

UNIT-I: Plant-water relations: Importance of water, water potential and its components; Transpiration and its significance; Factors affecting transpiration; Root pressure and guttation. (4 lectures)
Mineral nutrition: Essential elements, macro and micronutrients; Criteria of essentiality of elements; Role of essential elements; Transport of ions across cell membrane, active and passive transport, carriers, channels and pumps. (4 lectures)

Translocation in phloem.: Composition of phloem sap, girdling experiment; Pressure flow model; Phloem loading and unloading (4 lectures)

UNIT-II: Photosynthesis: Photosynthetic Pigments (Chl a, b, xanthophylls, carotene); Photo- system I and II, reaction center, antenna molecules; Electron transport and mechanism of ATP synthesis; C₃, C₄ and CAM pathways of carbon fixation; Photorespiration. (8 lectures)

UNIT-III: Respiration : Glycolysis, anaerobic respiration, TCA cycle; Oxidative phosphorylation, Glyoxylate, Oxidative Pentose Phosphate Pathway. (4 lectures)

UNIT-IV: Enzymes: Structure and properties; Mechanism of enzyme catalysis and enzyme inhibition. (3 lectures)

Nitrogen metabolism : Biological nitrogen fixation; Nitrate and ammonia assimilation. (3 lectures)

UNIT-V: Plant growth regulators : Discovery and physiological roles of auxins, gibberellins, cytokinins, ABA, ethylene. (5 lectures)

Plant response to light and temperature: Photoperiodism (SDP, LDP, Day neutral plants); **Phytochrome** (discovery and structure), red and far red light responses on photomorphogenesis; Vernalization. (5 lectures)

PRACTICAL

1. Determination of osmotic potential of plant cell sap by plasmolytic method.
2. To study the effect of two environmental factors (light and wind) on transpiration by excised twig.
3. Calculation of stomatal index and stomatal frequency of a mesophyte and a xerophyte.
4. Demonstration of Hill reaction.
5. Demonstrate the activity of catalase and study the effect of pH and enzyme concentration.
6. To study the effect of light intensity and bicarbonate concentration on O₂ evolution in photosynthesis.

7. Comparison of the rate of respiration in any two parts of a plant.
8. Separation of amino acids by paper chromatography.

Demonstration experiments (any four): (a) Bolting.

- (b) Effect of auxins on rooting.
- (c) Suction due to transpiration.
- (d) R.Q. (e) Respiration in roots.

Suggested Readings:

1. Taiz, L., Zeiger, E., Mller, I.M. and Murphy, A (2015). Plant Physiology and Development. Sinauer Associates Inc. USA. 6th edition.
2. Hopkins, W.G., Huner, N.P., (2009). Introduction to Plant Physiology. John Wiley & Sons, U.S.A. 4th Edition.
3. Bajracharya, D., (1999). Experiments in Plant Physiology- A Laboratory Manual. Narosa Publishing House, New Delhi.

GE-4B: BOTANY & PLANT BIO-TECHNOLOGY

(Credits-6: Theory-4, Practical-2)-Max. Marks: 100

THEORY (Each class 1 hr.): Marks-70 PRACTICAL

(Each class 2 hrs.): Marks-30 Lectures: 60 (40 Theory + 20 Practical classes)

UNIT-I: Origin of Cultivated Plants: Concept of centres of origin, their importance with reference to Vavilovs work. (3lectures)

UNIT-II: Cereals: Wheat -Origin, morphology, uses 3 lectures Legumes: General account with special reference to Gram and soybean (4 lectures)

UNIT-III: Spices: General account with special reference to clove and black pepper (Botanical name, family, part used, morphology and uses) (4 lectures)

Beverages: Tea (morphology, processing, uses) (3 lectures)

UNIT-IV: Oils and Fats: General description with special reference to groundnut 3 lectures Fibre Yielding Plants: General description with special reference to Cotton (Botanical name, family, part used, morphology and uses) (3 lectures)

UNIT-V: Introduction to biotechnology (2 lectures)

Plant tissue culture: Micropropagation; haploid production through androgenesis and gynogenesis; brief account of embryo and endosperm culture with their applications, Gene cloning by recombinant DNA technology, transgenic plants. (6 lectures)

Molecular Techniques: Blotting techniques: Northern, Southern and Western Blotting, DNA Fingerprinting; Molecular DNA markers i.e. RAPD, RFLP, SNPs; DNA sequencing, PCR and Reverse Transcriptase-PCR. Hybridoma and monoclonal antibodies, ELISA and Immunodetection. Molecular diagnosis of human disease, Human gene Therapy. (9lectures)

PRACTICAL

1. Study of economically important plants: Wheat, Gram, Soybean, Black pepper, Clove Tea, Cotton, Groundnut through specimens, sections and microchemical tests

2. Familiarization with basic equipments in tissue culture.
3. Study through photographs: Anther culture, somatic embryogenesis, endosperm and embryo culture; micropropagation.
4. Study of molecular techniques: PCR, Blotting techniques, AGE and PAGE.

Suggested Readings:

1. Kochhar, S.L. (2011). Economic Botany in the Tropics, MacMillan Publishers India Ltd., New Delhi. 4th edition.
2. Bhojwani, S.S. and Razdan, M.K., (1996). Plant Tissue Culture: Theory and Practice. Elsevier Science Amsterdam. The Netherlands.
3. Glick, B.R., Pasternak, J.J. (2003). Molecular Biotechnology- Principles and Applications of recombinant DNA. ASM Press, Washington.

GE-V: ENVIRONMENTAL BIO-TECHNOLOGY

(Credits-6: Theory-4, Practical-2)-Max. Marks: 100

THEORY (Each class 1 hr.): Marks-70 PRACTICAL

(Each class 2 hrs.): Marks-30 Lectures: 60 (40
Theory + 20 Practical classes)

UNIT-I: Environment - basic concepts and issues, global environmental problems ozone depletion, UV-B, greenhouse effect and acid rain due to anthropogenic activities, their impact and biotechnological approaches for management. (4 lectures)

An overview of atmosphere, hydrosphere, lithosphere and anthrosphere - environmental problems. Environmental pollution - types of pollution, sources of pollution, measurement of pollution, Bio-concentration, bio/geomagnification. (4 lectures)

UNIT-II: Microbiology of waste water treatment, aerobic process - activated sludge, oxidation ponds, trickling filter, towers, rotating discs, rotating drums, oxidation ditch. Anaerobic process - anaerobic digestion, anaerobic filters, up-flow anaerobic sludge blanket reactors. Treatment schemes for waste waters of dairy, distillery, tannery, sugar and antibiotic industries. (6 lectures)

UNIT-III: Xenobiotic compounds - organic (chlorinated hydrocarbons, substituted simple aromatic compounds, poly-aromatic hydrocarbons, pesticides, surfactants) and inorganic (metals, radionuclides, phosphates, nitrates). Bio-remediation of xenobiotics in environment - ecological consideration, decay behavior and degradative plasmids, molecular techniques in bio-remediation. (6 lectures)

Role of immobilized cells/enzymes in treatment of toxic compounds. Bio-pesticides, bio-reactors, bio-leaching, bio-mining, bio-sensors, bio-techniques for air pollution abatement and odour control. (4 lectures)

UNIT-IV: Sustainable Development: Economics and Environment: Economic growth, Gross National Productivity and the quality of life, Tragedy of Commons, Economics of Pollution control, Cost-benefit and cost effectiveness analysis, WTO and Environment, Corporate Social Responsibility, Environmental awareness and Education; Environmental Ethics. (6 lectures)

UNIT-V: International Legislations, Policies for Environmental Protection: Stockholm Conference (1972) and its declaration, WCED (1983) and Brundtland Report (1987), Rio Earth Summit-UNCED (1992) and its declaration, Montreal Protocol - 1987, Basel Convention (1989), Kyoto Protocol- 1997, Ramsar Convention 1971. (3 lectures)

National Legislations, Policies for Pollution Management: Salient features of Wild life protection act

1972, Water Pollution (Prevention and Control) Act- 1974, Forest conservation act 1980, Air Pollution (Prevention and Control) Act-1981, National Environmental Policy-2006, Central and State Pollution Control Boards: Constitution and power. (3 lectures)

Public Participation for Environmental Protection: Environmental movement and peoples participation with special references to Gandhamardan, Chilika and Narmada Bachao Andolan, Chipko and Silent valley Movement; Women and Environmental Protection, Role of NGO in bringing environmental awareness and education in the society. (4lectures)

PRACTICAL

1. Water/Soil analysis-DO, salinity, pH, chloride, total hardness, alkalinity, acidity, nitrate, calcium, Magnesium and phosphorus.
2. Gravimetric analysis-Total solid, dissolved solid, suspended solid in an effluent
3. Microbial assessment of air (open plate and air sample) and water.

Suggested Readings:

1. Waste water engineering-treatment, disposal and reuse, Metcalf and Eddy Inc., Tata McGraw Hill, New Delhi.
2. Environmental Chemistry, AK. De, Wiley Eastern Ltd, New Delhi.
3. Introduction to Bio-deterioration, D.Allsopp and K.J. Seal, ELBS / Edward Arnold.
4. Bioremediation, Baaker, KH and Herson D.S., 1994. Mc.GrawHill Inc, NewYork.
5. Industrial and Environmental Biotechnology - Nuzhat Ahmed, Fouad M. Qureshi and Obaid Y. Khan, 2006. Horizon Press.
6. Environmental Molecular Biology, Paul. A, Rochelle, 2001.Horizon Press.
7. Environmental Protection and Laws by Jadhav and Bhosale, V.M.Himalaya publ. House 13. Biodiversity Assessment and Conservation by PC Trivedi, Agrobios publ.

SKILL ENHANCEMENT COURSES (SEC)

SEC-I: BIO-FERTILIZERS

(Credits-2: Lectures: 30)

THEORY (Each class 1 hr.)-Marks: 50.

Unit-I: General account about the microbes used as biofertilizer Rhizobium isolation, identification, mass multiplication, carrier based inoculants, Actinorrhizal symbiosis. (4 lectures)

Unit-II: Azospirillum: isolation and mass multiplication carrier based inoculant, associative effect of different microorganisms. Azotobacter: classification, characteristics crop response to Azotobacter inoculum, maintenance and mass multiplication. (8 lectures)

Unit-III: Cyanobacteria (blue green algae), Azolla and Anabaena azollae association, nitrogen fixation, factors affecting growth, blue green algae and Azolla in rice cultivation. (4 lectures)

Unit-IV: Mycorrhizal association, types of mycorrhizal association, taxonomy, occurrence and distribution, phosphorus nutrition, growth and yield colonization of VAM isolation and inoculum production of VAM, and its influence on growth and yield of crop plants. (8 lectures)

Unit-V: Organic farming Green manuring and organic fertilizers, Recycling of biodegradable municipal, agricultural and Industrial wastes bio-compost making methods, types and method of vermicomposting field Application. (6 lectures)

Suggested Readings:

1. Dubey, R.C., 2005 A Text book of Biotechnology S.Chand & Co, New Delhi.
2. Kumaresan, V. 2005, Biotechnology, Saras Publications, New Delhi.
3. John Jothi Prakash, E. 2004. Outlines of Plant Biotechnology. Emkay, Publication, New Delhi.
4. Sathe, T.V. 2004 Vermiculture and Organic Farming. Daya publishers.
5. Subha Rao, N.S. 2000, Soil Microbiology, Oxford & IBH Publishers, New Delhi.
6. Vayas,S.C, Vayas, S. and Modi, H.A. 1998 Bio-fertilizers and organic, Farming Akta Prakashan, Nadiad

SEC-II: HERBAL TECHNOLOGY

(Credits-2: Lectures: 30)

THEORY (Each class 1 hr.)-Marks: 50.

Unit-I: Herbal medicines: history and scope - definition of medical terms - role of medicinal plants in Siddha systems of medicine; cultivation - harvesting - processing - storage - marketing and utilization of medicinal plants. (6 lectures)

Unit-II: Pharmacognosy - systematic position m edicinal uses of the following herbs in curing various ailments; Tulsi, Ginger, Fenugreek, Indian Goose berry and Ashoka. (6 lectures)

Unit-III:Phytochemistry - active principles and methods of their testing - identification and utilization of the medicinal herbs; Catharanthus roseus (cardiotonic), Withania somnifera (drugs acting on nervous system), Clerodendron phlomoides (anti-rheumatic) and Centella asiatica (memory booster). (6 lectures)

Unit-IV: Analytical pharmacognosy: Drug adulteration - types, methods of drug evaluation - Biological testing of herbal drugs - Phytochemical screening tests for secondary metabolites (alkaloids, flavonoids, steroids, triterpenoids, phenolic compounds) (8 lectures)

Unit-V: Medicinal plant banks micro propagation of important species (Withania somnifera, neem and tulsi- Herbal foods-future of pharmacognosy) (4 lectures)

Suggested Readings:

1. Glossary of Indian medicinal plants, R.N.Chopra, S.L.Nayar and I.C.Chopra, 1956. C.S.I.R, New Delhi.
2. The indigenous drugs of India, Kanny, Lall, Dey and Raj Bahadur, 1984. International Book Distributors.
3. Herbal plants and Drugs Agnes Arber, 1999. Mangal Deep Publications.
4. Ayurvedic drugs and their plant source. V.V. Sivarajan and Balachandran Indra 1994. Oxford IBH publishing Co.
5. Ayurveda and Aromatherapy. Miller, Light and Miller, Bryan, 1998. Banarsidass, Delhi.
6. Principles of Ayurveda, Anne Green, 2000. Thomsons, London.

7. Pharmacognosy, Dr.C.K.Kokate et al. 1999. Nirali Prakashan.

SEC-III: NURSERY & GARDENING

(Credits-2: Lectures: 30)

THEORY (Each class 1 hr.)-Marks: 50.

Unit-I: Nursery: definition, objectives and scope and building up of infrastructure for nursery, planning and seasonal activities - Planting - direct seeding and transplants. (4 lectures)

Unit-II: Seed: Structure and types - Seed dormancy; causes and methods of breaking dormancy - Seed storage: Seed banks, factors affecting seed viability, genetic erosion Seed production technology - seed testing and certification. (6 lectures)

Unit-III: Vegetative propagation: air-layering, cutting, selection of cutting, collecting season, treatment of cutting, rooting medium and planting of cuttings - Hardening of plants green house - mist chamber, shed root, shade house and glass house. (6 lectures)

Unit-IV: Gardening: definition, objectives and scope - different types of gardening landscape and home gardening - parks and its components - plant materials and design computer applications in landscaping - Gardening operations: soil laying, manuring, watering, management of pests and diseases and harvesting. (8 lectures)

Unit-V: Sowing/raising of seeds and seedlings - Transplanting of seedlings - Study of cultivation of different vegetables: cabbage, brinjal, lady's finger, onion, garlic, tomatoes, and carrots - Storage and marketing procedures. (6 lectures)

Suggested Readings:

1. Bose T.K. & Mukherjee, D., 1972, Gardening in India, Oxford & IBH Publishing Co., New Delhi.
2. Sandhu, M.K., 1989, Plant Propagation, Wile Eastern Ltd., Bangalore, Madras.
3. Kumar, N., 1997, Introduction to Horticulture, Rajalakshmi Publications, Nagercoil.
4. Edmond Musser & Andres, Fundamentals of Horticulture, McGraw Hill Book Co., New Delhi.
5. Agrawal, P.K. 1993, Hand Book of Seed Technology, Dept. of Agriculture and Cooperation, National Seed Corporation Ltd., New Delhi.
6. Janick Jules. 1979. Horticultural Science. (3rd Ed.), W.H. Freeman and Co., San Francisco, USA.

SEC-IV: FLORICULTURE

(Credits-2: Lectures: 30)

THEORY (Each class 1 hr.)-Marks: 50.

Unit-I: Introduction: History of gardening; Importance and scope of floriculture and landscape gardening. (2 lectures)

Unit-II: Nursery Management and Routine Garden Operations: Sexual and vegetative methods of propagation; Soil sterilization; Seed sowing; Pricking; Planting and transplanting; Shading; Stopping or pinching; Defoliation; Wintering; Mulching; Topiary; Role of plant growth regulators. (8 lectures)

Unit-III: Ornamental Plants: Flowering annuals; Herbaceous perennials; Divine vines; Shade and ornamental trees; Ornamental bulbous and foliage plants; Cacti and succulents; Palms and Cycads; Ferns and Selaginellas; Cultivation of plants in pots; Indoor gardening; Bonsai. (4 lectures)

Unit-IV: Principles of Garden Designs: English, Italian, French, Persian, Mughal and Japanese gardens; Features of a garden (Garden wall, Fencing, Steps, Hedge, Edging, Lawn, Flower beds,

Shrubbery, Borders, Water garden. Some Famous gardens of India (4 lectures)
Landscaping Places of Public Importance: Landscaping highways and Educational institutions. (4 lectures)

Unit-V: Commercial Floriculture: Factors affecting flower production; Production and packaging of cut flowers; Flower arrangements; Methods to prolong vase life; Cultivation of Important cut flowers (Carnation, Aster, Chrysanthemum, Dahlia, Gerbera, Gladiolous, Marigold, Rose, Liliium, Orchids). (6 lectures)

Diseases and Pests of Ornamental Plants. (2 lectures)

Suggested Readings:

Randhawa, G.S. and Mukhopadhyay, A. 1986. Floriculture in India. Allied Publishers.

SEC-V: MEDICAL BOTANY

(Credits-2: Lectures: 30)

THEORY (Each class 1 hr.)-Marks: 50.

Unit-I: History, Scope and Importance of Medicinal Plants. Indigenous Medicinal Sciences; Definition and Scope-Ayurveda: History, origin, panchamahabhutas, saptadhatu and tridosha concepts, Rasayana, plants used in ayurvedic treatments. (5 lectures)

Unit-II: Siddha: Origin of Siddha medicinal systems, Basis of Siddha system, plants used in Siddha medicine. Unani: History, concept: Umoor-e- tabiya, tumors treatments/ therapy, polyherbal formulations. (5 lectures)

Unit-III: Conservation of endangered and endemic medicinal plants. Definition: endemic and endangered medicinal plants, Red list criteria; In situ conservation: Biosphere reserves, sacred groves, National Parks; Ex situ conservation: Botanic Gardens, Ethno medicinal plant Gardens. (6 lectures)

Unit-IV: Propagation of Medicinal Plants: Objectives of the nursery, its classification, important components of a nursery, sowing, pricking, use of green house for nursery production, propagation through cuttings, layering, grafting and budding. (6 lectures)

Unit-V: Ethnobotany and Folk medicines. Definition; Ethnobotany in India: Methods to study ethnobotany; Applications of Ethnobotany: National interacts, Palaeo-ethnobotany. Folk medicines of ethnobotany, ethno medicine, ethno ecology, ethnic communities of India. Application of natural products to certain diseases- Jaundice, cardiac, infertility, diabetics, Blood pressure and skin diseases. (8 lectures)

Suggested Readings:

1. Trivedi P C, 2006. Medicinal Plants: Ethno botanical Approach, Agro-bios, India.
2. Purohit and Vyas, 2008. Medicinal Plant Cultivation: A Scientific Approach, 2nd Edn. Agro- bios, India.

SEC-VI: PLANT DIVERSITY & HUMAN WELFARE

(Credits-2: Lectures: 30)

THEORY (Each class 1 hr.)-Marks: 50.

Unit-I: Plant diversity and its scope- Genetic diversity, Species diversity, Plant diversity at the ecosystem level, Agro-bio-diversity and cultivated plant taxa, wild taxa. Values and uses of Biodiversity: Ethical and aesthetic values, Precautionary principle, Methodologies for valuation, Uses of plants, Uses of microbes. (6 lectures)

Unit-II: Loss of Bio-diversity: Loss of genetic diversity, Loss of species diversity, Loss of ecosystem diversity, Loss of agro-bio-diversity, Projected scenario for biodiversity loss, (6 lectures)

Unit-III: Management of Plant Bio-diversity: Organizations associated with bio-diversity management- Methodology for execution-IUCN, UNEP, UNESCO, WWF, NBPGR; Bio-diversity legislation and conservations, Bio-diversity information management and communication. (6 lectures)

Unit-IV: Conservation of Bio-diversity: Conservation of genetic diversity, species diversity and ecosystem diversity, In situ and ex situ conservation, Social approaches to conservation, Bio-diversity awareness programmes, Sustainable development. (6 lectures)

Unit-V: Role of plants in relation to Human Welfare: (a) Importance of forestry their utilization and commercial aspects (b) Avenue trees. (c) Ornamental plants of India. (d) Alcoholic beverages through ages. Fruits and nuts: Important fruit crops their commercial importance. Wood and its uses. (6 lectures)

Suggested Readings:

Krishnamurthy, K.V. (2004). An Advanced Text Book of Biodiversity - Principles and Practices. Oxford and IBH Publications Co. Pvt. Ltd. New Delhi

SEC-VII: ETHNOBOTANY

(Credits-2: Lectures: 30)

THEORY (Each class 1 hr.)-Marks: 50.

Unit-I: Introduction, concept, scope and objectives; Ethnobotany as an interdisciplinary science. The relevance of ethnobotany in the present context; Major and minor ethnic groups or Tribals of India, and their life styles. Plants used by the tribals: (a) Food plants. (b) intoxicants and beverages
c) Resins and oils and miscellaneous uses. (6 lectures)

Unit-II: Methodology of Ethnobotanical studies: (a) Field work. (b) Herbarium. (c) Ancient Literature. (d) Archaeological findings. (e) Temples and sacred places. (6 lectures)

Unit-III: Role of ethnobotany in modern Medicine Medico-ethnobotanical sources in India; Significance of the following plants in ethno botanical practices (along with their habitat and morphology) (a) Azadiractha indica. (b) Ocimum sanctum. (c) Vitex negundo. (d) Gloriosa superba e) Tribulus terrestris. (f) Pongamia pinnata. (g) Cassia auriculata. (h) Indigofera tinctoria. Role of ethnobotany in modern medicine with special example Rauvolfia sepentina, Trichopus zeylanicus, Artemisia, Withania. (8 lectures)

Unit-IV: Role of ethnic groups in conservation of plant genetic resources. Endangered taxa and forest management (participatory forest management). (4 lectures)

Unit-V: Ethnobotany and legal aspects Ethnobotany as a tool to protect interests of ethnic groups. Sharing of wealth concept with few examples from India. Biopiracy, Intellectual Property Rights and Traditional Knowledge. (6 lectures)

Suggested Readings:

1. S.K. Jain, Manual of Ethnobotany, Scientific Publishers, Jodhpur, 1995.
2. S.K. Jain (ed.) Glimpses of Indian. Ethnobotny, Oxford and I B H, New Delhi 1981
3. Lone et al., Palaeoethnobotany

4. S.K. Jain (ed.) 1989. Methods and approaches in ethnobotany. Society of ethnobotanists, Lucknow, India.
5. S.K. Jain, 1990. Contributions of Indian ethnobotny. Scientific publishers, Jodhpur.
6. Colton C.M. 1997. Ethnobotany Principles and applications. John Wiley and sons Chichester
7. Rama Ro, N and A.N. Henry (1996). The Ethnobotany of Eastern Ghats in Andhra Pradesh, India. Botanical Survey of India. Howrah.
8. Rajiv K. Sinha Ethnobotany The Renaissance of Traditional Herbal Medicine INA SHREE Publishers, Jaipur-1996
9. Faulks, P.J. 1958. An introduction to Ethnobotany, Moredale pub. Ltd.

SEC-VIII: MUSHROOM CULTURE TECHNOLOGY

(Credits-2: Lectures: 30)

THEORY (Each class 1 hr.)-Marks: 50.

Unit-I: Introduction, history. Nutritional and medicinal value of edible mushrooms; Poisonous mushrooms. Types of edible mushrooms available in India - *Volvariella volvacea*, *Pleurotus citrinopileatus*, *Agaricus bisporus*. (5 lectures)

Unit-II: Cultivation Technology : Infrastructure: substrates (locally available) Polythene bag, vessels, Inoculation hook, inoculation loop, low cost stove, sieves, culture rack, mushroom unit (Thatched house) water sprayer, tray, small polythene bag. (6 Lectures)

Unit-III: Pure culture: Medium, sterilization, preparation of spawn, multiplication. Mushroom bed preparation - paddy straw, sugarcane trash, maize straw, banana leaves. Factors affecting the mushroom bed preparation - Low cost technology, Composting technology in mushroom production. (6 lectures)

Unit-IV: Storage and nutrition : Short-term storage (Refrigeration - upto 24 hours) Long term Storage (canning, pickles, papads), drying, storage in salt solutions. Nutrition - Proteins - amino acids, mineral elements nutrition - Carbohydrates, Crude fibre content - Vitamins. (8 lectures)

Unit-V: Food Preparation: Types of foods prepared from mushroom. Research Centres - National level and Regional level. Cost benefit ratio - Marketing in India and abroad, Export Value. (5 lectures)

Suggested Readings:

1. Marimuthu, T. Krishnamoorthy, A.S. Sivaprakasam, K. and Jayarajan. R (1991) Oyster Mushrooms, Department of Plant Pathology, Tamil Nadu Agricultural University, Coimbatore.
2. Swaminathan, M. (1990) Food and Nutrition. Bappco, The Bangalore Printing and Publishing Co. Ltd., No. 88, Mysore Road, Bangalore - 560018.
3. Tewari, Pankaj Kapoor, S.C., (1988). Mushroom cultivation, Mittal Publications, Delhi.

4. Nita Bahl (1984-1988) Hand book of Mushrooms, II Edition, Vol. I & Vol. II.

SEC-IX: INTELLECTUAL PROPERTY RIGHTS

(Credits-2: Lectures: 30)

THEORY (Each class 1 hr.)-Marks: 50.

Unit-I: Introduction to intellectual property right (IPR) : Concept and kinds. Economic importance. IPR in India and world: Genesis and scope, some important examples. IPR and WTO (TRIPS, WIPO). (2 lectures)

Patents: Objectives, Rights, Patent Act 1970 and its amendments. Procedure of obtaining patents, Working of patents. Infringement. (3 Lectures)

Copyrights: Introduction, Works protected under copyright law, Rights, Transfer of Copyright, Infringement. (3 Lectures)

Unit-II: Trademarks: Objectives, Types, Rights, Protection of goodwill, Infringement, Passing off, Defences, Domain name. (3 Lectures)

Geographical Indications : Objectives, Justification, International Position, Multilateral Treaties, National Level, Indian Position. (3 Lectures)

Unit-III: Protection of Traditional Knowledge : Objective, Concept of Traditional Knowledge, Holders, Issues concerning, Bio-Prospecting and Bio-Piracy, Alternative ways, Protectability, need for a Sui-Generis regime, Traditional Knowledge on the International Arena, at WTO, at National level, Traditional Knowledge Digital Library. (4 Lectures)

Unit-IV: Protection of Plant Varieties : Plant Varieties Protection-Objectives, Justification, International Position, Plant varieties protection in India. Rights of farmers, Breeders and Researchers. National gene bank, Benefit sharing. Protection of Plant Varieties and Farmers Rights Act, 2001. (2 Lectures)

Unit-V: Industrial Designs: Objectives, Rights, Assignments, Infringements, Defences of Design Infringement (2 Lectures)

CHEMISTRY(HONOURS)

SEMESTER-I

C-1: INORGANIC CHEMISTRY-I

(Credits-6: Theory-4, Practical-2)-Max. Marks: 100
THEORY (Each class 1 hr.): Marks-70 PRACTICAL
(Each class 2 hrs.): Marks-30 Lectures: 60 (40 Theory
+ 20 Practical classes)

Unit-I: Atomic structure

Bohrs theory, its limitations and atomic spectrum of hydrogen atom. Wave mechanics: de Broglie equation, Heisenbergs Uncertainty Principle and its significance, Schrdingers wave equation, significance of ψ and ψ^2 . Quantum numbers and their significance. Normalized and orthogonal wave functions. Sign of wave functions. Radial and angular wave functions for hydrogen atom. Radial and angular distribution curves. Shapes of s, p, d and f orbitals. Paulis Exclusion Principle, Hunds rule of maximum multiplicity, Aufbaus principle and its limitations. (14 Lectures)

Unit-II: Periodicity of elements

Periodicity of elements Periodicity of Elements: s, p, d, f block elements, the long form of periodic table. Detailed discussion of the following properties of the elements, with reference to s & p-block. (a) Effective nuclear charge, shielding or screening effect, Slater rules, variation of effective nuclear charge in periodic table. (b) Atomic radii (van der Waals) (c) Ionic and crystal radii. (d) Covalent radii (octahedral and tetrahedral) (e) Ionization enthalpy, Successive ionization enthalpies and factors affecting ionization energy. Applications of ionization enthalpy. (f) Electron gain enthalpy, trends of electron gain enthalpy. (g) Electronegativity, Paulings/ Mullikens electronegativity scales. Variation of electronegativity with bond order, partial charge, hybridization, group electronegativity. Sandersons electron density ratio. (16 Lectures)

Unit-III: Chemical bonding-I

Ionic bond: General characteristics, types of ions, size effects, radius ratio rule and its limitations. Packing of ions in crystals. Born-Land equation with derivation. Madelung constant, Born-Haber cycle and its application, Solvation energy. (ii) Covalent bond: Lewis structure, Valence Bond theory (Heitler-London approach). Energetics of hybridization, equivalent and non-equivalent hybrid orbitals, Resonance and resonance energy, Molecular orbital theory. Molecular orbital diagrams of diatomic and simple polyatomic molecules N_2 , O_2 , C_2 , B_2 , F_2 , CO , NO , and their ions; Valence shell electron pair repulsion theory (VSEPR), shapes of simple molecules and ions containing lone pairs and bond pairs of electrons, multiple bonding (σ and π bond approach) and bond lengths. Covalent character in ionic compounds, polarizing power and polarizability. Fajans rules and consequences of polarization. Ionic character in covalent compounds: Bond moment and dipole moment. Percentage ionic character from dipole moment and electronegativity difference. (16 Lectures)

Unit-IV: Chemical Bonding-II

(i) Metallic Bond: Qualitative idea of valence bond and band theories. Semiconductors and insulators. (ii) Weak Chemical Forces: van der Waals forces, ion-dipole forces, dipole-dipole interactions,

induced dipole interactions, Instantaneous dipole-induced dipole interactions. Repulsive forces, Hydrogen bonding (theories of hydrogen bonding, valence bond treatment) Effects of chemical force, melting and boiling points, solubility energetics of dissolution process. (10 Lectures)

Oxidation-reduction Redox equations, standard electrode potential and its application to inorganic reactions. Principles involved in some volumetric analyses (iron, copper and manganese). (4 Lectures)

Reference Books:

- Lee, J.D. Concise Inorganic Chemistry, ELBS, 1991.
- Douglas, B.E. and Mc Daniel, D.H., Concepts & Models of Inorganic Chemistry, Oxford, 1970.
- Atkins, P.W. & Paula, J. Physical Chemistry, Oxford Press, 2006.
- Day, M.C. and Selbin, J. Theoretical Inorganic Chemistry, ACS Publications 1962.

PRACTICAL: C-1 LAB.

(A) Titrimetric Analysis:

(i) Calibration and use of apparatus. (ii) Preparation of solutions of different Molarity/Normality of titrants.

(B) Acid-Base Titrations:

(i) Estimation of carbonate and hydroxide present together in mixture. (ii) Estimation of carbonate and bicarbonate present together in a mixture. (iii) Estimation of free alkali present in different soaps/detergents.

(C) Oxidation-Reduction Titrimetry:

(i) Estimation of Fe(II) and oxalic acid using standardized KMnO_4 solution. (ii) Estimation of oxalic acid and sodium oxalate in a given mixture. (iii) Estimation of Fe(II) with $\text{K}_2\text{Cr}_2\text{O}_7$ using internal (diphenylamine, anthranilic acid) and external indicator.

Reference text:

Vogel, A.I. A Textbook of Quantitative Inorganic Analysis, ELBS.

C-2: PHYSICAL CHEMISTRY

(Credits-6: Theory-4, Practical-2)-Max. Marks: 100
THEORY (Each class 1 hr.): Marks-70 PRACTICAL
(Each class 2 hrs.): Marks-30 Lectures: 60 (40 Theory
+ 20 Practical classes)

Unit-I: Gaseous state

Kinetic molecular model of a gas: postulates and derivation of the kinetic gas equation; collision frequency; collision diameter; mean free path and viscosity of gases, including their temperature and pressure dependence, relation between mean free path and coefficient of viscosity, calculation of σ from η ; variation of viscosity with temperature and pressure. Maxwell distribution and its use in evaluating molecular velocities (average, root mean square and most probable) and average kinetic energy, law of equipartition of energy, degrees of freedom and molecular basis of heat capacities. Behaviour of real gases: Deviations from ideal gas behaviour, compressibility factor, Z, and its variation with pressure for different gases. Causes of deviation from ideal behaviour. van der Waals

equation of state, its derivation and application in explaining real gas behaviour. Isotherms of real gases and their comparison with van der Waals isotherms, continuity of states, critical state, relation between critical constants and van der Waals constants, law of corresponding states. (18 Lectures)

Unit-II: Liquid state

(i) Qualitative treatment of the structure of the liquid state; physical properties of liquids; vapour pressure, surface tension and coefficient of viscosity, and their determination. Effect of addition of various solutes on surface tension and viscosity. Explanation of cleansing action of detergents. Temperature variation of viscosity of liquids and comparison with that of gases. Qualitative discussion of structure of water. (6 Lectures)

Ionic equilibria- I

(ii) Strong, moderate and weak electrolytes, degree of ionization, factors affecting degree of ionization, ionization constant and ionic product of water. Ionization of weak acids and bases, pH scale, common ion effect; dissociation constants of mono- and diprotic acids. (6 Lectures)

Unit- III: Solid state

Nature of the solid state, law of constancy of interfacial angles, law of rational indices, Miller indices, elementary ideas of symmetry, symmetry elements and symmetry operations, seven crystal systems and fourteen Bravais lattices; X-ray diffraction, Bragg's law, a simple account of rotating crystal method and powder pattern method. Analysis of powder diffraction patterns of NaCl, CsCl and KCl. Defects in crystals. Glasses and liquid crystals. (16 Lectures)

Unit-IV: Ionic equilibria - II

Salt hydrolysis-calculation of hydrolysis constant, degree of hydrolysis and pH for different salts. Buffer solutions; derivation of Henderson equation and its applications; buffer capacity, buffer range, buffer action and applications of buffers in analytical chemistry and biochemical processes in the human body. Solubility and solubility product of sparingly soluble salts applications of solubility product principle. Qualitative treatment of acid base titration curves (calculation of pH at various stages). Theory of acidbase indicators; selection of indicators and their limitations. Multistage equilibria in polyelectrolyte systems; hydrolysis and hydrolysis constants. (14 Lectures)

Reference Books:

- Atkins, P. W. & Paula, J. de Atkins Physical Chemistry Ed., Oxford University Press (2006).
- Ball, D. W. Physical Chemistry Thomson Press, India (2007).
- Castellan, G. W. Physical Chemistry 4th Ed. Narosa (2004).
- Mortimer, R. G. Physical Chemistry 3rd Ed. Elsevier: NOIDA, UP (2009).
- Principles of Physical Chemistry, Puri, Sharma, Pathania, Vishal Pub. Co.

PRACTICAL: C-2 LAB.

Surface tension measurements.

- (a) Determine the surface tension by (i) drop number (ii) drop weight method.
- (b) Study the variation of surface tension of detergent solutions with concentration.

Viscosity measurement using Ostwalds viscometer.

- (a) Determination of viscosity of aqueous solutions of (i) polymer, (ii) ethanol, and (iii) sugar at room temperature.

(b) Study the variation of viscosity of sucrose solution with the concentration of solute.

pH metry.

(a) Study the effect on pH of addition of HCl/NaOH to solutions of acetic acid, sodium acetate and their mixtures.

(b) Preparation of buffer solutions of different pH (i) Sodium acetate-acetic acid, (ii) Ammonium chloride-ammonium hydroxide.

(c) pH metric titration of (i) strong acid vs. strong base, (ii) weak acid vs. strong base.

(d) Determination of dissociation constant of a weak acid.

Reference Books:

- Khosla, B. D.; Garg, V. C. & Gulati, A. Senior Practical Physical Chemistry, R. Chand & Co., New Delhi (2011).
- Garland, C. W., Nibler, J. W. & Shoemaker, D. P. Experiments in Physical Chemistry 8th Ed.; McGraw-Hill, New York (2003).
- Halpern, A. M. & McBane, G. C. Experimental Physical Chemistry 3rd Ed.; W.H. Freeman & Co., New York (2003).

SEMESTER-II

C-3: ORGANIC CHEMISTRY I

(Credits-6: Theory-4, Practical-2)-Max. Marks: 100

THEORY (Each class 1 hr.): Marks-70 PRACTICAL

(Each class 2 hrs.): Marks-30 Lectures: 60 (40 Theory

+ 20 Practical classes)

Unit-I: BASICS OF ORGANIC CHEMISTRY

Electronic Displacements: Inductive, electromeric, resonance and mesomeric effects, hyperconjugation and their applications; Dipole moment; Organic acids and bases; their relative strength. Homolytic and Heterolytic fission with suitable examples. Curly arrow rules; Electrophiles and Nucleophiles; Nucleophilicity and basicity; Types, shape and their relative stability of carbocations, carbanions, free radicals and carbenes. Introduction to types of organic reactions and their mechanism: Addition, Elimination and Substitution reactions.

CARBON-CARBON SIGMA BONDS

Chemistry of alkanes: Formation of alkanes, Wurtz Reaction, Wurtz-Fittig Reactions, Free radical substitutions: Halogenation -relative reactivity and selectivity. (12 Lectures)

Unit-II: STEREOCHEMISTRY

Fischer Projection, Newmann and Sawhorse Projection formulae; Geometrical isomerism: cis-trans and, syn-anti isomerism E/Z notations with C.I.P rules. Optical Isomerism: Optical Activity, Specific Rotation, Chirality/Asymmetry, Enantiomers, Molecules with one and two chiral-centres, Diastereoisomers, meso structures, Racemic mixture and resolution. Relative and absolute configuration: D/L and R/S designations. (18 Lectures)

Unit-III: CHEMISTRY OF ALIPHATIC HYDROCARBONS

A. Carbon-Carbon pi bonds:

Formation of alkenes and alkynes by elimination reactions, Mechanism of E1, E2, E1cb reactions. Saytzeff and Hofmann eliminations. Reactions of alkenes: Electrophilic additions their mechanisms (Markownikoff/ Anti Markownikoff addition), mechanism of oxymercuration-demercuration, hydroborationoxidation, ozonolysis, reduction (catalytic and chemical), syn and anti-hydroxylation(oxidation). 1,2- and 1,4-addition reactions in conjugated dienes and, Diels-Alder reaction; Allylic and benzylic bromination and mechanism, e.g. propene, 1-butene, toluene, ethyl benzene. Reactions of alkynes: Acidity, Electrophilic and Nucleophilic additions. Hydration to form carbonyl compounds, Alkylation of terminal alkynes. **B. Cycloalkanes and Conformational Analysis**

Types of cycloalkanes and their relative stability, Baeyer strain theory, Conformation analysis of alkanes (ethane and n-butane): Relative stability with energy diagrams. Energy diagrams of cyclohexane: Chair, Boat and Twist boat forms. (18 Lectures)

Unit-IV: AROMATIC HYDROCARBONS

Aromaticity: Hckels rule, aromatic character of arenes, cyclic carbocations/carbanions and heterocyclic compounds with suitable examples. Electrophilic aromatic substitution: halogenation, nitration, sulphonation and Friedel-Crafts alkylation/acylation with their mechanism. Directing effects of the groups. (12 Lectures)

Reference Books:

- Morrison, R. N. & Boyd, R. N. Organic Chemistry, Dorling Kindersley (India) Pvt. Ltd. (Pearson Education).
- Finar, I. L. Organic Chemistry (Volume 1), Dorling Kindersley (India) Pvt. Ltd. (Pearson Education).
- Finar, I. L. Organic Chemistry (Volume 2): Stereochemistry and the Chemistry of Natural Products, Dorling Kindersley (India) Pvt. Ltd. (Pearson Education).
- Eliel, E. L. & Wilen, S. H. Stereochemistry of Organic Compounds; Wiley: London, 1994.
- Kalsi, P. S. Stereochemistry Conformation and Mechanism; New Age International, 2005.

PRACTICAL: C-3 LAB.

1. Checking the calibration of the thermometer.
2. Purification of organic compounds by crystallization using the following solvents:
 - Water
 - Alcohol
 - Alcohol-Water
3. Determination of the melting points of above compounds and unknown organic compounds (Kjeldahl method and electrically heated melting point apparatus).
4. Effect of impurities on the melting point mixed melting point of two unknown organic compounds.
5. Determination of boiling point of liquid compounds. (boiling point lower than and more than 100C by distillation and capillary method)

6. Chromatography

- Separation of a mixture of two amino acids by ascending and horizontal paper chromatography.
- Separation of a mixture of two sugars by ascending paper chromatography.
- Separation of a mixture of o-and p-nitrophenol or o-and p-aminophenol by thin layer chromatography (TLC).

Reference Books:

- Mann, F.G. & Saunders, B.C. Practical Organic Chemistry, Pearson Education (2009).
- Furniss, B.S., Hannaford, A.J.; Smith, P.W.G.; Tatchell, A.R. Practical Organic Chemistry, 5th Ed., Pearson (2012).

C-4: PHYSICAL CHEMISTRY-II

(Credits-6: Theory-4, Practical-2)-Max. Marks: 100
THEORY (Each class 1 hr.): Marks-70 PRACTICAL
(Each class 2 hrs.): Marks-30 Lectures: 60 (40 Theory
+ 20 Practical classes)

Unit-I: Chemical thermodynamics

Intensive and extensive variables; state and path functions; isolated, closed and open systems; zeroth law of thermodynamics. First law: Concept of heat, q , work, w , internal energy, U , and statement of first law; enthalpy, H , relation between heat capacities, calculations of q , w , U and H for reversible, irreversible and free expansion of gases (ideal and van der Waals) under isothermal and adiabatic conditions. Thermochemistry: Heats of reactions: standard states; enthalpy of formation of molecules and ions and enthalpy of combustion and its applications; calculation of bond energy, bond dissociation energy and resonance energy from thermochemical data, effect of temperature (Kirchhoffs equations) and pressure on enthalpy of reactions. (14 Lectures)

Unit-II: Second Law: Concept of entropy; thermodynamic scale of temperature, statement of the second law of thermodynamics; molecular and statistical interpretation of entropy. Calculation of entropy change for reversible and irreversible processes. Third Law: Statement of third law, concept of residual entropy, calculation of absolute entropy of molecules. Free Energy Functions: Gibbs and Helmholtz energy; variation of S , G , A with T , V , P ; Free energy change and spontaneity. Relation between Joule-Thomson coefficient and other thermodynamic parameters; inversion temperature; Gibbs-Helmholtz equation; Maxwell 17 relations; thermodynamic equation of state. (14 Lectures)

Unit-III: Systems of variable composition

Partial molar quantities, dependence of thermodynamic parameters on composition; Gibbs Duhem equation, chemical potential of ideal mixtures, change in thermodynamic functions in mixing of ideal gases. Chemical equilibrium, Criteria of thermodynamic equilibrium, degree of advancement of reaction, chemical equilibria in ideal gases, concept of fugacity. Thermodynamic derivation of relation between Gibbs free energy of reaction and reaction quotient (van Hoff's reaction). Equilibrium constants and their quantitative dependence on temperature, pressure and concentration. Free energy of mixing and spontaneity; thermodynamic derivation of relations between the various equilibrium

constants K_p , K_c and K_x . Le Chatelier principle (quantitative treatment) and its applications. (18 Lectures)

Unit-IV: Solutions and Colligative Properties

Dilute solutions; lowering of vapour pressure, Raoult's and Henry's Laws and their applications. Thermodynamic derivation using chemical potential to derive relations between the four colligative properties [(i) relative lowering of vapour pressure, (ii) elevation of boiling point, (iii) Depression of freezing point, (iv) osmotic pressure] and amount of solute. Applications in calculating molar masses of normal, dissociated and associated solutes in solution. (14 Lectures)

Reference Books:

- Peter, A. & Paula, J. de. Physical Chemistry 9th Ed., Oxford University Press (2011).
- Castellan, G. W. Physical Chemistry 4th Ed., Narosa (2004).
- Engel, T. & Reid, P. Physical Chemistry 3rd Ed., Prentice-Hall (2012).
- McQuarrie, D. A. & Simon, J. D. Molecular Thermodynamics Viva Books Pvt. Ltd.: New Delhi (2004).
- Assael, M. J.; Goodwin, A. R. H.; Stamatoudis, M.; Wakeham, W. A. & Will, S. Commonly Asked Questions in Thermodynamics. CRC Press: NY (2011).
- Levine, I. N. Physical Chemistry 6th Ed., Tata Mc Graw Hill (2010).
- Metz, C.R. 2000 solved problems in chemistry, Schaum Series (2006).

PRACTICAL: C-4 LAB.

THERMOCHEMISTRY

- (a) Determination of heat capacity of a calorimeter for different volumes using change of enthalpy data of a known system (method of back calculation of heat capacity of calorimeter from known enthalpy of solution or enthalpy of neutralization).
- (b) Determination of heat capacity of the calorimeter and enthalpy of neutralization of hydrochloric acid with sodium hydroxide.
- (c) Calculation of the enthalpy of ionization of ethanoic acid.
- (d) Determination of heat capacity of the calorimeter and integral enthalpy (endothermic and exothermic) solution of salts.
- (e) Determination of basicity/proticity of a polyprotic acid by the thermochemical method in terms of the changes of temperatures observed in the graph of temperature versus time for different additions of a base. Also calculate the enthalpy of neutralization of the first step.
- (f) Determination of enthalpy of hydration of copper sulphate.
- (g) Study of the solubility of benzoic acid in water and determination of H .

Reference Books;

- Khosla, B. D.; Garg, V. C. & Gulati, A., Senior Practical Physical Chemistry, R. Chand & Co.: New Delhi (2011).
- Athawale, V. D. & Mathur, P. Experimental Physical Chemistry New Age International: New Delhi (2001).

SEMESTER-III

C-5: INORGANIC CHEMISTRY-II

(Credits-6: Theory-4, Practical-2)-Max. Marks: 100
THEORY (Each class 1 hr.): Marks-70 PRACTICAL
(Each class 2 hrs.): Marks-30 Lectures: 60 (40 Theory
+ 20 Practical classes)

UNIT-I: General Principles of Metallurgy

Chief modes of occurrence of metals based on standard electrode potentials. Ellingham diagrams for reduction of metal oxides using carbon and carbon monoxide as reducing agent. Electrolytic Reduction, Hydrometallurgy. Methods of purification of metals: Electrolytic process, Parting process, van Arkel-de Boer process and Mond's process, Zone refining. (8 Lectures)

Acids and Bases

Bronsted-Lowry concept of acid-base reactions, solvated proton, relative strength of acids, types of acid-base reactions, Lewis acid-base concept, Classification of Lewis acids, Hard and Soft Acids and Bases (HSAB) Application of HSAB principle. (8 Lectures)

UNIT-II: Chemistry of s and p Block Elements-I

Inert pair effect, Relative stability of different oxidation states, diagonal relationship and anomalous behaviour of first member of each group. Allotropy and catenation. Complex formation tendency of s and p block elements. Hydrides and their classification ionic, covalent and interstitial. Basic beryllium acetate and nitrate. (14 Lectures)

UNIT-III: Chemistry of s and p Block Elements-II

Study of the following compounds with emphasis on structure, bonding, preparation, properties and uses. Boric acid and borates, boron nitrides, borohydrides (diborane) carboranes and graphitic compounds, silanes. Oxides and oxoacids of nitrogen, Phosphorus and chlorine. Peroxo acids of sulphur, interhalogen compounds, polyhalide ions, pseudohalogens and basic properties of halogens. (14 Lectures)

UNIT-IV: Noble Gases

Occurrence and uses, rationalization of inertness of noble gases, Clathrates; preparation and properties of XeF_2 , XeF_4 and XeF_6 ; Nature of bonding in noble gas compounds (Valence bond treatment and MO treatment for XeF_2). Molecular shapes of noble gas compounds (VSEPR theory). (8 Lectures)

Inorganic Polymers:

Types of inorganic polymers, comparison with organic polymers, synthesis, structural aspects and applications of silicones and siloxanes. Borazines, silicates and phosphazenes, and polysulphates. (8 Lectures)

Reference Books:

- Lee, J.D. Concise Inorganic Chemistry, ELBS, 1991.
- Douglas, B.E; Mc Daniel, D.H. & Alexander, J.J. Concepts & Models of Inorganic Chemistry 3rd Ed., John Wiley Sons, N.Y. 1994.
- Greenwood, N.N. & Earnshaw. Chemistry of the Elements, Butterworth-Heinemann. 1997.

- Cotton, F.A. & Wilkinson, G. Advanced Inorganic Chemistry, Wiley, VCH, 1999.
- Miessler, G. L. & Donald, A. Tarr. Inorganic Chemistry 4th Ed., Pearson, 2010.
- Shriver & Atkins, Inorganic Chemistry 5th Ed.

PRACTICAL: C-5 LAB.

(A) Iodo / Iodimetric Titrations

- Estimation of Cu(II) and $K_2Cr_2O_7$ using sodium thiosulphate solution (Iodimetrically).
- Estimation of available chlorine in bleaching powder iodometrically.

(B) Inorganic preparations

- Cuprous chloride, Cu_2Cl_2 .
- Preparation of manganese(III) phosphate, $MnPO_4.H_2O$.
- Preparation of aluminium potassium sulphate $K_2SO_4.Al_2(SO_4)_3.24H_2O$ (Potashalum).

Reference Books:

- Vogel, A.I. A Textbook of Quantitative Inorganic Analysis, ELBS. 1978

C-6: ORGANIC CHEMISTRY-II

(Credits-6: Theory-4, Practical-2)-Max. Marks: 100
 THEORY (Each class 1 hr.): Marks-70 PRACTICAL
 (Each class 2 hrs.): Marks-30 Lectures: 60 (40 Theory
 + 20 Practical classes)

UNIT-I: Chemistry of Halogenated Hydrocarbons

Alkyl halides: Methods of preparation, nucleophilic substitution reactions SN_1 , SN_2 and SN_i mechanisms with stereochemical aspects and effect of solvent etc.; nucleophilic substitution vs. elimination. Aryl halides: Preparation, including preparation from diazonium salts, nucleophilic aromatic substitution; SN_{Ar} , Benzyne mechanism. Relative reactivity of alkyl, allyl/benzyl, vinyl and aryl halides towards nucleophilic substitution reactions. Organometallic compounds of Mg and Li Use in synthesis of organic compounds. (16 Lectures)

UNIT-II: Alcohols, Phenols, Ethers and Epoxides

Alcohols: preparation, properties and relative reactivity of 1, 2, 3 alcohols, Bouvaelt-Blanc Reduction; Preparation and properties of glycols: Oxidation by periodic acid and lead tetraacetate, Pinacol-Pinacolone rearrangement; Phenols: Preparation and properties; Acidity and factors effecting it, Ring substitution reactions, ReimerTiemann and KolbesSchmidt Reactions, Fries and Claisen rearrangements with mechanism; Ethers and Epoxides: Preparation and reactions with acids. Reactions of epoxides with alcohols, ammonia derivatives and $LiAlH_4$ (16 Lectures)

UNIT-III: Carbonyl Compounds

Structure, reactivity and preparation: Nucleophilic additions, Nucleophilic addition-elimination reactions with ammonia derivatives with mechanism; Mechanisms of Aldol and Benzoin condensation, Knoevenagel condensation, Perkin, Cannizzaro and Wittig reaction, Beckmann rearrangements, haloform reaction and Baeyer Villiger oxidation, - substitution reactions, oxidations and reductions (Clemmensen, Wolff-Kishner, $LiAlH_4$, $NaBH_4$, MPV.; Addition reactions of unsaturated carbonyl compounds: Michael addition. Active methylene compounds: Keto-enol tautomerism. Preparation and synthetic applications of diethyl malonate and ethyl acetoacetate. (14 Lectures)

UNIT-IV: Carboxylic Acids and their Derivatives

Preparation, physical properties and reactions of monocarboxylic acids: Typical reactions of dicar-

boxylic acids, hydroxy acids and unsaturated acids: succinic, lactic, malic, tartaric, citric, maleic and fumaric acids; Preparation and reactions of acid chlorides, anhydrides, esters and amides; Comparative study of nucleophilic substitution at acyl group -Mechanism of acidic and alkaline hydrolysis of esters, Claisen condensation, Dieckmann and Reformatsky reactions, Hofmann-bromamide degradation and Curtius rearrangement. (10 Lectures)

Sulphur containing compounds

Preparation and reactions of thiols, thioethers. (4 Lectures)

Reference Books:

- Morrison, R. T. & Boyd, R. N. Organic Chemistry, Dorling Kindersley (India) Pvt. Ltd. (Pearson Education).
- Graham Solomons, T.W. Organic Chemistry, John Wiley & Sons, Inc.

PRACTICAL: C-6 LAB.

1. Functional group tests for alcohols, phenols, carbonyl and carboxylic acid group.
2. Organic preparations:
 - (i) Acetylation of one of the following compounds: amines (aniline, o-, m-, p-toluidines and o-, m-, p-anisidine) and phenols (-naphthol, vanillin, salicylic acid) by any one method:
 - (a) Using conventional method.
 - (b) Using green approach.
 - (ii) Benzoylation of one of the following amines (aniline, o-, m-, p-toluidines and o-, m-, p-anisidine) and one of the following phenols (-naphthol, resorcinol, p-cresol) by Schotten-Baumann reaction.
 - (iii) Bromination of any one of the following:
 - (a) Acetanilide by conventional methods.
 - (b) Acetanilide using green approach (Bromate-bromide method).
 - (iv) Nitration of any one of the following:
 - (a) Acetanilide/nitrobenzene by conventional method.
 - (b) Salicylic acid by green approach (using ceric ammonium nitrate).

The above derivatives should be prepared using 0.5-1gm. of the organic compound. The solid samples must be collected and may be used for recrystallization, melting point and TLC. **Reference**

Books:

- Mann, F.G. & Saunders, B.C. Practical Organic Chemistry, Pearson Education (2009).
- Furniss, B.S.; Hannaford, A.J.; Smith, P.W.G.; Tatchell, A.R. Practical Organic Chemistry, 5th Ed., Pearson (2012).
- Ahluwalia, V.K. & Aggarwal, R. Comprehensive Practical Organic Chemistry: Preparation and Quantitative Analysis, University Press (2000).
- Ahluwalia, V.K. & Dhingra, S. Comprehensive Practical Organic Chemistry: Qualitative Analysis, University Press (2000).

C-7: PHYSICAL CHEMISTRY-III

(Credits-6: Theory-4, Practical-2)-Max. Marks: 100
THEORY (Each class 1 hr.): Marks-70 PRACTICAL
(Each class 2 hrs.): Marks-30 Lectures: 60 (40 Theory
+ 20 Practical classes))

UNIT-I: Phase Equilibria-I

Concept of phases, components and degrees of freedom, derivation of Gibbs Phase Rule for non-reactive and reactive systems; Clausius-Clapeyron equation and its applications to solid-liquid, liquid-vapour and solid-vapour equilibria, phase diagram for one component systems, with applications

(H_2O and sulphur system). Phase diagrams for systems of solid-liquid equilibria involving eutectic, congruent and incongruent melting points, solid solutions (Pb-Ag system, desilverisation of lead) (14 Lectures)

UNIT-II: Phase Equilibria-II

Three component systems, water-chloroform-acetic acid system, triangular plots. Binary solutions: Gibbs-Duhem-Margules equation, its derivation and applications to fractional distillation of binary miscible liquids (ideal and non-ideal), azeotropes, partial miscibility of liquids, CST, miscible pairs, steam distillation. Nernst distribution law: its derivation and applications. (14 Lectures)

UNIT-III: Chemical Kinetics

Order and molecularity of a reaction, rate laws in terms of the advancement of a reaction, differential and integrated form of rate expressions up to second order reactions, experimental methods of the determination of orders, kinetics of complex reactions (integrated rate expressions up to first order only): (i) Opposing reactions (ii) parallel reactions and (iii) consecutive reactions and their differential rate equations (steady-state approximation in reaction mechanisms) (iv) chain reactions. Temperature dependence of reaction rates; Arrhenius equation; activation energy. Collision theory of reaction rates, qualitative treatment of the theory of absolute reaction rates. (18 Lectures)

UNIT-IV: Catalysis

Types of catalyst, specificity and selectivity, mechanisms of catalyzed reactions at solid surfaces; effect of particle size and efficiency of nanoparticles as catalysts. Enzyme catalysis, Michaelis-Menten mechanism, acid-base catalysis. (8 Lectures)

Surface chemistry

Physical adsorption, chemisorption, adsorption isotherms (Langmuir, Freundlich and Gibbs isotherms), nature of adsorbed state. (6 Lectures)

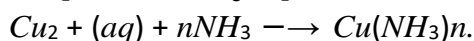
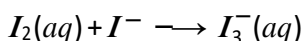
Reference Books:

- Peter Atkins & Julio De Paula, Physical Chemistry 9th Ed., Oxford University Press(2010).
- Castellan, G. W. Physical Chemistry, 4th Ed., Narosa (2004).
- McQuarrie, D. A. & Simon, J. D., Molecular Thermodynamics, Viva Books Pvt. Ltd.: New Delhi (2004).
- Engel, T. & Reid, P. Physical Chemistry 3rd Ed., Prentice-Hall (2012).
- Assael, M. J.; Goodwin, A. R. H.; Stamatoudis, M.; Wakeham, W. A. & Will, S.
- Commonly Asked Questions in Thermodynamics. CRC Press: NY (2011).
- Zundhal, S.S. Chemistry concepts and applications Cengage India(2011).
- Ball, D. W. Physical Chemistry Cengage India (2012).
- Mortimer, R. G. Physical Chemistry 3rd Ed., Elsevier: NOIDA, UP (2009).
- Levine, I. N. Physical Chemistry 6th Ed., Tata McGraw-Hill(2011).
- Metz, C. R. Physical Chemistry 2nd Ed., Tata McGraw-Hill(2009).

PRACTICAL: C-7 LAB.

I. Distribution of acetic/ benzoic acid between water and cyclohexane.

II. Study the equilibrium of at least one of the following reactions by the distribution method:



III. Study the kinetics of the following reactions.

(1) Integrated rate method:

- a. Acid hydrolysis of methyl acetate with hydrochloric acid.
- b. Saponification of ethyl acetate.

(2) Compare the strengths of HCl and H₂SO₄ by studying kinetics of hydrolysis of methylacetate.

Adsorption

Verify the Freundlich and Langmuir isotherms for adsorption of acetic acid on activated charcoal.

Reference Books:

- Khosla, B. D.; Garg, V. C. & Gulati, A. Senior Practical Physical Chemistry, R. Chand & Co.: New Delhi (2011).
- Garland, C. W.; Nibler, J. W. & Shoemaker, D. P. Experiments in Physical Chemistry 8th Ed.; McGraw-Hill: New York (2003).
- Halpern, A. M. & McBane, G. C. Experimental Physical Chemistry 3rd Ed.; W.H. Freeman & Co.: New York (2003).

SEMESTER- IV

C-8: INORGANIC CHEMISTRY-III

(Credits-6: Theory-4, Practical-2)-Max. Marks: 100
THEORY (Each class 1 hr.): Marks-70 PRACTICAL
(Each class 2 hrs.): Marks-30 Lectures: 60 (40 Theory
+ 20 Practical classes)

UNIT-I: Coordination Chemistry

Werners theory, valence bond theory (inner and outer orbital complexes), electroneutrality principle and back bonding. Crystal field theory, measurement of CFSE weak and strong fields, pairing energies, factors affecting the magnitude of $10 Dq$ in octahedral vs. tetrahedral coordination, tetragonal distortions from octahedral geometry, Jahn-Teller theorem, square planar geometry. Qualitative aspect of ligand field and MO Theory. IUPAC nomenclature of coordination compounds, isomerism in coordination compounds. Stereochemistry of complexes with 4 and 6 coordination numbers. Chelate effect, Labile and inert complexes. (20 Lectures)

UNIT-II: Transition Elements-I

General group trends with special reference to electronic configuration, colour, variable valency, magnetic and catalytic properties, ability to form complexes. Stability of various oxidation states and e.m.f. (Latimer & Bsworth diagrams). Difference between the first, second and third transition series. (12 Lectures)

UNIT-III: Transition Elements-II

Chemistry of Ti, V, Cr Mn, Fe and Co in various oxidation states (excluding their metallurgy). (12 Lectures)

UNIT-IV: Lanthanoids and Actinoids

Electronic configuration, oxidation states, colour, spectral and magnetic properties, lanthanide contraction, separation of lanthanides (ion-exchange method only). General features of actinoids, separation of Np, Pm, Am from U. (6 Lectures)

Bioinorganic Chemistry

Metal ions present in biological systems, classification of elements according to their action in biological system. Na/K-pump, carbonic anhydrase and carboxypeptidase. Excess and deficiency of some trace metals. Toxicity of metal ions (Hg, Pb, Cd and As), reasons for toxicity, Use of chelating agents in medicine. Iron and its application in bio-systems, Haemoglobin; Storage and transfer of iron. (10 Lectures)

Reference Books:

- Purcell, K.F & Kotz, J.C. Inorganic Chemistry W.B. Saunders Co, 1977.
- Huheey, J.E., Inorganic Chemistry, Prentice Hall, 1993.
- Lippard, S.J. & Berg, J.M. Principles of Bioinorganic Chemistry Panima Publishing Company 1994.
- Cotton, F.A. & Wilkinson, G, Advanced Inorganic Chemistry. Wiley-VCH, 1999.
- Basolo, F, and Pearson, R.C., Mechanisms of Inorganic Chemistry, John Wiley & Sons, NY, 1967.
- Greenwood, N.N. & Earnshaw A., Chemistry of the Elements, Butterworth-Heinemann, 1997.

PRACTICAL: C-8 LAB.

Gravimetric Analysis:

- i. Estimation of nickel(II) using Dimethylglyoxime (DMG).
- ii. Estimation of copper as CuSCN.
- iii. Estimation of iron as Fe_2O_3 by precipitating iron as $Fe(OH)_3$.
- iv. Estimation of Al(III) by precipitating with oxine and weighing as Al(oxine)₃ (aluminium oxinate).

Chromatography of metal ions

Principles involved in chromatographic separations. Paper chromatographic separation of following metal ions:

- i. Ni(II) and Co(II)
- ii. Fe(III) and Al(III)

Reference Book:

- Vogel, A.I. A text book of Quantitative Analysis, ELBS 1986.

C-9: ORGANIC CHEMISTRY-III

(Credits-6: Theory-4, Practical-2)-Max. Marks: 100

THEORY (Each class 1 hr.): Marks-70 PRACTICAL

(Each class 2 hrs.): Marks-30 Lectures: 60 (40 Theory

+ 20 Practical classes)

UNIT-I: Nitrogen Containing Functional Groups

Preparation and important reactions of nitro and compounds, nitriles. Amines: Effect of substituent and solvent on basicity; Preparation and properties: Gabriel phthalimide synthesis, Carbylamine reaction, Mannich reaction, Hoffmanns exhaustive methylation, Hofmann-elimination reaction; Distinction between 1, 2 and 3 amines with Hinsberg reagent and nitrous acid. (14 Lectures)

UNIT-II: Diazonium Salts

Preparation and their synthetic applications.

Polynuclear Hydrocarbons

Reactions of naphthalene and anthracene Structure, Preparation and structure elucidation and important derivatives of naphthalene and anthracene. Polynuclear hydrocarbons. (12 Lectures)

UNIT-III: Heterocyclic Compounds

Classification and nomenclature, Structure, aromaticity in 5-numbered and 6-membered rings containing one heteroatom; Synthesis, reactions and mechanism of substitution reactions of: Furan,

Pyrrrole (Paal-Knorr synthesis, Knorr pyrrole synthesis, Hantzsch synthesis), Thiophene, Pyridine (Hantzsch synthesis), Pyrimidine. Fischer indole synthesis and Madelung synthesis, structure of quinoline and isoquinoline. Derivatives of furan: Furfural and furoic acid (preparation only). (18 Lectures)

UNIT-IV: Alkaloids

Natural occurrence, General structural features, Isolation and their physiological action Hoffmann's exhaustive methylation, Emde's modification, Structure elucidation and synthesis of Hygrine and Nicotine. Medicinal importance of Nicotine, Hygrine, Quinine, Morphine, Cocaine, and Reserpine. (8 Lectures) Terpenes Occurrence, classification, isoprene rule; Elucidation of structure and synthesis of Citral, Neral and -terpineol. (8 Lectures)

Reference Books:

- Morrison, R. T. & Boyd, R. N. Organic Chemistry, Dorling Kindersley (India) Pvt. Ltd. (Pearson Education).
- Finar, I. L. Organic Chemistry (Volume 1), Dorling Kindersley (India) Pvt. Ltd. (Pearson Education).
- Finar, I. L. Organic Chemistry (Volume 2: Stereochemistry and the Chemistry of Natural Products), Dorling Kindersley (India) Pvt. Ltd. (Pearson Education).
- Acheson, R.M. Introduction to the Chemistry of Heterocyclic compounds, John Wiley & Sons (1976).
- Graham Solomons, T.W. Organic Chemistry, John Wiley & Sons, Inc.
- Kalsi, P. S. Textbook of Organic Chemistry 1st Ed., New Age International (P) Ltd. Pub.
- Clayden, J.; Greeves, N.; Warren, S.; Wothers, P.; Organic Chemistry, Oxford University Press.
- Singh, J.; Ali, S.M. & Singh, J. Natural Product Chemistry, Prajati Parakashan (2010).

PRACTICAL: C-9 LAB.

1. Detection of extra elements (N, X, S).
2. Functional group test for nitro, amine and amide groups.
3. Qualitative analysis of unknown organic compounds containing simple functional groups (alcohols, carboxylic acids, phenols and carbonyl compounds).

Reference Books:

- Mann, F.G. & Saunders, B.C. Practical Organic Chemistry, Pearson Education (2009).
- Furniss, B.S.; Hannaford, A.J.; Smith, P.W.G.; Tatchell, A.R. Practical Organic Chemistry, 5th Ed., Pearson (2012).
- Ahluwalia, V.K. & Aggarwal, R. Comprehensive Practical Organic Chemistry: Preparation and Quantitative Analysis, University Press (2000).
- Ahluwalia, V.K. & Dhingra, S. Comprehensive Practical Organic Chemistry: Qualitative Analysis, University Press (2000).

C-10: PHYSICAL CHEMISTRY-IV

(Credits-6: Theory-4, Practical-2)-Max. Marks: 100

THEORY (Each class 1 hr.): Marks-70 PRACTICAL

(Each class 2 hrs.): Marks-30 Lectures: 60 (40

Theory + 20 Practical classes)

UNIT-I: Conductance-I

Arrhenius theory of electrolytic dissociation. Conductivity, equivalent and molar conductivity and their variation with dilution for weak and strong electrolytes. Molar conductivity at infinite dilution. Kohlrausch law of independent migration of ions. Debye-Hckel-Onsager equation, Wien effect, Debye-Falkenhagen effect, Waldens rules. (12 Lectures)

UNIT-II: Conductance-II

Ionic velocities, mobilities and their determinations, transference numbers and their relation to ionic mobilities, determination of transference numbers using Hittorf and Moving Boundary methods. Applications of conductance measurement: (i) degree of dissociation of weak electrolytes, (ii) ionic product of water (iii) solubility and solubility product of sparingly soluble salts, (iv) conductometric titrations, and (v) hydrolysis constants of salts. (16 Lectures)

UNIT-III: Electrochemistry-I

Quantitative aspects of Faradays laws of electrolysis, rules of oxidation/reduction of ions based on half-cell potentials, applications of electrolysis in metallurgy and industry. Chemical cells, reversible and irreversible cells with examples. Electromotive force of a cell and its measurement, Nernst equation; Standard electrode (reduction) potential and its application to different kinds of half-cells. Application of EMF measurements in determining free energy, enthalpy and entropy of a cell reaction, (ii) equilibrium constants, and (iii) pH values, using hydrogen, quinone-hydroquinone, glass electrodes. (18 Lectures)

UNIT-IV: Electrochemistry-II

Concentration cells with and without transference, liquid junction potential; determination of activity coefficients and transference numbers. Qualitative discussion of potentiometric titrations (acid-base, redox, precipitation). Electrical properties of atoms and molecules Basic ideas of electrostatics, Electrostatics of dielectric media. Clausius-Mosotti equation and Lorenz-Laurentz equation (no derivation), Dipole moment and molecular polarizabilities and their measurements. (14 Lectures)

Reference Books:

- Atkins, P.W & Paula, J.D. Physical Chemistry, 9th Ed., Oxford University Press (2011).
- Castellan, G. W. Physical Chemistry 4th Ed., Narosa (2004).
- Mortimer, R. G. Physical Chemistry 3rd Ed., Elsevier: NOIDA, UP (2009).
- Barrow, G. M., Physical Chemistry 5th Ed., Tata McGraw Hill: New Delhi (2006).
- Engel, T. & Reid, P. Physical Chemistry 3rd Ed., Prentice-Hall (2012).
- Rogers, D. W. Concise Physical Chemistry Wiley (2010).
- Silbey, R. J.; Alberty, R. A. & Bawendi, M. G. Physical Chemistry 4th Ed., John Wiley & Sons, Inc. (2005).

PRACTICAL: C-10 LAB.

Conductometry

- I. Determination of cell constant.
- II. Determination of equivalent conductance, degree of dissociation and dissociation constant of a weak acid.
- III. Perform the following conductometric titrations:
 - i. Strong acid vs. strong base
 - ii. Weak acid vs. strong base
 - iii. Strong acid vs. weak base

Potentiometry

- I. Perform the following potentiometric titrations:
 - i. Strong acid vs. strong base
 - ii. Weak acid vs. strong base
 - iii. Dibasic acid vs. strong base

Reference Books:

- Khosla, B. D.; Garg, V. C. & Gulati, A. Senior Practical Physical Chemistry, R. Chand & Co.: New Delhi (2011).
- Garland, C. W.; Nibler, J. W. & Shoemaker, D. P. Experiments in Physical Chemistry 8th Ed.; McGraw-Hill: New York (2003).
- Halpern, A. M. & McBane, G. C. Experimental Physical Chemistry 3rd Ed.; W.H. Freeman & Co.: New York (2003).

SEMESTER- V

C-11: ORGANIC CHEMISTRY-IV

(Credits-6: Theory-4, Practical-2)-Max. Marks: 100
THEORY (Each class 1 hr.): Marks-70 PRACTICAL
(Each class 2 hrs.): Marks-30 Lectures: 60 (40 Theory
+ 20 Practical classes)

UNIT-I: Nucleic Acids

Components of nucleic acids, Nucleosides and nucleotides; Structure, synthesis and reactions of: Adenine, Guanine, Cytosine, Uracil and Thymine; Structure of polynucleotides. (9 Lectures) **Enzymes** Introduction, classification and characteristics of enzymes. Salient features of active site of enzymes. Mechanism of enzyme action (taking trypsin as example), factors affecting enzyme action, coenzymes and cofactors and their role in biological reactions, specificity of enzyme action (including stereospecificity), enzyme inhibitors and their importance, phenomenon of inhibition (competitive, uncompetitive and non-competitive inhibition including allosteric inhibition). (8 Lectures)

UNIT-II: Amino Acids, Peptides and Proteins

Amino acids, peptides and their classification. -Amino acids - Synthesis, ionic properties and reactions. Zwitterions, pKa values, isoelectric point and electrophoresis. Study of peptides: determination of their primary structures-end group analysis, methods of peptide synthesis. Synthesis

of peptides using N-protecting, C-protecting and C-activating groups -Solid-phase synthesis (16 Lectures)

UNIT-III: Lipids

Introduction to oils and fats; common fatty acids present in oils and fats, Hydrogenation of fats and oils, Saponification value, acid value, iodine number. Reversion and rancidity. (8 Lectures) **Concept of Energy in Biosystems**

Cells obtain energy by the oxidation of foodstuff (organic molecules). Introduction to metabolism (catabolism and anabolism). Overview of catabolic pathways of fat and protein. Interrelationship in the metabolic pathways of protein, fat and carbohydrate. Caloric value of food, standard caloric content of food types. (7 Lectures)

UNIT-IV: Pharmaceutical Compounds: Structure and Importance

Classification, structure and therapeutic uses of antipyretics: Paracetamol (with synthesis), Analgesics: Ibuprofen (with synthesis), Antimalarials: Chloroquine (with synthesis). An elementary treatment of Antibiotics and detailed study of chloramphenicol, Medicinal values of curcumin (haldi), azadirachtin (neem), vitamin C and antacid (ranitidine). (12 Lectures)

Reference Books:

- Berg, J.M., Tymoczko, J.L. and Stryer, L. (2006) Biochemistry. VIth Edition. W.H. Freeman and Co.
- Nelson, D.L., Cox, M.M. and Lehninger, A.L. (2009) Principles of Biochemistry. IV Edition. W.H. Freeman and Co.
- Murray, R.K., Granner, D.K., Mayes, P.A. and Rodwell, V.W. (2009) Harpers Illustrated Biochemistry. XXVIII edition. Lange Medical Books/McGraw-Hill.

PRACTICAL: C-11 LAB.

1. Preparations of the following compounds:
 - i. Aspirine, ii. Phenacetin, iii. Milk of magnesia, iv. Aluminium hydroxide gel, v. Divol.
2. Saponification value of an oil or a fat.
3. Determination of Iodine number of an oil/ fat.

Reference Books:

- Manual of Biochemistry Workshop, 2012, Department of Chemistry, University of Delhi.
- Arthur, I. Vogel, Quantitative Organic Analysis, Pearson.

C-12: PHYSICAL CHEMISTRY-V

(Credits-6: Theory-4, Practical-2)-Max. Marks: 100
THEORY (Each class 1 hr.): Marks-70 PRACTICAL
(Each class 2 hrs.): Marks-30 Lectures: 60 (40 Theory
+ 20 Practical classes)

UNIT-I: Quantum Chemistry

Postulates of quantum mechanics, quantum mechanical operators, Schrödinger equation and its application to free particle and particle-in-a-box (rigorous treatment), quantization of energy levels,

zero-point energy and Heisenberg Uncertainty principle; wave functions, probability distribution functions, nodal properties. Extension to three dimensional boxes, separation of variables, degeneracy. Qualitative treatment of simple harmonic oscillator model of vibrational motion: Setting up of Schrödinger equation and discussion of solution and wave functions. Vibrational energy of diatomic molecules and zero-point energy. Angular momentum: Commutation rules, quantization of square of total angular momentum and z-component. Rigid rotator model of rotation of diatomic molecule. Schrödinger equation, transformation to spherical polar coordinates. Separation of variables (Preliminary treatment). Qualitative treatment of hydrogen atom and hydrogen-like ions: setting up of Schrödinger equation in spherical polar coordinates, radial part, quantization of energy (only final energy expression). Average and most probable distances of electron from nucleus. (18 Lectures)

UNIT-II: Chemical Bonding

Chemical bonding: Covalent bonding, valence bond and molecular orbital approaches, LCAO-MO treatment of H^+ . Bonding and antibonding orbitals. Qualitative extension to H_2 . Comparison of LCAO-MO and VB treatments of H_2 (only wavefunctions, detailed solution not required) and their limitations. Qualitative description of LCAO-MO treatment of homonuclear and heteronuclear diatomic molecules (HF, LiH). Localised and non-localised molecular orbitals treatment of triatomic (BeH_2 , H_2O) molecules. Qualitative MO theory and its application to AH_2 type molecules. (12 Lectures)

UNIT-III: Molecular Spectroscopy-I

Interaction of electromagnetic radiation with molecules and various types of spectra; Born-Oppenheimer approximation. Rotation spectroscopy: Selection rules, intensities of spectral lines, determination of bond lengths of diatomic and linear triatomic molecules, isotopic substitution.

Vibrational spectroscopy: Classical equation of vibration, computation of force constant, amplitude of diatomic molecular vibrations, anharmonicity, Morse potential, dissociation energies, fundamental frequencies, overtones, hot bands, degrees of freedom for polyatomic molecules, modes of vibration.

Vibration-rotation spectroscopy: diatomic vibrating rotator, P, Q, R branches.

Raman spectroscopy: Qualitative treatment of Rotational Raman effect; Effect of nuclear spin, Vibrational Raman spectra, Stokes and anti-Stokes lines; their intensity difference, rule of mutual exclusion. (16 Lectures)

UNIT-IV: Molecular Spectroscopy-II

Electronic spectroscopy: Franck-Condon principle, electronic transitions, singlet and triplet states, fluorescence and phosphorescence, dissociation and predissociation. (6 Lectures) **Photochemistry**

Characteristics of electromagnetic radiation, Lambert-Beers law and its limitations, physical significance of absorption coefficients. Laws of photochemistry, quantum yield, actinometry, examples of low and high quantum yields, photochemical equilibrium and the differential rate of photochemical reactions, photosensitised reactions, quenching. Role of photochemical reactions in biochemical processes, photostationary states, chemiluminescence. (8 Lectures)

Reference Books:

- Banwell, C. N. & McCash, E. M. Fundamentals of Molecular Spectroscopy 4th Ed. Tata McGraw-

Hill: New Delhi (2006).

- Chandra, A. K. Introductory Quantum Chemistry Tata McGraw-Hill (2001).
- House, J. E. Fundamentals of Quantum Chemistry 2nd Ed. Elsevier: USA (2004).
- Lowe, J. P. & Peterson, K. Quantum Chemistry, Academic Press (2005).
- Kakkar, R. Atomic & Molecular Spectroscopy, Cambridge University Press (2015).

PRACTICAL: C-12 LAB.

Colourimetry

1. Determine the concentration of HCl against 0.1 N NaOH spectrophotometrically.
2. To find the strength of given ferric ammonium sulfate solution of (0.05 M) by using EDTA spectrophotometrically.
3. To find out the strength of CuSO₄ solution by titrating with EDTA spectrophotometrically.
4. To determine the concentration of Cu(II) and Fe(III) solution photometrically by titrating with EDTA.

Reference Books:

- Khosla, B. D.; Garg, V. C. & Gulati, A., Senior Practical Physical Chemistry, R. Chand & Co.: New Delhi (2011).
- Garland, C. W.; Nibler, J. W. & Shoemaker, D. P. Experiments in Physical Chemistry 8th Ed.; McGraw-Hill: New York (2003).
- Halpern, A. M. & McBane, G. C. Experimental Physical Chemistry 3rd Ed.; W.H. Freeman & Co.: New York (2003).
- Experimental Physical Chemistry by J. N. Gurtu, R. Kapoor.

SEMESTER- VI

C-13: INORGANIC CHEMISTRY-IV

(Credits-6: Theory-4, Practical-2)-Max. Marks: 100
THEORY (Each class 1 hr.): Marks-70 PRACTICAL
(Each class 2 hrs.): Marks-30 Lectures: 60 (40 Theory
+ 20 Practical classes)

UNIT-I: Organometallic Compounds-I

Definition and classification of organometallic compounds on the basis of bond type. Concept of hapticity of organic ligands. Metal carbonyls: 18 electron rule, electron count of mononuclear, polynuclear and substituted metal carbonyls of 3d series. General methods of preparation (direct combination, reductive carbonylation, thermal and photochemical decomposition) of mono and binuclear carbonyls of 3d series. Structures of mononuclear and binuclear carbonyls of Cr, Mn, Fe, Co and Ni using VBT. -acceptor behaviour of CO (MO diagram of CO to be discussed), synergic effect and use of IR data to explain extent of back bonding. Zeises salt: Preparation and structure, evidences of synergic effect and comparison of synergic effect with that in carbonyls. (14 Lectures)

UNIT-II: Organometallic Compounds-II

Metal Alkyls: Important structural features of methyl lithium (tetramer) and trialkyl aluminium

(dimer), concept of multicentre bonding in these compounds. Role of triethylaluminium in polymerisation of ethene (Ziegler Natta Catalyst). Species present in ether solution of Grignard reagent and their structures. Ferrocene: Preparation and reactions (acetylation, alkylation, metallation, Mannich Condensation), structure and aromaticity, comparison of aromaticity and reactivity with that of benzene. (14 Lectures)

UNIT-III: Theoretical Principles in Qualitative Analysis (H_2S Scheme)

Basic principles involved in analysis of cations and anions and solubility products, common ion effect. Principles involved in separation of cations into groups and choice of group reagents. Interfering anions (fluoride, borate, oxalate and phosphate) and need to remove them after Group II. (10 Lectures)

Catalysis by Organometallic Compounds

Study of the following industrial processes and their mechanism:

1. Alkene hydrogenation (Wilkinson's Catalyst).
2. Hydroformylation (Co salts).
3. Wacker Process.
4. Synthetic gasoline (Fischer Tropsch reaction). (8 Lectures)

UNIT-IV: Reaction Kinetics and Mechanism

Introduction to inorganic reaction mechanisms. Substitution reactions in square planar complexes, Trans-effect and its applications, theories of trans effect, Mechanism of nucleophilic substitution in square planar complexes. Thermodynamic and kinetic stability, Kinetics of octahedral substitution (classification of metal ions based on water exchange rate), General mechanism of substitution in octahedral complexes (D, I, Id, Ia). (14 Lectures)

Reference Books:

- Vogel, A.I. Qualitative Inorganic Analysis, Longman, 1972.
- Svehla, G. Vogel's Qualitative Inorganic Analysis, 7th Edition, Prentice Hall, 1996-03-07.
- Huheey, J. E.; Keiter, E.A. & Keiter, R.L. Inorganic Chemistry, Principles of Structure and Reactivity 4th Ed., Harper Collins 1993, Pearson, 2006.
- Sharpe, A.G. Inorganic Chemistry, 4th Indian Reprint (Pearson Education) 2005.
- Douglas, B. E.; McDaniel, D.H. & Alexander, J.J. Concepts and Models in Inorganic Chemistry, 3rd Ed., John Wiley and Sons, NY, 1994.
- Greenwood, N.N. & Earnshaw, A. Chemistry of the Elements, Elsevier 2nd Ed, 1997 (Ziegler Natta Catalyst and Equilibria in Grignard Solution).
- Lee, J.D. Concise Inorganic Chemistry 5th Ed., John Wiley and sons 2008.
- Powell, P. Principles of Organometallic Chemistry, Chapman and Hall, 1988.
- Shriver, D.D. & P. Atkins, Inorganic Chemistry 2nd Ed., Oxford University Press, 1994.
- Basolo, F. & Person, R. Mechanisms of Inorganic Reactions: Study of Metal Complexes in Solution 2nd Ed., John Wiley & Sons Inc; NY.
- Purcell, K.F. & Kotz, J.C., Inorganic Chemistry, W.B. Saunders Co. 1977.
- Miessler, G. L. & Donald, A. Tarr, Inorganic Chemistry 4th Ed., Pearson, 2010.
- Collman, James P. et al. Principles and Applications of Organotransition Metal Chemistry. Mill Valley, CA: University Science Books, 1987.

- Crabtree, Robert H. The Organometallic Chemistry of the Transition Metals, New York, NY: John Wiley, 2000.
- Spessard, Gary O., & Gary L. Miessler. Organometallic Chemistry. Upper Saddle River, NJ: Prentice-Hall, 1996.
- Mehrotra R.C. and Singh, A. Organometallic Chemistry, New Age International Publishers, 2nd Edn, 2000.

PRACTICAL: C-13 LAB.

Qualitative semimicro analysis of mixtures containing 3 anions and 3 cations. Emphasis should be given to the understanding of the chemistry of different reactions. The following radicals are suggested:

CO_3^{2-} , NO_2^- , S^- , SO_3^- , $S_2O_3^{2-}$, CH_3COO^- , F^- , Cl^- , Br^- , I^- , NO_3^- , BO_3^- , $C_2O_4^{2-}$, PO_4^{3-} , NH_4^+ , K^+ , Pb^{2+} , Cu^{2+} , Cd^{2+} , Bi^{3+} , Sn^{2+} , Sb^{3+} , Fe^{3+} , Al^{3+} , Cr^{3+} , Zn^{2+} , Mn^{2+} , Co^{2+} , Ni^{2+} , Ba^{2+} , Sr^{2+} , Ca^{2+} , Mg^{2+} .

Mixtures should preferably contain one interfering anion, or insoluble component ($BaSO_4$, $SrSO_4$, $PbSO_4$, CaF_2 or Al_2O_3) or combination of anions e.g. CO_3^{2-} and SO_3^{2-} , NO_2^- and NO_3^- , Cl^- and Br^- , Cl^- and I^- , Br^- and I^- , NO_3^- and Br^- , NO_3^- and I^- .

Spot tests should be done whenever possible.

Reference Books:

- Vogels Qualitative Inorganic Analysis, Revised by G.Svehla.
- Marr & Rockett Inorganic Preparations.

C-14: ORGANIC CHEMISTRY-IV

(Credits-6: Theory-4, Practical-2)-Max. Marks: 100

THEORY (Each class 1 hr.): Marks-70 PRACTICAL

(Each class 2 hrs.): Marks-30

Lectures: 60 (40 Theory + 20 Practical classes)

UNIT-I: Organic Spectroscopy-I

UV Spectroscopy: Types of electronic transitions, max, Chromophores and Auxochromes, Bathochromic and Hypsochromic shifts, Intensity of absorption; Application of Woodward rules for calculation of max for the following systems: the unsaturated aldehydes: ketones, carboxylic acids and esters; Conjugated dienes: alicyclic, homoannular and heteroannular; Extended conjugated systems (aldehydes, ketones and dienes); distinction between cis and trans isomers.

IR Spectroscopy: Fundamental and non-fundamental molecular vibrations; IR absorption positions of O, N and S containing functional groups; Effect of H-bonding, conjugation, resonance and ring size on IR absorptions; Fingerprint region and its significance; application in functional group analysis. (18 Lectures)

UNIT-II: Organic Spectroscopy-II

NMR Spectroscopy: Basic principles of Proton Magnetic Resonance, chemical shift and factors influencing it; Spin-spin coupling and coupling constant; Anisotropic effects in alkene, alkyne, aldehydes and aromatics; Interpretation of NMR spectra of simple compounds. Mass Spectroscopy-Basic principle, Fragmentation pattern, Instrumentation, Determination of m/e ratio. Application of Mass Spectroscopy on CH₄, C₂H₆, n-butane and neo-pentane. Applications of IR, UV and NMR for identification of simple organic molecules. (12 Lectures)

UNIT-III: Carbohydrates

Occurrence, classification and their biological importance. Monosaccharides: Constitution and absolute configuration of glucose and fructose, epimers and anomers, mutarotation, determination of ring size of glucose and fructose, Haworth projections and conformational structures; Interconversions of aldoses and ketoses; Killiani-Fischer synthesis and Ruff degradation; Disaccharides Structure elucidation of maltose. Polysaccharides Elementary treatment of starch, cellulose. (8 Lectures) **Dyes** Classification, colour and constitution; Mordant and Vat dyes; Chemistry of dyeing. Synthesis and applications of: Azo dyes Methyl orange and Congo red (mechanism of Diazo Coupling); Triphenyl methane dyes - Malachite Green, and crystal violet; Phthalein dyes Phenolphthalein and Fluorescein; Natural dyes Alizarin and Indigo; Edible dyes with examples. (8 Lectures)

UNIT-IV: Polymers

Introduction and classification including di-block, tri-block and amphiphilic polymers; Number average molecular weight, Weight average molecular weight, Degree of polymerization, Polydispersity Index. Polymerisation reactions -Addition and condensation -Mechanism of cationic, anionic and free radical addition polymerization; Metallocene-based Ziegler-Natta polymerisation of alkenes; Preparation and applications of plastics thermosetting (phenol-formaldehyde, Polyurethanes) and thermosoftening (PVC, polythene); Fabrics natural and synthetic (acrylic, polyamido, polyester); Rubbers natural and synthetic: Buna-S and Neoprene; Vulcanization; Polymer additives; Biodegradable and conducting polymers with examples. (14 Lectures)

Reference Books:

- Kalsi, P. S. Textbook of Organic Chemistry 1st Ed., New Age International (P) Ltd. Pub.
- Morrison, R. T. & Boyd, R. N. Organic Chemistry, Dorling Kindersley (India) Pvt. Ltd. (Pearson Education).
- Billmeyer, F. W. Textbook of Polymer Science, John Wiley & Sons, Inc.
- Gowariker, V. R.; Viswanathan, N. V. & Sreedhar, J. Polymer Science, New Age International (P) Ltd.

Pub.

- Finar, I. L. Organic Chemistry (Volume 2: Stereochemistry and the Chemistry of Natural Products), Dorling Kindersley (India) Pvt. Ltd. (Pearson Education).
- Graham Solomons, T.W. Organic Chemistry, John Wiley & Sons, Inc.
- Clayden, J.; Greeves, N.; Warren, S.; Wothers, P.; Organic Chemistry, Oxford University Press.
- Singh, J.; Ali, S.M. & Singh, J. Natural Product Chemistry, Pragati Prakashan (2010).
- Kemp, W. Organic Spectroscopy, Palgrave.

PRACTICAL: C-14 LAB.

1. Extraction of caffeine from tea leaves.
2. Preparation of sodium polyacrylate.
3. Preparation of urea formaldehyde.
4. Analysis of Carbohydrate: aldoses and ketoses, reducing and non-reducing sugars.
5. Qualitative analysis of unknown organic compounds containing mono-functional groups (carbohydrates, aryl halides, aromatic hydrocarbons, nitro compounds, amines and amides) and simple bifunctional groups, for e.g. salicylic acid, cinnamic acid, nitrophenols etc.

Reference Books:

- Vogel, A.I. Quantitative Organic Analysis, Part 3, Pearson (2012).
- Mann, F.G. & Saunders, B.C. Practical Organic Chemistry, Pearson Education (2009).
- Furniss, B.S., Hannaford, A.J.; Smith, P.W.G.; Tatchell, A.R. Practical Organic Chemistry, 5th Ed., Pearson (2012).
- Ahluwalia, V.K. & Aggarwal, R. Comprehensive Practical Organic Chemistry: Preparation and Quantitative Analysis, University Press (2000).
- Ahluwalia, V.K. & Dhingra, S. Comprehensive Practical Organic Chemistry: Qualitative Analysis, University Press (2000).

DISCIPLINE SPECIFIC ELECTIVE(DSE)

SEMESTER-V

DSE-1: POLYMER CHEMISTRY

(Credits-6: Theory-4, Practical-2)-Max. Marks: 100
THEORY (Each class 1 hr.): Marks-70 PRACTICAL
(Each class 2 hrs.): Marks-30 Lectures: 60 (40 Theory
+ 20 Practical classes)

UNIT-I: Introduction and history of polymeric materials:

Different schemes of classification of polymers, Polymer nomenclature, Molecular forces and chemical bonding in polymers, Texture of Polymers. (4 Lectures)

Functionality and its importance:

Criteria for synthetic polymer formation, classification of polymerization processes, Relationships between functionality, extent of reaction and degree of polymerization. Bi-functional systems, Poly-functional systems. (8 Lectures)

UNIT-II: Kinetics of Polymerization:

Mechanism and kinetics of step growth, radical chain growth, ionic chain (both cationic and anionic) and coordination polymerizations, Mechanism and kinetics of copolymerization, polymerization techniques. (8 lectures)

Crystallization and crystallinity:

Determination of crystalline melting point and degree of crystallinity, Morphology of crystalline polymers, Factors affecting crystalline melting point. (4 Lectures)

Nature and structure of polymers-Structure property relationships. (2 Lectures)

UNIT-III: Determination of molecular weight of polymers

(M_n , M_w , etc.) by end group analysis, viscometry, light scattering and osmotic pressure methods. Molecular weight distribution and its significance. Polydispersity index. (8 Lectures)

Glass transition temperature (T_g) and determination of T_g

WLF equation, Factors affecting glass transition temperature (T_g). (8 Lectures)

UNIT-IV: Polymer Solution

Criteria for polymer solubility, Solubility parameter, Thermodynamics of polymer solutions, entropy, enthalpy, and free energy change of mixing of polymers solutions. (8 Lectures)

Properties of Polymers

(Physical, thermal & mechanical properties). Brief introduction to preparation, structure, properties and application of the following polymers: polyolefins, polystyrene and styrene copolymers, poly(vinyl chloride) poly(vinyl acetate), polyacrylamide, fluoro polymers (Teflon), polyamides (nylon- 6 and nylon 6,6). Phenol formaldehyde resins (Bakelite, Novalac), polyurethanes, silicone polymers (polysiloxane), Polycarbonates, Conducting Polymers, (polyacetylene, polyaniline). (10 Lectures)

Reference Books:

- Seymours Polymer Chemistry, Marcel Dekker, Inc.

- G. Odian: Principles of Polymerization, John Wiley.
- F.W. Billmeyer: Text Book of Polymer Science, John Wiley.
- P. Ghosh: Polymer Science & Technology, Tata Mcgraw-Hill.
- R.W. Lenz: Organic Chemistry of Synthetic High Polymers.

PRACTICAL: DSE-1 LAB.

Polymer synthesis

1. Free radical solution polymerization of styrene (St) / Methyl Methacrylate (MMA) / Methyl Acrylate (MA) / Acrylic acid (AA).
 - (a) Purification of monomer.
 - (b) Polymerization using benzoyl peroxide (BPO) / 2,2-azo-bis-isobutyronitrile (AIBN).
2. Preparation of nylon 66/6.
3. Interfacial polymerization, preparation of polyester from isophthaloyl chloride (IPC) and phenolphthalein.
 - (a) Preparation of IPC.
 - (b) Purification of IPC.
 - (c) Interfacial polymerization.
4. Redox polymerization of acrylamide.
5. Precipitation polymerization of acrylonitrile.
6. Preparation of urea-formaldehyde resin.
7. Preparations of novalac resin/resold resin.
8. Microscale Emulsion Polymerization of poly(methylacrylate).

Polymer characterization

1. Determination of molecular weight by viscometry:
 - (a) Polyacrylamide-aq. NaNO₂ solution
 - (b) (Poly vinyl propylidene (PVP) in water
2. Determination of the viscosity-average molecular weight of poly(vinyl alcohol) (PVOH) and the fraction of head-to-head monomer linkages in the polymer.
3. Determination of molecular wt. by end group analysis: Polyethylene glycol (PEG) (OH group).
4. Determination of hydroxyl number of a polymer using colorimetric method.

Polymer analysis

1. Estimation of the amount of HCHO in the given solution by sodium sulphite method
2. Instrumental Techniques
3. IR studies of polymers

*at least 5 experiments to be carried out.

Reference Books:

- Malcolm P. Stevens, Polymer Chemistry: An Introduction, 3rd Ed.
- Harry R. Allcock, Frederick W. Lampe and James E. Mark, Contemporary Polymer Chemistry, 3rd ed. Prentice-Hall (2003).
- Fred W. Billmeyer, Textbook of Polymer Science, 3rd ed. Wiley-Interscience (1984).
- Joel R. Fried, Polymer Science and Technology, 2nd ed. Prentice-Hall (2003).
- Petr Munk and Tejraj M. Aminabhavi, Introduction to Macromolecular Science, 2nd ed. John

Wiley & Sons (2002).

- L.H. Sperling, Introduction to Physical Polymer Science, 4th ed. John Wiley & Sons (2005).
- Malcolm P. Stevens, Polymer Chemistry: An Introduction, 3rd ed. Oxford University Press (2005).
- Seymour/ Carrahers Polymer Chemistry, 9th ed. by Charles E. Carraher, Jr. (2013).

DSE-2: GREEN CHEMISTRY

(Credits-6: Theory-4, Practical-2)-Max. Marks: 100
THEORY (Each class 1 hr.): Marks-70 PRACTICAL
(Each class 2 hrs.): Marks-30 Lectures: 60 (40 Theory
+ 20 Practical classes)

UNIT-I: Introduction to Green Chemistry

What is Green Chemistry? Need for Green Chemistry. Goals of Green Chemistry. Limitations/Obstacles in the pursuit of the goals of Green Chemistry. (4 Lectures)

Principles of Green Chemistry and Designing a Chemical synthesis-I

Twelve principles of Green Chemistry with their explanations and examples with special emphasis on: Designing a Green Synthesis using these principles; Prevention of Waste/ byproducts; maximum incorporation of the materials used in the process into the final products, Atom Economy, calculation of atom economy of the rearrangement, addition, substitution and elimination reactions. Prevention/ minimization of hazardous/ toxic products reducing toxicity. risk = (function) hazard exposure; waste or pollution prevention hierarchy. Green solvents supercritical fluids, water as a solvent for organic reactions, ionic liquids, fluoruous biphasic solvent, PEG, solventless processes, immobilized solvents and how to compare greenness of solvents. (12 Lectures)

UNIT-II: Principles of Green Chemistry and Designing a Chemical synthesis-II

Explanation of principles with special emphasis on: Energy requirements for reactions alternative sources of energy: use of microwaves and ultrasonic energy. Selection of starting materials; avoidance of unnecessary derivatization careful use of blocking/protecting groups. Use of catalytic reagents (wherever possible) in preference to stoichiometric reagents; catalysis and green chemistry, comparison of heterogeneous and homogeneous catalysis, biocatalysis, asymmetric catalysis and photocatalysis. Prevention of chemical accidents designing greener processes, inherent safer design, principle of ISD What you dont have cannot harm you, greener alternative to Bhopal Gas Tragedy (safer route to carcarbaryl) and Flixiborough accident (safer route to cyclohexanol) subdivision of ISD, minimization, simplification, substitution, moderation and limitation. Strengthening/ development of analytical techniques to prevent and minimize the generation of hazardous substances in chemical processes. (14 Lectures)

UNIT-III: Examples of Green Synthesis/ Reactions and some real world cases-I Green Synthesis of the following compounds: adipic acid, catechol, disodium iminodiacetate (alternative to Strecker synthesis) Microwave assisted reactions in water: Hofmann Elimination, methyl benzoate to benzoic acid, oxidation of toluene and alcohols; microwave assisted reactions in organic solvents: Diels-Alder reaction and Decarboxylation reaction. Ultrasound assisted reactions: sonochemical Simmons-Smith Reaction (Ultrasonic alternative to Iodine). Surfactants for carbon dioxide replacing smog producing and ozone depleting solvents with CO₂ for precision cleaning and dry cleaning of garments. Designing of Environmentally safe marine antifoulant. (14 Lectures)

UNIT-IV: Examples of Green Synthesis/ Reactions and some real world cases-II Rightfit pigment: synthetic azopigments to replace toxic organic and inorganic pigments. An efficient, green synthesis of a compostable and widely applicable plastic (poly lactic acid) made from corn. Healthier Fats and oil by Green Chemistry: Enzymatic Inter esterification for production of

no Trans-Fats and Oils Development of Fully Recyclable Carpet: Cradle to Cradle Carpeting (6 Lectures)

Future Trends in Green Chemistry

Oxidation reagents and catalysts; Biomimetic, multifunctional reagents; Combinatorial green chemistry; Proliferation of solventless reactions; co crystal controlled solid state synthesis (C2S3); Green chemistry in sustainable development. (10 Lectures)

Reference Books:

- V.K. Ahluwalia & M.R. Kidwai: New Trends in Green Chemistry, • Anamalaya Publishers (2005).
- P.T. Anastas & J.K. Warner: Oxford Green Chemistry- Theory and Practical, University Press (1998).
- A.S. Matlack: Introduction to Green Chemistry, Marcel Dekker (2001).
- M.C. Cann & M.E. Connely: Real-World cases in Green Chemistry, American Chemical Society, Washington (2000).
- M.A. Ryan & M. Tinneland, Introduction to Green Chemistry, American Chemical Society, Washington (2002).

PRACTICAL: DSE-2

1. Safer starting materials.

- The Vitamin C clock reaction using Vitamin C tablets, tincture of iodine, hydrogen peroxide and liquid laundry starch.
- Effect of concentration on clock reaction.
- Preparation and characterization of nanoparticles (Ag, Au) using plant extract.

2. Using renewable resources

- Preparation of biodiesel from vegetable oil.

3. Avoiding waste

- Principle of atom economy.
- Use of molecular model kit to simulate the reaction to investigate how the atom economy can illustrate Green Chemistry.
- Preparation of propene by two methods can be studied.

(I) Triethylamine ion + OH⁻ $\xrightarrow{H_2SO_4/O}$ propene + trimethylpropene + water

(II) 1-propanol $\xrightarrow{\text{water}}$ propene + water

- The other types of reactions, like addition, elimination, substitution and rearrangement should also be studied for the calculation of atom economy.

4. Use of enzymes as catalysts

- Benzoin condensation using Thiamine Hydrochloride as a catalyst instead of cyanide

5. Alternative Green solvents

Diels Alder reaction in water

- Reaction between furan and maleic acid in water and at room temperature rather than in benzene and reflux.
- Extraction of D-limonene from orange peel using liquid CO₂ prepared from dry ice.
- Mechanochemical solvent free synthesis of azomethines

4. Alternative sources of energy

- Solvent free, microwave assisted one pot synthesis of phthalocyanine complex of Cu(II).

- Photoreduction of benzophenone to benzopinacol in the presence of sunlight.

Reference Books:

- Anastas, P.T & Warner, J.C. Green Chemistry: Theory and Practice, Oxford University Press (1998).
- Kirchoff, M. & Ryan, M.A. Greener approaches to undergraduate chemistry experiment. American Chemical Society, Washington DC (2002).
- Ryan, M.A. Introduction to Green Chemistry, Tinnesand; (Ed), American Chemical Society, Washington DC (2002).
- Sharma, R.K.; Sidhwani, I.T. & Chaudhari, M.K. I.K. Green Chemistry Experiment: A monograph International Publishing House Pvt Ltd. New Delhi. Bangalore CISBN 978-93-81141-55-7 (2013).
- Cann, M.C. & Connelly, M. E. Real world cases in Green Chemistry, American Chemical Society (2008).
- Cann, M. C. & Thomas, P. Real world cases in Green Chemistry, American Chemical Society (2008).

DSE-3: INDUSTRIAL CHEMICALS AND ENVIRONMENT

(Credits-6: Theory-4, Practical-2)-Max. Marks: 100

THEORY (Each class 1 hr.): Marks-70 PRACTICAL

(Each class 2 hrs.): Marks-30 Lectures: 60 (40 Theory + 20 Practical classes)

UNIT-I: Industrial Gases and Inorganic Chemicals

Industrial Gases: Large scale production, uses, storage and hazards in handling of the following gases: oxygen, nitrogen, argon, neon, helium, hydrogen, acetylene, carbon monoxide, chlorine, sulphur dioxide. Inorganic Chemicals: Manufacture, application and hazards in handling the following chemicals: hydrochloric acid, nitric acid, sulphuric acid, caustic soda, common salt, bleaching powder, sodium thiosulphate, hydrogen peroxide, potash alum, potassium dichromate and potassium permanganate. (10 Lectures)

Industrial Metallurgy

Preparation of metals (ferrous and nonferrous) and ultrapure metals for semiconductor technology. (4 Lectures)

UNIT-II: Environment and its segments

Ecosystems. Biogeochemical cycles of carbon, nitrogen and sulphur. Air Pollution: Major regions of atmosphere. Chemical and photochemical reactions in atmosphere. Air pollutants: types, sources, particle size and chemical nature; Photochemical smog: its constituents and photochemistry. Environmental effects of ozone. Major sources of air pollution. Pollution by SO_2 , CO_2 , CO , NO_x , and H_2S and control procedures. Effects of air pollution on living organisms and vegetation. Greenhouse effect and global warming, Ozone depletion by oxides of nitrogen, chlorofluorocarbons and halogens, removal of sulphur from coal. (14 Lectures)

UNIT-III: Water Pollution: Hydrological cycle, water resources, aquatic ecosystems, Sources and nature of water pollutants, Techniques for measuring water pollution, Impacts of water pollution on hydrological and ecosystems. Water purification methods. Effluent treatment plants (primary, sec-

ondary and tertiary treatment). Industrial effluents from the following industries and their treatment: electroplating, textile, tannery, dairy, petroleum and petrochemicals, fertilizer. Sludge disposal. Industrial waste management, incineration of waste. Water treatment and purification (reverse osmosis, ion exchange). Water quality parameters for waste water, industrial water and domestic water. (16 Lectures)

UNIT-IV: Energy & Environment

Sources of energy: Coal, petrol and natural gas. Nuclear fusion/fission, solar energy, hydrogen, geothermal, tidal and hydel. Nuclear Pollution: Disposal of nuclear waste, nuclear disaster and its management. (10 Lectures)

Biocatalysis: Introduction to biocatalysis: Importance in green chemistry and chemical industry. (6 Lectures)

Reference Books:

- E. Stocchi: Industrial Chemistry, Vol-I, Ellis Horwood Ltd. UK.
- R.M. Felder, R.W. Rousseau: Elementary Principles of Chemical Processes, Wiley Publishers, New Delhi.
- A. Kent: Riegels Handbook of Industrial Chemistry, CBS Publishers, New Delhi.
- S. S. Dara: A Textbook of Engineering Chemistry, S. Chand & Company Ltd. New Delhi.
- De, Environmental Chemistry: New Age International Pvt., Ltd, New Delhi.
- S. M. Khopkar, Environmental Pollution Analysis: Wiley Eastern Ltd, New Delhi.
- S.E. Manahan, Environmental Chemistry, CRC Press (2005).
- G.T. Miller, Environmental Science 11th edition. Brooks/ Cole (2006).
- Mishra, Environmental Studies. Selective and Scientific Books, New Delhi (2005).

PRACTICAL: DSE-3

1. Determination of dissolved oxygen in water.
2. Determination of Chemical Oxygen Demand (COD).
3. Determination of Biological Oxygen Demand (BOD).
4. Percentage of available chlorine in bleaching powder.
5. Measurement of chloride, sulphate and salinity of water samples by simple titration method ($AgNO_3$ and potassium chromate).
6. Estimation of total alkalinity of water samples (CO_3^{2-} , HCO_3^-) using double titration method.
7. Measurement of dissolved CO_2 .
8. Study of some of the common bio-indicators of pollution.
9. Estimation of SPM in air samples.
10. Preparation of borax/ boric acid.

Reference Books:

- E. Stocchi: Industrial Chemistry, Vol-I, Ellis Horwood Ltd. UK.
- R.M. Felder, R.W. Rousseau: Elementary Principles of Chemical Processes, Wiley Publishers, New Delhi.
- A. Kent: Riegels Handbook of Industrial Chemistry, CBS Publishers, New Delhi.
- S. S. Dara: A Textbook of Engineering Chemistry, S. Chand & Company Ltd. New Delhi.
- De, Environmental Chemistry: New Age International Pvt., Ltd, New Delhi.
- S. M. Khopkar, Environmental Pollution Analysis: Wiley Eastern Ltd, New Delhi.

DSE-4: DISSERTATION/PROJECT WORK

Marks:100

SKILL ENHANCEMENT COURSES (SEC)

SEMESTER- III

SEC-I: PESTICIDE CHEMISTRY

(Credits: 02)- Max. Marks: 50

30 Lectures(Each Lecture 1 hr.)

General introduction to pesticides (natural and synthetic), benefits and adverse effects, changing concepts of pesticides, structure activity relationship, synthesis and technical manufacture and uses of representative pesticides in the following classes: Organochlorines (DDT, Gammexene,); Organophosphates (Malathion, Parathion); Carbamates (Carbofuran and carbaryl); Quinones (Chloranil), Anilides (Alachlor and Butachlor).

Practical

- To calculate acidity/alkalinity in given sample of pesticide formulations as per BIS specifications.
- Preparation of simple organophosphates, phosphonates and thiophosphates.

Reference Book:

- R. Cremlyn: Pesticides, John Wiley.

SEMESTER- IV

SEC-II: FUEL CHEMISTRY

(Credits: 02)- Max. Marks: 50

30 Lectures(Each Lecture 1 hr.)

Review of energy sources (renewable and non-renewable). Classification of fuels and their calorific value Coal: Uses of coal (fuel and non-fuel) in various industries, its composition, carbonization of coal. Coal gas, producer gas and water gas composition and uses. Fractionation of coal tar, uses of coal tar bases chemicals, requisites of a good metallurgical coke, Coal gasification (Hydro gasification and Catalytic gasification), Coal liquefaction and Solvent Refining.

Petroleum and Petrochemical Industry: Composition of crude petroleum, Refining and different types of petroleum products and their applications. Fractional Distillation (Principle and process), Cracking (Thermal and catalytic cracking), Reforming Petroleum and non-petroleum fuels (LPG, CNG, LNG, bio-gas, fuels derived from biomass), fuel from waste, synthetic fuels (gaseous and liquids), clean fuels. Petrochemicals: Vinyl acetate, Propylene oxide, Isoprene, Butadiene, Toluene and its derivatives Xylene.

Lubricants: Classification of lubricants, lubricating oils (conducting and non-conducting) Solid and semisolid lubricants, synthetic lubricants. Properties of lubricants (viscosity index, cloud point, pore point) and their determination.

large Reference Books:

- E. Stocchi: Industrial Chemistry, Vol -I, Ellis Horwood Ltd. UK.
- P.C. Jain, M. Jain: Engineering Chemistry, Dhanpat Rai & Sons, Delhi.
- B.K. Sharma: Industrial Chemistry, Goel Publishing House, Meerut.

GENERIC ELECTIVE(GE)

B. Sc.(Hons.) Students other than Chemistry Honours will opt four Chemistry GE Papers.

SEMESTER-I

GE-I: ATOMIC STRUCTURE, BONDING, GENERAL ORGANIC CHEMISTRY & ALIPHATIC HYDROCARBONS

(Credits-6: Theory-4, Practical-2)-Max. Marks: 100
THEORY (Each class 1 hr.): Marks-70 PRACTICAL
(Each class 2 hrs.): Marks-30 Lectures: 60 (40 Theory
+ 20 Practical classes)

SECTION A: INORGANIC CHEMISTRY-1 (30 Periods)

Unit-I: Atomic Structure

Review of: Bohrs theory and its limitations, dual behaviour of matter and radiation, de-Broglies relation, Heisenberg Uncertainty principle. Hydrogen atom spectra.

What is Quantum mechanics ? Time independent Schrodinger equation and meaning of various terms in it. Significance of ψ and ψ^2 , Schrodinger equation for hydrogen atom. Radial and angular parts of the hydrogenic wave functions (atomic orbitals) and their variations for 1s, 2s, 2p, 3s, 3p and 3d orbitals (Only graphical representation). Significance of quantum numbers, orbital angular momentum and quantum numbers m_l and m_s . Shapes of s, p and d atomic orbitals, nodal planes. Discovery of spin, spin quantum number (s) and magnetic spin quantum number (m_s). Rules for filling electrons in various orbitals, Electronic configurations of the atoms. Stability of half-filled and completely filled orbitals, concept of exchange energy. Relative energies of atomic orbitals, Anomalous electronic configurations. (14 Lectures)

Unit-II: Chemical Bonding and Molecular Structure

Ionic Bonding: General characteristics of ionic bonding. Energy considerations in ionic bonding, lattice energy and solvation energy and their importance in the context of stability and solubility of ionic compounds. Statement of Born-Land equation for calculation of lattice energy, Born-Haber cycle and its applications, polarizing power and polarizability. Fajans rules, ionic character in covalent compounds, bond moment, dipole moment and percentage ionic character.

Covalent bonding: VB Approach: Shapes of some inorganic molecules and ions on the basis of VSEPR and hybridization with suitable examples of linear, trigonal planar, square planar, tetrahedral, trigonal bipyramidal and octahedral arrangements. Concept of resonance and resonating structures in various inorganic and organic compounds.

MO Approach: Rules for the LCAO method, bonding and antibonding MOs and their characteristics for s-s, s-p and p-p combinations of atomic orbitals, nonbonding combination of orbitals, MO treatment of homonuclear diatomic molecules (N_2 , O_2) and heteronuclear diatomic molecules (CO, NO). Comparison of VB and MO approaches. (16 Lectures)

Section B: Organic Chemistry-1 (30 Periods) Unit- III: Fundamentals of Organic Chemistry

Physical Effects, Electronic Displacements: Inductive Effect, Electromeric Effect, Resonance and Hyperconjugation. Cleavage of Bonds: Homolysis and Heterolysis.

Structure, shape and reactivity of organic molecules: Nucleophiles and electrophiles. Reactive Intermediates: Carbocations, Carbanions and free radicals. Strength of organic acids and bases: Comparative study with emphasis on factors affecting pK values. Aromaticity: Hckels rule. (8 Lectures)

Stereochemistry

Conformations with respect to ethane, butane and cyclohexane. Interconversion of Wedge Formula, Newmann, Sawhorse and Fischer representations. Concept of chirality (upto two carbon atoms). Configuration: Geometrical and Optical isomerism; Enantiomerism, Diastereomerism and Meso compounds). D and L; cis-trans nomenclature; CIP Rules: R/S (for one chiral carbon atoms) and E/Z Nomenclature (for up to two C=C systems). (10 Lectures)

Unit- IV: Aliphatic Hydrocarbons

Functional group approach for the following reactions (preparations & reactions) to be studied in context to their structure. Alkanes: (Upto 5 Carbons). Preparation: Catalytic hydrogenation, Wurtz reaction, Kolbes synthesis, from Grignard reagent. Reactions: Free radical Substitution: Halogenation.

Alkenes: (Upto 5 Carbons) Preparation: Elimination reactions: Dehydration of alkenes and dehydrohalogenation of alkyl halides (Saytzeffs rule); cis alkenes (Partial catalytic hydrogenation) and trans alkenes (Birch reduction). Reactions: cis-addition (alk. $KMnO_4$) and trans-addition (bromine), Addition of HX (Markownikoffs and anti-Markownikoffs addition), Hydration, Ozonolysis, Alkynes: (Upto 5 Carbons) Preparation: Acetylene from CaC_2 and conversion into higher alkynes; by dehalogenation of tetra halides and dehydrohalogenation of vicinal-dihalides.

Reactions: formation of metal acetylides, addition of bromine and alkaline $KMnO_4$, ozonolysis. (12 Lectures)

Reference Books:

- J. D. Lee: A new Concise Inorganic Chemistry, E L. B. S.
- F. A. Cotton & G. Wilkinson: Basic Inorganic Chemistry, John Wiley.
- Douglas, McDaniel and Alexander: Concepts and Models in Inorganic Chemistry, John Wiley.
- T. W. Graham Solomon: Organic Chemistry, John Wiley and Sons.
- Peter Sykes: A Guide Book to Mechanism in Organic Chemistry, Orient Longman.
- E. L. Eliel: Stereochemistry of Carbon Compounds, Tata McGraw Hill. I. L. Finar: Organic Chemistry (Vol. I & II), E. L. B. S.
- R. T. Morrison & R. N. Boyd: Organic Chemistry, Prentice Hall.
- Arun Bahl and B. S. Bahl: Advanced Organic Chemistry, S. Chand.

PRACTICAL: GE-I LAB.

Section A: Inorganic Chemistry-Volumetric Analysis

1. Estimation of sodium carbonate and sodium hydrogen carbonate present in a mixture.
2. Estimation of oxalic acid by titrating it with $KMnO_4$.
3. Estimation of water of crystallization in Mohrs salt by titrating with $KMnO_4$.

4. Estimation of Fe (II) ions by titrating it with $K_2Cr_2O_7$ using internal indicator.
5. Estimation of Cu (II) ions iodometrically using $Na_2S_2O_3$.

Section B: Organic Chemistry

1. Detection of extra elements (N, S, Cl, Br, I) in organic compounds (containing upto two extra elements).
2. Separation of mixtures by Chromatography: Measure the Rf value in each case (combination of two compounds to be given).
 - (a) Identify and separate the components of a given mixture of 2 amino acids (glycine, aspartic acid, glutamic acid, tyrosine or any other amino acid) by paper chromatography.
 - (b) Identify and separate the sugars present in the given mixture by paper chromatography.

large Reference Books:

- Vogels Qualitative Inorganic Analysis, A.I. Vogel, Prentice Hall, 7th Edition.
- Vogels Quantitative Chemical Analysis, A.I. Vogel, Prentice Hall, 6th Edition.
- Textbook of Practical Organic Chemistry, A.I. Vogel, Prentice Hall, 5th edition.
- Practical Organic Chemistry, F. G. Mann. & B. C. Saunders, Orient Longman, 1960.

SEMESTER-II

GE-II: CHEMICAL ENERGETICS, EQUILIBRIA & FUNCTIONAL ORGANIC CHEMISTRY-I

(Credits-6: Theory-4, Practical-2)-Max. Marks: 100
THEORY (Each class 1 hr.): Marks-70 PRACTICAL
(Each class 2 hrs.): Marks-30 Lectures: 60 (40 Theory
+ 20 Practical classes)

Section A: Physical Chemistry-1 (30 Lectures) Unit-I:

Chemical Energetics

Review of thermodynamics and the Laws of Thermodynamics. Important principles and definitions of thermochemistry. Concept of standard state and standard enthalpies of formations, integral and differential enthalpies of solution and dilution. Calculation of bond energy, bond dissociation energy and resonance energy from thermochemical data. Variation of enthalpy of a reaction with temperature Kirchhoffs equation. Statement of Third Law of thermodynamics (10 Lectures)

Chemical Equilibrium:

Free energy change in a chemical reaction. Thermodynamic derivation of the law of chemical equilibrium. Distinction between G and G_0 , Le Chateliers principle. Relationships between K_p , K_c and K_x for reactions involving ideal gases. (8 Lectures)

Unit- II: Ionic Equilibria

Strong, moderate and weak electrolytes, degree of ionization, factors affecting degree of ionization, ionization constant and ionic product of water. Ionization of weak acids and bases, pH scale, common ion effect. Salt hydrolysis-calculation of hydrolysis constant, degree of hydrolysis and pH for different

salts. Buffer solutions. Solubility and solubility product of sparingly soluble salts applications of solubility product principle. (12 Lectures)

Section B: Organic Chemistry-2 (30 Lectures) Unit- III:

Functional group approach for the following reactions (preparations & reactions) to be studied in context to their structure. Aromatic hydrocarbons: Preparation (Case benzene): from phenol, by decarboxylation, from acetylene, from benzene sulphonic acid. Reactions: (Case benzene): Electrophilic substitution: nitration, halogenation and sulphonation. Friedel-Crafts reaction (alkylation and acylation) (upto 4 carbons on benzene). Side chain oxidation of alkyl benzenes (up to 4 carbons on benzene). (8 Lectures)

Alkyl and Aryl Halides

Alkyl Halides (Up to 5 Carbons) Types of Nucleophilic Substitution (SN_1 , SN_2 and SN_i) reactions. Preparation: from alkenes and alcohols.

Reactions: hydrolysis, nitrite & nitro formation, nitrile & isonitrile formation. Williamsons ether synthesis: Elimination vs substitution.

Aryl Halides Preparation: (Chloro, bromo and iodo-benzene case): from phenol, Sandmeyer & Gattermann reactions. Reactions (Chlorobenzene): Aromatic nucleophilic substitution (replacement by OH group) and effect of nitro substituent. Benzyne Mechanism: KNH_2/NH_3 (or $NaNH_2/NH_3$). (8 Lectures)

Unit- IV: Alcohols, Phenols and Ethers (Upto 5 Carbons)

Alcohols: Preparation: Preparation of 1, 2 and 3 alcohols: using Grignard reagent, Esterhydrolysis, Reduction of aldehydes and ketones, carboxylic acid and esters.

Reactions: With sodium, HX (Lucas test), esterification, oxidation (with PCC, alk. $KMnO_4$, acidic dichromate, conc. HNO_3). Oppeneauer oxidation Diols: (Upto 6 Carbons) oxidation of diols. Pinacol-Pinacolone rearrangement.

Phenols: (Phenol case) Preparation: Cumene hydroperoxide method, from diazonium salts. Reactions: Electrophilic substitution: Nitration, halogenation and sulphonation. ReimerTiemann Reaction, Gattermann-Koch Reaction,

Ethers (aliphatic and aromatic): Cleavage of ethers with HI.

Aldehydes and ketones (aliphatic and aromatic): Formaldehyde, acetaldehyde, acetone and benzaldehyde

Preparation: from acid chlorides and from nitriles.

Reactions Reaction with HCN, ROH, $NaHSO_3$, $NH_2 - G$ derivatives. Iodoform test. Aldol Condensation, Cannizzaros reaction, Benzoin condensation. Clemensen reduction and Wolff Kishner reduction. (14 Lectures)

Reference Books:

- T. W. Graham Solomons: Organic Chemistry, John Wiley and Sons.
- Peter Sykes: A Guide Book to Mechanism in Organic Chemistry, Orient Longman.
- I.L. Finar: Organic Chemistry (Vol. I & II), E. L. B. S.
- R. T. Morrison & R. N. Boyd: Organic Chemistry, Prentice Hall.
- Arun Bahl and B. S. Bahl: Advanced Organic Chemistry, S. Chand.

- G. M. Barrow: Physical Chemistry Tata McGraw-Hill(2007).
- G. W. Castellan: Physical Chemistry 4th Edn. Narosa (2004).
- C. Kotz, P. M. Treichel & J. R. Townsend: General Chemistry Cengage Lening India Pvt. Ltd., New Delhi (2009).
- H. Mahan: University Chemistry 3rd Ed. Narosa (1998).
- R. H. Petrucci: General Chemistry 5th Ed. Macmillan Publishing Co.: New York (1985).

PRACTICAL: GE-II LAB.

Section A: Physical Chemistry Thermochemistry

1. Determination of heat capacity of calorimeter for different volumes.
2. Determination of enthalpy of neutralization of hydrochloric acid with sodium hydroxide.
3. Determination of enthalpy of ionization of acetic acid.
4. Determination of integral enthalpy of solution of salts (KNO₃, NH₄Cl).
5. Determination of enthalpy of hydration of copper sulphate.
6. Study of the solubility of benzoic acid in water and determination of H. **Ionic equilibria**
pH measurements a) Measurement of pH of different solutions like aerated drinks, fruit juices, shampoos and soaps (use dilute solutions of soaps and shampoos to prevent damage to the glass electrode) using pH-meter.
b) Preparation of buffer solutions:
(i) Sodium acetate-acetic acid.
(ii) Ammonium chloride-ammonium hydroxide.
Measurement of the pH of buffer solutions and comparison of the values with theoretical values.

Section B: Organic Chemistry

1. Purification of organic compounds by crystallization (from water and alcohol) and distillation.
2. Criteria of Purity: Determination of melting and boiling points.
3. Preparations: Mechanism of various reactions involved to be discussed. Recrystallisation, determination of melting point and calculation of quantitative yields to be done.
(a) Bromination of Phenol/Aniline.
(b) Benzoylation of amines/phenols.
(c) Oxime and 2,4 dinitrophenylhydrazone of aldehyde/ketone.

Reference Books:

- A.I. Vogel: Textbook of Practical Organic Chemistry, 5th edition, Prentice-Hall.
- F. G. Mann & B. C. Saunders, Practical Organic Chemistry, Orient Longman (1960).
- B.D. Khosla, Senior Practical Physical Chemistry, R. Chand & Co.

SEMESTER-III

GE-III: CHEMISTRY OF S- AND P-BLOCK ELEMENTS, STATES OF MATTER & CHEMICAL KINETICS

(Credits-6: Theory-4, Practical-2)-Max. Marks: 100

THEORY (Each class 1 hr.): Marks-70

PRACTICAL (Each class 2 hrs.): Marks-30

Lectures: 60 (40 Theory + 20 Practical classes)

UNIT-I: General Principles of Metallurgy

Chief modes of occurrence of metals based on standard electrode potentials. Ellingham diagrams for reduction of metal oxides using carbon as reducing agent. Hydrometallurgy, Methods of purification of metals (Al, Pb, Fe, Cu, Ni, Zn): electrolytic, oxidative refining, Parting process, van Arkel-de Boer process and Mond's process. (4 Lectures)

s- and p-Block Elements

Periodicity in s- and p-block elements with respect to electronic configuration, atomic and ionic size, ionization enthalpy, electronegativity (Pauling & Mulliken scales). Allotropy in C, S, and P. Oxidation states with reference to elements in unusual and rare oxidation states like carbides and nitrides), inert pair effect, diagonal relationship and anomalous behaviour of first member of each group. (11 Lectures)

UNIT-II: Compounds of s- and p-Block Elements

Hydrides and their classification (ionic, covalent and interstitial), structure and properties with respect to stability of hydrides of p- block elements. Concept of multicentre bonding (diborane). Structure, bonding and their important properties like oxidation/reduction, acidic/basic nature of the following compounds and their applications in industrial, organic and environmental chemistry. Hydrides of nitrogen (NH_3 , N_2H_4 , N_3H , NH_2OH)

Oxoacids of P, S and Cl.

Halides and oxohalides: PCl_3 , PCl_5 , $SOCl_2$. (15 Lectures)

Section B: Physical Chemistry-3 (30 Lectures) UNIT-III:

Kinetic Theory of Gases

Postulates of Kinetic Theory of Gases and derivation of the kinetic gas equation. Deviation of real gases from ideal behaviour, compressibility factor, causes of deviation. van der Waals equation of state for real gases. Boyle temperature (derivation not required). Critical phenomena, critical constants and their calculation from van der Waals equation. Maxwell Boltzmann distribution laws of molecular velocities and molecular energies (graphic representation derivation not required) and their importance.

Temperature dependence of these distributions. Most probable, average and root mean square velocities (no derivation). Collision cross section, collision number, collision frequency, collision diameter and mean free path of molecules. Viscosity of gases and effect of temperature and pressure on coefficient of viscosity (qualitative treatment only). (10 Lectures)

Liquids

Surface tension and its determination using stalagmometer. Viscosity of a liquid and determination of coefficient of viscosity using Ostwald viscometer. Effect of temperature on surface tension and coefficient of viscosity of a liquid (qualitative treatment only). (5 Lectures)

UNIT-IV: Solids

Forms of solids. Symmetry elements, unit cells, crystal systems, Bravais lattice types and identification of lattice planes. Laws of Crystallography - Law of constancy of interfacial angles, Law of

rational indices. Miller indices. XRay diffraction by crystals, Braggs law. Structures of NaCl, and CsCl (qualitative treatment only). Defects in crystals. (7 Lectures)

Chemical Kinetics

The concept of reaction rates. Effect of temperature, pressure, catalyst and other factors on reaction rates. Order and molecularity of a reaction. Derivation of integrated rate equations for zero, first and second order reactions (both for equal and unequal concentrations of reactants). Half-life of a reaction. General methods for determination of order of a reaction. Concept of activation energy and its calculation from Arrhenius equation. Theories of Reaction Rates: Collision theory and Activated Complex theory of bimolecular reactions. Comparison of the two theories (qualitative treatment only). (8 Lectures)

Reference Books:

- G. M. Barrow: Physical Chemistry Tata McGraw-Hill(2007).
- G. W. Castellan: Physical Chemistry 4th Edn. Narosa (2004).
- C. Kotz, P. M. Treichel & J. R. Townsend: General Chemistry Cengage Lening India Pvt. Ltd., New Delhi (2009).
- H. Mahan: University Chemistry 3rd Ed. Narosa (1998).
- R. H. Petrucci: General Chemistry 5th Ed. Macmillan Publishing Co.: New York (1985).
- D. Lee: A New Concise Inorganic Chemistry, E.L.B.S.
- F.A. Cotton & G. Wilkinson: Basic Inorganic Chemistry, John Wiley.
- F. Shriver and P. W. Atkins: Inorganic Chemistry, Oxford University Press.
- Gary Wulfsberg: Inorganic Chemistry, Viva Books Pvt. Ltd.

PRACTICAL: GE-III LAB.

Section A: Inorganic Chemistry

Semi-micro qualitative analysis using H_2S of mixtures- not more than four ionic species (two anions and two cations and excluding insoluble salts) out of the following:

Cations : NH_4^+ , Pb^{2+} , Ag^+ , Bi^{3+} , Cu^{2+} , Cd^{2+} , Sn^{2+} , Fe^{3+} , Al^{3+} , Co , Cr^{3+} ,

Ni^{2+} , Mn^{2+} , Zn^{2+} , Ba^{2+} , Sr^{2+} , Ca^{2+} , K^+

Anions: CO_3^{2-} , S^{2-} , SO_3^{2-} , NO_3^- , Cl^- , Br^- , I^- , NO_2^- , SO_4^{2-} , PO_4^{3-} , F^- (Spot tests should be carried out

wherever feasible)

Section B: Physical Chemistry Chemical Kinetics

Study the kinetics of the following reactions.

3. Initial rate method: Iodide-persulphate reaction.
4. Integrated rate method:
 - a) Acid hydrolysis of methyl acetate with hydrochloric acid.
 - b) Saponification of ethyl acetate.
 - c) Compare the strengths of HCl and H_2SO_4 by studying kinetics of hydrolysis of methyl acetate.

Reference Books:

- A.I. Vogel, Qualitative Inorganic Analysis, Prentice Hall, 7th Edn
- A.I. Vogel, Quantitative Chemical Analysis, Prentice Hall, 6th Edn.
- B.D. Khosla, Senior Practical Physical Chemistry, R. Chand & Co.

SEMESTER- IV

GE:IV ORGANOMETALLICS, BIOINORGANIC CHEMISTRY, POLYNUCLEAR HYDROCARBONS AND UV, IR SPECTROSCOPY

(Credits-6: Theory-4, Practical-2)-Max. Marks: 100
THEORY (Each class 1 hr.): Marks-70 PRACTICAL
(Each class 2 hrs.): Marks-30 Lectures: 60 (40 Theory
+ 20 Practical classes)

Section A: Inorganic Chemistry-4 (30 Lectures) UNIT-

I: Chemistry of 3d metals

Oxidation states displayed by Cr, Fe, Co, Ni and Cu. A study of the following compounds (including preparation and important properties); Peroxo compounds of Cr, $K_2Cr_2O_7$, $KMnO_4$, $K_4[Fe(CN)_6]$, sodium nitroprusside, $[Co(NH_3)_6]Cl_3$, $Na_3[Co(NO_2)_6]$. (6 Lectures)

Organometallic Compounds Definition and Classification with appropriate examples based on nature of metal-carbon bond (ionic, s, p and multicentre bonds). Structures of methyl lithium, Zeiss salt and ferrocene. EAN rule as applied to carbonyls. Preparation, structure, bonding and properties of mononuclear and polynuclear carbonyls of 3d metals. π -acceptor behaviour of carbon monoxide. Synergic effects (VB approach). (12 Lectures)

UNIT-II: Bio-Inorganic Chemistry

A brief introduction to bio-inorganic chemistry. Role of metal ions present in biological systems with special reference to Na^+ , K^+ and Mg^{2+} ions: Na/K pump; Role of Mg^{2+} ions in energy production and chlorophyll. Role of Ca^{2+} in blood clotting, stabilization of protein structures and structural role (bones). (12 Lectures)

Section B: Organic Chemistry-4 (30 Lectures)

UNIT-III: Polynuclear and heteronuclear aromatic compounds

Properties of the following compounds with reference to electrophilic and nucleophilic substitution: Naphthalene, Anthracene, Furan, Pyrrole, Thiophene, and Pyridine. (6 Lectures)

Active methylene compounds

Preparation: Claisen ester condensation. Keto-enol tautomerism. Reactions: Synthetic uses of ethylacetoacetate (preparation of non-heteromolecules having upto 6 carbon). (6 Lectures)

UNIT-IV: Application of Spectroscopy to Simple Organic Molecules

Applications of visible, ultraviolet and Infrared spectroscopy in organic molecules. Electromagnetic radiations, electronic transitions, λ_{max} and ϵ_{max} , chromophore, auxochrome, bathochromic and hypsochromic shifts. Application of electronic spectroscopy and Woodward rules for calculating λ_{max} of conjugated dienes and α , β -unsaturated compounds. Infrared radiation and types of molecular vibrations, functional group and fingerprint region. IR spectra of alkanes, alkenes and simple alcohols (inter and intramolecular hydrogen bonding), aldehydes, ketones, carboxylic acids and their derivatives (effect of substitution on $>C=O$ stretching absorptions). (18 Lectures)

Reference Books:

- James E. Huheey, Ellen Keiter & Richard Keiter: Inorganic Chemistry: Principles of Structure and

Reactivity, Pearson Publication.

- G.L. Miessler & Donald A. Tarr: Inorganic Chemistry, Pearson Publication.
- J.D. Lee: A New Concise Inorganic Chemistry, E.L.B.S.
- F.A. Cotton & G. Wilkinson: Basic Inorganic Chemistry, John Wiley & Sons.
- I.L. Finar: Organic Chemistry (Vol. I & II), E.L.B.S.
- John R. Dyer: Applications of Absorption Spectroscopy of Organic Compounds, • Prentice Hall.
- R.M. Silverstein, G.C. Bassler & T.C. Morrill: Spectroscopic Identification of Organic Compounds, John Wiley & Sons.
- R.T. Morrison & R.N. Boyd: Organic Chemistry, Prentice Hall.
- Peter Sykes: A Guide Book to Mechanism in Organic Chemistry, Orient Longman.
- Arun Bahl and B. S. Bahl: Advanced Organic Chemistry, S. Chand.

PRACTICAL: GE-IV LAB.

Section A: Inorganic Chemistry

1. Separation of mixtures by chromatography: Measure the R_f value in each case. (Combination of two ions to be given).

Paper chromatographic separation of Fe^{3+} , Al^{3+} and Cr^{3+} or Paper chromatographic separation of Ni^{2+} , Co^{2+} , Mn^{2+} and Zn^{2+}

Section B: Organic Chemistry

Systematic Qualitative Organic Analysis of Organic Compounds possessing mono-functional groups (-COOH, phenolic, aldehydic, ketonic, amide, nitro, amines) and preparation of one derivative.

Reference Books:

- A.I. Vogel: Qualitative Inorganic Analysis, Prentice Hall, 7th Edn.
- A.I. Vogel: Quantitative Chemical Analysis, Prentice Hall, 6th Edn.
- A.I. Vogel: Textbook of Practical Organic Chemistry, Prentice Hall, 5th Edn.
- F. G. Mann & B. C. Saunders: Practical Organic Chemistry, Orient Longman (1960).

SEMESTER- IV (CBZ Students)

GE:IV- MOLECULES OF LIFE

(Credits-6: Theory-4, Practical-2)-Max. Marks: 100
THEORY (Each class 1 hr.): Marks-70 PRACTICAL
(Each class 2 hrs.): Marks-30 Lectures: 60 (40 Theory
+ 20 Practical classes)

UNIT-I: Carbohydrates

Classification of carbohydrates, reducing and non reducing sugars, General Properties of Glucose and Fructose, their open chain structure. Epimers, mutarotation and anomers. Determination of configuration of Glucose (Fischer proof). Cyclic structure of glucose. Haworth projections. Cyclic structure of fructose. Linkage between monosachharides, structure of disacharrides (sucrose, maltose, lactose) and polysacharrides (starch and cellulose) excluding their structure elucidation. (12 Periods)

UNIT-II Amino Acids, Peptides and Proteins

Classification of Amino Acids, Zwitterion structure and Isoelectric point. Overview of Primary, Secondary, Tertiary and Quaternary structure of proteins. Determination of primary structure of peptides, determination of N-terminal amino acid (by DNFB and Edman method) and C-terminal amino acid (by thiohydantoin and with carboxypeptidase enzyme). Synthesis of simple peptides (upto dipeptides) by N-protection (t-butyloxycarbonyl and phthaloyl) & C-activating groups and Merrifield solid phase synthesis. (12 Periods)

UNIT-III: Enzymes and correlation with drug action

Mechanism of enzyme action, factors affecting enzyme action, Coenzymes and cofactors and their role in biological reactions, Specificity of enzyme action (Including stereospecificity), Enzyme inhibitors and their importance, phenomenon of inhibition (Competitive and Non competitive inhibition including allosteric inhibition). Drug action-receptor theory. Structure activity relationships of drug molecules, binding role of OH group, $-NH_2$ group, double bond and aromatic ring, (10 Periods)

Nucleic Acids

Components of Nucleic acids: Adenine, guanine, thymine and Cytosine (Structure only), other components of nucleic acids, Nucleosides and nucleotides (nomenclature), Structure of polynucleotides; Structure of DNA (Watson-Crick model) and RNA (types of RNA), Genetic Code, Biological roles of DNA and RNA: Replication, Transcription and Translation. (8 Periods)

UNIT-IV: Lipids

Introduction to lipids, classification. Oils and fats: Common fatty acids present in oils and fats, Omega fatty acids, Trans fats, Hydrogenation, Saponification value, Iodine number. Biological importance of triglycerides, phospholipids, glycolipids, and steroids (cholesterol). (8 Periods)

Concept of Energy in Biosystems

Calorific value of food. Standard caloric content of carbohydrates, proteins and fats. Oxidation of foodstuff (organic molecules) as a source of energy for cells. Introduction to Metabolism (catabolism, anabolism), ATP: the universal currency of cellular energy, ATP hydrolysis and free energy change. Conversion of food into energy. Outline of catabolic pathways of Carbohydrate- Glycolysis, Fermentation, Krebs Cycle. Overview of catabolic pathways of Fats and Proteins. Interrelationships in the metabolic pathways of Proteins, Fats and Carbohydrates. (10 Lectures)

Recommended Texts:

- Morrison, R. T. & Boyd, R. N. Organic Chemistry, Dorling Kindersley (India) Pvt. Ltd. (Pearson Education).
- Finar, I. L. Organic Chemistry (Volume 1), Dorling Kindersley (India) Pvt. Ltd. (Pearson Education).
- Finar, I. L. Organic Chemistry (Volume 2), Dorling Kindersley (India) Pvt. Ltd. (Pearson Education).
- Nelson, D. L. & Cox, M. M. Lehningers Principles of Biochemistry 7th Ed., W. H. Freeman.
- Berg, J. M., Tymoczko, J. L. & Stryer, L. Biochemistry 7th Ed., W. H. Freeman.

PRACTICAL: GE-IV(CBZ) LAB.

1. Separation of amino acids by paper chromatography.

2. To determine the concentration of glycine solution by formylation method.
3. Study of titration curve of glycine.
4. Action of salivary amylase on starch.
5. Effect of temperature on the action of salivary amylase on starch.
6. To determine the saponification value of an oil/fat.
7. To determine the iodine value of an oil/fat.
8. Differentiate between a reducing/ nonreducing sugar.
9. Extraction of DNA from onion/cauliflower.
10. To synthesise aspirin by acetylation of salicylic acid and compare it with the ingredient of an aspirin tablet by TLC.

Recommended Texts:

- Furniss, B.S.; Hannaford, A.J.; Rogers, V.; Smith, P.W.G.; Tatchell, A.R. *Vogels Textbook of Practical Organic Chemistry*, ELBS.
- Ahluwalia, V.K. & Aggarwal, R. *Comprehensive Practical Organic Chemistry*, Universities Press.

COMPUTER SCIENCE(HONOURS)

SEMESTER-I

C:1-PROGRAMMING USING C (Credit:6, Theory:4, Practical: 2)

UNIT- I

Introduction to Programming Language, Introduction to C Programming , Character Set, C Tokens, Keywords & Identifiers, Constants, Variables, Data Types, Variables , Storage Classes, Operators (Arithmetic, Relational, Logical , Assignment, Increment & Decrement, Conditional , Bitwise), Expressions , Input and Output Operations.

UNIT- II

Decision Making and Branching: Simple IF Statement, IF.. ELSE Statement, Nesting IF. ELSE Statement, ELSE IF Ladder, Switch Statement, Operator, GOTO Statement. Decision Making and Looping: The WHILE Statement, The DO Statement, The FOR Statement, Jumps in LOOPS. Arrays, Character Arrays and Strings.

UNIT- III

User-defined Functions: Need, Elements & Definition, Function Calls, Function Definition, Category of Functions, Recursion. Structures and Unions: Defining, Declaring, Accessing, Initialization Structure, Arrays of Structures, Arrays within Structures, Structures and Functions, Unions.

UNIT- IV

Pointers: Accessing the Address of a Variable, Declaring Pointer Variables, Initializations of Pointer Variable, Accessing a Variable through its Pointer, Chain of Pointers, Pointer Expressions, Pointer Increments and Scale Factor, Pointers and Arrays,, Pointers and Character Strings, Array of Pointers, Pointers as Function Arguments, Functions Returning Pointers, Pointers to Functions, Pointers to Structures, Troubles with Pointers.

UNIT- V

File Management in C: Defining and Opening a File, Closing a File, Input/ Output Operations on Files, Error Handling During I/O Operations, Random Access to Files, Command Line Arguments, Dynamic Memory Allocation.

Recommended Books:

1. E. Balaguruswamy, Programming in ANSI C,4/e, (TMH).
2. Paul Deitel, Harvey Deitel, C: How to Program, 8/e, Prentice Hall.
3. J. R. Hanly, Problem Solving & Program Design in C, 7/e, Pearson.
4. B. Kernighan & D.M. Ritchie, The C Programming Language, 2/e PHI.

C: 2-COMPUTER ORGANIZATION

(Credit:6, Theory:4, Practical: 2)

UNIT-I

Character Codes, Decimal System, Binary System, Decimal to Binary Conversion, Hexadecimal Notation, Boolean Algebra, Basic Logic Functions: Electronic Logic Gates, Synthesis of Logic Functions, Minimization of Logic Expressions, Minimization using Karnaugh Maps, Synthesis with NAND and NOR Gates.

UNIT-II

Flip-Flops, Gated Latches, Master-Slave Flip-Flops, Edge-Triggering, T Flip-Flops, JK Flip-Flops. Registers and Shift Registers, Counters, Decoders, Multiplexers, Programmable Logic Devices (PLDs), Programmable Array Logic (PAL), Complex Programmable Logic Devices (CPLDs), Field-Programmable Gate Array (FPGA), Sequential Circuits, Timing Diagrams, The Finite State Machine Model, Synthesis of Finite State Machines.

UNIT-III

Basic Structure of Computers: Computer Types, Functional Units, Input Unit, Memory Unit, Arithmetic and Logic Unit, Output Unit, Control Unit, Basic Operational Concepts, Bus Structures, Software. Machine Instructions and Programs: Numbers, Arithmetic Operations, and Characters: Number Representation, Addition of Positive Numbers, Addition and Subtraction of Signed Numbers, Overflow of Integer Arithmetic, Characters, Memory Locations and Addresses, Byte Addressability, Word Alignment, Accessing Numbers, Characters, and Character Strings, Memory Operations, Instructions and Instruction Sequencing, Register Transfer Notation, Basic Instruction Types, Instruction Execution and Straight-Line Sequencing, Branching, Condition Codes, Generating Memory Addresses, Addressing Modes, Implementation of Variables and Constants, Indirection and Pointers, Indexing and Arrays, Relative Addressing.

UNIT-IV

THE ARM EXAMPLE: Registers, Memory Access, and Data Transfer, Register Structure, Memory Access Instructions and Addressing Modes, Register Move Instructions, Arithmetic and Logic Instructions: Arithmetic Instructions, Logic Instructions, Branch Instructions, Setting Condition Codes, Assembly Language, Pseudo-Instructions, I/O Operations, Subroutines, Vector Dot Product Program, Byte-Sorting Program, Linked-List Insertion and Deletion Subroutines. Basic Input-Output Operations, Stacks and Queues, Subroutines. PowerPC Example: Basic PowerPC Processor Organization, Load and Store Instructions, Arithmetic and Logic Instructions, Flow Control Instructions, Compare Instructions, Logic Instructions, Subroutines.

UNIT-V

Memory System: Semiconductor RAM Memories, Internal Organization of Memory Chips, Static Memories, Asynchronous DRAMS, Synchronous DRAMS, Structure of Large Memories, Memory System Considerations, RAMBUS Memory. Read-Only Memories: ROM, PROM, EPROM, EEPROM, Flash Memory, Speed, Size, and Cost of Memory. Secondary Storage: Magnetic Hard Disks, Optical Disks, Magnetic Tape Systems.

Recommended Books:

1. Carl Hamacher, Z. Vranesic, S. Zaky: Computer Organization, 5/e (TMH)
2. William Stallings: Computer Organization and Architecture (Design for Performance), 9/e
3. S. Brown, & Z. Vranesic, Fundamentals of Digital Logic Design with VHDL, 2/e, McGraw-Hill
4. J. P. Uyemura, A First Course in Digital System Design, An Integrated Approach, Cengage Learning.

GE:1-PROBABILITY AND STATISTICS

Credits;4

UNIT-I

Probability and Probability Distribution: Events and the Sample Space, Calculating Probabilities using Simple events, Useful counting rules, Probability rules: Addition rule, Conditional probability and multiplication rule, Bayes rule.

UNIT-II

Probability Distributions: Random Variable, Discrete random variable, Mean and Standard deviation of discrete random variable, Discrete Probability Distributions: Binomial, Poisson and Hypergeometric probability distribution, Continuous Probability distribution: Normal distribution.

UNIT-III

Sampling Distribution: sampling plans and experimental designs, Sampling distribution of a statistic, Central Limit theorem, Sampling distribution of the Sample mean and Proportion. Large Sample Estimation: Point estimation, Interval estimation, Confidence interval of population mean, Population proportion, difference between two population means, difference between two population proportions.

UNIT-IV

Large Sample Tests of Hypothesis: Test of a Population mean, Test of difference of two population means, Test of hypothesis for a binomial proportion, Test of hypothesis for the difference between two binomial proportions. Inference from Small Samples: Students t Distribution, Small Sample inferences concerning a population mean and difference between two population means, Inferences concerning a population variance and difference between two population variances.

UNIT-V

Analysis of Variance: One-way classification, Two-way classification. Linear regression and Correlation: Method of least squares, Analysis of variance for linear regression, Testing the usefulness of the linear regression model, Estimation and Prediction using the fitted line. Carl Pearsons coefficient of Correlation, Test of hypothesis concerning the Correlation coefficient.

Recommended Books: 1. William Mendenhall, Robert J. Beaver, Barbara M. Beaver, Probability and Statistics 14/e, CENGAGE Learning. 2. W. W. Hines, D.C. Montgomery, D.M. Goldsman, & C.M. Borror, Probability & Statistics in Engineering”.

C: 3-PROGRAMMING USING C++

(Credit:6, Theory:4, Practical: 2)

UNIT-I

Principles of Object-Oriented Programming: Object-Oriented Programming (OOP) Paradigm, Basic Concepts of OOP, Benefits of OOP, Object Oriented Languages, Applications of OOP. Beginning with C++: Applications of C++, C++ statements, Example with Class, Structure of C++ Program, Creating the Source File, Compiling and Linking. Tokens, Expressions and Control Structures: Tokens, Keywords, Identifiers & Constants, Basic Data Types, User-Defined Data Types, Derived Data Types, Symbolic Constants, Type Compatibility, Declaration of Variables, Dynamic Initialization of Variables, Reference Variables, Operators in C++, Scope Resolution Operator, Member Deferencing Operators, Memory Management Operators, Manipulators, Type Cast Operators, Expressions and

their Types, Special Assignment Expressions, Implicit Conversions, Operator Overloading, Operator Precedence, Control Structures.

UNIT- II

Functions in C++: The Main Function, Function Prototyping, Call By Reference, Return by Reference, Inline Functions, Default Arguments, Const. Arguments, Function Overloading, Friend & Virtual Functions, Math. Library Functions. **Classes and Objects**: Specifying a Class, Defining Member Functions, Making an outside Function Inline, Nested Member Functions, Private Member Functions, Arrays within a Class, Memory Allocation for Objects, Static Data Members, Static Member Functions, Arrays of Objects, Objects as Function Arguments, Friendly Functions, Returning Objects, Const. Member Functions, Pointer to Members, Local Classes.

UNIT- III

Constructors & Destructors: Constructors, Parameterized Constructors, Multiple Constructors in a Class, Constructors with Default Arguments, Dynamic Initialization of Objects, Copy Constructor, Dynamic Constructors, Constructing Two-Dimensional Arrays, Const. Objects, Destructors. **Operator Overloading and Type Conversions**: Defining Operator Overloading, Overloading Unary Operators, Overloading Binary Operators, Overloading Binary Operators using Friends, Manipulation of Strings using Operators, Rules for Overloading Operators, Type Conversions.

UNIT- IV

Inheritance : Defining Derived Classes, Single Inheritance, Making a Private Member Inheritance, Multilevel Inheritance, Multiple Inheritance, Hierarchical Inheritance, Hybrid Inheritance, Virtual Base Classes, Abstract Classes, Constructors in Derived Classes, Member Classes, Nesting of Classes. Pointers, Virtual Functions and Polymorphism: Pointers, Pointers to Objects, this Pointer, Pointers to Derived Classes, Virtual Functions, Pure Virtual Functions.

UNIT- V

Managing Console I/O Operations: **C++ Streams**, C++ Stream Classes, Unformatted I/O Operations, Formatted Console I/O Operations, Managing Output with Manipulators. **Files**: Classes for File Stream Operations, Opening and Closing a File, Detecting end-of-file, File Modes, File Pointers and their Manipulations, Sequential Input and Output Operations, Updating a File: Random Access, Error Handling During File Operations, Command-line Arguments.

Recommended Books:

1. E. Balgurusamy, Object Oriented Programming with C++ :, 4/e (TMH).
2. Paul Deitel, Harvey Deitel, "C++: How to Program",9/e. Prentice Hall.
3. J. Farrell, Object-Oriented Programming, Cengage Learning.
4. Bjarne Stroustrup, "Programming – Principles and Practice using C++", 2/e, Addison-Wesley 2014.

C: 4-DATA STRUCTURES (Credit:6, Theory:4, Practical: 2)

UNIT-I

Introduction and Overview: Definitions, Concept of Data Structures, Overview of Data Structures, Implementation of Data Structures. Arrays: Terminology, One-Dimensional Array, Multi-Dimensional Arrays, Pointer Arrays.

UNIT-II

Linked Lists: Single Linked List, Circular Linked List, Double Linked List, Circular Double Linked List, Application of Linked Lists, Memory Representation, Boundary Tag System, De-allocation Strategy, Buddy System, Compaction.

UNIT-III

Stacks: Definition, Representation of Stack (Array, Linked List), Operations on Stacks, Applications of Stack (Evaluation of Arithmetic Expressions, Code Generation, Implementation of Recursion, Factorial Calculation, Quick Sort, Tower of Hanoi, Activation Record Management).

UNITIV

Queues: Definition, Representation of Queues (Array, Linked List), Circular Queue, Deque, Priority Queue, Application of Queues (Simulation, CPU Scheduling in Multiprogramming Environment, Round Robin Algorithm).

UNITV

Tree: Binary Trees, Properties of Binary Tree, Linear Representation of Binary a Binary Tree, Linked Representation of a Binary Tree, Physical Implementation of Binary Tree in Memory, Operations on Binary Tree (Insertion, Deletion, Traversal, Merging of two Binary Trees), Types of Binary Trees (Expression Tree, Binary Search Tree, Heap Tree, Threaded Binary Trees, Height Balanced Binary Tree, Weighted Binary Tree, Decision Trees).

Recommended Books:

1. D. Samanta, Classic Data Structures:, 2/e (PHI).
2. D.S Malik, Data Structure using C++, 2/e, Cengage Learning, 2010.
3. Adam Drozdek, "Data Structures and algorithm in C++", 3/e, Cengage Learning, 2012.
4. Robert L. Kruse, "Data Structures and Program Design in C++", Pearson.

GE: 2-NUMERICAL TECHNIQUES

Credits;4

UNIT-I

Introduction: Numbers and their accuracy, Chopping and Rounding off, Errors: Absolute and Relative errors, Floating point representations of numbers, Loss of significance. Solution of Algebraic and Transcendental Equations: Bisection Method, Newton-Raphson Method, Secant Method, Method of false position, Rate of convergence and comparison of iterative methods.

UNIT-II

Interpolation and Numerical Differentiation: Polynomial Interpolation, Interpolating polynomial: Lagrange form, Newton form, Nested form, Divided difference Interpolation, Inverse Interpolation, Errors in polynomial Interpolation. First derivative and second derivative via Taylor Series, Richardson Extrapolation.

UNIT-III

Numerical Integration: Trapezoidal Rule, Composite Trapezoidal rule, Simpsons 1/3 rule, Simpsons 3/8 rule, Gaussian Quadrature formulae (1-point, 2-point, 3-point)

UNIT-IV

Solution of System of Linear Equations: Gaussian Elimination method and Pivoting, LU factorization method, ill Conditioning, Iterative Methods: Jacobi iterative method, Gauss Seidel iterative method. Eigen Values and Eigen Vectors: Eigen value properties, Computation Eigen values by Power method.

UNIT-V

Solution of Ordinary Differential Equations: Taylor Series method, Runge-Kutta method of order 2 and order 4, Predictor-Corrector method: Adams-Bashforth-Moulton method. Smoothing of Data and the Method of Least Squares: Linear and non-linear least square method.

Recommended Books:

1. E. Ward Cheney and David R. Kincaid, Numerical Methods and Applications CENGAGE Learning India Private Ltd., New Delhi.
2. S.R.K. Iyengar, R.K. Jain, & M.K. Jain, Numerical Methods for Scientific & Engineering Computation, 6/e, New Age Int. Pub.
3. S.S. Sastry, Introductory Methods of Numerical Analysis, 5/e, EEE
4. Steven C. Chapra, Applied Numerical Methods with MATLAB, 2/e, McGraw-Hill.

SEMESTER-III

C: 5-OPERATING SYSTEMS

(Credit:6, Theory:4, Practical: 2)

UNIT-I

Operating System, Computer-System Organization, Computer-System Architecture, Operating-System Structure, Operating-System Operations, Process Management, Memory Management, Storage Management, Protection and Security, Distributed Systems, Special Purpose Systems, Computing Environments, Open-Source Operating Systems. Operating System Services, User Operating System Interface, System Calls, Types of System Calls, System Programs, Operating-System Design and Implementation, Operating System Structure, Virtual Machines, Operating System Debugging, Operating System Generations. System Boot.

UNIT-II

Process: Process Concept, Process Scheduling, Operations on Processes, Inter-Process Communication, Examples of IPC Systems, Communication in Client-Server Systems. Multithreaded Programming: Multithreading Models, Thread Libraries, Threading Issues, Operating-System Examples.

UNIT-III

Process Scheduling: Basic Concepts, Scheduling Criteria, Scheduling Algorithms, Thread Scheduling. Multiple Process Scheduling. Synchronization: The Critical Section Problem, Peterson's Solution, Synchronization Hardware, Semaphores, Classical Problems of Synchronization, Monitors, Synchronization Examples, Atomic Transactions.

UNIT-IV

Deadlocks: System Model, Deadlock Characterization, Methods of Handling Deadlocks, Deadlock Prevention, Deadlock avoidance, Deadlock Detection, Recovery from Deadlock. Memory Management Strategies: Swapping, Contiguous Memory Allocation, Paging, Structure of the Page Table, Segmentation, Example: The Intel Pentium.

UNIT-V

Virtual-Memory Management: Demand Paging, Copy-on-Write, Page Replacement, Allocation of Frames, Thrashing, Memory-Mapped Files, Allocating Kernel Memory. File System: File Concept, Access Methods, Directory and Disk Structure, File-System Mounting, File Sharing, Protection.

Recommended Books:

1. A Silberschatz, P.B. Galvin, G. Gagne, Operating Systems Concepts, 8/e, John Wiley Publications 2008.
2. A.S. Tanenbaum, Modern Operating Systems, 3/e, Pearson Education 2007.
3. W. Stallings, Operating Systems, Internals & Design Principles, 5/e, Prentice Hall of India. 2008.
4. G. Nutt, Operating Systems: A Modern Perspective, 2/e, Pearson Education 1997.

C: 6-DATABASE MANAGEMENT SYSTEM**(Credit:6, Theory:4, Practical: 2)****UNIT-I**

Databases and Database Users, Database System Concepts and Architecture, Data Modelling using the Entity-Relationship (ER) Model, The Enhanced Entity-Relationship (EER) Model.

UNIT-II

Relational Model: The Relational Data Model and Relational Database Constraints, The Relational Algebra and Relational Calculus.

UNIT-III

Relational Database Design by ER- and EER-to-Relational Mapping, SQL-99: Schema Definition, Constraints, Queries, and Views, Introduction to SQL Programming Techniques.

UNIT-IV

Functional Dependencies and Normalization for Relational Databases, Relational Database Algorithms and Further Dependencies, Practical Database Design Methodology and use of UML Diagrams.

UNIT-V

Disk Storage, Basic File Structures, and Hashing, Indexing Structures for Files, Algorithms for Query Processing and Optimization, Physical Database Design and Tuning.

Recommended Books:

1. R. Elmasri, S.B. Navathe, Fundamentals of Database Systems, 6/e, Pearson Education, 2010.
2. A. Silberschatz, H.F. Korth, S. Sudarshan, Database System Concepts 6/e, McGraw Hill, 2010.
3. R. Ramakrishanan, J. Gehrke, Database Management Systems, McGraw-Hill.
4. C. Coronel, S. Morris, & P. Rob, Database Principles (Fundamentals of Design, Implementation, and Management), 9/e, Cengage Learning.

C: 7-DISCRETE STRUCTURES**(Credit:6, Theory:4, Practical: 2)**

UNIT-I Logic and Proofs: Propositional Logic, Propositional Equivalences, Predicates and Quantifiers, Nested Quantifiers, Rules of Inference, Introduction to Proofs, Normal Forms, Proof Methods and Strategy, Mathematical Induction, Strong Induction and Well-Ordering, Recursive Definitions and Structural Induction, Recursive Algorithms.

UNIT-II

Basic Structures: Sets, Set Operations, Functions, Recursive Functions, Sequences and Summations. **Relations:** Relations and their Properties, n-ary Relations and their Applications, Representing Relations, Closures of Relations, Equivalence Relations, Partial Ordering. Boolean.

UNIT-III

Algebra: Boolean Functions, Representing Boolean Functions, Logic Gates, Minimization of Circuits. Algebraic Structures & Coding Theory: The Structure of Algebras, Semi-groups, Monoids and Groups, Homomorphism, Normal Subgroups, and Congruence Relations, Rings, Integral Domains and Fields, Quotient and Product Algebras, Coding Theory. Polynomial Rings and Polynomial Codes.

UNIT-IV

Counting: Basics of Counting, The Pigeonhole Principle, Permutations and Combinations, Binomial Coefficients, Generalized Permutations and Combinations, Generating Permutations and Combinations. Advanced Counting Techniques, Applications of Inclusion-Exclusion, Discrete probability, Conditional probability, Bayes Theorem.

UNIT-V

Graphs: Graphs and Graph Models, Graph Terminology and Special Types of Graphs, Havel-Hakimi Theorem, Representing Graphs and Graph Isomorphism, Connectivity, Cut-Sets, Euler and Hamiltonian Paths, Shortest-Path Problem, Planar Graphs, Graph Coloring, Network Flows.

Recommended Books:

1. Kenneth H Rosen, Discrete Mathematics & Its Applications, McGraw-Hill. 7/e.
2. J. L. Hein, Discrete Structures, Logic, and Computability, 3rd Edition, Jones and Bartlett Publishers, 2009
3. C.L. Liu, D.P. Mahopatra, Elements of Discrete mathematics, 2nd Edition, Tata McGraw Hill, 1985
4. M. O. Albertson and J. P. Hutchinson, Discrete Mathematics with Algorithms, John Wiley Publication, 1988

GE:3-ELECTRICITY & MAGNETISM

(Credit: 06, Theory:04, Practical:02)

UNIT-I

Electric Field and Electric Potential: Electric field: Electric field lines. Electric flux. Gauss Law with applications to charge distributions with spherical, cylindrical and planar symmetry. Conservative nature of Electrostatic Field. Electrostatic Potential. Laplace and Poisson, equations. The Uniqueness Theorem. Potential and Electric Field of a dipole. Force and Torque on a dipole.

UNIT-II

Electrostatic energy of system of charges. Electrostatic energy of a charged sphere. Conductors in an electrostatic Field. Surface charge and force on a conductor. Capacitance of a system of charged conductors. Parallel-plate capacitor. Capacitance of an isolated conductor. Method of Images and its application to: (1) Plane Infinite Sheet, and (2) Sphere.

UNIT-III

Dielectric Properties of Matter: Electric Field in matter. Polarization, Polarization Charges. Electrical Susceptibility and Dielectric Constant. Capacitor (parallel plate, spherical, cylindrical) filled with dielectric. Displacement vector D. Relations between E, P and D. Gauss Law in dielectrics.

UNIT-IV

Magnetic Field: Magnetic force between current elements and definition of Magnetic Field B. Biot-Savarts Law and its simple applications: straight wire and circular loop. Current Loop as a Magnetic

Dipole and its Dipole Moment (Analogy with Electric Dipole). Amperes Circuital Law and its application to (1) Solenoid and (2) Toroid. Properties of B: curl and divergence. Vector Potential. Magnetic Force on (1) point charge (2) current carrying wire (3) between current elements. Torque on a current loop in a uniform Magnetic Field.

UNIT-V

Magnetic Properties of Matter: Magnetization vector (M). Magnetic Intensity(H). Magnetic Susceptibility and permeability. Relation between B, H, M. Ferromagnetism. B-H curve and hysteresis. Electromagnetic Induction: Faradays Law. Lenzs Law. Self Inductance and Mutual Inductance. Reciprocity Theorem. Energy stored in a Magnetic Field. Introduction to Maxwells Equations. Charge Conservation and Displacement current. Electrical Circuits: AC Circuits: Kirchhoffs laws for AC circuits. Complex Reactance and Impedance. Series LCR Circuit: (1) Resonance, (2) Power Dissipation and (3) Quality Factor, and (4) Band Width. Parallel LCR Circuit. Network theorems: Ideal Constant-voltage and Constant-current Sources. Network Theorems: Thevenin theorem, Norton theorem, Superposition theorem, Reciprocity theorem, Maximum Power Transfer theorem. Applications to dc circuits.

Recommended Books:

1. S. Mahajan & Choudhury, Electricity, Magnetism & Electromagnetic Theory, 2012, Tata McGraw Hill
2. Edward M. Purcell, Electricity and Magnetism, 1986 McGraw-Hill Education
3. M.N.O. Sadiku, Elements of Electromagnetics, 2010, Oxford University Press.
4. J.H.Fewkes & J.Yarwood , Electricity and Magnetism,. Vol. I, 1991, Oxford Univ. Press

SEMESTER-IV

C: 8-JAVA PROGRAMMING

(Credit:6, Theory:4, Practical: 2)

UNIT-I

Introduction to Java: Java Architecture and Features, Understanding the semantic and syntax differences between C++ and Java, Compiling and Executing a Java Program, Variables, Constants, Keywords **Data Types**, Operators (Arithmetic, Logical and Bitwise) and Expressions, Comments, Doing Basic Program Output, Decision Making Constructs (conditional statements and loops)and Nesting, Java Methods (Defining, Scope, Passing and Returning Arguments, Type Conversion and Type and Checking, Built-in Java Class Methods).

UNIT-II

Arrays, Strings and I/O: Creating & Using Arrays (One Dimension and Multi-dimensional), Referencing Arrays Dynamically, Java Strings: The Java String class, Creating & Using String Objects, Manipulating Strings, String Immutability & Equality, Passing Strings To & From Methods, String Buffer Classes. Simple I/O using System.out and the Scanner class, Byte and Character streams, Reading/Writing from console and files. Object-Oriented Programming Overview: Principles of Object-Oriented Programming, Defining & Using Classes, Controlling Access to Class Members, Class Constructors, Method Overloading, Class Variables & Methods, Objects as parameters, final classes, Object class, Garbage Collection.

UNIT-III

Inheritance, Interfaces, Packages, Enumerations, Autoboxing and Metadata: Inheritance: (Single Level and Multilevel, Method Overriding, Dynamic Method Dispatch, Abstract Classes), Interfaces and Packages, Extending interfaces and packages, Package and Class Visibility, Using Standard Java Packages (util, lang, io, net), **Wrapper Classes**, Autoboxing/Unboxing, Enumerations and Metadata.

UNIT-IV

Exception Handling, Threading, Networking and Database Connectivity: Exception types, uncaught exceptions, throw, built-in exceptions, Creating your own exceptions; Multi-threading: The Thread class and Runnable interface, creating single and multiple threads, Thread prioritization, synchronization and communication, suspending/resuming threads. Using java.net package, Overview of TCP/IP and Datagram programming. Accessing and manipulating databases using JDBC.

UNIT-V

Applets and Event Handling: Java Applets: Introduction to Applets, Writing Java Applets, Working with Graphics, Incorporating Images & Sounds. Event Handling Mechanisms, Listener Interfaces, Adapter and Inner Classes. The design and Implementation of GUIs using the AWT controls, Swing components of Java Foundation Classes such as labels, buttons, text fields, layout managers, menus, events and listeners; Graphic objects for drawing figures such as lines, rectangles, ovals, using different fonts. Overview of servlets.

Recommended Books:

1. E. Balagurusamy, Programming with Java, 4/e, TMH
2. Bruce Eckel, "Thinking Java", 8/e, Pearson India, 2010.
3. John R. Hubbard, "Programming with JAVA", Schaum's Series, 2/e, 2004.
4. Cay S. Horstmann, Gary Cornell, "Core Java 2 Volume 1", 9/e, Printice Hall, 2012.

C: 9-COMPUTER NETWORK (Credit:6, Theory:4, Practical: 2)

UNIT-I

Introduction: Data Communications, Networks, The Internet, Protocols and Standards. Network Models: Layered Tasks, The OSI Model, **Layers in the OSI Model**, **TCP/ IP Protocol Suite**, **Ad- dressing**.

UNIT-II

Data and Signals: Analog and Digital, Periodic Analog Signals, Digital Signals, Transmission Impairment, Data Rate Limits, Performance. **Digital Transmission: Digital-To-Digital Conversion, Analog-To-Digital Conversion, Transmission Modes. Analog Transmission: Digital-To-Analog Conversion, Analog-To-Analog Conversion.**

UNIT-III

Multiplexing and Spreading: Multiplexing, Spread Spectrum. **Transmission Media: Guided Media, Unguided Media (Wireless).** Switching: Circuit Switched, Datagrams, Virtual Circuit Networks, Structure of a Switch. Telephone Network, Dial-Up MODEMS, Digital Subscriber Line (DSL), Cable TV Networks, Cable TV for Data Transfer.

UNIT-IV

Error Detection and Correction: Introduction, Block Coding, Linear Block Codes, Cyclic Codes,

Checksum. Data Link Control: Framing, Flow and Error Control, Protocols, Noiseless Channels, Noisy Channels, HDLC, Point-To-Point Protocol. Multiple Access: Random Access, Controlled Access, Channelization. Wired LANs: IEEE Standards, Standard Ethernet, Changes in the Standard, Fast Ethernet, Gigabit Ethernet: Wireless LANs: IEEE 802.11, Bluetooth.

UNIT-V

Connecting LANs: Connecting Devices, Backbone Networks, Virtual LANs. Wireless LANs: Cellular Telephony, Satellite Networks. SONET: Architecture, SONET Layers, SONET Frames, STS Multiplexing, SONET Networks, Virtual Tributaries. Virtual-Circuit Networks. Frame Relay, ATM, ATM LANs,

Recommended Books:

1. B. A. Forouzan, Data Communications and Networking, 4/e, THM, 2007
2. A. S. Tanenbaum, & David J. Wetherall, Computer Networks, 5/e, Pearson

C: 10-COMPUTER GRAPHICS

(Credit:6, Theory:4, Practical: 2)

UNIT-I

Computer Graphics: A Survey of Computer graphics, Overview of Graphics System: Video Display Devices, Raster-Scan Systems, Input Devices, Hard-Copy Devices, Graphics Software, Introduction to OpenGL. Graphics Output Primitives: Point and Lines, Algorithms for line, circle & ellipse generation, Filled-Area Primitives. Attributes of Graphics Primitives: Point, line, curve attributes, fill area attributes, fill methods for areas with irregular boundaries, Antialiasing.

UNIT-II

Geometric Transformations (both 2-D & 3-D): Basic Geometric Transformations, Matrix Representation and Homogeneous Coordinates, Composite Transformations, Inverse Transformations, Other Transformations (Reflection, shear), Transformation between coordinate systems, Affine Transformations. Two Dimensional Viewing: Viewing pipeline, Clipping Window, Normalization & Viewport coordinate Transformations, Clipping Algorithms: Point clipping, Line clipping and Polygon clipping. Three Dimensional Viewing: 3-dimensional Viewing Concepts, Viewing pipeline, Projection Transformations (Orthogonal, Oblique parallel, Perspective), Clipping Algorithms.

UNIT-III

Three Dimensional Object Representations: Curved Surfaces, Quadratic Surfaces, Spline Representations, Bezier Spline Curves and Surfaces, B-Spline Curves and Surfaces, Octrees, BSP Trees, Fractal Geometry Methods, Gamma correction.

UNIT-IV

Visible Surface Detection Methods: Classification of Visible-Surface Detection Algorithms, Back-Face Detection, Depth-Buffer method, A-Buffer Method, Scan line and Depth Sorting, Area subdivision Method, Ray Casting Method.

UNIT-V

Illumination Models: Basic Illumination Models, Displaying light Intensities, Halftone Patterns and Dithering techniques, Polygon-Rendering Methods (Gouraud Shading, Phong Shading), Ray-Tracing Methods (Basic Ray-Tracing Algorithm, Ray-Surface Intersection Calculations). Computer Animation, Hierarchical Modeling (introductory idea only).

Recommended Books:

1. Donald Hearn & M. Pauline Baker, Computer Graphics with OpenGL, Pearson Education.
2. A.V. Dan, F.H. Jones, J.D. Foley, S.K. Feiner, Computer Graphics Principles & Practices in C, 2/e, Pearson.
3. D. F. Rogers, Procedural Elements for Computer Graphics, McGraw Hill.
4. D. F. Rogers, & J. A. Adams, Mathematical Elements for Computer Graphics, 2/e, McGraw Hill.

SEC: II-ANDROID PROGRAMMING**(Credit:02)****UNIT-I**

Introduction: History of Android, Introduction to Android Operating Systems, Android Development Tools, Android Architecture. Overview of object oriented programming using Java: OOPs Concepts: Inheritance, Polymorphism, Interfaces, Abstract class, Threads, Overloading and Overriding, Java Virtual Machine.

UNIT-II

Development Tools: Installing and using Eclipse with ADT plug-in, Installing Virtual machine for Android sandwich/Jelly bean (Emulator), configuring the installed tools, creating a androidproject , Hello Word, run on emulator, Deploy it on USB-connected Android device.

UNIT-III

User Interface Architecture: Application context, intents, Activity life cycle, multiple screen sizes.

UNIT-IV

User Interface Design: Form widgets, Text Fields, Layouts, Button control, toggle buttons, Spinners (Combo boxes), Images, Menu, Dialog.

UNIT-V

Database: Understanding of SQLite database, connecting with the database.

Recommended Books:

1. James C. Sheusi, Android application Development for Java Programmers, Cengage Learning, 2013.
2. M. Burton, & D. Felker, Android Application Development for Dummies, 2/e, Wiley India.

GE:IV-ELECTRONICS**(Credit: 06, Theory:04, Practical:02)****UNIT-I**

Semiconductor Diodes: P and N type semiconductors. Energy Level Diagram. Conductivity and Mobility, Concept of Drift velocity. PN Junction Fabrication (Simple Idea). Barrier Formation in PN Junction Diode. Static and Dynamic Resistance. Current. Flow Mechanism in Forward and Reverse Biased Diode. Drift Velocity. Derivation for Barrier Potential, Barrier Width and Current for Step Junction. Current Flow Mechanism in Forward and Reverse Biased Diode.

UNIT-II

Two-terminal Devices and their Applications: (1) Rectifier Diode: Half-wave Rectifiers. Centre-tapped and Bridge Full-wave Rectifiers, Calculation of Ripple Factor and Rectification Efficiency, C-filter (2) Zener Diode and Voltage Regulation. Principle and structure of (1) LEDs, (2) Photodiode

and (3) Solar Cell. Bipolar Junction Transistors: n-p-n and p-n-p Transistors. Characteristics of CB, CE and CC Configurations. Current gains α and β Relations between α and β . Load Line analysis of Transistors. DC Load line and Q-point. Physical Mechanism of Current Flow. Active, Cutoff and Saturation Regions.

UNIT-III

Amplifiers: Transistor Biasing and Stabilization Circuits. Fixed Bias and Voltage Divider Bias. Transistor as 2-port Network. h-parameter Equivalent Circuit. Analysis of a single-stage CE amplifier using Hybrid Model. Input and Output Impedance. Current, Voltage and Power Gains. Classification of Class A, B & C Amplifiers.

UNIT-IV

Coupled Amplifier: Two stage RC-coupled amplifier and its frequency response. Feedback in Amplifiers: Effects of Positive and Negative Feedback on Input Impedance, Output Impedance, Gain, Stability, Distortion and Noise. Sinusoidal Oscillators: Barkhausen's Criterion for self-sustained oscillations. RC Phase shift oscillator, determination of Frequency. Hartley & Colpitts oscillators. Operational Amplifiers (Black Box approach): Characteristics of an Ideal and Practical Op-Amp. (IC 741) Open-loop and Closed-loop Gain. Frequency Response. CMRR. Slew Rate and concept of Virtual ground.

UNIT-V

Applications of Op-Amps: (1) Inverting and non-inverting amplifiers, (2) Adder, (3) Subtractor, (4) Differentiator, (5) Integrator, (6) Log amplifier, (7) Zero crossing detector (8) Wein bridge oscillator. Conversion: Resistive network (Weighted and R-2R Ladder). Accuracy and Resolution. A/D Conversion (successive approximation)

Recommended Books:

1. J. Millman and C.C. Halkias, Integrated Electronics, 1991, Tata Mc-GrawHill.
2. J.D. Ryder, Electronics: Fundamentals and Applications, 2004, Prentice Hall.
3. B. G. Streetman & S. K. Banerjee, Solid State Electronic Devices, 6/e, 2009, PHI Learning.
4. S. Salivahanan & N. S. Kumar, Electronic Devices & Circuits, 3/e, 2012, Tata Mc-GrawHill.
5. R. A. Gayakwad, OP-Amps and Linear Integrated Circuit, 4/e, 2000, Prentice Hall.

SEMESTER-V

C: 11-INTERNET TECHNOLOGY

(Credit: 06, Theory:04, Practical:02)

UNIT-I

Java: Use of Objects, Array and Array List class

UNIT-II

JavaScript: Data types, operators, functions, control structures, events and event handling.

UNIT-III

JDBC: JDBC Fundamentals, Establishing Connectivity and working with connection interface, Working with statements, Creating and Executing SQL Statements, Working with Result Set Objects. **UNIT-IV**

JSP: Introduction to Java Server Pages, HTTP and Servlet Basics, The Problem with Servlets, The

Anatomy of a JSP Page, JSP Processing, JSP Application Design with MVC, Setting Up the JSP Environment, Implicit JSP Objects, Conditional Processing, Displaying Values, Using an expression to Set an Attribute, Declaring Variables and Methods, Error Handling and Debugging, Sharing Data Between JSP Pages, Requests, and Users, Database Access.

UNIT-V

Java Beans: Java Beans Fundamentals, JAR files, Introspection, Developing a simple Bean, Connecting to DB

Recommended Books:

1. Ivan Bayross, Web Enabled Commercial Application Development Using HTML, DHTML, Javascript, Perl CGI , BPB Publications, 2009.
2. Cay Horstmann, BIG Java, Wiley Publication , 3/e, 2009.
3. Herbert Schildt , Java 7, The Complete Reference, , 8/e, 2009.
4. Jim Keogh ,The Complete Reference J2EE, TMH, , 2002.

C: 12-SOFTWARE ENGINEERING

(Credit: 06, Theory:04, Practical:02)

UNIT-I

Professional Software Development, Software Engineering Ethics, Software Processes, Software Process Models, Process Activities, Coping with Change, The Rational Unified Process, Agile Software Development, Agile Methods, Plan-Driven and Agile Development, Extreme Programming, Agile Project Management, Scaling Agile Methods.

UNIT-II

Requirements Engineering, Functional and Non-Functional Requirements, The Software Requirements Document, Requirements Specification, Requirements Engineering Processes, Requirements Elicitation and Analysis, Requirements Validation, Requirements Management, System Modelling, Context Models, Interaction Models, Structural Models, Behavioural Models, Model-Driven, Engineering, Architectural Design, Architectural Design Decisions, Architectural Views, Architectural Patterns, Application Architectures.

UNIT-III

Design and Implementation: Object-Oriented Design using the UML, Design Patterns, Implementation Issues, Open Source Development, Software Testing: Development Testing, Test-Driven Development, Release Testing, User Testing, Software Evolution: Evolution Processes, Program Evolution Dynamics, Software Maintenance, Legacy System Management, Dependability and Security.

UNIT-IV

Socio-technical Systems: Complex Systems, Systems Engineering, System Procurement, System Development, System Operation. Dependability and Security: Dependability Properties, Availability and Reliability, Safety, Security. Dependability and Security Specification: Risk-Driven Requirements, Specification, Safety Specification, Reliability Specification, Security, Specification, Formal Specification.

UNIT-V

Dependability Engineering: Redundancy and Diversity, Dependable Processes, Dependable Systems Architectures, Dependable Programming. Security Engineering: Security Risk Management, Design

for Security, System Survivability. Dependability and Security Assurance: Static Analysis, Reliability Testing, Security Testing, Process Assurance, Safety and Dependability Cases.

Recommended Books:

1. I. Sommerville, Software Engineering, 9/e, Addison Wesley.
2. R. Mall, Fundamentals of Software Engineering, 3/e, PHI.
3. R.S. Pressman, Software Engineering, A Practitioners Approach, 7/e, McGraw-Hill, 2009.
4. K.K. Aggarwal and Y. Singh, Software Engineering, 2/e, New Age International Publishers, 2008.

**DSE:1-Information Security (Credit: 06,
Theory:04, Practical:02)**

UNIT-I

Introduction: Security, Attacks, Computer Criminals, Security Services, Security Mechanisms. Cryptography: Substitution ciphers, Transpositions Cipher, Confusion, diffusion, Symmetric, Asymmetric Encryption. DES Modes of DES, Uses of Encryption, Hash function, key exchange, Digital Signatures, Digital Certificates.

UNIT-II

Program Security: Secure programs, Non malicious Program errors, Malicious codes virus, Trap doors, Salami attacks, Covert channels, Control against program.

UNIT-III

Threats: Protection in OS: Memory and Address Protection, Access control, File Protection, User Authentication. Database Security: Requirements, Reliability, Integrity, Sensitive data, Inference, Multilevel Security.

UNIT-IV

Security in Networks: Threats in Networks, Security Controls, firewalls, Intrusion detection systems, Secure e-mails.

UNIT-V

Administrating Security: Security Planning, Risk Analysis, Organisational Security Policy, Physical Security. Ethical issues in Security: Protecting Programs and data. Information and law.

Recommended Books:

1. C. P. Pfleeger, S. L. Pfleeger; Security in Computing, PHI, 2006.
2. W. Stallings; Network Security Essentials: Applications and Standards, 4/E, 2010.

**DSE: 2-MICROPROCESSOR
(Credit: 06, Theory:04, Practical:02)**

UNIT-I

An Introduction to Processor Design: Processor architecture and organization, Abstraction in hardware design, MUO - a simple processor, Instruction set design, Processor design trade-offs, The Reduced Instruction Set Computer, Design for low power consumption. The ARM Architecture: The Acorn RISC Machine, Architectural inheritance, The ARM programmer's model, ARM development tools.

UNIT-II ARM Assembly Language Programming: Data processing instructions, Data transfer instructions, Control flow instructions, Writing simple assembly language programs. ARM Organization and Implementation: Pipeline, Types, 3-stage pipeline ARM organization, 5-stage pipeline

ARM organization, ARM instruction execution, ARM implementation, The ARM coprocessor interface.

UNIT-IIIThe ARM Instruction Set: Introduction, Exceptions, Conditional execution, Branch and Branch with Link (B, BL), Branch, Branch with Link and exchange (BX, BLX), Software Interrupt (SWI), Data processing instructions, Multiply instructions, Single word and unsigned byte data transfer instructions, Half-word and signed byte data transfer instructions, Multiple register transfer instructions, Status register to general register transfer instructions, General register to status register transfer instructions, Coprocessor instructions. Coprocessor data operations, Coprocessor data transfers, Coprocessor register transfers, Breakpoint instruction (BRK - architecture v5T only), Unused instruction space, Memory faults, ARM architecture variants.

UNIT-IV

Architectural Support for High-Level Languages: Abstraction in software design, Data types, Floating-point data types, The ARM floating-point architecture, Expressions, Conditional statements, Loops, Functions and procedures, Use of memory, Run-time environment, Examples and exercises.

UNIT-V

Thumb Instruction Set: The Thumb bit in the CPSR, The Thumb programmer's model, Thumb branch instructions, Thumb software interrupt instruction, Thumb data processing instructions, Thumb single register data transfer instructions, Thumb multiple register data transfer instructions, Thumb breakpoint instruction, Thumb implementation, Thumb applications. Architectural Support for System Development: The ARM memory interface, The Advanced Microcontroller Bus Architecture (AMBA), The ARM reference peripheral specification, Hardware system prototyping tools, The ARMulator.

Recommended Books:

Steve Furber :ARM System-On-Chip Architecture.

SEMESTER-VI

C: 13-ARTIFICIAL INTELLIGENCE (Credit: 06, Theory:04, Practical:02)

UNIT-I

Intelligent Agents, Solving problems by searching, Uninformed search strategies (BFS, DFS, DLS, IDS, BD and Uniform cost search), Informed search and exploration (Greedy Best first, A* and its variations) Constraint satisfaction Problems, Adversarial search (Alpha-beta pruning).

UNIT-II

Knowledge and reasoning, logical agent (Wumpus world), Propositional logic, First order logic, Inference in first order logic (Forward chaining, backward chaining, Resolution), Knowledge representation.

UNIT-III

Planning, Partial-Order planning, Planning Graphs, Planning and acting in the real world, Uncertain knowledge and reasoning.

UNIT-IV

Learning from Observations, Decision trees, Neural network (Multilayer), Reinforcement Learning.

UNIT-V

NLP, Communication, A formal grammar for a fragment of English, Syntactic analysis (chat parsing), semantic Interpretation, Ambiguity of grammar, Machine Translation.

Recommended Books:

1. Stuart Russell and Peter Norvig, ARTIFICIAL INTELLIGENCE A MODERN APPROACH, 2/e, PHI.
2. D.W. Patterson, Introduction to A.I and Expert Systems, PHI, 2007.

3. Rich & Knight, Artificial Intelligence, 2/e, Tata McGraw Hill, 1991.

C:14-DESIGN AND ANALYSIS OF ALGORITHMS

(Credit: 06, Theory:04, Practical:02)

UNIT-I

Analysis and Design of Algorithm (Case study insertion sort and merge sort) Asymptotic Analysis, Divide and Conquer, Recurrence Relations, Strassen's Matrix Multiplication.

UNIT-II

Sorting: Quick sort, heap sort, Counting sort, lower bound for sorting, Randomized quicksort, Order Statistics.

UNIT-III

Amortized Analysis (Aggregate analysis, Accounting analysis, Potential analysis), 2-3-4 tree Advanced Data structure: Fibonacci heap, Red black tree, hashing, data structure on disjoint set, Scicinet Data Structure.

UNIT-IV

Dynamic Programming: Matrix Chain multiplication, LCS, TSP, Branch and Bound. Greedy Algorithm: MST: Kruskal, Prim's, Dijkstra Algorithm, Huffman Coding, Maxflow matching, Computational geometry: Convex Hull, 0-1-knapsack, fractional knapsack, Backtracking (4-Queen Prob.) **UNIT-V** Complexity Class: P, PSPACE, NP, NP-Hard, NP Complete, Satisfiability, Chequer, Vertex Cover, Independent set, Exact cover, Graph Coloring, Hamiltonian, Cycle Matching. Approximation Algorithm: Vertex Cover, TSP, Independent Set, Sum of subset.

Recommended Books:

1. T.H. Cormen, Charles E. Leiserson, Ronald L. Rivest, Clifford Stein Introduction to Algorithms, PHI, 3/e, 2009.
2. Sarabasse & A.V. Gelder Computer Algorithm, Introduction to Design and Analysis, Pearson 3/e, 1999.
3. E. Horowitz, S. Sahni, & S. Rajasekaran, Fundamentals of Computer Algorithms, 2/e, University Press.
4. A.V. Aho, J.E. Hopcroft, & J.D. Ullman, The Design and Analysis of Computer Algorithm, Pearson.

DSE:3-CLOUD COMPUTING
(Credit: 06, Theory:04, Practical:02)

Unit - I

Overview of Computing Paradigm: Recent trends in Computing: Grid Computing, Cluster Computing, Distributed Computing, Utility Computing, Cloud Computing. Introduction to Cloud Computing: Introduction to Cloud Computing, History of Cloud Computing, Cloud service providers, Benefits and limitations of Cloud Computing.

UNIT-II

Cloud Computing Architecture: Comparison with traditional computing architecture (client/server), Services provided at various levels, Service Models- Infrastructure as a Service (IaaS), Platform as a Service (PaaS), Software as a Service (SaaS), How Cloud Computing Works, Deployment, Models- Public cloud, Private cloud, Hybrid cloud, Community cloud, Case study of NIST architecture.

UNIT-III

Case Studies: Case Study of Service, Model using Google App Engine, Microsoft Azure, Amazon EC2, Eucalyptus.

UNIT-IV

Service Management in Cloud Computing, Service Level Agreements (SLAs), Billing & Accounting, Comparing Scaling Hardware: Traditional vs. Cloud, Economics of Scaling.

UNIT-V

Cloud Security: Infrastructure Security- Network level security, Host level security, Application level security, Data security and Storage- Data privacy and security Issues, Jurisdictional issues raised by Data location, Authentication in Cloud Computing.

Recommended Books:

1. Barrie Sosinsky, Cloud Computing Bible, Wiley-India, 2010.
2. Rajkumar Buyya, James Broberg, Andrzej, M. Goscinski, Cloud Computing Principles & Paradigms, Wiley-2011.
3. Nikos Antonopoulos, Lee Gillam, Cloud Computing: Principles, Systems and Applications, Springer, 2012.
4. Ronald L. Krutz, Russell Dean Vines, Cloud Security: A Comprehensive Guide to Secure Cloud Computing, Wiley-India, 2010.
5. Toby Velte, Anthony Velte, Robert Elsenpeter, Cloud Computing, A Practical Approach, Mc- Graw Hills, 2010.
6. Dimitris N. Chorafas, Cloud Computing Strategies, CRC Press, 2010.

DSE:4-PROJECT WORK(Credit: 06)

ELECTRONICS

CC 1: Basic Circuit Theory and Network Analysis (Credits: Theory-04, Practicals-02)

Theory Lectures 60

Unit- 1 (13 Lectures)

Basic Circuit Concepts: Voltage and Current Sources, Resistors: Fixed and Variable resistors, Construction and Characteristics, Color coding of resistors, resistors in series and parallel. Inductors: Fixed and Variable inductors, Self and mutual inductance, Faraday's law and Lenz's law of electromagnetic induction, Energy stored in an inductor, Inductance in series and parallel, Testing of resistance and inductance using multimeter. Capacitors: Principles of capacitance, Parallel plate capacitor, Permittivity, Definition of Dielectric Constant, Dielectric strength, Energy stored in a capacitor, Air, Paper, Mica, Teflon, Ceramic, Plastic and Electrolytic capacitor, Construction and application, capacitors in series and parallel, factors governing the value of capacitors, testing of capacitors using multimeter.

Unit- 2 (13 Lectures)

Circuit Analysis: Kirchhoff's Current Law (KCL), Kirchhoff's Voltage Law (KVL), Node Analysis, Mesh Analysis, Star-Delta Conversion. **DC Transient Analysis:** RC Circuit- Charging and discharging with initial charge, RL Circuit with Initial Current, Time Constant, RL and RC Circuits With Sources, DC Response of Series RLC Circuits.

Unit-3 (18 Lectures)

AC Circuit Analysis: Sinusoidal Voltage and Current, Definition of Instantaneous, Peak, Peak to Peak, Root Mean Square and Average Values. Voltage-Current relationship in Resistor, Inductor and Capacitor, Phasor, Complex Impedance, Power in AC Circuits: Instantaneous Power, Average Power, Reactive Power, Power Factor. Sinusoidal Circuit Analysis for RL, RC and RLC Circuits. Resonance in Series and Parallel RLC Circuits, Frequency Response of Series and Parallel RLC Circuits, Quality (Q) Factor and Bandwidth. Passive Filters: Low Pass, High Pass, Band Pass and Band Stop.

Unit-4 (16 Lectures)

Network Theorems: Principal of Duality, Superposition Theorem, Thevenin's Theorem, Norton's Theorem, Reciprocity Theorem, Millman's Theorem, Maximum Power Transfer Theorem. AC circuit analysis using Network theorems. Two Port Networks: Impedance (Z) Parameters, Admittance (Y) Parameters, Transmission (ABCD) Parameters.

Suggested books:

1. S. A. Nasar, Electric Circuits, Schaum's outline series, Tata McGraw Hill (2004)
2. Electrical Circuits, M. Nahvi and J. Edminister, Schaum's Outline Series, Tata McGraw-Hill.(2005)
3. Robert L. Boylestad,

Essentials of Circuit Analysis, Pearson Education (2004) 4. W. H. Hayt, J. E. Kemmerly, S. M. Durbin, Engineering Circuit Analysis, Tata McGraw Hill(2005) 5. Alexander and M. Sadiku, Fundamentals of Electric Circuits, McGraw Hill (2008)

Basic Circuit Theory and Network Analysis Lab (Hardware and Circuit Simulation Software) 60 Lectures

1. Familiarization with a) Resistance in series, parallel and series – Parallel. b) Capacitors & Inductors in series & Parallel. c) Multimeter – Checking of components. d) Voltage sources in series, parallel and series – Parallel e) Voltage and Current dividers
2. Measurement of Amplitude, Frequency & Phase difference using CRO. 3. Verification of Kirchoff's Law. 4. Verification of Norton's theorem. 5. Verification of Thevenin's Theorem. 6. Verification of Superposition Theorem. 7. Verification of the Maximum Power Transfer Theorem. 8. RC Circuits: Time Constant, Differentiator, Integrator. 9. Designing of a Low Pass RC Filter and study of its Frequency Response. 10. Designing of a High Pass RC Filter and study of its Frequency Response. 11. Study of the Frequency Response of a Series LCR Circuit and determination of its (a) Resonant Frequency (b) Impedance at Resonance (c) Quality Factor Q (d) Band Width.

CC 2: Mathematics Foundation for Electronics (Credits: Theory-04, Practicals-02)

Theory Lectures
60

Unit-1 (16 Lectures)

Ordinary Differential Equations: First Order Ordinary Differential Equations, Basic Concepts, Separable Ordinary Differential Equations, Exact Ordinary Differential Equations, Linear Ordinary Differential Equations. Second Order homogeneous and non-homogeneous Differential Equations. **Series solution of differential equations and special functions:** Power series method, Legendre Polynomials, Frobenius Method, Bessel's equations and Bessel's functions of first and second kind. Error functions and gamma function.

Unit-2 (14 Lectures)

Matrices: Introduction to Matrices, System of Linear Algebraic Equations, Gaussian Elimination Method, Gauss-Seidel Method, LU decomposition, Solution of Linear System by LU decomposition. Eigen Values and Eigen Vectors, Linear Transformation, Properties of Eigen Values and Eigen Vectors, Cayley-Hamilton Theorem, Diagonalization, Powers of a Matrix. Real and Complex Matrices, Symmetric, Skew Symmetric, Orthogonal Quadratic Form, Hermitian, Skew Hermitian, Unitary Matrices.

Unit-3 (14 Lectures)

Sequences and series: Sequences, Limit of a sequence, Convergence, Divergence and Oscillation of a sequence, Infinite series, Necessary condition for Convergence, Cauchy's Integral Test, D'Alembert's Ratio Test, Cauchy's nth Root Test, Alternating Series, Leibnitz's Theorem, Absolute Convergence and Conditional Convergence, Power Series.

Unit-4 (16 Lectures)

Complex Variables and Functions: Complex Variable, Complex Function, Continuity, Differentiability, Analyticity. Cauchy-Riemann (C- R) Equations, Harmonic and Conjugate Harmonic Functions, Exponential Function, Trigonometric Functions, Hyperbolic Functions. Line Integral in Complex Plane, Cauchy's Integral Theorem, Cauchy's Integral Formula, Derivative of Analytic Functions. Sequences, Series and Power Series, Taylor's Series, Laurent Series, Zeroes and Poles. Residue integration method, Residue integration of real Integrals.

Suggested Books

1. E. Kreyszig, advanced engineering mathematics, Wiley India (2008)
2. Murray Spiegel, Seymour Lipschutz, John Schiller, Outline of Complex Variables, Schaum Outline Series, Tata McGraw Hill (2007)
3. R. K. Jain, and S.R.K. Iyengar, Advanced Engineering Mathematics, Narosa Publishing House (2007)
4. C .R. Wylie and L. C. Barrett, Advanced Engineering Mathematics, Tata McGraw-Hill (2004)
5. B. V. Ramana, Higher Engineering Mathematics, Tata McGraw Hill Publishing Company Limited (2007)

Mathematics Foundation for Electronics Lab (Scilab/MATLAB/ any other Mathematical Simulation software) 60 Lectures

1. Solution of First Order Differential Equations
2. Solution of Second Order homogeneous Differential Equations
3. Solution of Second Order non-homogeneous Differential Equations
4. Convergence of a given series.
5. Divergence of a given series.
6. Solution of linear system of equations using Gauss Elimination method.
7. Solution of linear system of equations using Gauss – Seidel method.
8. Solution of linear system of equations using L-U decomposition method.

CC 3: Semiconductor Devices (Credits: Theory-04, Practicals-02)

Theory

Lectures 60 Unit 1 (14 Lectures)

Semiconductor Basics: Introduction to Semiconductor Materials, Crystal Structure, Planes and Miller Indices, Energy Band in Solids, Concept of Effective Mass, Density of States, Carrier Concentration at Normal Equilibrium in Intrinsic Semiconductors, Derivation of Fermi Level for Intrinsic & Extrinsic Semiconductors, Donors, Acceptors, Dependence of Fermi Level on Temperature and Doping Concentration,

Temperature Dependence of Carrier Concentrations. Carrier Transport Phenomena: Carrier Drift, Mobility, Resistivity, Hall Effect, Diffusion Process, Einstein Relation, Current Density Equation, Carrier Injection, Generation And Recombination Processes, Continuity Equation.

Unit 2 (14 Lectures)

P-N Junction Diode: Formation of Depletion Layer, Space Charge at a Junction, Derivation of Electrostatic Potential Difference at Thermal Equilibrium, Depletion Width and Depletion Capacitance of an Abrupt Junction. Concept of Linearly Graded Junction, Derivation of Diode Equation and I-V Characteristics. Zener and Avalanche Junction Breakdown Mechanism. Tunnel diode, varactor diode, solar cell: circuit symbol, characteristics, applications

Unit 3 (14 Lectures)

Bipolar Junction Transistors (BJT): PNP and NPN Transistors, Basic Transistor Action, Emitter Efficiency, Base Transport Factor, Current Gain, Energy Band Diagram of Transistor in Thermal Equilibrium, Quantitative Analysis of Static Characteristics (Minority Carrier Distribution and Terminal Currents), Base- Width Modulation, Modes of operation, Input and Output Characteristics of CB, CE and CC Configurations. Metal Semiconductor Junctions: Ohmic and Rectifying Contacts.

Unit 4 (18 Lectures)

Field Effect Transistors: JFET, Construction, Idea of Channel Formation, Pinch-Off and Saturation Voltage, Current-Voltage Output Characteristics. MOSFET, types of MOSFETs, Circuit symbols, Working and Characteristic curves of Depletion type MOSFET (both N channel and P Channel) and Enhancement type MOSFET (both N channel and P channel). Complimentary MOS (CMOS). **Power Devices:** UJT, Basic construction and working, Equivalent circuit, intrinsic Standoff Ratio, Characteristics and relaxation oscillator-expression. SCR, Construction, Working and Characteristics, Triac, Diac, IGBT, MESFET, Circuit symbols, Basic constructional features, Operation and Applications.

Suggested Books:

- 1) S. M. Sze, Semiconductor Devices: Physics and Technology, 2nd Edition, Wiley India edition (2002).
- 2) Ben G Streetman and S. Banerjee, Solid State Electronic Devices, Pearson Education (2006)
- 3) Dennis Le Croisette, Transistors, Pearson Education (1989)
- 4) Jasprit Singh, Semiconductor Devices: Basic Principles, John Wiley and Sons (2001)
- 5) Kanaan Kano, Semiconductor Devices, Pearson Education (2004)
- 6) Robert F. Pierret, Semiconductor Device Fundamentals, Pearson Education (2006)

Semiconductor Devices Lab (Hardware and Circuit Simulation Software) 60 Lectures

1. Study of the I-V Characteristics of Diode – Ordinary and Zener Diode.
2. Study of the I-V Characteristics of the CE configuration of BJT and obtain r_i , r_o , β .
3. Study of the I-V Characteristics of the

Common Base Configuration of BJT and obtain r_i, r_o, α . 4. Study of the I-V Characteristics of the Common Collector Configuration of BJT and obtain voltage gain, r_i, r_o . 5. Study of the I-V Characteristics of the UJT. 6. Study of the I-V Characteristics of the SCR. 7. Study of the I-V Characteristics of JFET. 8. Study of the I-V Characteristics of MOSFET. 9. Study of Characteristics of Solar Cell 10. Study of Hall Effect.

CC 4: Applied Physics (Credits: Theory- 04, Practicals-02)

Theory Lectures
60

Unit-1 (19 Lectures)

Quantum Physics: Inadequacies of Classical physics. Compton's effect, Photo-electric Effect, Wave-particle duality, de Broglie waves. Basic postulates and formalism of quantum mechanics: probabilistic interpretation of waves, conditions for physical acceptability of wave functions. Schrodinger wave equation for a free particle and in a force field (1 dimension), Boundary and continuity conditions. Operators in Quantum Mechanics, Conservation of probability, Time-dependent form, Linearity and superposition, Operators, Time-independent one dimensional Schrodinger wave equation, Stationary states, Eigen-values and Eigen functions. Particle in a one-dimensional box, Extension to a three dimensional box, Potential barrier problems, phenomenon of tunneling. Kronig Penney Model and development of band structure. Spherically symmetric potentials, the Hydrogen-like atom problem.

Unit-2 (11 Lectures)

Mechanical Properties of Materials: Elastic and Plastic Deformations, Hooke's Law, Elastic Moduli, Brittle and Ductile Materials, Tensile Strength, Theoretical and Critical Shear Stress of Crystals. Strengthening Mechanisms, Hardness, Creep, Fatigue, Fracture.

Unit-3 (15 Lectures)

Thermal Properties: Brief Introduction to Laws of Thermodynamics, Concept of Entropy, Concept of Phonons, Heat Capacity, Debye's Law, Lattice Specific Heat, Electronic Specific Heat, Specific Heat Capacity for Si and GaAs, Thermal Conductivity, Thermoelectricity, Seebeck Effect, Thomson Effect, Peltier Effect.

Unit-4 (15 Lectures)

Electric and Magnetic Properties: Conductivity of metals, Ohm's Law, relaxation time, collision time and mean free path, electron scattering and resistivity of metals, heat developed in current carrying conductor, Superconductivity. Classification of Magnetic Materials, Origin of Magnetic moment, Origin of dia, para, ferro and antiferro magnetism and their comparison, Ferrimagnetic materials, Saturation Magnetisation and Curie temperature, Magnetic domains, Concepts of Giant Magnetic Resistance (GMR), Magnetic recording.

Suggested Books:

1. S. Vijaya and G. Rangarajan, Material Science, Tata Mcgraw Hill (2003)
2. W. E. Callister, Material Science and Engineering: An Introduction, Wiley India (2006)
3. A. Beiser, Concepts of Modern Physics , McGraw-Hill Book Company (1987)
4. A. Ghatak & S. Lokanathan, Quantum Mechanics: Theory and Applications, Macmillan India (2004)

Applied Physics

Lab 60 Lectures

1. To determine Young's modulus of a wire by optical lever method.
2. To determine the modulus of rigidity of a wire by Maxwell's needle.
3. To determine the elastic constants of a wire by Searle's method.
4. To measure the resistivity of a Ge crystal with temperature by four –probe method from room temperature to 200 °C).
5. To determine the value of Boltzmann Constant by studying forward characteristics of diode.
6. To determine the value of Planck's constant by using LEDs of at least 4 different wavelengths. 7. To determine e/m of electron by Bar Magnet or by Magnetic Focusing.

CC 5: Electronics Circuits (Credits: Theory-04, Practicals-02)

Unit- 1 (14 Lectures)

Theory Lectures 60

Diode Circuits: Ideal diode, piecewise linear equivalent circuit, dc load line analysis, Quiescent (Q) point. Clipping and clamping circuits. Rectifiers: HWR, FWR (center tapped and bridge). Circuit diagrams, working and waveforms, ripple factor & efficiency, comparison. Filters: types, circuit diagram and explanation of shunt capacitor filter with waveforms. Zener diode regulator circuit diagram and explanation for load and line regulation, disadvantages of Zener diode regulator.

Unit- 2 (15 Lectures)

Bipolar Junction Transistor: Review of CE, CB Characteristics and regions of operation. Hybrid parameters. Transistor biasing, DC load line, operating point, thermal runaway, stability and stability factor, Fixed bias without and with RE, collector to base bias, voltage divider bias and emitter bias (+VCC and –VEE bias), circuit diagrams and their working. Transistor as a switch, circuit and working, Darlington pair and its applications. BJT amplifier (CE), dc and ac load line analysis, hybrid model of CE configuration, Quantitative study of the frequency response of a CE amplifier, Effect on gain and bandwidth for Cascaded CE amplifiers (RC coupled).

Unit- 3 (13 Lectures)

Feedback Amplifiers: Concept of feedback, negative and positive feedback, advantages and disadvantages of negative feedback, voltage (series and shunt), current (series and shunt) feedback amplifiers, gain, input and output impedances. Barkhausen criteria for oscillations, Study of phase shift oscillator, Colpitts oscillator and Hartley oscillator.

Unit- 4 (18 Lectures)

MOSFET Circuits: Review of Depletion and Enhancement MOSFET, Biasing of MOSFETs, Small Signal Parameters, Common Source amplifier circuit analysis, CMOS circuits. **Power Amplifiers:** Difference between voltage and power amplifier, classification of power amplifiers, Class A, Class B, Class C and their comparisons. Operation of a Class A single ended power amplifier. Operation of Transformer coupled Class A power amplifier, overall efficiency. Circuit operation of complementary symmetry Class B push pull power amplifier, crossover distortion, heat sinks. **Single tuned amplifiers:** Circuit diagram, Working and Frequency Response for each, Limitations of single tuned amplifier, Applications of tuned amplifiers in communication circuits.

Suggested Books:

1. Electronic Devices and circuit theory, Robert Boylestad and Louis Nashelsky, 9th Edition, 2013, PHI
2. Electronic devices, David A Bell, Reston Publishing Company
3. D. L. Schilling and C. Belove, Electronic Circuits: Discrete and Integrated, Tata McGraw Hill (2002)
4. Donald A. Neamen, Electronic Circuit Analysis and Design, Tata McGraw Hill (2002)
5. J. Millman and C. C. Halkias, Integrated Electronics, Tata McGraw Hill (2001)
6. J. R. C. Jaegar and T. N. Blalock, Microelectronic Circuit Design, Tata McGraw Hill (2010)
7. J. J. Cathey, 2000 Solved Problems in Electronics, Schaum's outline Series, Tata McGraw Hill (1991)
8. Allen Mottershed, Electronic Devices and Circuits, Goodyear Publishing Corporation

Simulation Software) 60 Lectures

1. Study of the half wave rectifier and Full wave rectifier.
2. Study of power supply using C filter and Zener diode.
3. Designing and testing of 5V/9 V DC regulated power supply and find its load-regulation
4. Study of clipping and clamping circuits .
5. Study of Fixed Bias, Voltage divider and Collector-to-Base bias Feedback configuration for transistors.
6. Designing of a Single Stage CE amplifier.
7. Study of Class A, B and C Power Amplifier.
8. Study of the Colpitt's Oscillator.
9. Study of the Hartley's Oscillator.
10. Study of the Phase Shift Oscillator
11. Study of the frequency response of Common Source FET amplifier.

CC 6: Digital Electronics and Verilog/VHDL (Credits: Theory-04, Practicals-02)

Theory Lectures
60

Unit-1 (11 Lectures)

Number System and Codes: Decimal, Binary, Hexadecimal and Octal number systems, base conversions, Binary, octal and hexadecimal arithmetic (addition, subtraction by complement method, multiplication), representation of signed and unsigned numbers, Binary Coded Decimal code. **Logic Gates and Boolean algebra:** Introduction to Boolean Algebra and Boolean operators, Truth Tables of OR, AND, NOT, Basic postulates and fundamental theorems of Boolean algebra, Truth tables, construction and symbolic representation of XOR, XNOR, Universal (NOR and NAND) gates. **Digital Logic families:** Fan-in, Fan out, Noise Margin, Power Dissipation, Figure of merit, Speed power product, TTL and CMOS families and their comparison.

Unit-2 (13 Lectures)

Combinational Logic Analysis and Design: Standard representation of logic functions (SOP and POS), Karnaugh map minimization, Encoder and Decoder, Multiplexers and Demultiplexers, Implementing logic functions with multiplexer, binary Adder, binary subtractor, parallel adder/subtractor.

Unit-3 (18 Lectures)

Sequential logic design: Latches and Flip flops , S-R Flip flop, J-K Flip flop, T and D type Flip flop, Clocked and edge triggered Flip flops, master slave flip flop, Registers, Counters (synchronous and asynchronous and modulo-N), State Table, State Diagrams, counter design using excitation table and equations. , Ring counter

and Johnson counter. **Programmable Logic Devices:** Basic concepts- ROM, PLA, PAL, CPLD, FPGA

Unit-4 (18 Lectures)

Introduction to Verilog: A Brief History of HDL, Structure of HDL Module, Comparison of VHDL and Verilog, Introduction to Simulation and Synthesis Tools, Test Benches. Verilog Modules, Delays, data flow style, behavioral style, structural style, mixed design style, simulating design. Introduction to Language Elements, Keywords, Identifiers, White Space Characters, Comments, format, Integers, reals and strings.

Logic Values, Data Types-net types, undeclared nets, scalars and vector nets, Register type, Parameters. Expressions, Operands, Operators, types of Expressions **Data flow Modeling and Behavioral Modeling:** Data flow Modeling: Continuous assignment, net declaration assignments, delays, net delays. Behavioral Modeling: Procedural constructs, timing controls, block statement, procedural assignments, conditional statement, loop statement, procedural continuous assignment. **Gate level modeling** - Introduction, built in Primitive Gates, multiple input gates, Tri-state gates, pull gates, MOS switches, bidirectional switches, gate delay, array instances, implicit nets, Illustrative Examples (both combinational and sequential logic circuits).

OR

Introduction to VHDL: A Brief History of HDL, Structure of HDL Module, Comparison of VHDL and Verilog, Introduction to Simulation and Synthesis Tools, Test Benches. VHDL Modules, Delays, data flow style, behavioral style, structural style, mixed design style, simulating design. Introduction to Language Elements, Keywords, Identifiers, White Space Characters, Comments, format. VHDL terms, describing hardware in VHDL, entity, architectures, concurrent signal assignment, event scheduling, statement concurrency, structural designs, sequential behavior, process statements, process declarative region, process statement region, process execution, sequential statements, architecture selection, configuration statements, power of configurations. **Behavioral Modeling:** Introduction to behavioral modeling, inertial delay, transport delay , inertial delay model, transport delay model, transport vs inertial delay, simulation delta drivers, driver creation, generics, block statements, guarded blocks. **Sequential Processing:** Process statement, sensitivity list, signal assignment vs variable assignment, sequential statements, IF, CASE ,LOOP, NEXT, ,EXIT and ASSERT statements, assertion BNF, WAIT ON signal, WAIT UNTIL expression, WAIT FOR time expression, multiple wait conditions, WAIT Time-Out, Sensitivity List vs WAIT Statement

Concurrent Assignment, Passive Processes. **Data types:** Object types-signal, variable, constant, Data types –scalar types, composite types, incomplete types, File Type caveats, subtypes, Subprograms and functions

Suggested Books:

1. M. Morris Mano Digital System Design, Pearson Education Asia, (Fourth Edition)
2. Thomas L. Floyd, Digital Fundamentals, Pearson Education Asia (1994)
3. W. H. Gothmann, Digital Electronics: An Introduction To Theory And Practice, Prentice Hall of India(2000)
4. R. L. Tokheim, Digital Principles, Schaum's Outline Series, Tata McGraw- Hill (1994)
5. A Verilog HDL Primer – J. Bhasker, BSP, 2003 II Edition.
6. Verilog HDL-A guide to digital design and synthesis-Samir Palnitkar, Pearson, 2nd edition.

Digital Electronics and Verilog/VHDL Lab (Hardware and Circuit Simulation Software) 60 lectures

1. To verify and design AND, OR, NOT and XOR gates using NAND gates.
2. To convert a Boolean expression into logic gate circuit and assemble it using logic gate IC's.
3. Design a Half and Full Adder.
4. Design a Half and Full Subtractor.
5. Design a seven segment display driver.
6. Design a 4 X 1 Multiplexer using gates.
7. To build a Flip- Flop Circuits using elementary gates. (RS, Clocked RS, D-type).
8. Design a counter using D/T/JK Flip-Flop.
9. Design a shift register and study Serial and parallel shifting of data.

Experiments in Verlog/VHDL

1. Write code to realize basic and derived logic gates.
2. Half adder, Full Adder using basic and derived gates.
3. Half subtractor and Full Subtractor using basic and derived gates. 4. Clocked D FF, T FF and JK FF (with Reset inputs).
5. Multiplexer (4x1, 8x1) and Demultiplexer using logic gates.
6. Decoder (2x4, 3x8), Encoders and Priority Encoders.
7. Design and simulation of a 4 bit Adder. 8. Code converters (Binary to Gray and vice versa). 9. 2 bit Magnitude comparator. 10. 3 bit Ripple counter.

CC 7: C Programming and Data Structures (Credits: Theory-04, Practicals-02)

Theory Lectures
60

Unit- 1 (12 Lectures)

C Programming Language: Introduction, Importance of C, Character set, Tokens, keywords, identifier, constants, basic data types, variables: declaration & assigning values. Structure of C program Arithmetic operators, relational operators, logical operators, assignment operators, increment and decrement operators, conditional operators, bit wise operators, expressions and evaluation of expressions, type cast operator, implicit conversions, precedence of operators. Arrays-concepts, declaration, accessing elements, storing elements, two-dimensional and multi-dimensional arrays. Input output statement and library functions (math and string related functions).

Unit-2 (19 Lectures)

Decision making, branching & looping: Decision making, branching and looping: if, if-else, else-if, switch statement, break, for loop, while loop and do loop. Functions: Defining functions, function arguments and passing, returning values from functions. **Structures:** defining and declaring a structure variables, accessing structure members, initializing a structure, copying and comparing structure variables, array of structures, arrays within structures, structures within structures, structures and functions. Pointers. **Introduction to C++:** Object oriented programming, characteristics of an object-oriented language.

Unit-3 (15 Lectures)

Data Structures: Definition of stack, array implementation of stack, conversion of infix expression to prefix, postfix expressions, evaluation of postfix expression. Definition of Queue, Circular queues, Array implementation of queues. Linked List and its implementation, Link list implementation of stack and queue, Circular and doubly linked list.

Unit-4 (14 Lectures)

Searching and sorting: Insertion sort, selection sort, bubble sort, merge sort, linear Search, binary search. **Trees :** Introduction to trees, Binary search tree, Insertion and searching in a BST, preorder, postorder and inorder traversal (recursive)

Suggested Books:

1. Yashavant Kanetkar, Let Us C , BPB Publications
2. Programming in ANSI C, Balagurusamy, 2nd edition, TMH.
3. Byron S Gottfried, Programming with C , Schaum Series
4. Brian W. Kernighan, Dennis M. Ritchie, The C Programming Language, Prentice Hall
5. Yashavant Kanetkar, Pointers in C, BPB Publications
6. S. Sahni and E. Horowitz, "Data Structures", Galgotia Publications
7. Tanenbaum: "Data Structures using C", Pearson/PHI.
8. Ellis Horowitz and Sartaz Sahani "Fundamentals of Computer Algorithms", Computer Science Press.

C Programming and Data Structures Lab

60 Lectures

1. Generate the Fibonacci series up to the given limit N and also print the number of elements in the series.
2. Find minimum and maximum of N numbers.
3. Find the GCD of two integer numbers.
4. Calculate factorial of a given number.
5. Find all the roots of a quadratic equation $Ax^2 + Bx + C = 0$ for non – zero coefficients A, B and C. Else report error.
6. Calculate the value of $\sin(x)$ and $\cos(x)$ using the series. Also print $\sin(x)$ and $\cos(x)$ value using

library function.

7. Generate and print prime numbers up to an integer N.
8. Sort given N numbers in ascending order.
9. Find the sum & difference of two matrices of order MxN and PxQ.
10. Find the product of two matrices of order MxN and PxQ.
11. Find the transpose of given MxN matrix.
12. Find the sum of principle and secondary diagonal elements of the given MxN matrix.
13. Calculate the subject wise and student wise totals and store them as a part of the structure.
14. Maintain an account of a customer using classes.
15. Implement linear and circular linked lists using single and double pointers.
16. Create a stack and perform Pop, Push, Traverse operations on the stack using Linear Linked list
17. Create circular linked list having information about a college and perform Insertion at front, Deletion at end.
18. Create a Linear Queue using Linked List and implement different operations such as Insert, Delete, and Display the queue elements.
19. Implement polynomial addition and subtraction using linked lists.
20. Implement sparse matrices using arrays and linked lists.
21. Create a Binary Tree to perform Tree traversals (Preorder, Postorder, Inorder) using the concept of recursion.
22. Implement binary search tree using linked lists. Compare its time complexity over that of linear search.
23. Implement Insertion sort, Merge sort, Bubble sort, Selection sort.

CC 8: Operational Amplifiers and Applications (Credits: Theory-04, Practicals-02)

Theory Lectures
60

Unit-1 (18 Lectures)

Basic Operational Amplifier: Concept of differential amplifiers (Dual input balanced and unbalanced output), constant current bias, current mirror, cascaded differential amplifier stages with concept of level translator, block diagram of an operational amplifier (IC 741)

Op-Amp parameters: input offset voltage, input offset current, input bias current, differential input resistance, input capacitance, offset voltage adjustment range, input voltage range, common mode rejection ratio, slew rate, supply voltage rejection ratio.

Unit-2 (18 Lectures)

Op-Amp Circuits: Open and closed loop configuration, Frequency response of an op-amp in open loop and closed loop configurations, Inverting, Non-inverting, Summing and difference amplifier, Integrator, Differentiator, Voltage to current converter, Current to voltage converter. **Comparators:** Basic comparator, Level detector, Voltage limiters, Schmitt Trigger. **Signal generators:** Phase shift oscillator, Wein bridge oscillator, Square wave generator, triangle wave generator, saw tooth wave generator, and Voltage controlled oscillator(IC 566).

Unit-3 (12 Lectures)

Multivibrators (IC 555): Block diagram, Astable and monostable multivibrator circuit, Applications of Monostable and Astable multivibrators. Phase locked loops (PLL): Block diagram, phase detectors, IC565. **Fixed and variable IC regulators:** IC 78xx and IC 79xx -concepts only, IC LM317- output voltage equation

Unit-4 (12 Lectures)

Signal Conditioning circuits: Sample and hold systems, Active filters: First order low pass and high pass butterworth filter, Second order filters, Band pass filter, Band reject filter, All pass filter, Log and antilog amplifiers.

Suggested Books:

1. R. A. Gayakwad, Op-Amps and Linear IC's, Pearson Education (2003)
2. R. F. Coughlin and F. F. Driscoll, Operational amplifiers and Linear Integrated circuits, Pearson Education (2001)
3. J. Millman and C.C. Halkias, Integrated Electronics, Tata McGraw-Hill,(2001)
4. A.P.Malvino, Electronic Principals,6th Edition , Tata McGraw-Hill,(2003)
5. K.L.Kishore,OP-AMP and Linear Integrated Circuits, Pearson(2011)

Operational Amplifiers and Application Lab (Hardware and Circuit Simulation Software) 60 Lectures

1. Study of op-amp characteristics: CMRR and Slow rate.
2. Designing of an amplifier of given gain for an inverting and non-inverting configuration using an op-amp.
3. Designing of analog adder and subtractor circuit.
4. Designing of an integrator using op- amp for a given specification and study its frequency response.

5. Designing of a differentiator using op- amp for a given specification and study its frequency response.
6. Designing of a First Order Low-pass filter using op-amp.
7. Designing of a First Order High-pass filter using op-amp.
8. Designing of a RC Phase Shift Oscillator using op-amp.
9. Study of IC 555 as an astable multivibrator.
10. Study of IC 555 as monostable multivibrator.
11. Designing of Fixed voltage power supply using IC regulators using 78 series and 79 series

CC 9: Signals & Systems **(Credits: Theory-04, Practicals-02)**

Theory Lectures
60

Unit-1 (17 Lectures)

Signals and Systems: Continuous and discrete time signals, Transformation of the independent variable, Exponential and sinusoidal signals, Impulse and unit step functions, Continuous-Time and Discrete-Time Systems, Basic System Properties.

Unit-2 (13 Lectures)

Linear Time -Invariant Systems (LTI): Discrete time LTI systems, the Convolution Sum, Continuous time LTI systems, the Convolution integral. Properties of LTI systems, Commutative, Distributive, Associative. LTI systems with and without memory, Invariability, Causality, Stability, Unit Step response. Differential and Difference equation formulation, Block diagram representation of first order systems.

Unit-3 (18 Lectures)

Fourier Series Representation of Periodic Signals: Continuous-Time periodic signals, Convergence of the Fourier series, Properties of continuous-Time Fourier series, Discrete-Time periodic signals, Properties of Discrete-Time Fourier series. Frequency-Selective filters, Simple RC highpass and lowpass filters **Fourier Transform:** Aperiodic signals, Periodic signals, Properties of Continuous-time Fourier transform, Convolution and Multiplication Properties, Properties of Fourier transform and basic Fourier transform Pairs.

Unit-4 (12 Lectures)

Laplace Transform: Laplace Transform, Inverse Laplace Transform, Properties of the Laplace Transform, Laplace Transform Pairs, Laplace Transform for signals, Laplace Transform Methods in Circuit Analysis, Impulse and Step response of RL, RC and RLC circuits.

Suggested Book:

1. V. Oppenheim, A. S. Wilsky and S. H. Nawab, Signals and Systems, Pearson Education (2007)
2. S. Haykin and B. V. Veen, Signal and Systems, John Wiley & Sons (2004)
3. C. Alexander and M. Sadiku, Fundamentals of Electric Circuits , McGraw Hill (2008)
4. H. P. Hsu, Signals and Systems, Tata McGraw Hill (2007)
5. S. T. Karris, Signal and Systems: with MATLAB Computing and Simulink Modelling, Orchard Publications (2008)
6. W. Y. Young, Signals and Systems with MATLAB, Springer (2009)
7. M. Roberts, Fundamentals of Signals and Systems, Tata McGraw Hill (2007)

Signals & Systems Lab (Scilab/MATLAB/ Other Mathematical Simulation software)

60

Lectures

1. Generation of Signals: continuous time
2. Generation of Signals: discrete time
3. Time shifting and time scaling of signals.
4. Convolution of Signals
5. Solution of Difference equations.
6. Fourier series representation of continuous time signals.
7. Fourier transform of continuous time signals.
8. Laplace transform of continuous time signals.
9. Introduction to Xcos/similar function and calculation of output of systems represented by block diagram

CC 10: Electronic Instrumentation (Credits: Theory-04, Practicals- 02)

Theory Lectures
60

Unit-1 (15 Lectures)

Qualities of Measurement: Specifications of instruments, their static and dynamic characteristics, Error (Gross error, systematic error, absolute error and relative error) and uncertainty analysis. Statistical analysis of data and curve fitting. **Basic Measurement Instruments:** PMMC instrument, galvanometer, DC measurement - ammeter, voltmeter, ohm meter, AC measurement, Digital voltmeter systems (integrating and non-integrating types), digital multimeters, digital frequency meter system (different modes and universal counter). **Connectors and Probes:** low capacitance probes, high voltage probes, current probes, identifying electronic connectors – audio and video, RF/Coaxial, USB etc.

Unit-2 (15 Lectures)

Measurement of Resistance and Impedance: Low Resistance: Kelvin's double bridge method, Medium

Resistance by Voltmeter Ammeter method, Wheatstone bridge method, High Resistance by Megger. A.C. bridges, Measurement of Self Inductance, Maxwell's bridge, Hay's bridge, and Anderson's bridge, Measurement of Capacitance, Schering's bridge, DeSauty's bridge, Measurement of frequency, Wien's bridge. **A-D and D-A Conversion:** 4 bit binary weighted resistor type D-A conversion, circuit and working. Circuit of R-2R ladder. A-D conversion characteristics, successive approximation ADC. (Mention of relevant ICs for all).

Unit-3 (16 Lectures)

Oscilloscopes: CRT, wave form display and electrostatic focusing, time base and sweep synchronization, measurement of voltage, frequency and phase by CRO, Oscilloscope probes, Dual trace oscilloscope, Sampling Oscilloscope, DSO and Powerscope: Block diagram, principle and working, Advantages and applications, CRO specifications (bandwidth, sensitivity, rise time). **Signal Generators:** Audio oscillator, Pulse Generator, Function generators.

Unit-4 (14 Lectures)

Transducers and sensors: Classification of transducers, Basic requirement/characteristics of transducers, active & passive transducers, Resistive (Potentiometer, Strain gauge – Theory, types, temperature compensation and applications), Capacitive (Variable Area Type – Variable Air Gap type – Variable Permittivity type), Inductive (LVDT) and piezoelectric transducers. Measurement of displacement, velocity and acceleration (translational and rotational). Measurement of pressure (manometers, diaphragm, bellows), Measurement of temperature (RTD, thermistor, thermocouple, semiconductor IC sensors), Light transducers (photoresistors, photovoltaic cells, photodiodes).

Suggested Books:

1. H. S. Kalsi, Electronic Instrumentation, TMH(2006)
2. W.D. Cooper and A. D. Helfrick, Electronic Instrumentation and Measurement Techniques, Prentice-Hall (2005).
3. Instrumentation Measurement and analysis: Nakra B C, Chaudry K, TMH
4. E.O.Doebelin, Measurement Systems: Application and Design, McGraw Hill Book - fifth Edition(2003).
5. Joseph J Carr, Elements of Electronic Instrumentation and Measurement, Pearson Education (2005)
6. David A. Bell, Electronic Instrumentation and Measurements, Prentice Hall (2013).
7. Oliver and Cage, "Electronic Measurements and Instrumentation", TMH (2009).
8. Alan S. Morris, "Measurement and Instrumentation Principles", Elsevier (Buterworth Heinmann- 2008).
9. A. K Sawhney, Electrical and Electronics Measurements and Instrumentation, DhanpatRai and Sons (2007).
10. C. S. Rangan, G. R. Sarma and V. S. Mani, Instrumentation Devices and Systems, Tata Mcgraw Hill (1998).

Electronic Instrumentation Lab 60 Lectures

1. Design of multi range ammeter and voltmeter using galvanometer.
2. Measurement of resistance by Wheatstone bridge and measurement of bridge sensitivity.
3. Measurement of Capacitance by de'Sautys.

4. Measure of low resistance by Kelvin's double bridge.
5. To determine the Characteristics of resistance transducer - Strain Gauge (Measurement of Strain using half and full bridge.)
6. To determine the Characteristics of LVDT.
7. To determine the Characteristics of Thermistors and RTD.
8. Measurement of temperature by Thermocouples and study of transducers like AD590 (two terminal temperature sensor), PT-100, J- type, K-type.
9. To study the Characteristics of LDR, Photodiode, and Phototransistor:Variable Illumination. (ii) Linear Displacement.
10. Characteristics of one Solid State sensor/ Fiber optic sensor

CC 11: Microprocessor and Microcontrollers (Credits: Theory- 04, Practicals-02)

Theory Lectures
60

Unit-1 (18 Lectures)

Introduction to Microprocessor: Introduction, Applications, Basic block diagram, Speed, Word size, Memory capacity, Classification of microprocessors (mention of different microprocessors being used) **Microprocessor 8085:** Features, Architecture -block diagram, General purpose registers, register pairs, flags, stack pointer, program counter, types of buses. Multiplexed address and data bus, generation of control signals, pin description of microprocessor 8085. Basic interfacing concepts, Memory mapped I/O and I/O mapped I/O. **8085 Instructions:** Operation code, Operand & Mnemonics. Instruction set of 8085, instruction classification, addressing modes, instruction format. Data transfer instructions, arithmetic instructions, increment & decrement instructions, logical instructions, branch instructions and machine control instructions. Assembly language programming examples.

Unit-2 (10 Lectures)

Stack operations, subroutine, call and return instructions. Delay loops, use of counters, timing diagrams-instruction cycle, machine cycle, T- states, time delay. Interrupt structure of 8085A microprocessor, processing of vectored and non-vectored interrupts, latency time and response time; Handling multiple interrupts

Microcontrollers: Introduction, different types of microcontrollers, embedded microcontrollers, processor architectures. Harvard vs. Princeton, CISC vs. RISC architectures, microcontroller memory types, microcontroller features, clocking, I/O pins, interrupts, timers, peripherals.

Unit-3 (18 Lectures)

PIC16F887 Microcontroller: Core features, Architecture, pin diagram, memory organization- Program and data memory organization, I/O Ports, oscillator module, Timer modules (Timer 0, Timer 1 and Timer 2), comparator module, analog-to-digital converter (ADC) module, data EEPROM, Enhanced capture/compare/PWM module, EUSART, master synchronous serial port (MSSP) module, special features of the CPU, interrupts, addressing modes, instruction set.

Unit-4 (14 Lectures)

Interfacing to PIC16F887: LED, Switches, Solid State Relay, Seven Segment Display, 16x2 LCD display, 4x4 Matrix Keyboard, Digital to Analog Converter, Stepper Motor and DC Motor. Interfacing program examples using C language.

Suggested Books:

1. Microprocessor Architecture, Programming and Applications with 8085, Ramesh S.Gaonkar - Wiley Eastern Limited- IV Edition.
2. Fundamentals of Microprocessor & Microcomputer: B. Ram—Danpat Rai Publications.
3. Microchip PIC16F87X datasheet
4. PIC Microcontrollers, Milan Verle, , mikro Elektronika, 1st edition (2008)
5. Muhammad Ali Mazidi, "Microprocessors and Microcontrollers", Pearson, 2006

Microprocessor and Microcontrollers Lab 60 Lectures 8085 Assembly language programs:

1. Program to transfer a block of data.
2. Program for multibyte addition
3. Program for multibyte subtraction
4. Program to multiply two 8-bit numbers.
5. Program to divide a 16 bit number by 8 bit number.
6. Program to search a given number in a given list.
7. Program to generate terms of Fibonacci series.
8. Program to find minimum and maximum among N numbers
9. Program to find the square root of an integer.
10. Program to find GCD of two numbers.
11. Program to sort numbers in ascending/descending order.
12. Program to verify the truth table of logic gates.

PIC Microcontroller Programming Note: Programs to be written using C programming language

1. LED blinking with a delay of 1 second.
2. Solid State Relay Interface
2. Interfacing of LCD (2X16).
3. Interfacing of stepper motor and Rotating stepper motor by N steps clockwise/anticlockwise with

speed control.

4. To test all the gates of a given IC74XX is good or bad.
5. Generate sine, square, saw tooth, triangular and staircase waveform using DAC interface.
6. Display of 4-digit decimal number using the multiplexed 7-segment display interface.
7. Analog to digital conversion using internal ADC and display the result on LCD.
8. Implementation of DC-Volt meter (0-5V) using internal ADC and LCD
9. Digital to analog conversion using PWM (pulse delay to be implemented using timers).
10. Speed control of DC motor using PWM (pulse delay to be implemented using timers).
11. Interfacing of matrix keyboard (4X4).
12. Serial communication between microcontroller and PC.

CC 12: Electromagnetics (Credits: Theory-04, Practicals-02)

Theory Lectures 60

Unit-1 (16 Lectures)

Vector Analysis: Scalars and Vectors, Vector Algebra, Rectangular (Cartesian) Coordinate System, Vector

Components and Unit Vector, Vector Field, Products, Cylindrical Coordinates, Spherical Coordinates, Differential Length, Area and Volume, Line Surface and Volume integrals, Del Operator, Gradient of a Scalar, Divergence and Curl of a Vector, the Laplacian. **Electrostatic Fields:** Coulomb's Law and Electric Field, Field due to Discrete and Continuous Charge Distributions, Electric Flux Density, Gauss's Law and Applications, Divergence Theorem and Maxwell's First Equation. Electric Potential, Potential due to a Charge and Charge distribution, Electric dipole. Electric Fields in Conductors, Current and Current Density, Continuity of Current, Metallic Conductor Properties and Boundary Conditions, Method of Images. Dielectric materials, Polarization, Dielectric Constant, Isotropic and Anisotropic dielectrics, Boundary conditions, Capacitance and Capacitors. Electrostatic Energy and Forces.

Unit- 2 (14 Lectures)

Poisson's Equation and Laplace's Equation: Derivation of Poisson's and Laplace's equation, Uniqueness Theorem, Examples of Solution of Laplace's Equation: Cartesian, Cylindrical and Spherical Coordinates.

Magnetostatics: Biot Savert's law and Applications, Magnetic dipole, Ampere's Circuital Law, Curl and Stoke's Theorem, Maxwell's Equation, Magnetic Flux and Magnetic Flux Density, Scalar and Vector Magnetic Potentials. Magnetization in Materials and Permeability, Anisotropic materials, Magnetic Boundary Conditions, Inductors and Inductances, Magnetic Energy, Magnetic Circuits. Inductances and Inductors, Magnetic Energy, Forces and Torques.

Unit-3 (13 Lectures)

Time-Varying Fields and Maxwell's Equations: Faraday's Law of Electromagnetic Induction, Stationary Circuit in Time-Varying Magnetic Field, Transformer and Motional EMF, Displacement Current, Maxwell's Equations in differential and integral form and Constitutive Relations. Potential Functions, Lorentz gauge and the Wave Equation for Potentials, Concept of Retarded Potentials. Electromagnetic Boundary Conditions. Time-Harmonic Electromagnetic Fields and use of Phasors

Unit-4 (17 Lectures)

Electromagnetic Wave Propagation: Time-Harmonic Electromagnetic Fields and use of Phasors, the Electromagnetic Spectrum, Wave Equation in a source free isotropic homogeneous media, Uniform Plane Waves in Lossless and Lossy unbounded homogeneous media, Wave Polarization, Phase and Group velocity, Flow of Electromagnetic Power and Poynting Vector. Uniform Plane wave incident on a Plane conductor boundary, concept of reflection and standing wave. **Guided Electromagnetic Wave Propagation:** Waves along Uniform Guiding Structures, TEM, TE and TM waves, Electromagnetic Wave Propagation in Parallel Plate and Rectangular Metallic Waveguides.

Suggested Books:

1. Murray. R. Spiegel, Vector Analysis, Schaum series, Tata McGraw Hill (2006)
2. M. N. O. Sadiku, Elements of Electromagnetics, Oxford University Press (2001)
3. W. H. Hayt and J. A. Buck, Engineering Electromagnetics, Tata McGraw Hill (2006)
4. D. C. Cheng, Field and Wave Electromagnetics, Pearson Education (2001)
5. J. A. Edminster, Electromagnetics, Schaum Series, Tata McGraw Hill (2006)
6. N. Narayan Rao, Elements of Engineering Electromagnetics, Pearson Education (2006)

7. Introduction to Electrodynamics, D.J. Griffiths, Pearson Education (2012)
8. Electromagnetic Wave and Radiating System, Jordan and Balmain, Prentice Hall (1979)

Electromagnetics Lab (using Scilab/ any other similar freeware) **60 Lectures**

1. Understanding and Plotting Vectors.
2. Transformation of vectors into various coordinate systems.
3. 2D and 3D Graphical plotting with change of view and rotation.
4. Representation of the Gradient of a scalar field, Divergence and Curl of Vector Fields.
5. Plots of Electric field and Electric Potential due to charge distributions.
6. Plots of Magnetic Flux Density due to current carrying wire.
7. Programs and Contour Plots to illustrate Method of Images
8. Solutions of Poisson and Laplace Equations – contour plots of charge and potential distributions
9. Introduction to Computational Electromagnetics: Simple Boundary Value Problems by FiniteDifference/Finite Element Methods.

**CC 13: Communication
Electronics (Credits: Theory-04,
Practicals- 02)**

**Theory Lectures
60**

Unit-1 (10 Lectures)

Electronic communication: Block diagram of an electronic communication system, electromagnetic spectrum-band designations and applications, need for modulation, concept of channels and base-band signals. Concept of Noise, Types of Noise, Signal to noise ratio, Noise Figure, Noise Temperature, Friss formula.

Unit-2 (20 Lectures)

Amplitude Modulation: Amplitude Modulation, modulation index and frequency spectrum. Generation of AM, Amplitude Demodulation (diode detector), Concept of Double side band suppressed carrier, Single side band suppressed carrier, other forms of AM (Pilot Carrier Modulation, Vestigial Side Band modulation, Independent Side Band Modulation). Block diagram of AM Transmitter and Receiver

Angle modulation: Frequency and Phase modulation, modulation index and frequency spectrum, equivalence between FM and PM, Generation of FM (direct and indirect methods), FM detector (PLL). Block diagram of FM Transmitter and Receiver Comparison between AM, FM and PM.

Unit -3 (14 Lectures)

Pulse Analog Modulation: Channel capacity, Sampling theorem, PAM, PDM, PPM modulation and detection techniques, Multiplexing, TDM and FDM. **Pulse Code**

Modulation: Need for digital transmission, Quantizing, Uniform and Non- uniform Quantization,

Quantization Noise, Companding, Coding, Decoding, Regeneration.

Unit -4 (16 Lectures)

Digital Carrier Modulation Techniques: Block diagram of digital transmission and reception, Information capacity, Bit Rate, Baud Rate and M-ary coding. Amplitude Shift Keying (ASK), Frequency Shift Keying (FSK), Phase Shift Keying (PSK), Binary Phase Shift Keying (BPSK) and Quadrature Phase Shift Keying (QPSK)

Suggested Books:

1. Electronic communication systems- Kennedy, 3rd edition, McGraw international publications
2. Principles of Electronic communication systems – Frenzel, 3rd edition, McGraw Hill
3. Communication Systems, S. Haykin, Wiley India (2006)
4. Advanced electronic communications systems – Tomasi, 6th edition, PHI.
5. Communication Systems, S. Haykin, Wiley India (2006)

Communication Electronics Lab (Hardware and Circuit Simulation Software) 60 Lectures

1. Study of Amplitude Modulation
2. Study of Amplitude Demodulation
3. Study of Frequency Modulation
4. Study of Frequency Demodulation
5. Study of Pulse Amplitude Modulation
6. AM Transmitter/Receiver
7. FM Transmitter/Receiver
8. Study of TDM, FDM
9. Study of Pulse Width Modulation
10. Study of Pulse Position Modulation
11. Study of Pulse Code Modulation
12. Study of Amplitude Shift Keying
13. Study of Phase Shift Keying,
14. Study of Frequency Shift Keying.

CC 14: Photonics (Credits: Theory-04, Practicals-02)

Theory Lectures
60

Unit-1 (22 Lectures)

Light as an Electromagnetic Wave: Plane waves in homogeneous media, concept of spherical waves. Reflection and transmission at an interface, total internal reflection, Brewster's Law. Interaction of electromagnetic waves with dielectrics: origin of refractive index, dispersion. **Interference :** Superposition of waves of same frequency, Concept of coherence, Interference by division of wavefront, Young's double slit, Division of Amplitude, thin film interference, anti-reflecting films, Newton's rings; Michelson interferometer. Holography. **Diffraction:** Huygen Fresnel Principle, Diffraction Integral, Fresnel and Fraunhofer approximations. Fraunhofer Diffraction by a single slit, rectangular aperture, double slit, Resolving power of microscopes and telescopes; Diffraction grating: Resolving power and Dispersive power

Unit-2 (13 Lectures)

Polarization: Linear, circular and elliptical polarization, polarizer-analyzer and Malus' law; Double refraction by crystals, Interference of polarized light, Wave propagation in uniaxial media. Half wave and quarter wave plates. Faraday rotation and electro-optic effect.

Unit-3 (13 Lectures)

Light Emitting Diodes: Construction, materials and operation. **Lasers:** Interaction of radiation and matter, Einstein coefficients, Condition for amplification, laser cavity, threshold for laser oscillation, line shape function. Examples of common lasers. The semiconductor injection laser diode. **Photodetectors:** Bolometer, Photomultiplier tube, Charge Coupled Device. Photo transistors and Photodiodes (p-i-n, avalanche), quantum efficiency and responsivity. **LCD Displays:** Types of liquid crystals, Principle of Liquid Crystal Displays, applications, advantages over LED displays.

Unit-4 (12 Lectures)

Guided Waves and the Optical Fiber: TE and TM modes in symmetric slab waveguides, effective index, field distributions, Dispersion relation and Group Velocity. Step index optical fiber, total internal reflection, concept of linearly polarized waves in the step index circular dielectric waveguides, single mode and multimode fibers, attenuation and dispersion in optical fiber.

Suggested Books:

1. Ajoy Ghatak, Optics, Tata McGraw Hill, New Delhi (2005)
2. E. Hecht, Optics, Pearson Education Ltd. (2002)
3. J. Wilson and J. F. B. Hawkes, Optoelectronics: An Introduction, Prentice Hall India (1996)
4. S. O. Kasap, Optoelectronics and Photonics: Principles and Practices, Pearson Education (2009)
5. Ghatak A.K. and Thyagarajan K., "Introduction to fiber optics," Cambridge Univ. Press. (1998)

Photonics Lab 60 Lectures

1. To verify the law of Malus for plane polarized light.
2. To determine wavelength of sodium light using Michelson's Interferometer.
3. To determine wavelength of sodium light using Newton's Rings.
4. To determine the resolving power and Dispersive power of Diffraction Grating.
5. Diffraction experiments using a laser.
6. Study of Faraday rotation.
7. Study of Electro-optic Effect.
8. To determine the specific rotation of scan sugar using polarimeter.
9. To determine characteristics of LEDs and Photo- detector.
10. To measure the numerical aperture of an optical fiber.

DSE 1: Power Electronics (Credits: Theory-04, Practicals-02)

Theory Lectures 60

Unit- 1 (12 Lectures)

Power Devices: Need for semiconductor power devices, Power diodes, Enhancement of reverse blocking capacity, Introduction to family of thyristors. **Silicon Controlled Rectifier (SCR):** structure, I-V characteristics, Turn-On and Turn-Off characteristics, ratings, Factors affecting the characteristics/ratings of SCR, Gate-triggering circuits, Control circuits design and Protection circuits, Snubber circuit.

Unit- 2 (14 Lectures)

Diac and Triac: Basic structure, working and V-I characteristic of, application of a Diac as a triggering device for a Triac. **Insulated Gate Bipolar Transistors (IGBT):** Basic structure, I-V Characteristics, switching characteristics, device limitations and safe operating area (SOA) etc. **Application of SCR:** SCR as a static switch, phase controlled rectification, single phase half wave, full wave and bridge rectifiers with inductive & non- inductive loads; AC voltage control using SCR and Triac as a switch. **Power MOSFETs:** operation modes, switching characteristics, power BJT, second breakdown, saturation and quasi-saturation state.

Unit- 3 (17 Lectures)

Power Inverters: Need for commutating circuits and their various types, d.c. link invertors, Parallel capacitor commutated invertors with and without reactive feedback and its analysis, Series Invertor, limitations and its improved versions, bridge invertors. **Choppers:** basic chopper circuit, types of choppers (Type A-D), step-down chopper, step-up chopper, operation of d.c. chopper circuits using self commutation (A & B-type commutating circuit), cathode pulse turn-off chopper (using class D commutation), load sensitive cathode pulse turn-off chopper (Jones Chopper), Morgan's chopper

Unit- 4 (17 Lectures)

Electromechanical Machines: DC Motors, Basic understanding of field and armature, Principle of operation, EMF equation, Back EMF, Factors controlling motor speed, Thyristor based speed control of dc motors, AC motor (Induction Motor only), Rotor and stator, torque & speed of induction motor, Thyristor control of ac motors(block diagrams only)

Suggested Books:

1. Power Electronics, P.C. Sen, TMH
2. Power Electronics & Controls, S.K. Dutta
3. Power Electronics, M.D. Singh & K.B. Khanchandani, TMH
4. Power Electronics Circuits, Devices and Applications, 3rd Edition, M.H. Rashid, Pearson Education
5. Power Electronics, Applications and Design, Ned Mohan, Tore.
6. Power Electronics, K. HariBabu, Scitech Publication.
7. Power Electronics, M.S. Jamil Asghar, PHI.
8. A Textbook of Electrical Technology-Vol-II, B.L. Thareja, A.K. Thareja, S.Chand

Power Electronics Lab 60 Lectures

1. Study of I-V characteristics of DIAC
2. Study of I-V characteristics of a TRIAC
3. Study of I-V characteristics of a SCR
4. SCR as a half wave and full wave rectifiers with R and RL loads
5. DC motor control using SCR.
6. DC motor control using TRIAC.
7. AC voltage controller using TRIAC with UJT triggering.
8. Study of parallel and bridge inverter.
9. Design of snubber circuit
10. VI Characteristic of MOSFET and IGBT (Both)
11. Study of chopper circuits

**DSE 2: Digital Signal Processing
(Credits: Theory-04, Practicals-02)**

Theory Lectures 60

Unit- 1 (15 Lectures)

Discrete Time systems: Discrete sequences, linear coefficient difference equation, Representation of DTS, LSI Systems. Stability and causality, frequency domain representations and Fourier transform of DT sequences.

Unit- 2 (15 Lectures)

Z-Transform: Definition and properties, Inverse Z Transform and stability. Parsevals Theorem and applications. **System Function:** signal flow graph, its use in representation and analysis of Discrete Time Systems. Techniques of representations. Matrix generation and solution for DTS evaluations.

Unit- 3 (15 Lectures)

Discrete Fourier Transform: DFT assumptions and Inverse DFT. Matrix relations, relationship with

FT and its inverse, circular convolution, DFT theorems, DCT. Computation of DFT. FFT Algorithms and processing gain, Discrimination, interpolation and extrapolation. Gibbs phenomena. FFT of real functions interleaving and resolution improvement. Word length effects.

Unit- 4 (15 Lectures)

Digital Filters: Analog filter review. System function for IIR and FIR filters, network representation. Canonical and decomposition networks. IIR filter realization methods and their limitations. FIR filter realization techniques. Discrete correlation and convolution; Properties and limitations.

Suggested Books:

1. A.V. Oppenheim and Schafer, Discrete Time Signal Processing, Prentice Hall, 1989.
2. John G. Proakis and D.G. Manolakis, Digital Signal Processing: Principles, Algorithms and Applications, Prentice Hall, 1997.

Digital Signal Processing Lab (Scilab/MATLAB/Other Mathematical Simulation software) 60 Lectures

1. Generation of unit sample sequence, unit step, ramp function, discrete time sequence, real sinusoidal sequence.
2. Generate and plot sequences over an interval.
3. Given $x[n]$, write program to find $X[z]$.
4. Fourier Transform, Discrete Fourier Transform and Fast Fourier Transform
5. Design of a Butterworth analog filter for low pass and high pass.
6. Design of digital filters.

DSE 3: Computer Networks (Credits: Theory-04, Practicals-02)

Theory Lectures 60

Unit- I (15 Lectures)

Data Communications: Components, protocols and standards, Network and Protocol Architecture, Reference Model ISO-OSI, TCP/IP-Overview, topology, transmission mode, digital signals, digital to digital encoding, digital data transmission, DTE-DCE interface, interface standards, modems, cable modem, transmission media- guided and unguided, transmission impairment, Performance, wavelength and Shannon capacity. Review of Error Detection and Correction codes. **Switching:** Circuit switching (space-division, time division and space-time division), packet switching (virtual circuit and Datagram approach), message switching.

Unit-2 (15 Lectures)

Data Link Layer: Design issues, Data Link Control and Protocols: Flow and Error Control, Stop-and-wait ARQ. Sliding window protocol, Go-Back-N ARQ, Selective Repeat

ARQ, HDLC, Point-to-Point Access: PPP Point-to-Point Protocol, PPP Stack, **Medium Access Sub layer**: Channel allocation problem, Controlled Access, Channelization, multiple access protocols, IEEE standard 802.3 & 802.11 for LANs and WLAN, high-speed LANs, Token ring, Token Bus, FDDI based LAN, Network Devices-repeaters, hubs, switches bridges.

Unit-3 (15 Lectures)

Network Layer: Design issues, Routing algorithms, Congestion control algorithms, Host to Host Delivery: Internetworking, addressing and routing, IP addressing (class full & Classless), Subnet, Network Layer Protocols: ARP, IPV4, ICMP, IPV6, ICMPV6.

Unit-4 (15 Lectures)

Transport Layer: Process to Process Delivery: UDP; TCP, congestion control and Quality of service.

Application Layer: Client Server Model, Socket Interface, Domain Name System (DNS): Electronic Mail (SMTP), file transfer (FTP), HTTP and WWW.

Suggested Books:

1. S. Tannenbum, D. Wetherall, "Computer Networks", Prentice Hall, Pearson, 5thEd
2. Behrouz A. Forouzan, "Data Communications and Networking", Tata McGraw-Hill, 4thEd

Computer Networks Lab 60 Lectures

1. Introduction to Computer Network laboratory Introduction to Discrete Event Simulation Discrete Event Simulation Tools - ns2/ns3, Omnet++
2. Using Free Open Source Software tools for network simulation of telnet and ftp between N sources - N sinks (N = 1, 2, 3). Evaluate the effect of increasing data rate on congestion.
3. Using Free Open Source Software tools for network simulation to study the effect of queuing disciplines on network performance - Random Early Detection/Weighted RED / Adaptive RED.
4. Using Free Open Source Software tools for network simulation for http, ftp and DBMS access in networks
5. Using Free Open Source Software tools for network simulation to study effect of VLAN on network performance - multiple VLANs and single router.
6. Using Free Open Source Software tools for network simulation to study effect of VLAN on network performance - multiple VLANs with separate multiple routers.
7. Using Free Open Source Software tools for network simulation to study the performance of wireless networks

BACHELOR OF SCIENCE(ITM)

SEMESTER-I

C:1-PROGRAMMING USING C (Credit:6, Theory:4, Practical: 2)

UNIT- I

Introduction to Programming Language, Introduction to C Programming, Character Set, C Tokens, Keywords & Identifiers, Constants, Variables, Data Types, Variables, Storage Classes, Operators (Arithmetic, Relational, Logical, Assignment, Increment & Decrement, Conditional, Bitwise), Expressions, Input and Output Operations.

UNIT- II

Decision Making and Branching: Simple IF Statement, IF. ELSE Statement, Nesting IF. ELSE Statement, ELSE IF Ladder, Switch Statement, Operator, GOTO Statement. Decision Making and Looping: The WHILE Statement, The DO Statement, The FOR Statement, Jumps in LOOPS. Arrays, Character Arrays and Strings.

UNIT- III

User-defined Functions: Need, Elements & Definition, Function Calls, Function Definition, Category of Functions, Recursion. Structures and Unions: Defining, Declaring, Accessing, Initialization Structure, Arrays of Structures, Arrays within Structures, Structures and Functions, Unions.

UNIT- IV

Pointers: Accessing the Address of a Variable, Declaring Pointer Variables, Initializations of Pointer Variable, Accessing a Variable through its Pointer, Chain of Pointers, Pointer Expressions, Pointer Increments and Scale Factor, Pointers and Arrays, Pointers and Character Strings, Array of Pointers, Pointers as Function Arguments, Functions Returning Pointers, Pointers to Functions, Pointers to Structures, Troubles with Pointers.

UNIT- V

File Management in C: Defining and Opening a File, Closing a File, Input/ Output Operations on Files, Error Handling During I/O Operations, Random Access to Files, Command Line Arguments, Dynamic Memory Allocation.

Recommended Books:

1. E. Balaguruswamy, Programming in ANSI C,4/e, (TMH).
2. Paul Deitel, Harvey Deitel, C: How to Program, 8/e, Prentice Hall.
3. J. R. Hanly, Problem Solving & Program Design in C, 7/e, Pearson.
4. B. Kernighan & D.M. Ritchie, The C Programming Language, 2/e PHI.

C: 2-COMPUTER ORGANIZATION (Credit:6, Theory:4, Practical: 2)

UNIT-I

Character Codes, Decimal System, Binary System, Decimal to Binary Conversion, Hexadecimal Notation, Boolean Algebra, Basic Logic Functions: Electronic Logic Gates, Synthesis of Logic Functions, Minimization of Logic Expressions, Minimization using Karnaugh Maps, Synthesis with NAND and NOR Gates.

UNIT-II

Flip-Flops, Gated Latches, Master-Slave Flip-Flops, Edge-Triggering, T Flip-Flops, JK Flip-Flops.

Registers and Shift Registers, Counters, Decoders, Multiplexers, Programmable Logic Devices (PLDs), Programmable Array Logic (PAL), Complex Programmable Logic Devices (CPLDs), Field-Programmable Gate Array (FPGA), Sequential Circuits, Timing Diagrams, The Finite State Machine Model, Synthesis of Finite State Machines.

UNIT-III

Basic Structure of Computers: Computer Types, Functional Units, Input Unit, Memory Unit, Arithmetic and Logic Unit, Output Unit, Control Unit, Basic Operational Concepts, Bus Structures, Software. Machine Instructions and Programs: Numbers, Arithmetic Operations, and Characters: Number Representation, Addition of Positive Numbers, Addition and Subtraction of Signed Numbers, Overflow of Integer Arithmetic, Characters, Memory Locations and Addresses, Byte Addressability, Word Alignment, Accessing Numbers, Characters, and Character Strings, Memory Operations, Instructions and Instruction Sequencing, Register Transfer Notation, Basic Instruction Types, Instruction Execution and Straight-Line Sequencing, Branching, Condition Codes, Generating Memory Addresses, Addressing Modes, Implementation of Variables and Constants, Indirection and Pointers, Indexing and Arrays, Relative Addressing.

UNIT-IV

THE ARM EXAMPLE: **Registers**, Memory Access, and Data Transfer, Register Structure, Memory Access Instructions and Addressing Modes, Register Move Instructions, Arithmetic and Logic Instructions: Arithmetic Instructions, Logic Instructions, Branch Instructions, Setting Condition Codes, Assembly Language, Pseudo-Instructions, I/O Operations, Subroutines, Vector Dot Product Program, Byte-Sorting Program, Linked-List Insertion and Deletion Subroutines. Basic Input-Output Operations, Stacks and Queues, Subroutines. PowerPC Example: Basic PowerPC Processor Organization, Load and Store Instructions, Arithmetic and Logic Instructions, Flow Control Instructions, Compare Instructions, Logic Instructions, Subroutines.

UNIT-V

Memory System: Semiconductor RAM Memories, Internal Organization of Memory Chips, Static Memories, Asynchronous DRAMS, Synchronous DRAMS, Structure of Large Memories, Memory System Considerations, RAMBUS Memory. Read-Only Memories: ROM, PROM, EPROM, EEPROM, Flash Memory, Speed, Size, and Cost of Memory. Secondary Storage: Magnetic Hard Disks, Optical Disks, Magnetic Tape Systems.

Recommended Books:

1. Carl Hamacher, Z. Vranesic, S. Zaky: Computer Organization, 5/e (TMH)
2. William Stallings: Computer Organization and Architecture (Design for Performance), 9/e
3. S. Brown, & Z. Vranesic, Fundamentals of Digital Logic Design with VHDL, 2/e, McGraw-Hill
4. J. P. Uyemura, A First Course in Digital System Design, An Integrated Approach, Cengage Learning.

GE:1-DISCRETE STRUCTURES

(Credit:6, Theory:4, Practical: 2)

UNIT-I Logic and Proofs: Propositional Logic, Propositional Equivalences, Predicates and Quantifiers, Nested Quantifiers, Rules of Inference, Introduction to Proofs, Normal Forms, Proof Methods and Strategy, Mathematical Induction, Strong Induction and Well-Ordering, Recursive Definitions and Structural Induction, Recursive Algorithms.

UNIT-II

Basic Structures: Sets, Set Operations, Functions, Recursive Functions, Sequences and Summations. Relations: Relations and their Properties, n-ary Relations and their Applications, Representing Relations, Closures of Relations, Equivalence Relations, Partial Ordering. Boolean.

UNIT-III

Algebra: Boolean Functions, Representing Boolean Functions, Logic Gates, Minimization of Circuits. Algebraic Structures & Coding Theory: The Structure of Algebras, Semi-groups, Monoids and Groups, Homomorphism, Normal Subgroups, and Congruence Relations, Rings, Integral Domains and Fields, Quotient and Product Algebras, Coding Theory. Polynomial Rings and Polynomial Codes.

UNIT-IV

Counting: Basics of Counting, The Pigeonhole Principle, Permutations and Combinations, Binomial Coefficients, Generalized Permutations and Combinations, Generating Permutations and Combinations. Advanced Counting Techniques, Applications of Inclusion-Exclusion, Discrete probability, Conditional probability, Bayes Theorem.

UNIT-V

Graphs: Graphs and Graph Models, Graph Terminology and Special Types of Graphs, Havel-Hakimi Theorem, Representing Graphs and Graph Isomorphism, Connectivity, Cut-Sets, Euler and Hamiltonian Paths, Shortest-Path Problem, Planar Graphs, Graph Coloring, NetworkFlows.

Recommended Books:

1. Kenneth H Rosen, Discrete Mathematics & Its Applications, McGraw-Hill. 7/e.
2. J. L. Hein, Discrete Structures, Logic, and Computability, 3rd Edition, Jones and Bartlett Publishers, 2009
3. C.L. Liu , D.P. Mahopatra, Elements of Discrete mathematics, 2nd Edition , Tata McGraw Hill, 1985
4. M. O. Albertson and J. P. Hutchinson, Discrete Mathematics with Algorithms , John wiley Publication, 1988.

SEMESTER-II

C: 3-PERSONAL MANAGEMENT & ORGANIZATIONAL BEHAVIOUR

(Credit:6, Theory:4, Practical: 2)

C: 4-PROGRAMMING USING C++

(Credit:6, Theory:4, Practical: 2)

UNIT-I

Principles of Object-Oriented Programming: Object-Oriented Programming (OOP) Paradigm, Basic Concepts of OOP, Benefits of OOP, Object Oriented Languages, Applications of OOP. Beginning with C++: Applications of C++, C++ statements, Example with Class, Structure of C++ Program, Creating the Source File, Compiling and Linking. Tokens, Expressions and Control Structures: Tokens, Keywords, Identifiers & Constants, Basic Data Types, User-Defined Data Types, Derived Data Types, Symbolic Constants, Type Compatibility, Declaration of Variables, Dynamic Initialization of Variables, Reference Variables, Operators in C++, Scope Resolution Operator, Member Deferencing Operators, Memory Management Operators, Manipulators, Type Cast Operators, Expressions and their Types, Special Assignment Expressions, Implicit Conversions, Operator Overloading, Operator Precedence, Control Structures.

UNIT- II

Functions in C++: The Main Function, Function Prototyping, Call By Reference, Return by Reference, Inline Functions, Default Arguments, Const. Arguments, Function Overloading, Friend & Virtual Functions, Math. Library Functions. Classes and Objects: Specifying a Class, Defining Member Functions, Making an outside Function Inline, Nested Member Functions, Private Member Functions, Arrays within a Class, Memory Allocation for Objects, Static Data Members, Static Member Functions, Arrays of Objects, Objects as Function Arguments, Friendly Functions, Returning Objects, Const. Member Functions, Pointer to Members, Local Classes.

UNIT- III

Constructors & Destructors: Constructors, Parameterized Constructors, Multiple Constructors in a Class, Constructors with Default Arguments, Dynamic Initialization of Objects, Copy Constructor, Dynamic Constructors, Constructing Two-Dimensional Arrays, Const. Objects, Destructors. Operator Overloading and Type Conversions: Defining Operator Overloading, Overloading Unary Operators, Overloading Binary Operators, Overloading Binary Operators using Friends, Manipulation of Strings using Operators, Rules for Overloading Operators, Type Conversions.

UNIT- IV

Inheritance : Defining Derived Classes, Single Inheritance, Making a Private Member Inheritance, Multilevel Inheritance, Multiple Inheritance, Hierarchical Inheritance, Hybrid Inheritance, Virtual Base Classes, Abstract Classes, Constructors in Derived Classes, Member Classes, Nesting of Classes. Pointers, Virtual Functions and Polymorphism: Pointers, Pointers to Objects, this Pointer, Pointers to Derived Classes, Virtual Functions, Pure Virtual Functions.

UNIT- V

Managing Console I/O Operations: C++ Streams, C++ Stream Classes, Unformatted I/O Operations, Formatted Console I/O Operations, Managing Output with Manipulators. Files: Classes for File Stream Operations, Opening and Closing a File, Detecting end-of-file, File Modes, File Pointers and their Manipulations, Sequential Input and Output Operations, Updating a File: Random Access, Error Handling During File Operations, Command-line Arguments.

Recommended Books:

1. E. Balgurusamy, Object Oriented Programming with C++ :, 4/e (TMH).
2. Paul Deitel, Harvey Deitel, "C++: How to Program", 9/e. Prentice Hall.
3. J. Farrell, Object-Oriented Programming, Cengage Learning.
4. Bjarne Stroustrup, "Programming – Principles and Practice using C++", 2/e, Addison-Wesley 2014.

C: 5-DATA STRUCTURES

(Credit:6, Theory:4, Practical: 2)

UNIT-I

Introduction and Overview: Definitions, Concept of Data Structures, Overview of Data Structures, Implementation of Data Structures. Arrays: Terminology, One-Dimensional Array, Multi-Dimensional Arrays, Pointer Arrays.

UNIT-II

Linked Lists: Single Linked List, Circular Linked List, Double Linked List, Circular Double Linked List, Application of Linked Lists, Memory Representation, Boundary Tag System, De-allocation Strategy, Buddy System, Compaction.

UNIT-III

Stacks: Definition, Representation of Stack (Array, Linked List), Operations on Stacks, Applications of Stack (Evaluation of Arithmetic Expressions, Code Generation, Implementation of Recursion, Factorial Calculation, Quick Sort, Tower of Hanoi, Activation Record Management).

UNITIV

Queues: Definition, Representation of Queues (Array, Linked List), Circular Queue, Deque, Priority Queue, Application of Queues (Simulation, CPU Scheduling in Multiprogramming Environment, Round Robin Algorithm).

UNITV

Tree: Binary Trees, Properties of Binary Tree, Linear Representation of Binary a Binary Tree, Linked Representation of a Binary Tree, Physical Implementation of Binary Tree in Memory, Operations on Binary Tree (Insertion, Deletion, Traversal, Merging of two Binary Trees), Types of Binary Trees (Expression Tree, Binary Search Tree, Heap Tree, Threaded Binary Trees, Height Balanced Binary Tree, Weighted Binary Tree, Decision Trees).

Recommended Books:

1. D. Samanta, Classic Data Structures:, 2/e (PHI).
2. D.S Malik, Data Structure using C++, 2/e, Cengage Learning, 2010.
3. Adam Drozdek, "Data Structures and algorithm in C++", 3/e, Cengage Learning, 2012.
4. Robert L. Kruse, "Data Structures and Program Design in C++", Pearson.

GE:2-STATISTICS FOR BUSINESS**(Credit:6, Theory:4, Practical: 2)****UNIT-I**

Probability and Probability Distribution: Events and the Sample Space, Calculating Probabilities using Simple events, Useful counting rules, Probability rules: Addition rule, Conditional probability and multiplication rule, Bayes rule.

UNIT-II

Probability Distributions: Random Variable, Discrete random variable, Mean and Standard deviation of discrete random variable, Discrete Probability Distributions: Binomial, Poisson and Hypergeometric probability distribution, Continuous Probability distribution: Normal distribution.

UNIT-III

Sampling Distribution: sampling plans and experimental designs, Sampling distribution of a statistic, Central Limit theorem, Sampling distribution of the Sample mean and Proportion. Large Sample Estimation: Point estimation, Interval estimation, Confidence interval of population mean, Population proportion, difference between two population means, difference between two population proportions.

UNIT-IV

Large Sample Tests of Hypothesis: Test of a Population mean, Test of difference of two population means, Test of hypothesis for a binomial proportion, Test of hypothesis for the difference between two binomial proportions. Inference from Small Samples: Students t Distribution, Small Sample inferences concerning a population mean and difference between two population means, Inferences concerning a population variance and difference between two population variances.

UNIT-V

Analysis of Variance: One-way classification, Two-way classification. Linear regression and Correlation: Method of least squares, Analysis of variance for linear regression, Testing the usefulness of the linear regression model, Estimation and Prediction using the fitted line. Carl Pearsons coefficient of Correlation, Test of hypothesis concerning the Correlation coefficient.

Recommended Books:

1. William Mendenhall, Robert J. Beaver, Barbara M. Beaver, Probability and Statistics 14/e, CENGAGE Learning.
2. W. W. Hines, D.C. Montgomery, D.M. Goldsman, & C.M. Borror, Probability & Statistics in Engineering"

SEMESTER-III

C: 6-OPERATING SYSTEMS**(Credit:6, Theory:4, Practical: 2)****UNIT-I**

Operating System, Computer-System Organization, Computer-System Architecture, Operating-System Structure, Operating-System Operations, Process Management, Memory Management, Storage Management, Protection and Security, Distributed Systems, Special Purpose Systems, Computing

Environments, Open-Source Operating Systems. Operating System Services, User Operating System Interface, System Calls, Types of System Calls, System Programs, Operating-System Design and Implementation, Operating System Structure, Virtual Machines, Operating System Debugging, Operating System Generations. System Boot.

UNIT-II

Process: Process Concept, Process Scheduling, Operations on Processes, Inter-Process Communication, Examples of IPC Systems, Communication in Client-Server Systems. Multithreaded Programming: Multithreading Models, Thread Libraries, Threading Issues, Operating-System Examples.

UNIT-III

Process Scheduling: Basic Concepts, Scheduling Criteria, Scheduling Algorithms, Thread Scheduling. Multiple-Process Scheduling. Synchronization: The Critical Section Problem, Peterson's Solution, Synchronization Hardware, Semaphores, Classical Problems of Synchronization, Monitors, Synchronization Examples, Atomic Transactions.

UNIT-IV

Deadlocks: System Model, Deadlock Characterization, Methods of Handling Deadlocks, Deadlock Prevention, Deadlock avoidance, Deadlock Detection, Recovery from Deadlock. Memory Management Strategies: Swapping, Contiguous Memory Allocation, Paging, Structure of the Page Table, Segmentation, Example: The Intel Pentium.

UNIT-V

Virtual-Memory Management: Demand Paging, Copy-on-Write, Page Replacement, Allocation of Frames, Thrashing, Memory-Mapped Files, Allocating Kernel Memory. File System: File Concept, Access Methods, Directory and Disk Structure, File-System Mounting, File Sharing, Protection.

Recommended Books:

1. A Silberschatz, P.B. Galvin, G. Gagne, Operating Systems Concepts, 8/e, John Wiley Publications 2008.
2. A.S. Tanenbaum, Modern Operating Systems, 3/e, Pearson Education 2007.
3. W. Stallings, Operating Systems, Internals & Design Principles, 5/e, Prentice Hall of India. 2008.
4. G. Nutt, Operating Systems: A Modern Perspective, 2/e, Pearson Education 1997.

C: 7-BUSINESS ACCOUNTING

(Credit:6, Theory:4, Practical: 2)

UNIT-I

Introduction to Financial Accounting. Accounting as an Information System. Importance, Scope, and Limitations. Users of Accounting Information. Generally Accepted Accounting Principles. The Accounting Equation. Nature of Accounts and Rules of Debit and Credit. Recording Transactions in General Journal. Recording Transactions in three column Cash Book. An overview of Subsidiary books Purchase Book, Purchase Returns Book, Sales Book, and Sales Returns Book. Opening and Closing Entries. Preparation of Ledger Accounts.

UNIT-II

Introduction to International Financial Reporting Standards (IFRS). Understanding Accounting Standards issued by the ICAI related to Disclosure of Accounting Policies, Depreciation Accounting, and Revenue Recognition. Methods of charging Depreciation Straight-line Method, and Written-down-value Method. Preparation of Trial Balance. Adjustment Entries. Post-adjusted Trial Balance. Bank Reconciliation Statement.

UNIT-III

Preparation of Financial Statements: Preparing Trading Account, Profit & Loss Account and Balance Sheet for a Sole Proprietor. Understanding contents of Financial Statements of a Joint Stock Company as per Companies Act 2013. Understanding the contents of a Corporate Annual Report. Preparation of Cash Flow Statement as per AS-3 (revised).

UNIT-IV

Analyzing Financial Statements: Objectives of Financial Statement Analysis; Sources of Information; Standards of Comparison; Techniques of Financial Statement Analysis - Horizontal Analysis, Vertical Analysis, and Ratio Analysis. Meaning and Usefulness of Financial Ratios; Analysis of Financial Ratios from the perspective of different Stakeholders like Investors, Lenders, and Short-term Creditors; Profitability Ratios, Solvency Ratios, Liquidity Ratios, and Turnover Ratios; Limitations of Ratio Analysis.

Recommended Books:

1. S.N. Maheshwari, Suneel K. Maheshwari, and Sharad K. Maheshwari: An Introduction to Accountancy, Vikas Publishing House Pvt. Ltd.
2. R. Narayanaswamy, Financial Accounting: A Managerial Perspective, PHI Learning Pvt. Ltd.
3. Charles T. Horngren, Gart L. Sundem, John A. Elliott, and Donna R. Philbrick, Introduction to Financial Accounting, Pearson.
4. J.R. Monga, Financial Accounting: Concepts and Applications, Mayur Paperbacks.
5. T.P. Ghosh, Financial Accounting for Managers: Taxmann Allied Services Pvt. Ltd.

C: 8-MANAGERIAL ECONOMICS

(Credit:6, Theory:4, Practical: 2)

UNIT-I

Demand, Supply and Market equilibrium: individual demand, market demand, individual supply, market supply, market equilibrium; Elasticities of demand and supply : Price elasticity of demand, income elasticity of demand, cross price elasticity of demand, elasticity of supply; Theory of consumer behavior : cardinal utility theory, ordinal utility theory(indifference curves, budget line, consumer choice, price effect, substitution effect, income effect for normal, inferior and giffen goods), revealed preference theory.

UNIT-II

Producer and optimal production choice : optimizing behavior in short run(geometry of product curves, law of diminishing margin productivity, three stages of production), optimizing behavior in long run (isoquants, isocost line, optimal combination of resources) Costs and scale : traditional theory of cost (short run and long run, geometry of cot curves, envelope curves), modern theory of cost (short run and long run), economies of scale, economies of scope.

UNIT-III Theory of firm and market organization : perfect competition (basic features, short run equilibrium of firm/industry, long run equilibrium of firm/industry, effect of changes in demand, cost and imposition of taxes) ; monopoly (basic features, short run equilibrium, long run equilibrium, effect of changes in demand, cost and imposition of taxes, comparison with perfect competition, welfare cost of monopoly), price discrimination, multiplant monopoly ; monopolistic competition (basic features, demand and cost, short run equilibrium, long run equilibrium, excess capacity) ; oligopoly (Cournots model, kinked demand curve model, dominant price leadership model, prisoners dilemma)

UNIT-IV

Factor market : demand for a factor by a firm under marginal productivity theory (perfect competition in the product market, monopoly in the product market), market demand for a factor, supply of labour, market supply of labour, factor market equilibrium.

Recommended Books:

1. Dominick Salvatore (2009). Principles of Microeconomics (5th ed.) Oxford University Press.
2. Lipsey and Chrystal. (2008). Economics.(11th ed.) Oxford University Press.
3. Koutosyannis (1979). Modern Micro Economics. Palgrave Macmillan.

4. Pindyck, Rubinfeld and Mehta. (2009). Micro Economics. (7th ed.), Pearson.

SEC:1-BUSINESS COMMUNICATION

(Credits:2)

GE:1-NUMERICAL TECHNIQUES

(Credit:6, Theory:4, Practical: 2)

UNIT-I

Introduction: Numbers and their accuracy, Chopping and Rounding off, Errors: Absolute and Relative errors, Floating point representations of numbers, Loss of significance. Solution of Algebraic and Transcendental Equations: Bisection Method, Newton-Raphson Method, Secant Method, Method of false position, Rate of convergence and comparison of iterative methods.

UNIT-II

Interpolation and Numerical Differentiation: Polynomial Interpolation, Interpolating polynomial: Lagrange form, Newton form, Nested form, Divided difference Interpolation, Inverse Interpolation, Errors in polynomial Interpolation. First derivative and second derivative via Taylor Series, Richardson Extrapolation.

UNIT-III

Numerical Integration: Trapezoidal Rule, Composite Trapezoidal rule, Simpsons 1/3 rule, Simpsons 3/8 rule, Gaussian Quadrature formulae (1-point, 2-point, 3-point)

UNIT-IV

Solution of System of Linear Equations: Gaussian Elimination method and Pivoting, LU factorization method, ill Conditioning, Iterative Methods: Jacobi iterative method, Gauss Seidel iterative method. Eigen Values and Eigen Vectors: Eigen value properties, Computation Eigen values by Power method.

UNIT-V

Solution of Ordinary Differential Equations: Taylor Series method, Runge-Kutta method of order 2 and order 4, Predictor-Corrector method: Adams-Bashforth-Moulton method. Smoothing of Data and the Method of Least Squares: Linear and non-linear least square method.

Recommended Books:

1. E. Ward Cheney and David R. Kincaid, Numerical Methods and Applications CENGAGE Learning India Private Ltd., New Delhi.
2. S.R.K. Iyengar, R.K. Jain, & M.K. Jain, Numerical Methods for Scientific & Engineering Computation, 6/e, New Age Int. Pub.
3. S.S. Sastry, Introductory Methods of Numerical Analysis, 5/e, EEE
4. Steven C. Chapra, Applied Numerical Methods with MATLAB, 2/e, McGraw-Hill.

SEMESTER-IV

C: 9-JAVA PROGRAMMING

(Credit:6, Theory:4, Practical: 2)

UNIT-I

Introduction to Java: Java Architecture and Features, Understanding the semantic and syntax

differences between C++ and Java, Compiling and Executing a Java Program, Variables, Constants, Keywords Data Types, Operators (Arithmetic, Logical and Bitwise) and Expressions, Comments, Doing Basic Program Output, Decision Making Constructs (conditional statements and loops) and Nesting, Java Methods (Defining, Scope, Passing and Returning Arguments, Type Conversion and Type and Checking, Built-in Java Class Methods).

UNIT-II

Arrays, Strings and I/O: Creating & Using Arrays (One Dimension and Multi-dimensional), Referencing Arrays Dynamically, Java Strings: The Java String class, Creating & Using String Objects, Manipulating Strings, String Immutability & Equality, Passing Strings To & From Methods, String Buffer Classes. Simple I/O using System.out and the Scanner class, Byte and Character streams, Reading/Writing from console and files. Object-Oriented Programming Overview: Principles of Object-Oriented Programming, Defining & Using Classes, Controlling Access to Class Members, Class Constructors, Method Overloading, Class Variables & Methods, Objects as parameters, final classes, Object class, Garbage Collection.

UNIT-III

Inheritance, Interfaces, Packages, Enumerations, Autoboxing and Metadata: Inheritance: (Single Level and Multilevel, Method Overriding, Dynamic Method Dispatch, Abstract Classes), Interfaces and Packages, Extending interfaces and packages, Package and Class Visibility, Using Standard Java Packages (util, lang, io, net), Wrapper Classes, Autoboxing/Unboxing, Enumerations and Metadata.

UNIT-IV

Exception Handling, Threading, Networking and Database Connectivity: Exception types, uncaught exceptions, throw, built-in exceptions, Creating your own exceptions; Multi-threading: The Thread class and Runnable interface, creating single and multiple threads, Thread prioritization, synchronization and communication, suspending/resuming threads. Using java.net package, Overview of TCP/IP and Datagram programming. Accessing and manipulating databases using JDBC.

UNIT-V

Applets and Event Handling: Java Applets: Introduction to Applets, Writing Java Applets, Working with Graphics, Incorporating Images & Sounds. Event Handling Mechanisms, Listener Interfaces, Adapter and Inner Classes. The design and Implementation of GUIs using the AWT controls, Swing components of Java Foundation Classes such as labels, buttons, text fields, layout managers, menus, events and listeners; Graphic objects for drawing figures such as lines, rectangles, ovals, using different fonts. Overview of servlets.

Recommended Books:

1. E. Balagurusamy, Programming with Java, 4/e, TMH
2. Bruce Eckel, "Thinking Java", 8/e, Pearson India, 2010.
3. John R. Hubbard, "Programming with JAVA", Schaum's Series, 2/e, 2004.
4. Cay S. Horstmann, Gary Cornell, "Core Java 2 Volume 1", 9/e, Printice Hall, 2012.

C: 10-DATABASE MANAGEMENT SYSTEM

(Credit:6, Theory:4, Practical: 2)

UNIT-I

Databases and Database Users, Database System Concepts and Architecture, Data Modelling using

the Entity-Relationship (ER) Model, The Enhanced Entity-Relationship (EER) Model.

UNIT-II

Relational Model: The Relational Data Model and Relational Database Constraints, The Relational Algebra and Relational Calculus.

UNIT-III

Relational Database Design by ER- and EER-to-Relational Mapping, SQL-99: Schema Definition, Constraints, Queries, and Views, Introduction to SQL Programming Techniques.

UNIT-IV

Functional Dependencies and Normalization for Relational Databases, Relational Database Algorithms and Further Dependencies, Practical Database Design Methodology and use of UML Diagrams.

UNIT-V

Disk Storage, Basic File Structures, and Hashing, Indexing Structures for Files, Algorithms for Query Processing and Optimization, Physical Database Design and Tuning.

Recommended Books:

1. R. Elmasri, S.B. Navathe, Fundamentals of Database Systems, 6/e, Pearson Education, 2010.
2. A. Silberschatz, H.F. Korth, S. Sudarshan, Database System Concepts 6/e, McGraw Hill, 2010.
3. R. Ramakrishnan, J. Gehrke, Database Management Systems, McGraw-Hill.
4. C. Coronel, S. Morris, & P. Rob, Database Principles (Fundamentals of Design, Implementation, and Management), 9/e, Cengage Learning.

C: 11-MANAGEMENT ACCOUNTING

(Credit:6, Theory:4, Practical: 2)

UNIT-I

Nature, Scope of Management Accounting: Meaning, definition, nature and scope of Management Accounting; Comparison of Management Accounting with Cost Accounting and Financial Accounting. Cost concepts: Meaning, Scope, Objectives, and Importance of Cost Accounting; Cost, Costing, Cost Control, and Cost Reduction; Elements of Cost, Components of total Cost, Cost Sheet. Classification of Costs: Fixed, Variable, Semivariable, and Step Costs; Product, and Period Costs; Direct, and Indirect Costs; Relevant, and Irrelevant Costs; Shut-down, and Sunk Costs; Controllable, and Uncontrollable Costs; Avoidable, and Unavoidable Costs; Imputed / Hypothetical Costs; Out-of-pocket Costs; Opportunity Costs; Expired, and Unexpired Costs; Conversion Cost. Cost Ascertainment: Cost Unit and Cost Center. Introduction to Overhead allocation, Overhead apportionment, and Overhead absorption.

UNIT-II

Cost-Volume-Profit Analysis: Contribution, Profit-Volume Ratio, Margin of safety, Cost Break-even Point, Composite Break-even Point, Cash Break-even Point, Key Factor, Break-even Analysis. Relevant Costs and Decision Making: Pricing, Product Profitability, Make or Buy, Exploring new markets, Export Order, Sell or Process Further, Shut down vs. Continue.

UNIT-III

Budgets and Budgetary Control: Meaning, Types of Budgets, Steps in Budgetary Control, Fixed and Flexible Budgeting, Cash Budget. Responsibility Accounting: Concept, Significance, Different

responsibility centers, Divisional performance Financial measures, Transfer pricing.

UNIT-IV

Standard Costing and Variance Analysis: Meaning of Standard Cost and Standard Costing, Advantages, Limitations and Applications; Material, Labor, Overhead and Sales variances. Introduction to Target Costing, Life Cycle Costing, Quality Costing, and Activity based Costing.

Recommended Books:

1. C.T. Horngren, Gary L. Sundem, Jeff O. Schatzberg, and Dave Burgstahler: Introduction to Management Accounting, Pearson.
2. M.N. Arora: A Textbook of Cost and Management Accounting, Vikas Publishing House Pvt. Ltd.
3. M.Y. Khan, and P.K. Jain, Management Accounting: Text Problems and Cases, McGraw Hill Education (India) Pvt. Ltd.
4. S.N. Maheshwari, and S.N. Mittal, Cost Accounting: Theory and Problems, Shree Mahavir Book Depot (Publishers).

SEC: 2-HTML PROGRAMMING

(Credit:2)

UNIT-I

Introduction

The Basics: The Head, the Body, Colors, Attributes, Lists, ordered and unordered.

UNIT-II

Links: Introduction, Relative Links, Absolute Links, Link Attributes, Using the ID Attribute to Link within a Document.

UNIT-III

Images: Putting an Image on a Page, Using Images as Links, Putting an Image in the Background

UNIT-IV

Tables, Creating a Table , Table Headers, Captions, Spanning Multiple Columns, Styling Table

UNIT-V

Forms: Basic Input and Attributes, Other Kinds of Inputs, Styling forms with CSS, Where To Go From Here

Recommended Books:

Introduction to HTML and CSS -O' Reilly.

GE:4-QUANTITATIVE TECHNIQUES

(Credit:6, Theory:4, Practical: 2)

UNIT-I

Linear Programming: Formulation of L.P. Problems, Graphical Solutions (Specialcases: Multiple optimal solution, infeasibility, unbounded solution); Simplex Methods(Special cases: Multiple optimal solution, infeasibility, degeneracy, unbounded solution)Big-M method and Two-phase method; Duality and Sensitivity (emphasis on formulation & economic interpretation); Formulation of Integer programming, Zero-oneprogramming, Goal Programming.

UNIT-II

Elementary Transportation: Formulation of Transport Problem, Solution by N.W. Corner Rule, Least Cost method, Vogels Approximation Method (VAM), Modified Distribution Method. (Special cases: Multiple Solutions, Maximization case, Unbalanced case, prohibited routes) Elementary Assignment: Hungarian Method, (Special cases: Multiple Solutions, Maximization case, Unbalanced case, Restrictions on assignment).

UNIT-III

Network Analysis: Construction of the Network diagram, Critical Path- float and slack analysis (Total float, free float, independent float), PERT, Project Time Crashing.

UNIT-IV

Decision Theory: Pay off Table, Opportunity Loss Table, Expected Monetary Value, Expected Opportunity Loss, Expected Value of Perfect Information and Sample Information.

UNIT-V

Markov Chains: Predicting Future Market Shares, Equilibrium Conditions (Questions based on Markov analysis) Limiting probabilities, Chapman Kolmogorov equation. Introduction to Game Theory: Pay off Matrix- Two person Zero-Sum game, Pure strategy, Saddle point; Dominance Rule, Mixed strategy, Reduction of $m \times n$ game and solution of 2×2 , $2 \times s$, and $r \times 2$ cases by Graphical and Algebraic methods; Introduction to Simulation: Monte Carlo Simulation.

Recommended Books:

1. N. D. Vohra: Quantitative Management, Tata McGraw Hill.
2. P. K. Gupta, Man Mohan, Kanti Swarup: Operations Research, Sultan Chand.
3. V. K. Kapoor: Operations Research, Sultan Chand & Sons.
4. J. K. Sharma: Operations Research Theory & Applications, Macmillan India, Limited.

SEMESTER-V

C: 12-DATA COMMUNICATIONS

(Credit:6, Theory:4, Practical: 2)

UNIT-I

Introduction: Data Communications, Networks, The Internet, Protocols and Standards. Network Models: Layered Tasks, The OSI Model, Layers in the OSI Model, TCP/ IP Protocol Suite, Addressing.

UNIT-II

Data and Signals: Analog and Digital, Periodic Analog Signals, Digital Signals, Transmission Impairment, Data Rate Limits, Performance. Digital Transmission: Digital-To-Digital Conversion, Analog-To-Digital Conversion, Transmission Modes. Analog Transmission: Digital-To-Analog Conversion, Analog-To-Analog Conversion.

UNIT-III

Multiplexing and Spreading: Multiplexing, Spread Spectrum. Transmission Media: Guided Media, Unguided Media (Wireless). Switching: Circuit Switched, Datagram, Virtual Circuit Networks, Structure of a Switch. Telephone Network, Dial-Up MODEMS, Digital Subscriber Line (DSL), Cable TV Networks, Cable TV for Data Transfer.

UNIT-IV

Error Detection and Correction: Introduction, Block Coding, Linear Block Codes, Cyclic Codes, Checksum. Data Link Control: Framing, Flow and Error Control, Protocols, Noiseless Channels, Noisy Channels, HDLC, Point-To-Point Protocol. Multiple Access: Random Access, Controlled Access, Channelization. Wired LANs: IEEE Standards, Standard Ethernet, Changes in the Standard, Fast Ethernet, Gigabit Ethernet: Wireless LANs: IEEE 802.11, Bluetooth.

UNIT-V— Connecting LANs: Connecting Devices, Backbone Networks, Virtual LANs. Wireless LANs: Cellular Telephony, Satellite Networks. SONET: Architecture, SONET Layers, SONET Frames, STS Multiplexing, SONET Networks, Virtual Tributaries. Virtual-Circuit Networks. Frame Relay, ATM, ATM LANs.

Recommended Books:

1. B. A. Forouzan, Data Communications and Networking, 4/e, THM ,2007.
2. A. S. Tanenbaum, & David J. Wetherall, Computer Networks, 5/e, Pearson

C: 13-SOFTWARE ENGINEERING

(Credit:6, Theory:4, Practical: 2)

UNIT-I

Professional Software Development, Software Engineering Ethics, Software Processes, Software Process Models, Process Activities, Coping with Change, The Rational Unified Process, Agile Software Development, Agile Methods, Plan-Driven and Agile Development, Extreme Programming, Agile Project Management, Scaling Agile Methods.

UNIT-II

Requirements Engineering, Functional and Non-Functional Requirements, The Software Requirements Document, Requirements Specification, Requirements Engineering Processes, Requirements Elicitation and Analysis, Requirements Validation, Requirements Management, System Modelling, Context Models, Interaction Models, Structural Models, Behavioural Models, Model-Driven, Engineering, Architectural Design, Architectural Design Decisions, Architectural Views, Architectural Patterns, Application Architectures.

UNIT-III

Design and Implementation: Object-Oriented Design using the UML, Design Patterns, Implementation Issues, Open Source Development, Software Testing: Development Testing, Test-Driven Development, Release Testing, User Testing, Software Evolution: Evolution Processes, Program Evolution Dynamics, Software Maintenance, Legacy System Management, Dependability and Security.

UNIT-IV

Socio-technical Systems: Complex Systems, Systems Engineering, System Procurement, System Development, System Operation. Dependability and Security: Dependability Properties, Availability and Reliability, Safety, Security. Dependability and Security Specification: Risk-Driven Requirements, Specification, Safety Specification, Reliability Specification, Security, Specification, Formal Specification.

UNIT-V

Dependability Engineering: Redundancy and Diversity, Dependable Processes, Dependable Systems Architectures, Dependable Programming. Security Engineering: Security Risk Management, Design for Security, System Survivability. Dependability and Security Assurance: Static Analysis, Reliability Testing, Security Testing, Process Assurance, Safety and Dependability Cases.

Recommended Books:

1. I. Sommerville, Software Engineering, 9/e, Addison Wesley.
2. R. Mall, Fundamentals of Software Engineering, 3/e, PHI.
3. R.S. Pressman, Software Engineering, A Practitioners Approach, 7/e, McGraw-Hill, 2009.
4. K.K. Aggarwal and Y. Singh, Software Engineering, 2/e, New Age International Publishers, 2008.

DSE: 1-PROGRAMMING IN VISUAL BASIC

(Credit:6, Theory:4, Practical: 2)

UNIT-I

GUI Environment: Introduction to graphical user interface (GUI), programming language (procedural, object oriented, event driven), the GUI environment, compiling, debugging, and running the programs. Controls : Introduction to controls textboxes, frames, check boxes, option buttons, images, setting borders and styles, the shape control, the line control, working with multiple controls and their properties, designing the user interface, keyboard access, tab controls, default & cancel property, coding for controls.

UNIT-II

Operations: Data types, constants, named & intrinsic, declaring variables, scope of variables, val function, arithmetic operations, formatting data. Decision Making: If statement, comparing strings, compound conditions (and, or, not), nested if statements, case structure, using if statements with

option buttons & check boxes, displaying message in message box, testing whether input is valid or not.

UNIT-III

Modular programming: Menus, sub-procedures and sub-functions defining / creating and modifying a menu, using common dialog box, creating a new sub-procedure, passing variables to procedures, passing argument by value or by reference, writing a function/ procedure. Forms Handling : Multiple forms creating, adding, removing forms in project, hide, show method, load, unload statement, me keyword, referring to objects on a different forms.

UNIT-IV

Iteration Handling: Do/loops, for/next loops, using msgbox function, using string function Arrays and Grouped Data Control: Arrays - 1-dimension arrays, initializing an array using for each, user- defined data types, accessing information with user-defined data types, using list boxes with array, two dimensional arrays. lists, loops and printing list boxes & combo boxes, filling the list using property window/additem method, clear method, list box properties, removing an item from a list, list box/ combo box operations.

UNIT-V

Database Connectivity: Database connectivity of forms with back end tool like mysql, populating the data in text boxes, list boxes etc. searching of data in database. using forms. Updating/ editing of data based on a criterion.

Recommended Books:

Programming in Visual Basic 6.0 by Julia Case Bradley, Anita C. Millispangh (Tata Mcgraw Hill Edition 2000 (Fourteenth Reprint 2004).

DSE: 2-FINANCIAL MANAGEMENT

(Credit:6, Theory:4, Practical: 2)

UNIT-I

Nature of Financial Management: Finance and related disciplines; Scope of Financial Management; Profit Maximization, Wealth Maximization - Traditional and Modern Approach; Functions of finance Finance Decision, Investment Decision, Dividend Decision; Objectives of Financial Management; Organisation of finance function; Concept of Time Value of Money, present value, future value, and annuity; Risk & Return: Historical return, expected return, absolute return, holding period return, annualized return, arithmetic & geometric return; Risk - Systematic & unsystematic risk their sources and measures.

UNIT-II

Long -term investment decisions: Capital Budgeting - Principles and Techniques; Nature and meaning of capital budgeting; Estimation of relevant cash flows and terminal value; Evaluation techniques - Accounting Rate of Return, Net Present Value, Internal Rate of Return & MIRR, Net Terminal Value, Profitably Index Method. Concept and Measurement of Cost of Capital: Explicit and Implicit costs; Measurement of cost of capital; Cost of debt; Cost of perpetual debt; Cost of Equity Share; Cost of Preference Share; Cost of Retained Earning; Computation of over-all cost of capital based on Historical and Market weights.

UNIT-III

Capital Structures: Approaches to Capital Structure Theories - Net Income approach, Net Operating Income approach, Modigliani-Miller (MM) approach, Traditional approach, Capital Structure and Financial Distress, Trade-Off Theory.

Dividend Policy Decision - Dividend and Capital; The irrelevance of dividends: General, MM hypothesis; Relevance of dividends: Walter's model, Gordon's model; Leverage Analysis: Operating and Financial Leverage; EBIT -EPS analysis; Combined leverage.

UNIT-IV

Working Capital Management: Management of Cash - Preparation of Cash Budgets (Receipts and Payment Method only); Cash management technique, Receivables Management Objectives; Credit Policy, Cash Discount, Debtors.

Outstanding and Ageing Analysis; Costs - Collection Cost, Capital Cost, Default Cost, Delinquency Cost, Inventory Management (Very Briefly) - ABC Analysis; Minimum Level; Maximum Level; Reorder Level; Safety Stock; EOQ, Determination of Working Capital.

Recommended Books:

1. M.Y. Khan & P.K. Jain: Financial Management Text Problem and Cases, Tata McGraw Hill Publishing Co. Ltd.
2. R. P. Rustogi: Financial Management: Theory Concepts and Practices, Taxmann Publication.
3. I.M. Pandey: Financial Management: Theory and Practices, Vikas Publishing House.
4. R.A. Brealey, S.C. Myers, F. Allen & P. Mohanty: Principles of Corporate Finance, McGraw Hill Higher Education.
5. J.V. Horne & J.M. Wachowicz: Fundamentals of Financial Management Prentice Hall.

SEMESTER-VI

C: 14-INTERNET TECHNOLOGY

(Credit:6, Theory:4, Practical: 2)

UNIT-I

Java: Use of Objects, Array and Array List class.

UNIT-II

JavaScript: Data types, operators, functions, control structures, events and event handling.

UNIT-III

JDBC: JDBC Fundamentals, Establishing Connectivity and working with connection interface, Working with statements, Creating and Executing SQL Statements, Working with Result Set Objects. **UNIT-IV** JSP: Introduction to Java Server Pages, HTTP and Servlet Basics, The Problem with Servlets, The Anatomy of a JSP Page, JSP Processing, JSP Application Design with MVC, Setting Up the JSP Environment, Implicit JSP Objects, Conditional Processing, Displaying Values, Using an expression to Set an Attribute, Declaring Variables and Methods, Error Handling and Debugging, Sharing Data Between JSP Pages, Requests, and Users, Database Access.

UNIT-V

Java Beans: Java Beans Fundamentals, JAR files, Introspection, Developing a simple Bean, Connecting to DB.

Recommended Books:

1. Ivan Bayross, Web Enabled Commercial Application Development Using HTML, DHTML, Javascript, Perl CGI , BPB Publications, 2009.
2. Cay Horstmann, BIG Java, Wiley Publication , 3/e, 2009.
3. Herbert Schildt , Java 7, The Complete Reference, , 8/e, 2009.
4. Jim Keogh ,The Complete Reference J2EE, TMH, , 2002.

**C: 15-PROGRAMMING IN NET
(Credit:6, Theory:4, Practical: 2)****DSE: 3-E-COMMERCE
(Credit:6, Theory:4, Practical: 2)****UNIT-I**

An introduction to Electronic commerce: What is E-Commerce (Introduction And Definition), Main activities E-Commerce, Goals of E-Commerce, Technical Components of E-Commerce, Functions of E-Commerce, Advantages and disadvantages of E-Commerce, Scope of E-Commerce, Electronic Commerce Applications, Electronic Commerce and Electronic Business(C2C)(C2G,G2G, B2G, B2P, B2A, P2P, B2A, C2A, B2B, B2C).

UNIT-II

The Internet and WWW: Evolution of Internet, Domain Names and Internet Organization (.edu, .com, .mil, .gov, .net etc.) , Types of Network, Internet Service Provider, World Wide Web, Internet & Extranet, Role of Internet in B2B Application, building own Website, Cost, Time, Reach, Registering a Domain Name, Web promotion, Target email, Baner, Exchange, Shopping Bots.

UNIT-III

Internet Security: Secure Transaction, Computer Monitoring, Privacy on Internet, CorporateEmail privacy, Computer Crime(Laws , Types of Crimes), Threats, Attack on Computer System, Software Packages for privacy, Hacking, Computer Virus(How it spreads, Virus problem, virus protection, Encryption and Decryption, Secret key Cryptography, DES, Public Key Encryption, RSA, Authorisation and Authentication, Firewall, Digital Signature(How it Works).

UNIT-IV

Electronic Data Exchange: Introduction, Concepts of EDI and Limitation, Applications of EDI, Disadvantages of EDI, EDI model,Electronic Payment System: Introduction, Types of Electronic Payment System, Payment Types, Value Exchange System, Credit Card System, Electronic Fund Transfer, Paperless bill, Modern Payment Cash, Electronic Cash.

UNIT-V

Planning for Electronic Commerce: Planning Electronic Commerce initiates, Linking objectives to business strategies, Measuring cost objectives, Comparing benefits to Costs, Strategies for developing electronic commerce web sites.

Recommended Books:

1. E-Commerce Concepts, Models, Strategies-G.S.V.Murthy, Himalaya Publishing House.
2. E- Commerce:-Kamlesh K Bajaj and Debjani Nag.
3. Electronic commerce-Gray P. Schneider.
4. E-Commerce, Fundamentals & Applications: Chand (Wiley) Web and E-Commerce.

DSE: 4-PROJECT WORK
(Credit:6)

MATHEMATICS (HONOURS)

SEMESTER-I

C:1-CALCULUS-I

(Total Marks: 100)

Part-I (Marks: 70)

4 Lectures, 1 Tutorial (per week)

Unit-I

Hyperbolic functions, higher order derivatives, Leibnitz rule and its applications to problems of the type $e^{ax+b} \sin x$, $e^{ax+b} \cos x$, $(ax + b)^n \sin x$, $(ax + b)^n \cos x$, concavity and inflection points, asymptotes, curve tracing in Cartesian coordinates, tracing in polar coordinates of standard curves, L'Hospital's rule, applications in business, economics and life sciences.

Unit-II

Reduction formulae, derivations and illustrations of reduction formulae of the type $\int \sin^n x dx$, $\int \cos^n x dx$, $\int \tan^n x dx$, $\int \sec^n x dx$, $\int (\log x)^n dx$, $\int \sin^n x \cos^n x dx$, volumes by slicing, disks and washers methods, volumes by cylindrical shells, parametric equations, parameterizing a curve, arc length, arc length of parametric curves, area of surface of revolution.

Unit-III

Techniques of sketching conics, reflection properties of conics, rotation of axes and second degree equations, classification into conics using the discriminant, polar equations of conics. Sphere, Cone, Cylinder, Conicoids.

Unit-IV

Vector triple product, Introduction to vector functions, operations with vector-valued functions, limits and continuity of vector functions, differentiation and integration of vector functions, tangent and normal components of acceleration.

Part-II(PRACTICAL)

(Marks: 30)

List of Practical (Using any software/MATLAB) Practical/Lab work to be performed on a Computer.

1. Plotting the graphs of the functions e^{ax+b} , $\log(ax + b)$, $1/(ax + b)$, $\sin(ax + b)$, $\cos(ax + b)$, $|ax + b|$ and to illustrate the effect of a and b on the graph.
2. Plotting the graphs of the polynomial of degree 4 and 5, the derivative graph, the second derivative graph and comparing them.

3. Sketching parametric curves (eg. Trochoid, Cycloid, Epicycloids, Hypocycloid).
4. Obtaining the surface of revolution of curves.
5. Tracing of conics in cartesian/polar coordinates.
6. Sketching Ellipsoid, Hyperboloid of one and two sheets, Elliptic cone, Elliptic, Paraboloid, Hyperbolic paraboloid using cartesian coordinates.
7. Matrix operation (addition, multiplication, inverse, transpose).

Books Recommended:

1. H. Anton, I. Bivens and S. Davis: Calculus, 10-th Ed., John Wiley and Sons (Asia) P. Ltd., Singapore, 2002. Chapters: 3 (3.1, 3.2), 5 (5.2-5.5), 6(6.5, 6.8), 10 (10.1-10.5), 11(11.1, 11.4), 12(12.1, 12.2, 12.3, 12.6).
2. B.P. Acharya and D.C. Sahu: Analytical Geometry of Quadratic Surfaces, B.P. Acharya and D.C. Sahu, Kalyani Publishers, New Delhi, Ludhiana, Chapters: 2 and 3.
3. Shantinakaran: Text Book of Calculus(Part-II), S. Chand & Co. Pvt. Ltd., New Delhi, Chapters: 6,7, 10 (Art. 33-36).
4. Shantinakaran: Text Book of Calculus(Part-III), S. Chand & Co., Pvt. Ltd., New Delhi, Chapters: 1(Art.1,2), 3 (Art.7,8), 6 (15 restricted).

Books for Reference:

1. G.B. Thomas and R.L. Finney: Calculus, 9-th Ed., Pearson Education, Delhi, 2005.
2. R. Courant and F. John: Introduction to Calculus and Analysis (Volumes I & II), Springer- Verlag, New York, Inc., 1989.
3. Shanti Narayan and P.K. Mittal: Analytical Solid Geometry, S. Chand & Co. Pvt. Ltd., New Delhi.
4. M.J. Strauss, G.L. Bradley and K. J. Smith: Calculus, 3-rd Ed., Dorling Kindersley (India) P. Ltd. (Pearson Education), Delhi, 2007.

C:2-ALGEBRA-I

Total Marks: 100-(Theory: 80 Marks+Mid-Sem: 20 Marks)

5 Lectures, 1 Tutorial (per week)

Unit-I

Polar representation of complex numbers, n -th roots of unity, De Moivres theorem for rational indices and its applications.

Unit-II

Equivalence relations, Basic Terminology, Functions, Inverse and composition of functions, One-to-One correspondence and cardinality of a set, Division algorithm, Divisibility and Euclidean algorithm, Prime numbers, Congruence relation between integers, Principles of Mathematical Induction, Statement of Fundamental Theorem of Arithmetic.

Unit-III

Systems of linear equations, row reduction and echelon forms, vector equations, the matrix equation $Ax = b$, solution sets of linear systems, applications of linear systems, linear independence.

Unit-IV

Introduction to linear transformations, Matrix of a linear transformation, Inverse of a matrix, Characterizations of invertible matrices. Subspaces of \mathbb{R}^n , Dimension of subspaces of \mathbb{R}^n and Rank of a matrix, Eigen values, Eigen Vectors and Characteristic equation of a matrix.

Books Recommended:

1. Titu Andreescu and Dorin Andrica: Complex Numbers from A to Z , Birkhauser, 2006. Chapter: 2.
2. Edgar G. Goodaire and Michael M. Parmenter: Discrete Mathematics with Graph Theory, 3-rd Ed., Pearson Education (Singapore) P. Ltd., Indian Reprint, 2005. Chapters: 2(2.4), 3, 4(4.1 – 4.1.6, 4.2 – 4.2.12, 4.3 – 4.3.9, 4.4 – 4.4.8), 5(5.1 – 5.1.4).
3. David C. Lay: Linear Algebra and its Applications, 3rd Ed., Pearson Education Asia, Indian Reprint, 2007. Chapters: 1(1.1 – 1.9), 2(2.1 – 2.3, 2.8, 2.9), 5(5.1, 5.2).

SEMESTER-II

C:3-REAL ANALYSIS (ANALYSIS-I)

Total Marks: 100-(Theory: 80 Marks+Mid-Sem: 20 Marks)

5 Lectures, 1 Tutorial (per week)

Unit-I

Review of Algebraic and Order Properties of \mathbb{R} , Upper bound & Lower bound, Least upper bound (LUB), Greatest lower bound (GLB), LUB & GLB property of an ordered field, Completeness of an ordered field, Incompleteness of \mathbb{Q} , Supremum and Infimum, Roots, Archimedean property, Rational & Irrational density theorems, Decimal representations of real numbers.

Unit-II

Idea of countable, uncountable sets and theorems relating to these sets, Sequences, Convergence & divergence of sequences, Limit of a sequence & Limit Theorems, Monotonic sequences, Weierstrass completeness principle, Nested Intervals, Cantor's completeness principle, Idea about higher order cardinals (restricted).

Unit-III

Subsequences, Bolzano Weierstrass theorem for sequences, Cluster points, Cauchy(Fundamental)

sequence, Cauchy's Convergence Criterion, Limit superior and Limit inferior, Convergence and divergence of infinite series, Series of positive terms, Tests of convergence.

Unit-IV

Absolute convergence, Rearrangement of terms of a series, Conditional convergence of a series, Open sets, Closed sets, Limit points, Closure, Interior and Boundary of sets. Bolzano Weierstrass theorem for sets.

Book Recommended:

1. G. Das and S. Pattanayak: Fundamentals of Mathematics Analysis, TMH Publishing Co. ,Chapters: 2(2.1-2.7), 3(3.1-3.4), 4(4.1-4.8, 4.11-4.13), 5(5.1-5.5).

Books for Reference:

1. R.G. Bartle and D. R. Sherbert: Introduction to Real Analysis, 3-rd Ed., John Wiley and Sons (Asia) Pvt. Ltd., Singapore, 2002.
2. Gerald G. Bilodeau , Paul R. Thie, G.E. Keough: An Introduction to Analysis, 2-nd Ed., Jones & Bartlett, 2010.
3. Brian S. Thomson, Andrew. M. Bruckner and Judith B. Bruckner: Elementary Real Analysis, Prentice Hall, 2001.
4. S.K. Berberian: A First Course in Real Analysis, Springer Verlag, New York, 1994.
5. S.C. Mallik and S. Arora: Mathematical Analysis, New Age International Publications.
6. D. Somasundaram and B. Choudhury: A First Course in Mathematical Analysis, Narosa Publishing House.
7. S.L. Gupta and Nisha Rani: Real Analysis, Vikas Publishing House Pvt. Ltd., New Delhi.

C-:4-DIFFERENTIAL EQUATIONS

(Total Marks:100)

Part-I (Marks: 70)

4 Lectures, 1 Tutorial (per week)

Unit-I

Basic concepts of Differential equations and mathematical models. First order and first degree Ordinary differential equations(variables separable, homogeneous, exact, and linear). Applications of first order differential equations(Growth, Decay and Chemical Reactions, Heat flow, Oxygen debt, Economics). Equations of first order but of higher degree.

Unit-II

Second order linear equations(both homogeneous and non-homogeneous) with constant coefficients, second order equations with variable coefficients, variation of parameters, method of undetermined coefficients, Euler's equation, Second order differential equations with variable coefficients, Equations reducible to linear equations with constant coefficients.

Unit-III

Power series solutions of second order differential equations.

Unit-IV

Laplace transforms and its applications to solutions of differential equations.

Part-II(PRACTICAL)

(Marks: 30)

List of Practical (Using any Software/MATLAB) Practical/Lab work to be performed on a Computer.

1. Plotting of second order solution of family of differential equations.
2. Plotting of third order solution of family of differential equations.
3. Growth model (exponential case only).
4. Decay model (exponential case only).
5. Oxygen debt model.
6. Economic model.
7. Vibration problems.

Book Recommended:

1. J. Sinha Roy and S. Padhy: A Course of Ordinary and Partial Differential Equations, Kalyani Publishers, New Delhi. Chapters: 1, 2, 3, 4(4.1-4.8), 5, 7, 9(9.1-9.5, 9.10, 9.11, 9.13).

Books for Reference:

1. Martin Braun: Differential Equations and their Applications, Springer International.
2. M.D. Raisinghania: Advanced Differential Equations, S. Chand & Company Ltd., New Delhi.
3. G. Dennis Zill: A First Course in Differential Equations with Modelling Applications, Cengage Learning India Pvt. Ltd.
4. S.L. Ross: Differential Equations, John Wiley & Sons, India, 2004.

SEMESTER-III

C-5: THEORY OF REAL FUNCTIONS (ANALYSIS-II)

Total Marks: 100-(Theory: 80 Marks+Mid-Sem: 20 Marks)

5 Lectures, 1 Tutorial (per week)

Unit-I

Limits of functions ($\epsilon - \delta$ approach), Sequential criterion for limits, Divergence criteria. Limit theorems, one-sided limits. Infinite limits and limit at infinity. Continuous functions, Sequential criterion for continuity, Algebra of continuous functions and theorems related to continuity of functions.

Unit-II

Discontinuity and kinds of discontinuity, Further properties of continuity, Uniform continuity, Differentiable functions, Left hand & Right hand derivatives, Algebra of differentiable functions, Caratheodory's theorem.

Unit-III

Mean value conditions, Global and local maximum & minimum, Rolle's theorem, Generalized mean value theorem, Cauchy mean value theorem, Lagrange's mean value theorem and their applications, Darboux's theorem, Indeterminant forms, Higher order derivatives (Leibnitz theorem), Taylor's theorem and its applications to approximating functions by means of polynomials.

Unit-IV

Maxima and Minima, Taylor's theorem with different forms of remainder, Maclaurin's theorem, Deduction of Taylor's theorem from mean value theorem, Taylor's and Maclaurin's infinite series, Taylor's series and Maclaurin's series expansions of exponential and trigonometric functions, $\ln(1+x)$, $1/(ax+b)$ and $(1+x)^n$.

Books Recommended:

1. G. Das and S. Pattanayak: Fundamentals of Mathematics Analysis, TMH Publishing Co., Chapters: 6(6.1-6.7), 7(7.1-7.7), 9(9.7 only).
2. S.C. Mallik and S. Arora: Mathematical Analysis, New Age International Publications, Chapter: 6(8.1-8.6).

Books for Reference:

1. R. Bartle and D.R. Sherbert, Introduction to Real Analysis, John Wiley and Sons, 2003.
2. K.A. Ross, Elementary Analysis: The Theory of Calculus, Springer, 2004.
3. A. Mattuck, Introduction to Analysis, Prentice Hall, 1999.
4. S.R. Ghorpade and B.V. Limaye, A Course in Calculus and Real Analysis, Springer, 2006.

C-6: GROUP THEORY (ALGEBRA-II)

Total Marks: 100-(Theory: 80 Marks+Mid-Sem: 20 Marks)

5 Lectures, 1 Tutorial (per week)

Unit-I

Symmetries of a square, Dihedral groups, Definition and examples of groups including permutation groups and quaternion groups (illustration through matrices), Elementary properties of groups.

Subgroups and examples of subgroups, Centralizer, Normalizer, Center of a group, Product of two subgroups.

Unit-II

Properties of cyclic groups, Classification of subgroups of cyclic groups. Cycle notation for permutations, Properties of permutations, Even and Odd permutations, Alternating group, Properties of cosets, Lagranges theorem and consequences including Fermats Little theorem.

Unit-III

External direct product of a finite number of groups, Normal subgroups, Factor groups, Cauchy's theorem for finite abelian groups.

Unit-IV

Group homomorphisms, properties of homomorphisms, Cayley's theorem, Properties of isomorphisms, First isomorphism theorem, Second and Third isomorphism theorems (Statements only).

Book Recommended:

1. Joseph A. Gallian: Contemporary Abstract Algebra(4-th Edn.), Narosa Publishing House, New Delhi, Chapters: I, II, III, IV, V, VI(up to Theorem 6.2 only), VII, VIII, IX, X, XI.

Books for Reference:

1. D.S. Malik, J.M. Mordeson, and M.K. Sen: Fundamentals of Abstract Algebra, McGraw-Hill, 1997.
2. John B. Fraleigh: A First Course in Abstract Algebra, 7-th Ed., Pearson, 2002.
3. M. Artin: Abstract Algebra, 2-nd Ed., Pearson, 2011.
4. Joseph J. Rotman: An Introduction to the Theory of Groups, 4-th Ed., Springer Verlag, 1995.
5. I.N. Herstein: Topics in Algebra, Wiley Eastern Limited, India, 1975.

C-7: PARTIAL DIFFERENTIAL EQUATIONS & SYSTEMS OF ORDINARY DIFFERENTIAL EQUATIONS

(Total Marks: 100)

Part-I (Marks: 70)

04 Lectures (per week)

Unit-I

Systems of Linear Differential Equations: Basic theory of linear systems, Trial solution method for linear system with constant coefficients, Simultaneous linear first order equations in three variables, Methods of solution, Pfaffian differential equations, methods of solutions of Pfaffian differential equations in three variables.

Unit-II

Formation of first order partial differential equations, Linear and non-linear partial differential equations of first order, Special types of first-order equations, Solutions of partial differential equations of first order satisfying given conditions.

Unit-III

Linear partial differential equations with constant coefficients, Equations reducible to linear partial differential equations with constant coefficients, Partial differential equations with variable coefficients, Some standard forms of variable coefficients.

Unit-IV

Laplace equation, Solution of Laplace equations by separation of variables, One-dimensional Wave equation, Solution of the Wave equation (method of separation of variables), Diffusion equation, Solution of one-dimensional diffusion equation, Method of separation of variables.

Part-II(PRACTICAL)

(Marks: 30)

List of Practical (Using any Software/MATLAB) Practical/Lab work to be performed on a Computer.

1. To find the general solution of the non-homogeneous system of the form:

$$\frac{dx}{dt} = a_1x + b_1y + f_1(t), \quad \frac{dy}{dt} = a_2x + b_2y + f_2(t)$$

with given conditions.

2. Plotting the integral surfaces of a given first order PDE with initial data.

3. Solution of wave equation $\frac{\partial^2 u}{\partial t^2} - c^2 \frac{\partial^2 u}{\partial x^2} = 0$ for the following associated conditions:

(a) $u(x, 0) = \varphi(x)$, $u_t(x, 0) = \psi(x)$, $x \in \mathbb{R}$, $t > 0$. (b) $u(x, 0) = \varphi(x)$, $u_t(x, 0) = \psi(x)$, $u_x(0, t) = 0$, $x \in (0, \infty)$, $t > 0$. (c) $u(x, 0) = \varphi(x)$, $u_t(x, 0) = \psi(x)$, $u(0, t) = 0$, $x \in (0, \infty)$, $t > 0$. (d) $u(x, 0) = \varphi(x)$, $u_t(x, 0) = \psi(x)$, $u(0, t) = 0$, $u(1, t) = 0$, $0 < x < 1$, $t > 0$.

4. Solution of Diffusion equation $\frac{\partial u}{\partial t} - k^2 \frac{\partial^2 u}{\partial x^2} = 0$ for the following associated conditions:

(a) $u(x, 0) = \varphi(x)$, $u(0, t) = a$, $u(l, t) = b$, $0 < x < l$, $t > 0$.

(b) $u(x, 0) = \varphi(x)$, $x \in \mathbb{R}$, $0 < t < T$.

(c) $u(x, 0) = \varphi(x)$, $u(0, t) = a$, $x \in (0, \infty)$, $t \geq 0$.

Book Recommended:

1. J.Sinha Roy and S. Padhy: A Course on Ordinary and Partial Differential Equations, Kalyani Publishers, New Delhi, Ludhiana, 2012.
Chapters: 8 (8.1-8.3), 11, 12, 13(13.1-13.5), 15(15.1 & 15.5 only), 16(16.1 & 16.1.1 only), 17(17.1-17.3).

Books for References:

1. Tyn Myint-U and Lokenath Debnath: Linear Partial Differential Equations for Scientists and Engineers, 4-th edition, Springer, Indian reprint, 2006.

2. S.L. Ross: Differential equations, 3-rd Ed., John Wiley and Sons, India, 2004.

SEMESTER-IV

C-8: NUMERICALMETHODS

(Total Marks: 100)

Part-I (Marks: 70)

04 Lectures (per week)

Unit-I

Rate of convergence, Algorithms, Errors: Relative, Absolute, Round off, Truncation. Numerical solution of non-linear equations : Bisection method, Regular-Falsi method, Secant method, Newton-Raphson method, Fixed-point Iteration method, Newton-Raphson method for multiple roots, Aitken's O^2 process, Muller's method. Rate of convergence of these methods.

Unit-II

System of linear equations: Gaussian Elimination method, Gauss-Jordan method, Gauss Jacobi method, Gauss-Seidel method and their convergence analysis, .

Unit-III

Polynomial interpolation: Existence uniqueness of interpolating polynomials, Lagrange and Newtons divided difference interpolation, Error in interpolation, Central difference & averaging operators, Gauss-forward and backward difference interpolation, Simple numerical methods for derivatives, Interpolatory formulas.

Unit-IV

Numerical Integration: Some simple quadrature rules, Newton-Cotes rules, Trapezoidal rule, Simpsons rule, Simpsons $\frac{3}{8}$ -th rule, Compound quadrature rules, Compound mid-point rule, Compound

Trapezoidal rule, Compound Simpsons rule, Gauss-Legendre 2-point & 3-point rules. Numerical solutions of Differential Equations: Eulers method. Runge-Kutta methods of orders two, three and four.

Part-II(PRACTICAL)

(Marks: 30)

List of Practical (Using any Software/MATLAB) Practical/Lab work to be performed on a Computer.

1. Calculate the sum $1/1 + 1/2 + 1/3 + 1/4 + \dots + 1/N$.
2. To find the absolute value of an integer.
3. Enter 100 integers into an array and sort them in an ascending order.

4. Bisection Method.
5. Newton-Raphson Method.
6. Secant Method.
7. Regular-Falsi Method.
8. LU decomposition Method.
9. Gauss-Jacobi Method.
10. SOR Method or Gauss-Siedel Method.
11. Lagrange Interpolation or Newton Interpolation.
12. Simpsons rule.

Note: For any of the CAS (Computer aided software) Data types-simple data types, floating data types, character data types, arithmetic operators and operator precedence, variables and constant declarations, expressions, input/output, relational operators, logical operators and logical expressions, control statements and loop statements, arrays should be introduced to the students.

Book Recommended:

1. B.P. Acharya and R.N. Das: A Course on Numerical Analysis, Kalyani Publishers, New Delhi, Ludhiana. Chapters: 0(0.2, 0.8), 1(1.8, 1.9), 2(2.1-2.4, 2.6-2.9), 3(3.1-3.4, 3.6-3.11), 5(5.1- 5.3), 6(6.1-6.3, 6.5, 6.10, 6.11), 7(7.1-7.5 & 7.7).
2. Brian Bradie, A Friendly Introduction to Numerical Analysis, Pearson Education, India, 2007.

Books for Reference:

1. M.K. Jain, S.R.K. Iyengar and R.K. Jain: Numerical Methods for Scientific and Engineering Computation, 6th Ed., New age International Publisher, India, 2007.
2. C.F. Gerald and P.O. Wheatley: Applied Numerical Analysis, Pearson Education, India, 2008.
3. Uri M. Ascher and Chen Greif: A First Course in Numerical Methods, 7th Ed., PHI Learning Private Limited, 2013.
4. John H. Mathews and Kurtis D. Fink: Numerical Methods using Matlab, 4th Ed., PHI Learning Private Limited, 2012.
5. P. Khandasamy, K. Thilagavathy and K. Gunavathi: Numerical Methods, S. Chand & Company Ltd., 2012.
6. E. Balagurusamy: Numerical Methods, Tata McGraw-Hill Pub. Co. Ltd., 1999.

C-9: RIEMANN INTEGRATION & SERIES OF FUNCTIONS (ANALYSIS-III)

Total Marks: 100-(Theory: 80 Marks+Mid-Sem: 20 Marks)

5 Lectures, 1 Tutorial (per week)

Unit-I

Riemann integration, Inequalities of upper and lower sums, Riemann conditions of integrability. Riemann sum and definition of Riemann integral through Riemann sums, Equivalence of two definitions, Riemann integrability of monotone and continuous functions, Properties of the Riemann integral, Definition and integrability of piecewise continuous and monotone functions, Fundamental theorems of Calculus.

Unit-II

Improper integrals; Series and Integrals, Absolute convergence of integrals, Convergence of Beta and Gamma functions.

Unit-III

Point-wise and Uniform convergence of sequence of functions, Cauchy's criterion & Weierstrass M-test for uniform convergence, Dedekind test, Uniform convergence and Continuity, Term by term integration of series, Term by term differentiation of series.

Unit-IV

Power series (Cauchy Hadamard Theorem), Radius of convergence, Differentiation and integration of power series, Abels Limit Theorem, Stirling's formula, More about Taylor's series, Weierstrass Approximation Theorem.

Books Recommended:

1. G. Das and S. Pattanayak: Fundamentals of Mathematics Analysis, TMH Publishing Co., Chapters: 4(4.14 only), 8 (8.1-8.6), 9 (9.1-9.6, 9.8).
2. S.C. Mallik and S. Arora: Mathematical Analysis, New Age International Ltd., New Delhi, Chapters: 11(3.3, 4.3 only), 12(Restricted).

Books for Reference:

1. K.A. Ross, Elementary Analysis: The Theory of Calculus, Undergraduate Texts in Mathematics, Springer (SIE), Indian reprint, 2004.
2. R.G. Bartle D.R. Sherbert: Introduction to Real Analysis, 3rd Ed., John Wiley and Sons (Asia) Pvt. Ltd., Singapore, 2002.
3. Charles G. Denlinger: Elements of Real Analysis, Jones & Bartlett (Student Edition), 2011.
4. Shanti Narayan and M.D. Raisinghania: Elements of Real Analysis, S. Chand & Co. Pvt. Ltd.

C-10: RING THEORY & LINEAR ALGEBRA (ALGEBRA-III)

Total Marks: 100-(Theory: 80 Marks+Mid-Sem: 20 Marks)

5 Lectures, 1 Tutorial (per week)

Unit-I

Definition and examples of rings, Properties of rings, Subrings, Integral domains and Fields, Characteristic of a ring, Ideal, Ideal generated by a subset of a ring, Factor rings, Operations on Ideals, Prime and Maximal ideals.

Unit-II

Ring homomorphisms, Properties of ring homomorphisms, Isomorphism Theorems I, II and III, Field of quotients.

Unit-III

Vector spaces, Subspaces, Algebra of subspaces, Quotient spaces, Linear combination of vectors, Linear span, Linear independence, Basis and Dimension, Dimension of subspaces.

Unit-IV

Linear transformations, Null space, Range, Rank and Nullity of a linear transformation, Matrix representation of a linear transformation, Algebra of linear transformations. Isomorphisms, Isomorphism theorems, Invertibility and Isomorphisms, Change of co-ordinate matrix.

Book Recommended:

1. Joseph A. Gallian: Contemporary Abstract Algebra(8th Edn.), Narosa Publishing House, New Delhi. Chapters: 12, 13, 14, 15.
2. Stephen H. Friedberg, Arnold J. Insel, and Lawrence E. Spence: Linear Algebra, 4th Ed., Prentice- Hall of India Pvt. Ltd., New Delhi, 2004. Chapters: 1 (1.2-1.6), 2(2.1-2.5).

Books for Reference:

1. John B. Fraleigh: A First Course in Abstract Algebra, 7th Ed., Pearson, 2002.
2. M. Artin: Abstract Algebra, 2nd Ed., Pearson, 2011.
3. S. Lang: Introduction to Linear Algebra, 2nd Ed., Springer, 2005.
4. Gilbert Strang: Linear Algebra and its Applications, Cengage Learning India Pvt. Ltd.
5. S. Kumaresan: Linear Algebra- A Geometric Approach, Prentice Hall of India,1999.
6. Kenneth Hoffman, and Ray Alden Kunze: Linear Algebra, 2nd Ed., Prentice-Hall of India Pvt. Ltd., 1971.
7. I.N. Herstein: Topics in Algebra, Wiley Eastern Pvt. Ltd.

SEMESTER-V

C-11: MULTIVARIATE CALCULUS (CALCULUS-II)

Total Marks: 100-(Theory:80 Marks+Mid-Sem: 20 Marks)

5 Lectures, 1 Tutorial (per week)

Unit-I

Functions of several variables, limit and continuity of functions of two variables, Partial differentiation, Tangent planes, Approximation and Differentiability, Chain rule for one and two independent parameters.

Unit-II

Directional derivatives and gradient, Maximal property of the gradient, Normal property of the gradient, Tangent planes and the normal lines, Extrema of functions of two variables, Method of Lagrange multipliers, Lagrange Multipliers, Constrained optimization problems, A geometrical interpretation.

Unit-III

Double integration over rectangular region and over non-rectangular region, Double integrals in polar co-ordinates, Triple integrals, Triple integral over a parallelepiped and solid regions, Volume by triple integrals. cylindrical and spherical co-ordinates. Change of variables in double integrals and triple integrals.

Unit-IV

Definition of vector field, Divergence and Curl, Line integrals, Applications of line integrals: Mass and Work, Fundamental theorem and path independence for line integrals.

Unit-V

Green's theorem, Area as a line integral, Alternative forms of Green's theorem, Normal derivatives, Surface integrals, Integrals over parametrically defined surfaces. Stokes theorem, The Divergence theorem.

Book Recommended:

1. M.J. Strauss, G.L. Bradley and K. J. Smith: Calculus, 3rd Ed., Dorling Kindersley (India) Pvt. Ltd. (Pearson Education), Delhi, 2007. Chapters: 11(11.1(Pages: 541-543), 11.2- 11.6, 11.7(Pages:598-605), 11.8(Pages:610-614)), 12 (12.1, -12.3, 12.4(Pages:652-660), 12.5, 12.6), 13 (13.1-13.3, 13.4(Pages:712-716, 718-720), 13.5(Pages:723-726; 729-730), 13.6 (Pages:733-737), 13.7(Pages:742-745)).

Books for Reference:

1. G.B. Thomas and R.L. Finney: Calculus, 9th Ed., Pearson Education, Delhi, 2005.
2. E. Marsden, A.J. Tromba and A. Weinstein: Basic Multivariable Calculus, Springer (SIE), Indian reprint, 2005.
3. Santosh K. Sengar and S.P. Singh: Advanced Calculus, Cengage Learning India Pvt. Ltd.

C-12: PROBABILITY & STATISTICS

Total Marks:100-(Theory: 80 Marks+Mid-Sem: 20 Marks)

4 Lectures, 1 Tutorial (per week)

Unit-I

Sample space, Probability axioms, Independent events, Conditional probability & Bayes' theorem, Real random variables (discrete and continuous), Cumulative distribution function, Expectation of random variables, Some special expectations.

Unit-II

Multivariate distributions, Joint cumulative distribution functions, Joint probability distributions, Marginal & conditional distributions, Some probability distributions(Discrete case), Uniform distribution, Binomial distribution, Negative Binomial & Geometric distributions, Poisson distribution.

Unit-III

Some probability distributions(Continuous case), Uniform, Gamma, Exponential, Beta distributions, Normal distributions, Normal approximation to the Binomial distribution, Bivariate normal distribution.

Unit-IV

Distribution of two random variables, Expectation of function of two random variables, Moment generating functions, Conditional distributions & expectations, Correlation coefficient, Co-variance, Independent random variables, Linear regression for two variables.

Unit-V

Limit theorems, Markov's inequality, Chebyshev's inequality, Statement and interpretation of Weak and Strong law of large numbers, Central Limit theorem for independent and identically distributed random variables with finite variance, Markov Chains: Introduction, Chapman-Kolmogorov equations.

Books Recommended:

1. Irwin Miller and Marylees Miller, John E. Freund: Mathematical Statistics with Applications, 7th Ed., Pearson Education, Asia, 2006. Chapters: 2 (excluding Art.9), 3 (excluding Art.8), 4, 5(5.1, 5.2, 5.4, 5.5,5.7), 6(6.1-6.7), 14(14.1, 14.2)
2. Sheldon Ross: Introduction to Probability Models, 9th Ed., Academic Press, Indian Reprint, 2007. Chapters:8(8.1-8.4(up to pages 428)), 9(9.1, 9.2).

Books for Reference:

1. Alexander M. Mood, Franklin A. Graybill and Duane C. Boes: Introduction to the Theory of Statistics, 3rd Ed., Tata McGraw- Hill, Reprint 2007.
2. S.C. Gupta and V.K. Kapoor: Fundamentals of Mathematical Statistics, S. Chand and Company Pvt. Ltd., New Delhi.
3. Sheldon Ross: A First Course in Probability, Pearson Education.
4. Robert V. Hogg, Joseph W. McKean and Allen T. Craig: Introduction to Mathematical Statistics, Pearson Education, Asia, 2102.

5. Kai Lai Chung: Elementary Probability Theory with Stochastic Processes, 3-rd Edn., Springer International Student Edition.

SEMESTER-VI

C-13: METRIC SPACES & COMPLEX ANALYSIS (ANALYSIS-IV)

Total Marks: 100-(Theory: 80 Marks+Mid-Sem: 20 Marks)

5 Lectures, 1 Tutorial (per week)

Unit-I

Metric spaces: Definition and examples, Open & Closed spheres, Neighborhoods, Interior points, Open set, Closed set, Boundary points, Limit points & isolated points, Closure of a set, Dense sets, Separable metric spaces, Sequences in metric spaces, Convergent sequences, Cauchy sequences, Complete metric spaces, Distance between sets & diameter of a set, Subspaces, Cantor's theorem.

Unit-II

Continuous functions: Definition & characterizations, Sequential criterion and other characterizations of continuity, Uniform continuity, Homeomorphism, Connectedness, Connected subsets of \mathbb{R} , Separated sets, Disconnected sets, Contraction mappings, Banach Fixed point theorem.

Unit-III

Properties of complex numbers, Regions in the complex plane, Functions of complex variable, Mappings, Limits & Continuity of complex functions, Derivatives, Differentiation formulas, Cauchy-Riemann equations, Sufficient conditions for differentiability, Polar Co-ordinates, Analytic functions, Examples of analytic functions.

Unit-IV

Exponential function, Logarithmic function, Trigonometric function, Derivatives of these functions, Definite integrals of functions, Contours, Contour integrals and its examples, Upper bounds for moduli of contour integrals, Theorems on antiderivatives, Cauchy- Goursat theorem (statement only), Cauchy integral formula, Its extension and consequences.

Unit-V

Liouville's theorem and the Fundamental theorem of Algebra, Convergence of sequences and series, Taylor series with examples, Laurent series (without proof) with examples, Absolute and uniform convergence of power series.

Books Recommended:

1. P.K. Jain and K. Ahmad: Metric Spaces, Narosa Publishing House, New Delhi. Chapters: 2(1-9, 12), 3(1-4), 4(1-4), 6(1-2, 4), 7(1 only).
2. James Ward Brown and Ruel V. Churchill: Complex Variables and Applications, 8th Ed., McGraw Hill International Edition, 2009. Chapters: 1(11 only), 2(12, 13, 15-25), 3(29, 30, 34), 4(37-41, 43-46, 50-53), 5(55-60, 62,63,66).

Books for Reference:

1. Satish Shirali and Harikishan L. Vasudeva: Metric Spaces, Springer Verlag, London, 2006.
2. S. Kumaresan: Topology of Metric Spaces, 2nd Ed., Narosa Publishing House, 2011.
3. S. Arumgum, A.T. Issac and A. Somasundaram: Complex Analysis, Scitech Publ. Pvt. Ltd.
4. S. Ponnusamy: Foundations of Complex Analysis, Alpha Science International Ltd.
5. J.B. Conway: Functions of one complex variable, Springer International Student Edn..
6. N. Das: Complex Function Theory, Allied Publishers Pvt. Ltd., Mumbai.

C-14: LINEAR PROGRAMMING

Total Marks: 100-(Theory: 80 Marks+Mid-Sem: 20 Marks)

5 Lectures, 1 Tutorial (per week)

Unit-I

Introduction to linear programming problems(LPP), Mathematical formulation of the LPP with illustrations, Graphical method, General Linear programming problems, Canonical & standard form of LPP.

Unit-II

Theory of Simplex method, Optimality and unboundedness, the Simplex algorithm, Simplex method in tableau format, Introduction to artificial variables, Two-phase method, Big-M method and their comparisons.

Unit-III

Duality in LPP: Introduction, General Primal-Dual pair, Formulation of the Dual problem, Primal- Dual relationships, Duality theorems, Complementary slackness theorem, Duality & Simplex method, Economic interpretation of the Duality.

Unit-IV

Transportation Problem(TP): LP formulation of TP, Existence of solution and Duality in TP, Solution of Transportation problems, North-West corner method, Least-Cost method and Vogel approximation method for determination of starting basic solution, Algorithm for solving transportation problem, Assignment problem and its mathematical formulation, Solution methods of Assignment problem, Special cases in Assignment problems.

Unit-V

Games and Strategies: Introduction, Formulation of two person zero sum games, solving two person zero sum games, Maximin-Minimax principle, Games without saddle points, Games with mixed strategies, Graphical solution procedure to $(2 \times n)$ and $(m \times 2)$ games.

Book Recommended:

1. Kanti Swarup, P.K. Gupta and Man Mohan: Operations Research, S. Chand and Co. Pvt. Ltd., Chapters: 2, 3, 4, 5(5.1-5.8), 10(10.1-10.10), 11(11.1-11.4), 17(17.1-17.6).

Books for Reference:

1. G. Hadley: Linear Programming, Narosa Publishing House, New Delhi, 2002.
2. N.V.R. Naidu, G. Rajendra and T. Krishna Rao: Operations Research, I.K. International Publishing House Pvt. Ltd., New Delhi, Bangalore.
3. R. Veerachamy and V. Ravi Kumar: Operations Research- I.K. International Publishing House Pvt. Ltd., New Delhi, Bangalore.
4. P.K. Gupta and D.S. Hira: Operations Research, S. Chand and Company Pvt. Ltd., New Delhi.
5. Mokhtar S. Bazaraa, John J. Jarvis and Hanif D. Sherali: Linear Programming and Network Flows, 2-nd Ed., John Wiley and Sons, India, 2004.
6. F.S. Hillier and G.J. Lieberman: Introduction to Operations Research, 9-th Ed., Tata McGraw Hill, Singapore, 2009.
7. Hamdy A. Taha: Operations Research, An Introduction, 8-th Ed., PrenticeHall India, 2006.

DISCIPLINE SPECIFIC ELECTIVES(DES)

DSE-1 Programming in C++ (Compulsory)

(Total Marks; 100)

Part-I(Marks: 70)

Introduction to structured programming: data types- simple data types, floating data types, character data types, string data types, arithmetic operators and operators precedence, variables and constant declarations, expressions, input using the extraction operator $\&\&$ and cin, output using the insertion operator $\&\&$ and cout, preprocessor directives, increment(++) and decrement(--) operations, creating a C++ program, input/ output, relational operators, logical operators and logical expressions, if and if-else statement, switch and break statements. for, while and do-while loops and continue statement, nested control statement, value returning functions, value versus reference parameters, local and global variables, one dimensional array, two dimensional array, pointer data and pointer variables.

Book Recommended:

1. D. S. Malik: C++ Programming Language, Edition-2009, Course Technology, Cengage Learning, India Edition. Chapters: 2(Pages:37-95), 3(Pages:96-129), 4(Pages:134-178), 5(Pages:181- 236), 6, 7(Pages:287-304), 9 (pages: 357-390), 14(Pages:594-600).

Books for Reference:

1. E. Balaguruswami: Object oriented programming with C++, fifth edition, Tata McGraw Hill Education Pvt. Ltd.
2. R. Johnsonbaugh and M. Kalin-Applications Programming in ANSI C, Pearson Education.
3. S. B. Lippman and J. Lajoie, C++ Primer, 3rd Ed., Addison Wesley, 2000.
4. Bjarne Stroustrup , The C++ Programming Language, 3rd Ed., Addison Welsley.

Part-II(PRACTICAL, Marks:30)

List of Practicals (Using any software) Practical/Lab work to be performed on a Computer.

1. Calculate the Sum of the series $\frac{1}{1} \pm \frac{1}{2} \pm \frac{1}{3} + \frac{1}{N}$ for any positive integer N .
2. Write a user defined function to find the absolute value of an integer and use it to evaluate the function $(-1)^n/|n|$, for $n = -2, -1, 0, 1, 2$.
3. Calculate the factorial of any natural number.
4. Read floating numbers and compute two averages: the average of negative numbers and the average of positive numbers.
5. Write a program that prompts the user to input a positive integer. It should then output a message indicating whether the number is a prime number.
6. Write a program that prompts the user to input the value of a, b and c involved in the equation $ax^2+bx+c=0$ and outputs the type of the roots of the equation. Also the program should outputs all the roots of the equation.
7. write a program that generates random integer between 0 and 99. Given that first two Fibonacci numbers are 0 and 1, generate all Fibonacci numbers less than or equal to generated number.
8. Write a program that does the following:
 - a. Prompts the user to input five decimal numbers.
 - b. Prints the five decimal numbers.
 - c. Converts each decimal number to the nearest integer.
 - d. Adds these five integers.
 - e. Prints the sum and average of them.
9. Write a program that uses whileloops to perform the following steps:
 - a. Prompt the user to input two integers :first Num and second Num (first Num shoul be less than second Num).
 - b. Output all odd and even numbers between first Num and second Num.
 - c. Output the sum of all even numbers between first Num and second Num.
 - d. Output the sum of the square of the odd numbers firs tNum and second Num.
 - e. Output all uppercase letters corresponding to the numbers between first Num and second Num, if any.

10. Write a program that prompts the user to input five decimal numbers. The program should then add the five decimal numbers, convert the sum to the nearest integer, and print the result.
11. Write a program that prompts the user to enter the lengths of three sides of a triangle and then outputs a message indicating whether the triangle is a right triangle or a scalene triangle.
12. Write a value returning function smaller to determine the smallest number from a set of numbers. Use this function to determine the smallest number from a set of 10 numbers.
13. Write a function that takes as a parameter an integer (as a long value) and returns the number of odd, even, and zero digits. Also write a program to test your function.
14. Enter 100 integers into an array and sort them in an ascending/ descending order and print the largest/ smallest integers.
15. Enter 10 integers into an array and then search for a particular integer in the array.
16. Multiplication/ Addition of two matrices using two dimensional arrays.
17. Using arrays, read the vectors of the following type: $A = (12345678)$, $B = (02340156)$ and compute the product and addition of these vectors.
18. Read from a text file and write to a text file.
19. Write a function, reverse Digit, that takes an integer as a parameter and returns the number with its digits reversed. For example, the value of function reverse Digit 12345 is 54321 and the value of reverse Digit -532 is -235.

DSE-2

Total Marks:100-(Theory: 80 Marks+Mid-Sem: 20 Marks)

5 Lectures, 1 Tutorial (per week)

(Any one of the following)

1-DISCRETE MATHEMATICS

Unit-I

Propositional Logic, Propositional equivalences, Predicates and Quantifiers, Nested quantifiers, Rules of Inference, Methods of proof, Relations and their properties, n-ary relations and their applications, The basic counting, the Pigeon-hole principle, Generalized Permutations and Combinations.

Unit-II

Recurrence relations, Modelling with recurrence relations, Solving linear homogeneous recurrence relations with constant coefficients, Generating functions, Solving recurrence relations using generating functions, Principle of Inclusion-Exclusion & applications.

Unit-III

Partially ordered sets, Hasse diagram of partially ordered sets, maps between ordered sets, Boolean

expressions and Boolean functions, Duality principle, Lattices as ordered sets, Lattices as algebraic structures, sublattices, Boolean algebra and its properties.

Unit-IV

Graphs: Basic concepts and graph terminology, representing graphs and graph isomorphism, Cut-vertices and Cut-edges, Distance in a graph (restricted), Connectivity, Euler and Hamiltonian path, Shortest-Path problems, Planar graphs, Graph coloring.

Book Recommended:

1. Kenneth H. Rosen: Discrete Mathematics and Applications, Tata McGraw Hill Publications, Chapters: 1(1.1-1.6), 4(4.1, 4.2, 4.5), 5(5.1, 5.2, 5.5), 6(6.1, 6.2, 6.4-6.6), 7(7.1, 7.2), 8, 10(10.1, 10.2).

Books for References:

1. B A. Davey and H. A. Priestley: Introduction to Lattices and Order, Cambridge University Press, Cambridge, 1990.
2. Edgar G. Goodaire and Michael M. Parmenter: Discrete Mathematics with Graph Theory (2nd Edition), Pearson Education (Singapore) Pte. Ltd., Indian Reprint 2003.
3. Rudolf Lidl and Gnter Pilz: Applied Abstract Algebra (2nd Edition), Undergraduate Texts in Mathematics, Springer (SIE), Indian reprint, 2004.
4. D.S. Malik: Discrete Mathematics: Theory & Applications, Cengage Learning India Pvt. Ltd.
5. Kevin Ferland: Discrete Mathematical Structures, Cengage Learning India Pvt. Ltd.

2-MATHEMATICAL MODELLING

Unit-I

Simple situations requiring Mathematical modelling. The technique of Mathematical modelling, Mathematical modelling through differential equations, linear growth and decay models, non-linear growth and decay models, compartment models, Mathematical modelling of geometrical problems through ordinary differential equations of first order.

Unit-II

Mathematical modelling in population dynamics, Mathematical modelling of epidemics through systems of ordinary differential equations of first order, compartment models through systems of ordinary differential equations, Mathematical modelling in economics through systems of ordinary differential equations of first order.

Unit-III

Mathematical models in medicine, arms race, battles and international trade in terms of systems of ordinary differential equations, Mathematical modelling of planetary motions, Mathematical modelling of circular motion and motion of satellites, mathematical modelling through linear differential equations of second order.

Unit-IV

Situation giving rise to partial differential equations models, mass balance equations: First method of getting PDE models, momentum balance equations. The second method of obtaining partial differential models, variational principles, third function, fourth method of obtaining partial differential equation models, models for traffic flow of a highway. Situation that can be modelled through graphs, mathematical models in terms of directed graphs, optimization principles and techniques, Mathematical modelling through calculus of variations.

Book Recommended:

1. J.N. Kapur: Mathematical Modelling, Chapters: 1(1.1 and 1.2), 2(2.1 to 2.4, 2.6), 3(3.1 to 3.5), 4(4.1 to 4.3), 6(6.1 to 6.6), 7(7.1 to 7.2), 9(9.1 and 9.2).

3-NUMBER THEORY

Unit-I

Divisibility theorem in integers, Primes and their distributions, Fundamental theorem of arithmetic, Greatest common divisor, Euclidean algorithms, Modular arithmetic, Linear Diophantine equation, prime counting function, statement of prime number theorem, Goldbach conjecture.

Unit-II

Introduction to congruences, Linear Congruences, Chinese Remainder theorem, Polynomial congruences, System of linear congruences, complete set of residues, Chinese remainder theorem, Fermats little theorem, Wilsons theorem.

Unit-III

Number theoretic functions, sum and number of divisors, totally multiplicative functions, definition and properties of the Dirichlet product, the Mbius inversion formula, the greatest integer function, Eulers phi function, Eulers theorem, reduced set of residues, some properties of Eulers phi-function.

Unit-IV

Order of an integer modulo n , primitive roots for primes, composite numbers having primitive roots, Eulers criterion, the Legendre symbol and its properties, quadratic reciprocity, quadratic congruences with composite moduli.

Book Recommended:

1. D.M. Burton: Elementary Number Theory, McGraw Hill, Chapters: 2(2.1 to 2.4), 3(3.1 to 3.3), 4(4.1 to 4.4), 5(5.1 to 5.4), 6(6.1 to 6.3), 7(7.1 to 7.3), 8(8.1 to 8.2), 9(9.1 to 9.3).

Books for Reference:

1. K.H. Rosen: Elementary Number Theory & its Applications, Pearson Addition Wesley.
2. I. Niven and H.S. Zuckerman: An Introduction to Theory of Numbers, Wiley Eastern Pvt. Ltd.

3. Tom M. Apostol: Introduction to Analytic Number Theory, Springer International Student Edn.
4. Neville Robinns: Beginning Number Theory (2nd Edition), Narosa Publishing House Pvt. Limited, Delhi, 2007.

4-BOOLEAN ALGEBRA & AUTOMATA THEORY

Unit-I

Definition, examples and basic properties of ordered sets, maps between ordered sets, duality principle, lattices as ordered sets, lattices as algebraic structures, sublattices, products and homomorphisms. Definition, examples and properties of modular and distributive lattices, Boolean algebras, Boolean polynomials, minimal forms of Boolean polynomials, QuinnMcCluskey method, Karnaugh diagrams, switching circuits and applications of switching circuits.

Unit-II

Introduction: Alphabets, strings, and languages. Finite Automata and Regular Languages: deterministic and non-deterministic finite automata, regular expressions, regular languages and their relationship with finite automata, pumping lemma and closure properties of regular languages.

Unit-III

Context Free Grammars and Pushdown Automata: Context free grammars (CFG), parse trees, ambiguities in grammars and languages, pushdown automaton (PDA) and the language accepted by PDA, deterministic PDA, Non- deterministic PDA, properties of context free languages; normal forms, pumping lemma, closure properties, decision properties.

Unit-IV

Turing Machines: Turing machine as a model of computation, programming with a Turing machine, variants of Turing machine and their equivalence. Undecidability: Recursively enumerable and recursive languages, undecidable problems about Turing machines: halting problem, Post Correspondence Problem, and undecidability problems About CFGs.

Books Recommended:

1. B A. Davey and H. A. Priestley, Introduction to Lattices and Order, Cambridge University Press, Cambridge, 1990.
2. Edgar G. Goodaire and Michael M. Parmenter, Discrete Mathematics with Graph Theory, (2nd Ed.), Pearson Education (Singapore) P.Ltd., Indian Reprint 2003.
3. Rudolf Lidl and Gnter Pilz, Applied Abstract Algebra, 2nd Ed., Undergraduate Texts in Mathematics, Springer (SIE), Indian reprint, 2004.
4. J. E. Hopcroft, R. Motwani and J. D. Ullman, Introduction to Automata Theory, Languages, and Computation, 2nd Ed., Addison-Wesley, 2001.
5. H.R. Lewis, C.H. Papadimitriou, C. Papadimitriou, Elements of the Theory of Computation, 2nd Ed., Prentice-Hall, NJ, 1997.

6. J.A. Anderson, Automata Theory with Modern Applications, Cambridge University Press, 2006.

DSE-3

**Total Marks:100-(Theory:80 Marks+Mid-Sem:20 Marks) 5 Lectures,
1 Tutorial (per week)
(Any one of the following)**

1-DIFFERENTIAL GEOMETRY

Unit-I

Theory of Space Curves: Space curves, Planer curves, Curvature, torsion and Serret-Frenet formulae. Osculating circles, Osculating circles and spheres. Existence of space curves. Evolutes and involutes of curves.

Unit-II

Osculating circles, Osculating circles and spheres. Existence of space curves. Evolutes and involutes of curves.

Unit-III

Developables: Developable associated with space curves and curveson surfaces, Minimal surfaces.

Unit-IV

Theory of Surfaces: Parametric curves on surfaces. Direction coefficients. First and second Fundamental forms. Principal and Gaussian curvatures. Lines of curvature, Eulers theorem. Rodrigues formula, Conjugate and Asymptotic lines.

Book Recommended:

1. C.E. Weatherburn, Differential Geometry of Three Dimensions, Cambridge University Press 2003. Chapters:1(1-4, 7,8,10), 2(13, 14, 16, 17), 3, 4(29-31, 35, 37, 38).

Books for References

1. T.J. Willmore, An Introduction to Differential Geometry, Dover Publications, 2012.
2. S. Lang, Fundamentals of Differential Geometry, Springer, 1999.
3. B. O'Neill, Elementary Differential Geometry, 2nd Ed., Academic Press, 2006.
4. A.N. Pressley-Elementary Differential Geometry, Springer.
5. B.P. Acharya and R.N. Das-Fundamentals of Differential Geometry, Kalyani Publishers, Ludhiana, New Delhi.

2-MECHANICS

Unit-I

Moment of a force about a point and an axis, couple and couple moment, Moment of a couple about a line, resultant of a force system, distributed force system, free body diagram, free body involving interior sections, general equations of equilibrium, two point equivalent loading, problems arising from structures, static indeterminacy.

Unit-II

Laws of Coulomb friction, application to simple and complex surface contact friction problems, transmission of power through belts, screw jack, wedge, first moment of an area and the centroid, other centers, Theorem of Pappus-Guldinus, second moments and the product of area of a plane area, transfer theorems, relation between second moments and products of area, polar moment of area, principal axes.

Unit-III

Conservative force field, conservation for mechanical energy, work energy equation, kinetic energy and work kinetic energy expression based on center of mass, moment of momentum equation for a single particle and a system of particles.

Unit-IV

Translation and rotation of rigid bodies, Chasles theorem, general relationship between time derivatives of a vector for different references, relationship between velocities of a particle for different references, acceleration of particle for different references.

Book Recommended:

1. I.H. Shames and G. Krishna Mohan Rao, Engineering Mechanics: Statics and Dynamics, (4th Ed.), Dorling Kindersley (India) Pvt. Ltd. (Pearson Education), Delhi, 2009. Chapters:3, 4, 5, 6(6.1-6.7), 7, 11, 12(12.5, 12.6), 13.

Books for Reference:

1. R.C. Hibbeler and Ashok Gupta, Engineering Mechanics: Statics and Dynamics, 11th Ed., Dorling Kindersley (India) Pvt. Ltd. (Pearson Education), Delhi.
2. Grant R Fowles, Analytical Mechanics, Cengage Learning India Pvt. Ltd.

3-MATHEMATICAL FINANCE

Unit-I

Basic principles: Comparison, arbitrage and risk aversion, Interest (simple and compound, discrete and continuous), time value of money, inflation, net present value, internal rate of return (calculation by bisection and Newton-Raphson methods), comparison of NPV and IRR. Bonds, bond prices and yields, Macaulay and modified duration, term structure of interest rates: spot and forward rates, explanations of term structure, running present value, floating-rate bonds, immunization, convexity, puttable and callable bonds.

Unit-II

Asset return, short selling, portfolio return, (brief introduction to expectation, variance, covariance

and correlation), random returns, portfolio mean return and variance, diversification, portfolio diagram, feasible set, Markowitz model (review of Lagrange multipliers for 1 and 2 constraints), Two fund theorem, risk free assets, One fund theorem, capital market line, Sharpe index. Capital Asset Pricing Model (CAPM), betas of stocks and portfolios, security market line, use of CAPM in investment analysis and as a pricing formula, Jensen's index.

Unit-III

Forwards and futures, marking to market, value of a forward/futures contract, replicating portfolios, futures on assets with known income or dividend yield, currency futures, hedging (short, long, cross, rolling), optimal hedge ratio, hedging with stock index futures, interest rate futures, swaps.

Unit-IV

Lognormal distribution, Lognormal model / Geometric Brownian Motion for stock prices, Binomial Tree model for stock prices, parameter estimation, comparison of the models. Options, Types of options: put / call, European / American, pay off of an option, factors affecting option prices, put call parity.

Books Recommended:

1. David G. Luenberger, Investment Science, Oxford University Press, Delhi, 1998. Chapters:1, 2, 3, 4, 6, 7, 8(8.5-8.8), 10(except 10.11, 10.12), 11(except 11.2 11.8).
2. John C. Hull, Options, Futures and Other Derivatives (6th Edition), Prentice-Hall India, Indian reprint, 2006. Chapters: 3, 5, 6, 7(except 7.10, 7.11), 8, 9.
3. Sheldon Ross, An Elementary Introduction to Mathematical Finance (2nd Edition), Cambridge University Press, USA, 2003. Chapter:3

Books for References:

1. R.C. Hibbeler and Ashok Gupta, Engineering Mechanics: Statics and Dynamics, 11th Ed., Dorling Kindersley (India) Pvt. Ltd. (Pearson Education), Delhi.
2. Grant R Fowles, Analytical Mechanics, Cengage Learning India Pvt. Ltd.

4-RING THEORY & LINEAR ALGEBRA-II

Unit-I

Polynomial rings over commutative rings, division algorithm and consequences, principal ideal domains, factorization of polynomials, reducibility tests, irreducibility tests, Eisenstein criterion, unique factorization in $\mathbb{Z}[x]$.

Unit-II

Divisibility in integral domains, irreducibles, primes, unique factorization domains, Euclidean domains.

Unit-III

Dual spaces, dual basis, double dual, transpose of a linear transformation and its matrix in the

dual basis, annihilators, Eigenspaces of a linear operator, diagonalizability, invariant subspaces and Cayley-Hamilton theorem, the minimal polynomial for a linear operator.

Unit-IV

Inner product spaces and norms, Gram-Schmidt orthogonalisation process, orthogonal complements, Bessels inequality, the adjoint of a linear operator, Least Squares Approximation, minimal solutions to systems of linear equations, Normal and self-adjoint operators, Orthogonal projections and Spectral theorem.

Books Recommended:

1. Joseph A. Gallian: Contemporary Abstract Algebra (4th Ed.), Narosa Publishing House, 1999. Chapters: 16, 17, 18.
2. Stephen H. Friedberg, Arnold J. Insel, Lawrence E. Spence: Linear Algebra (4th Edition), Prentice-Hall of India Pvt. Ltd., New Delhi, 2004. Chapters: 2(2.6 only), 5(5.1, 5.2, 5.4), 6(6.1, 6.4, 6.6), 7(7.3 only).

Books for Reference:

(For LINEAR ALGEBRA)

1. S Lang: Introduction to Linear Algebra (2nd edition), Springer, 2005
2. Gilbert Strang: Linear Algebra and its Applications, Thomson, 2007
3. S. Kumaresan: Linear Algebra- A Geometric Approach, Prentice Hall of India, 1999.
4. 4. Kenneth Hoffman, Ray Alden Kunze: Linear Algebra 2nd Ed., Prentice-Hall Of India Pvt. Limited, 1971.

(For RING THEORY)

1. John B. Fraleigh: A first course in Abstract Algebra, 7th Edition, Pearson Education India, 2003.
2. Herstein: Topics in Algebra (2nd edition), John Wiley & Sons, 2006
3. Michael Artin: Algebra (2nd edition), Pearson Prentice Hall, 2011
4. Robinson, Derek John Scott.: An introduction to abstract algebra, Hindustan book agency, 2010.

DSE-4

PROJECT WORK/DISSERTATION (Compulsory)

Total Marks:100-(Project:75 Marks+Viva-Voce:25 Marks)

SKILL ENHANCEMENT COURSES (SEC)
(Credit: 2 each, Total Marks:50) SEC-1
to SEC-4

SEC-1

COMMUNICATIVE ENGLISH & WRITING SKILL (Compulsory)

SEC-2

(Any one of the following)

1-COMPUTER GRAPHICS

Development of computer Graphics: Raster Scan and Random Scan graphics storages, displays processors and character generators, colour display techniques, interactive input/output devices. Points, lines and curves: Scan conversion, line-drawing algorithms, circle and ellipse generation, conic-section generation, polygon filling anti aliasing. Two-dimensional viewing: Coordinate systems, linear transformations, line and polygon clipping algorithms.

Books Recommended:

1. D. Hearn and M.P. Baker-Computer Graphics, 2nd Ed., PrenticeHall of India, 2004.
2. J.D. Foley, A van Dam, S.K. Feiner and J.F. Hughes-Computer Graphics: Principals and Practices, 2nd Ed., Addison-Wesley, MA, 1990.
3. D.F. Rogers-Procedural Elements in Computer Graphics, 2nd Ed., McGraw Hill Book Company, 2001.
4. D.F. Rogers and A.J. Admas-Mathematical Elements in Computer Graphics, 2nd Ed., McGraw Hill Book Company, 1990.

2-LOGIC & SETS

Introduction, propositions, truth table, negation, conjunction and disjunction. Implications, biconditional propositions, converse, contra positive and inverse propositions and precedence of logical operators. Propositional equivalence: Logical equivalences. Predicates and quantifiers: Introduction, Quantifiers, Binding variables and Negations. Sets, subsets, Set operations and the laws of set theory and Venn diagrams. Examples of finite and infinite sets. Finite sets and counting principle. Empty set, properties of empty set. Standard set operations. Classes of sets. Power set of a set. Difference and Symmetric difference of two sets. Set identities, Generalized union and intersections. Relation: Product set, Composition of relations, Types of relations, Partitions, Equivalence Relations with example of congruence modulo relation, Partial ordering relations, nary relations.

Books Recommended:

1. R.P. Grimaldi-Discrete Mathematics and Combinatorial Mathematics, Pearson Education, 1998.
2. P.R. Halmos-Naive Set Theory, Springer, 1974.
3. E. Kamke-Theory of Sets, Dover Publishers, 1950.

3-COMBINATORIAL MATHEMATICS

Basic counting principles, Permutations and Combinations (with and without repetitions), Binomial theorem, Multinomial theorem, Counting subsets, Set-partitions, Stirling numbers Principle of Inclusion and Exclusion, Derangements, Inversion formulae Generating functions: Algebra of formal power series, Generating function models, Calculating generating functions, Exponential generating functions. Recurrence relations: Recurrence relation models, Divide and conquer relations, Solution of recurrence relations, Solutions by generating functions. Integer partitions, Systems of distinct representatives.

Books Recommended:

1. J.H. van Lint and R.M. Wilson-A Course in Combinatorics, 2nd Ed., Cambridge University Press, 2001.
2. V. Krishnamurthy-Combinatorics, Theory and Application, Affiliated East-West Press 1985.
3. P.J. Cameron-Combinatorics, Topics, Techniques, Algorithms, Cambridge University Press, 1995.
4. M. Jr. Hall-Combinatorial Theory, 2nd Ed., John Wiley & Sons, 1986.
5. S.S. Sane-Combinatorial Techniques, Hindustan Book Agency, 2013.
6. R.A. Brualdi-Introductory Combinatorics, 5th Ed., Pearson Education Inc., 2009.

4-INFORMATION SECURITY

Overview of Security: Protection versus security; aspects of security data integrity, data availability, privacy; security problems, user authentication, Orange Book. Security Threats: Program threats, worms, viruses, Trojan horse, trap door, stack and buffer over flow; system threats- intruders; communication threats- tapping and piracy. Security Mechanisms: Intrusion detection, auditing and logging, tripwire, system-call monitoring.

Books Recommended:

1. C. Pfleeger and S.L. Pfleeger-Security in Computing , 3rd Ed., Prentice-Hall of India, 2007.
2. D. Gollmann-Computer Security, John Wiley and Sons, NY, 2002.
3. J. Piwprzyk, T. Hardjono and J. Seberry-Fundamentals of Computer Security, Springer- Verlag Berlin, 2003.

4. J.M. Kizza-Computer Network Security, Springer, 2007.
5. M. Merkow and J. Breithaupt-Information Security: Principles and Practices, Pearson Education, 2006.

GENERIC ELECTIVES(Interdisciplinary)
(04 Papers, 02 papers each from two Allied disciplines) (Credit: 06 each,
Marks:100)
GE-1 to GE-4

GE-1 : CALCULUS & ORDINARY DIFFERENTIAL EQUATIONS

Total Marks:100-(Theory: 80 Marks+Mid-Sem: 20 Marks)

Unit-I

Curvature, Asymptotes, Tracing of Curves (Cartenary, Cycloid, Folium of Descartes), Rectification, Quadrature, Elementary ideas about Sphere, Cones, Cylinders and Conicoids.

Unit-II

Review of limits, continuity and differentiability of functions of one variables and their properties, Limit and Continuity of functions of several variables, Partial derivatives, Partial derivatives of higher orders, Homogeneous functions, Change of variables, Mean value theorem, Taylors theorem and Maclaurins theorem for functions of two variables(statements & applications).

Unit-III

Maxima and Minima of functions of two and three variables, Implicit functions, Lagranges multipliers (Formulae & its applications), Concepts of Multiple integrals & its applications.

Unit-IV

Ordinary Differential Equations of order one and degree one (variables separable, homogeneous, exact and linear). Equations of order one but higher degree. Second order linear equations with constant coefficients, homogeneous forms, Second order equations with variable coefficients, Variation of parameters.

Books Recommended:

1. S.K. Sengar and S.P. Singh: Advanced Calculus, Cengage Learning India Pvt. Ltd.(6th Indian Reprint), Chapters: 1(1.11-1.14 restricted), 2(2.1-2.13 restricted), 4(4.1-4.11), 5, 7(7.1-7.3 restricted), 11(restricted).
2. Shantinayakan: Text Book of Calculus, Part-II, S. Chand and Co., Chapter-8 (Art. 24, 25, 26)
3. Shantinayakan: Text Book of Calculus, Part-III, S. Chand and Co., Chapter-1 (Art 1,2), 3, 4(Art. 10 to 12 ommitting Simpsons Rule), 5(Art-13) and 6(Art-15).
4. B.P. Acharya and D.C. Sahu: Analytical Geometry of Quadratic Surfaces, Kalyani Publishers, New Delhi, Ludhiana.

5. J. Sinharoy and S. Padhy: A Course of Ordinary and Partial Differential Equations, Kalyani Publishers. Chapters: 2(2.1 to 2.7), 3, 4(4.1 to 4.7), 5.

Books for Reference:

1. Shanti Narayan and P.K. Mittal: Analytical Solid Geometry, S. Chand & Company Pvt.Ltd., New Delhi.
2. David V. Weider: Advanced Calculus, Dover Publications.
3. Martin Braun: Differential Equations and their Applications-Martin Braun, Springer International.
4. M.D. Raisinghania: Advanced Differential Equations, S. Chand & Company Ltd., New Delhi.
5. G. Dennis Zill: A First Course in Differential Equations with Modelling Applications, Cengage Learning India Pvt. Ltd.

GE-2: LINEAR ALGEBRA, ABSTRACT ALGEBRA & NUMERICAL ANALYSIS

Total Marks:100-(Theory: 80 Marks+Mid-Sem: 20 Marks)

Unit-I

Vector space, Subspace, Span of a set, Linear dependence and Independence, Dimensions and Basis. Linear transformations, Range, Kernel, Rank, Nullity, Inverse of a linear map, Rank-Nullity theorem.

Unit-II

Matrices and linear maps, Rank and Nullity of a matrix, Transpose of a matrix, Types of matrices. Elementary row operations, System of linear equations, Matrix inversion using row operations, Determinant and Rank of matrices, Eigen values, Eigen vectors.

Unit-III

Group Theory: Definition and examples, Subgroups, Normal subgroups, Cyclic groups, Cosets, Quotient groups, Permutation groups, Homomorphism. Elementary ideas about Rings, Field (definitions, statements, and examples only).

Unit-IV

Convergence, Errors: Relative, Absolute, Round off, Truncation. Transcendental and Polynomial equations: Bisection method, Newtons method, Secant method. Rate of convergence of these methods. System of linear algebraic equations: Gaussian Elimination and Gauss Jordan methods. Interpolation: Lagrange and Newtons methods. Error bounds. Finite difference operators. Gregory forward and backward difference interpolation (statements, definitions and uses/examples only).

Books Recommended:

1. V. Krishnamurty, V. P. Mainra, J. L. Arora: An introduction to Linear Algebra, Affiliated East-West Press Pvt. Ltd., New Delhi, Chapters: 3, 4(4.1 to 4.7), 5(except 5.3), 6(6.1, 6.2, 6.5, 6.6, 6.8), 7(7.4 only).

2. I.N. Herstein: Topics in Algebra, Wiley Eastern Pvt. Ltd. Chapters: 2(2.1-2.7), 3(3.1, 3.2).
3. B.P. Acharya and R.N. Das: A Course on Numerical Analysis, Kalyani Publishers, New Delhi, Ludhiana. Chapters: 1, 2(2.1 to 2.4, 2.6, 2.8, 2.9), 3(3.1 to 3.4), 4(4.1, 4.2), 5(5.1- 5.3), 6(6.1- 6.3, 6.10, 6.11).

Books for References:

1. I.H. Seth: Abstract Algebra, Prentice Hall of India Pvt. Ltd., New Delhi.
2. S. Kumaresan: Linear Algebra, A Geometric Approach, Prentice Hall of India.
3. Rao and Bhimasankaran: Linear Algebra, Hindustan Publishing House.
4. S. Singh: Linear Algebra, Vikas Publishing House Pvt. Ltd., New Delhi.
5. Gilbert Strang: Linear Algebra & its Applications, Cengage Learning India Pvt. Ltd.
6. Gallian: Contemporary Abstract Algebra, Narosa publishing House.
7. Artin: Algebra, Prentice Hall of India.
8. V.K. Khanna and S.K. Bhambri: A Course in Abstract Algebra, Vikas Publishing House Pvt. Ltd., New Delhi.

PHYSICS(HONOURS)

SEMESTER-I

C-I: MATHEMATICAL PHYSICS-I

(Credits: Theory-04, Practicals-02)
Marks:100 (Theory:70, Practical: 30)
Theory: 40 Classes (1 hr. duration)

The emphasis of course is on applications in solving problems of interest to physicists. The students are to be examined entirely on the basis of problems, seen and unseen.

UNIT-I

Calculus: Calculus of functions of more than one variable: Partial derivatives, exact and inexact differentials, Integrating factor, with simple illustration. Constrained Maximization using Lagrange Multipliers. (4 Lectures)

Vector Calculus: Recapitulation of vectors: Properties of vectors under rotations. Scalar product and its invariance under rotations. Vector product, Scalar triple product and their interpretation in terms of area and volume respectively. Scalar and Vector fields. (5 Lectures)

UNIT-II

Orthogonal Curvilinear Coordinates: Orthogonal Curvilinear Coordinates, Derivation of Gradient, Divergence, Curl and Laplacian in Cartesian, Spherical and Cylindrical Coordinate Systems. Comparison of velocity and acceleration in cylindrical and spherical coordinate system. (7 Lectures)

Dirac Delta function and its properties: Definition of Dirac delta function. Representation as limit of a Gaussian function and rectangular function. Properties of Dirac delta function. (3 Lectures)

UNIT-III

Vector Differentiation: Directional derivatives and normal derivative. Gradient of a scalar field and its geometrical interpretation. Divergence and curl of a vector field. Del and Laplacian operators. Vector identities, Gradient, divergence, curl and Laplacian in spherical and cylindrical coordinates. (8 Lectures)

UNIT-IV

Vector Integration: Ordinary Integrals of Vectors. Multiple integrals, Jacobian. Notion of infinitesimal line, surface and volume elements. Line, surface and volume integrals of Vector fields. Flux of a vector field. Gauss' divergence theorem, Green's and Stokes Theorems and their applications (no rigorous proofs). (13 Lectures)

Reference Books:

1. Mathematical Methods for Physicists, G.B. Arfken, H.J. Weber, F.E. Harris, 2013, 7th Edn., Elsevier.
2. An introduction to ordinary differential equations, E.A. Coddington, 2009, PHI learning.

3. Differential Equations, George F. Simmons, 2007, McGraw Hill.
4. Mathematical Tools for Physics, James Nearing, 2010, Dover Publications.
5. Mathematical methods for Scientists and Engineers, D.A. McQuarrie, 2003, Viva Book
6. Advanced Engineering Mathematics, D.G. Zill and W.S. Wright, 5 Ed., 2012, Jones and Bartlett Learning
7. Advanced Engineering Mathematics, Erwin Kreyszig, 2008, Wiley India.
8. Essential Mathematical Methods, K.F.Riley & M.P.Hobson, 2011, Cambridge Univ. Press
9. Mathematical Physics and Special Relativity-M. Das, P.K. Jena and B.K. Dash (Srikrishna Prakashan) 2nd Edition 2009
10. Mathematical Physics–H. K. Dass, Dr. Rama Verma (S. Chand Higher Academics), th Edition 2011.
11. Mathematical PhysicsC. Harper, (Prentice Hall India) 2006.
12. Mathematical Physics-Goswami (Cengage Learning) 2014
13. Mathematical Method for Physical Sciences- M. L. Boas (Wiley India) 2006

PHYSICS LAB-C:I

20 Classes (2 hrs. duration)

The aim of this Lab is not just to teach computer programming and numerical analysis but to emphasize its role in solving problems in Physics.

- Highlights the use of computational methods to solve physical problems.
- The course will consist of lectures (both theory and practical) in the Lab.
- Evaluation done not on the programming but on the basis of formulating the problem.
- Aim at teaching students to construct the computational problem to be solved.
- Students can use any one operating system Linux or Microsoft Windows.

Topics	Description with Applications
Introduction and Overview	Computer architecture and organization, memory and Input/output devices.
Basics of scientific computing	Binary and decimal arithmetic, Floating point numbers, algorithms, Sequence, Selection and Repetition, single and double precision arithmetic, underflow & overflow emphasize the importance of making equations in terms of dimensionless variables, Iterative methods.
Errors and error Analysis	Truncation and round off errors, Absolute and relative errors, Floating point computations.
Review of C & C++ programming fundamentals	Introduction to Programming, constants, variables and data types, operators and Expressions, I/O statements, scanf and printf, c in and c out, Manipulators for data formatting, Control statements (decision making and looping statements) (If-statement. If-else Statement. Nested if Structure. Else-if Statement. Ternary Operator.

	Goto Statement. Switch Statement. Unconditional and Conditional Looping. While Loop. Do-While Loop. FOR Loop. Break and Continue Statements. Nested Loops), Arrays (1D & 2D) and strings, user defined functions, Structures and Unions, Idea of classes and objects.
Programs	Sum & average of a list of numbers, largest of a given list of numbers and its location in the list, sorting of numbers in ascending descending order, Binarysearch.
Random number generation	Area of circle, area of square, volume of sphere, value of π .

Referred Books:

1. Introduction to Numerical Analysis, S.S. Sastry, 5th Edn. , 2012, PHI Learning Pvt. Ltd.
2. Schaum's Outline of Programming with C++. J. Hubbard, 2000, McGraw-Hill Pub.
3. Numerical Recipes in C: The Art of Scientific Computing, W.H. Pressetal, 3rd Edn. 2007, Cambridge University Press.
4. A first course in Numerical Methods, U.M. Ascher & C. Greif, 2012, PHI Learning.
5. Elementary Numerical Analysis, K.E. Atkinson, 3 rd Edn. , 2007 , Wiley India Edition.
6. Numerical Methods for Scientists & Engineers, R.W. Hamming, 1973, Courier Dover Pub.
7. An Introduction to computational Physics, T. Pang, 2nd Edn., 2006,Cambridge Univ. Press.

C-2: MECHANICS

(Credits: Theory-04, Practicals-02)

Marks:100 (Theory:70, Practical: 30)

Theory: 40 Classes (1 hr. duration)

UNIT-I

Rotational Dynamics: Centre of Mass and Laboratory frames. Angular momentum of a particle and system of particles. Torque. Principle of conservation of angular momentum. Rotation about a fixed axis. **Moment of Inertia.** Calculation of moment of inertia for rectangular, cylindrical and spherical bodies. Kinetic energy of rotation. Motion involving both translation and rotation. (9 Lectures)

Non-Inertial Systems: Non-inertial frames and fictitious forces. Uniformly rotating frame. Laws of Physics in rotating coordinate systems. Centrifugal force. Coriolis force and its applications. (3 Lectures)

UNIT-II

Elasticity: Relation between Elastic constants. Twisting torque on a Cylinder or Wire. (3 Lectures)

Fluid Motion: Kinematics of Moving Fluids: Poiseuilles Equation for Flow of a Liquid through a Capillary Tube . (3 Lectures)

Oscillations: SHM: **Simple Harmonic Oscillations.** Differential equation of SHM and its solution. Kinetic energy, potential energy, total energy and their time-average values. Damped oscillation. Forced oscillations: Transient and steady states; Resonance, sharpness of resonance; powerdissipation and Quality Factor. (5 Lectures)

UNIT-III

Gravitation and Central Force Motion: Law of gravitation. Gravitational potential energy. Inertial and gravitational mass. Potential and field due to spherical shell and solid sphere. (3 Lectures)

Motion of a particle under a central force field. Two-body problem and its reduction to one-body problem and its solution. The energy equation and energy diagram. **Keplers Laws.** Satellite in circular orbit and applications. Geosynchronous orbits. Weightlessness. Basic idea of global positioning system (GPS). Physiological effects on astronauts.(5 Lectures)

UNIT-IV

Special Theory of Relativity: Michelson-Morley Experiment and its outcome. Postulates of Special Theory of Relativity. Lorentz Transformations. Simultaneity and order of events. Lorentz contraction. Time dilation. Relativistic transformation of velocity, frequency and wave number. Relativistic addition of velocities. Variation of mass with velocity. Massless Particles. Mass-energy Equivalence. Relativistic Doppler effect. Relativistic Kinematics. Transformation of Energy and Momentum. Energy-Momentum Four Vector. (9 Lectures)

Reference Books:

1. An introduction to mechanics, D. Kleppner, R.J. Kolenkow, 1973, McGraw-Hill.
2. Mechanics, Berkeley Physics, vol.1, C.Kittel, W.Knight, et.al. 2007, Tata McGraw-Hill.
3. Physics, Resnick, Halliday and Walker 8/e. 2008, Wiley.
4. Analytical Mechanics, G.R. Fowles and G.L. Cassiday. 2005, Cengage Learning.

5. Feynman Lectures, Vol. I, R.P.Feynman, R.B.Leighton, M.Sands, 2008, Pearson Education
6. Introduction to Special Relativity, R. Resnick, 2005, John Wiley and Sons.
7. University Physics, Ronald Lane Reese, 2003, Thomson Brooks/Cole.
(Additional Books for Reference)
8. Mechanics, D.S. Mathur, S. Chand and Company Limited, 2000
9. University Physics. F.W Sears, M.W Zemansky, H.D Young 13/e, 1986, Addison Wesley
10. Physics for scientists and Engineers with Modern Phys., J.W. Jewett, R.A.Serway, 2010, Cengage Learning
11. Theoretical Mechanics, M.R. Spiegel, 2006, Tata McGraw Hill.
12. Mechanics - J. C. Slater and N. H. Frank (McGraw-Hill)

PHYSICS LAB-C:II

20 Classes (2 hrs. duration)

1. To study the random error in observations.
2. To determine the height of a building using a Sextant.
3. To study the Motion of Spring and calculate (a) Spring constant, (b) g and (c) Modulus of rigidity.
4. To determine the Moment of Inertia of a Flywheel.
5. To determine g and velocity for a freely falling body using Digital Timing Technique
6. To determine Coefficient of Viscosity of water by Capillary Flow Method (Poiseuilles method).
7. To determine the Young's Modulus of a Wire by Optical Lever Method.
8. To determine the Modulus of Rigidity of a Wire by Maxwells needle. 9. To determine the elastic Constants of a wire by Searles method.
9. To determine the value of g using Bar Pendulum.
10. To determine the value of g using Katers Pendulum

Reference Books:

1. Advanced Practical Physics for students, B. L. Flint and H.T. Worsnop, 1971, AsiaPublishing House
2. Advanced level Physics Practicals, Michael Nelson and Jon M. Ogborn, 4th Edition, reprinted 1985, Heinemann Educational Publishers
3. A Text Book of Practical Physics, I.Prakash & Ramakrishna, 11th Edn, 2011, Kitab Mahal

SEMESTER-II

C-3: ELECTRICITY AND MAGNETISM

(Credits: Theory-04, Practicals-02)

Marks:100 (Theory:70, Practical: 30)

Theory: 40 Classes (1 hr. duration)

UNIT-I

Electric Field and Electric Potential: Electric field: Electric field lines. Electric flux. Gauss Law with applications to charge distributions with spherical, cylindrical and planar symmetry. (3 Lectures)

Conservative nature of Electrostatic Field. Electrostatic Potential. Laplaces and Poissonequations. The Uniqueness Theorem. Potential and Electric Field of a dipole. Force and Torque on a dipole. (3 Lectures)

Electrostatic energy of system of charges. Electrostatic energy of a charged sphere. Conductors in an electrostatic Field. Surface charge and force on a conductor. Capacitance of a system of charged conductors. Parallel-plate capacitor. Capacitance of an isolated conductor. Method of Images and its application to: (1) Plane Infinite Sheet and (2) Sphere. (4 Lectures)

UNIT-II

Magnetic Field: Magnetic force between current elements and definition of Magnetic Field B. Biot-Savarts Law and its simple applications: straight wire and circular loop. Current Loop as a Magnetic Dipole and its Dipole Moment (Analogy with Electric Dipole). Amperes Circuital Law and its application to (1) Solenoid and (2) Toroid. Properties of B: curl and divergence. Vector Potential. Magnetic Force on (1) point charge (2) current carrying wire (3) between current elements. Torque on a current loop in a uniform Magnetic Field. Ballistic Galvanometer: Torque on a current Loop. Ballistic Galvanometer: Current and Charge Sensitivity. Electromagnetic damping. Logarithmic damping. CDR. (10 Lectures)

UNIT-III

Dielectric Properties of Matter: Electric Field in matter. Polarization, Polarization Charges. Electrical Susceptibility and Dielectric Constant. Capacitor (parallel plate, spherical, cylindrical) filled with dielectric. Displacement vector D. Relations between E, P and D. Gauss Law in dielectrics. (4 Lecturers)

Magnetic Properties of Matter: Magnetization vector (M). Magnetic Intensity (H). Magnetic Susceptibility and permeability. Relation between B, H, M. Ferromagnetism. B-H curve and hysteresis. (4 Lecturers)

Electromagnetic Induction: Faradays Law. Lenzs Law. Self Inductance and Mutual Inductance. Reciprocity Theorem. Energy stored in a Magnetic Field. (2 Lectures)

UNIT-IV

Electrical Circuits: AC Circuits: Kirchhoffs laws for AC circuits. Complex Reactance and Impedance. Series LCR Circuit: (1) Resonance, (2) Power Dissipation and (3) Quality Factor, and (4) Band Width,. Parallel LCR Circuit. (5 Lectures)

Network theorems: Ideal Constant-voltage and Constant-current Sources. Network Theorems:

Thevenin theorem, Norton theorem, Superposition theorem, Reciprocity theorem, Maximum Power Transfer theorem. Growth & decay of currents in RC, RL, and LCR Series circuits for DC. (5 Lectures)

Reference Books:

1. Electricity, Magnetism & Electromagnetic Theory, S. Mahajan and Choudhury, 2012, Tata McGraw
2. Electricity and Magnetism, Edward M. Purcell, 1986 McGraw-Hill Education
3. Introduction to Electrodynamics, D.J. Griffiths, 3rd Edn., 1998, Benjamin Cummings.
4. Feynman Lectures Vol.2, R.P.Feynman, R.B.Leighton, M. Sands, 2008, Pearson Education
5. Elements of Electromagnetics, M.N.O. Sadiku, 2010, Oxford University Press.
6. Electricity and Magnetism, J.H.Fewkes & J.Yarwood. Vol. I, 1991, Oxford Univ. Press.

PHYSICS LAB-C:III

20 Classes (2 hrs. duration)

1. Use a Multimeter for measuring (a) Resistances, (b) AC and DC Voltages, (c) DC Current, (d) Capacitances, and (e) Checking electrical fuses.
2. To study the characteristics of a series RC Circuit.
3. To determine an unknown Low Resistance using Potentiometer.
4. To determine an unknown Low Resistance using Carey Fosters Bridge.
5. To compare capacitances using DeSautys bridge.
6. Measurement of field strength B and its variation in a solenoid (determine dB/dx)
7. To verify the Thevenin and Norton theorems.
8. To verify the Superposition, and Maximum power transfer theorems.
9. To determine self inductance of a coil by Andersons bridge.
10. To study response curve of a Series LCR circuit and determine its (a) Resonant frequency, (b) Impedance at resonance, (c) Quality factor Q, and (d) Band width.
11. To study the response curve of a parallel LCR circuit and determine its (a) Antiresonant frequency and (b) Quality factor Q.
12. Measurement of charge and current sensitivity and CDR of Ballistic Galvanometer
13. Determine a high resistance by leakage method using Ballistic Galvanometer.
14. To determine self-inductance of a coil by Rayleighs method.

15. To determine the mutual inductance of two coils by Absolute method.

Reference Books:

1. Advanced Practical Physics for students, B.L. Flint and H.T. Worsnop, 1971, Asia Publishing House
2. A Text Book of Practical Physics, I.Prakash & Ramakrishna, 11th Ed., 2011, Kitab Mahal
3. Advanced level Physics Practicals, Michael Nelson and Jon M. Ogborn, 4th Edition, reprinted 1985, Heinemann Educational Publishers
4. A Laboratory Manual of Physics for undergraduate classes, D.P.Khandelwal, 1985, Vani Pub.

C-4: WAVES AND OPTICS

(Credits: Theory-04, Practicals-02)

Marks:100 (Theory:70, Practical: 30)

Theory: 40 Classes (1 hr. duration)

UNIT-I

Geometrical optics: Fermats principle, reflection and refraction at plane interface, Matrix formulation of geometrical Optics. Idea of dispersion. Application to thick lense, Ramsden and Huygens eyepiece.(5 Lecturers)

Wave Optics: Electromagnetic nature of light. Definition and properties of wave front. Huygens Principle. Temporal and Spatial Coherence. Division of amplitude and wavefront. Youngs double slit experiment. Lloyds Mirror and Fresnels Biprism. Phase change on reflection: Stokestreatment. (5 Lecturers)

UNIT-II

Wave Motion: Plane and Spherical Waves. Longitudinal and Transverse Waves. Plane Progressive (Travelling) Waves. Wave Equation. Particle and Wave Velocities. Differential Equation. Pressure of a Longitudinal Wave. Energy Transport. Intensity of Wave. Water Waves: Ripple and Gravity Waves. (5 Lectures)

Superposition of two perpendicular Harmonic Oscillations: Graphical and Analytical Methods. Lissajous Figures (1:1 and 1:2) and their uses. Superposition of N harmonic waves. (3 Lectures)

UNIT-III

Interference: Interference in Thin Films: parallel and wedge-shaped films. Fringes of equal inclination (Haidinger Fringes); Fringes of equal thickness (Fizeau Fringes). Newtons Rings: Measurement of wavelength and refractive index. (5 Lecturers)

Interferometer: Michelson Interferometer-(1) Idea of form of fringes (No theory required), (2) Determination of Wavelength, (3) Wavelength Difference, (4) Refractive Index, and (5) Visibility of Fringes. Fabry-Perot interferometer. . (5 Lectures)

UNIT-IV

Fraunhofer diffraction: Single slit. Circular aperture, Resolving Power of a telescope. Double slit. Multiple slits. Diffraction grating. Resolving power of grating. (6 Lectures)

Fresnel Diffraction: Fresnel's Assumptions. Fresnel's Half-Period Zones for Plane Wave. Explanation of Rectilinear Propagation of Light. Theory of a Zone Plate: Multiple Foci of a Zone Plate. Fresnel's Integral, Fresnel diffraction pattern of a straight edge, a slit and a wire. (6 Lectures)

Reference Books:

1. Waves: Berkeley Physics Course, vol. 3, Francis Crawford, 2007, Tata McGraw-Hill.
2. Fundamentals of Optics, F.A. Jenkins and H.E. White, 1981, McGraw-Hill
3. Principles of Optics, Max Born and Emil Wolf, 7th Edn., 1999, Pergamon Press.
4. Optics, Ajoy Ghatak, 2008, Tata McGraw Hill
5. The Physics of Vibrations and Waves, H. J. Pain, 2013, John Wiley and Sons.
6. The Physics of Waves and Oscillations, N.K. Bajaj, 1998, Tata McGraw Hill.
7. Optics - Brijlal & Subramaniam- (S. Chand Publication) 2014.
8. Geometrical and Physical Optics R.S. Longhurst, Orient Blackswan, 01-Jan-1986
9. Vibrations and Waves - A. P. French, (CBS) Indian print 2003
10. Optics, E. Hecht (Pearson India)

PHYSICS LAB-C:IV

20 Classes (2 hrs. duration)

1. To determine the frequency of an electric tuning fork by Melde's experiment and verify $2T$ law.
2. To investigate the motion of coupled oscillators.
3. To study Lissajous Figures.
4. Familiarization with: Schuster's focusing; determination of angle of prism.
5. To determine refractive index of the material of a prism using sodium source.
6. To determine the dispersive power and Cauchy constants of the material of a prism using mercury source.
7. To determine the wavelength of sodium source using Michelson's interferometer.
8. To determine wavelength of sodium light using Fresnel Biprism.
9. To determine wavelength of sodium light using Newton's Rings.
10. To determine the thickness of a thin paper by measuring the width of the interference fringes produced by a wedge-shaped film.

11. To determine wavelength of (1) Na source and (2) spectral lines of Hg source using plane diffraction grating.
12. To determine dispersive power and resolving power of a plane diffraction grating.

Reference Books:

1. Advanced Practical Physics for students, B.L. Flint and H.T. Worsnop, 1971, Asia Publishing House
2. A Text Book of Practical Physics, I. Prakash & Ramakrishna, 11th Ed., 2011, Kitab Mahal
3. Advanced level Physics Practicals, Michael Nelson and Jon M. Ogborn, 4th Edition, reprinted 1985, Heinemann Educational Publishers
4. A Laboratory Manual of Physics for undergraduate classes, D.P. Khandelwal, 1985, Vani

SEMESTER-III

C-5: MATHEMATICAL PHYSICS-II

(Credits: Theory-04, Practicals-02)

Marks:100 (Theory:70, Practical: 30)

Theory: 40 Classes (1 hr. duration)

The emphasis of the course is on applications in solving problems of interest to physicists. Students are to be examined on the basis of problems, seen and unseen.

UNIT-I

Fourier series: Periodic functions. Orthogonality of sine and cosine functions, Dirichlet Conditions (Statement only). Expansion of periodic functions in a series of sine and cosine functions and determination of Fourier coefficients. Complex representation of Fourier series. Expansion of functions with arbitrary period. Expansion of non-periodic functions over an interval. Even and odd functions and their Fourier expansions. Application. Summing of Infinite Series. Term-by-Term differentiation and integration of Fourier series. Parseval Identity. (11 Lectures)

UNIT-II

Frobenius Method and Special Functions: Singular Points of Second Order Linear Differential Equations and their importance, Frobenius method and its applications to differential equations: Legendre & Hermite Differential Equations. Properties of Legendre & Hermite Polynomials: Rodrigues Formula, Generating Function, Orthogonality. Simple recurrence relations. Expansion of function in a series of Legendre Polynomials. Associated Legendre polynomials and spherical harmonics. (10 Lectures)

UNIT-III

Some Special Integrals: Beta and Gamma Functions and Relation between them. Expression of Integrals in terms of Gamma Functions. Error Function (Probability Integral). (5 Lectures) Theory of Errors: Systematic and Random Errors. Propagation of Errors. Normal Law of Errors. Standard and Probable Error. (4 Lectures)

UNIT-IV

Partial Differential Equations: Solutions to partial differential equations, using separation of variables: Laplace's Equation in problems of rectangular, cylindrical and spherical symmetry. Conducting and dielectric sphere in an external uniform electric field. Wave equation and its solution for vibrational modes of a stretched string. (10 Lectures)

Reference Books:

1. Mathematical Methods for Physicists: Arfken, Weber, 2005, Harris, Elsevier.
2. Fourier Analysis by M.R. Spiegel, 2004, Tata McGraw-Hill.
3. Mathematics for Physicists, Susan M. Lea, 2004, Thomson Brooks/Cole.
4. Differential Equations, George F. Simmons, 2006, Tata McGraw-Hill.
5. Partial Differential Equations for Scientists & Engineers, S.J. Farlow, 1993, Dover Pub.
6. Mathematical methods for Scientists & Engineers, D.A. McQuarrie, 2003, Viva Books
7. Mathematical Physics and Special Relativity –M. Das, P.K. Jena and B.K. Dash (Srikrishna Prakashan) 2nd Edition 2009
8. Mathematical Physics–H. K. Dass, Dr. Rama Verma (S. Chand Higher Academics) 6th Edition 2011.
9. Mathematical Physics C. Harper, (Prentice Hall India) 2006.
10. Mathematical Physics–Goswami (CENGAGE Learning) 2014
11. Mathematical Method for Physical Sciences – M. L. Boas (Wiley India) 2006
12. Mathematics for Physicists, P. Dennery and A. Krzywicki Dover)
13. Advanced Engineering Mathematics, E. Kreyszig (New Age Publication) 2011.

PHYSICS LAB-C:V

20 Classes (2 hrs. duration)

The aim of this Lab is to use the computational methods to solve physical problems. Course will consist of lectures (both theory and practical) in the Lab. Evaluation done not on the programming but on the basis of formulating the problem.

Topics	Description with Applications
Introduction to Numerical computation software Scilab	Introduction to Scilab, Advantages and disadvantages, Scilab environment, Command window, Figure window, Edit window, Variables and arrays, Initialising variables in Scilab, Multidimensional arrays, Subarray, Special values, Displaying output data, data file, Scalar and array operations, Hierarchy of operations, Built in Scilab functions, Introduction to plotting, 2D and 3D plotting (2), Branching Statements and program design, Relational & logical operators, the while loop, for loop, details of loop operations, break & continue statements, nested loops, logical arrays and vectorization (2) User defined functions, Introduction to Scilab functions, Variable passing in Scilab, optional arguments, preserving data between calls to a function, Complex and Character data, string function, Multidimensional arrays (2) an introduction to Scilab file processing, file opening and closing, Binary I/o functions, comparing binary and formatted functions, Numerical methods and developing the skills of writing a program (2).
Curve fitting, Least square fit, Goodness of fit, standard deviation	Ohms law to calculate R, Hookes law to calculate spring constant
Solution of Linear system of equations by Gauss elimination method and Gauss Seidal method. Diagonalization of matrices, Inverse of a matrix, Eigen vectors, eigen values problems.	Solution of mesh equations of electric circuits (3 meshes) Solution of coupled spring mass systems (3 masses)

<p>Solution of ODE First order Differential equation Euler, modified Euler and Runge-Kutta second order methods Second order differential equation. Fixed difference method.</p>	<p>First order differential equation</p> <ul style="list-style-type: none"> • Radioactive decay • Current in RC, LC circuits with DC source • Newtons law of cooling • Classical equations of motion <p>Second order Differential Equation</p> <ul style="list-style-type: none"> • Harmonic oscillator (no friction) • Damped Harmonic oscillator • Over damped • Critical damped • Oscillatory • Forced Harmonic oscillator • Transient and • Steady state solution • Apply above to LCR circuits also.
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Reference Books:

1. Mathematical Methods for Physics and Engineers, K.F Riley, M.P. Hobson and S. J.20 Bence, 3rd ed., 2006, Cambridge University Press
2. Complex Variables, A.S. Fokas & M.J. Ablowitz, 8th Ed., 2011, Cambridge Univ. Press
3. First course in complex analysis with applications, D.G. Zill and P.D. Shanahan, 1940, Jones & Bartlett
4. Simulation of ODE/PDE Models with MATLAB, OCTAVE and SCILAB: Scientific and Engineering Applications: A.V. Wouwer, P. Saucez, C.V. Fernandez. 2014 Springer
5. Scilab by example: M. Affouf 2012, ISBN: 978-1479203444
6. Scilab (A free software to Matlab): H.Ramchandran, A.S.Nair. 2011 S.Chand & Company
7. Scilab Image Processing: Lambert M. Surhone. 2010 Betascript Publishing

C-6: THERMAL PHYSICS

(Credits: Theory-04, Practicals-02)
Marks:100 (Theory:70, Practical: 30)
Theory: 40 Classes (1 hr. duration)

UNIT-I

Introduction to Thermodynamics: Recapitulation of Zeroth and First law of thermodynamics: Second Law of Thermodynamics: Reversible and Irreversible process with examples. Conversion of Work into Heat and Heat into Work. Heat Engines. Carnots Cycle, Carnot engine & efficiency. Refrigerator & coefficient of performance, 2nd Law of Thermodynamics: Kelvin-Planck and Clausius Statements and their Equivalence. **Carnots Theorem. Applications of Second Law of Thermodynamics:** Thermodynamic Scale of Temperature and its Equivalence to Perfect Gas Scale. (5 Lectures)

Entropy: Concept of Entropy, Clausius Theorem. Clausius Inequality, Second Law of Thermodynamics in terms of Entropy. Entropy of a perfect gas. Principle of Increase of Entropy. Entropy Changes in Reversible and Irreversible processes with examples. Entropy of the Principle of Increase of Entropy. Temperature Entropy diagrams for Carnots Cycle. Third Law of Thermodynamics. Unattainability of Absolute Zero. (6 Lectures)

UNIT-II

Thermodynamic Potentials: Extensive and Intensive Thermodynamic Variables. Thermodynamic Potentials: Internal Energy, Enthalpy, Helmholtz Free Energy, Gibbs Free Energy. Their Definitions, Properties and Applications. Surface Films and Variation of Surface Tension with Temperature. Magnetic Work, Cooling due to adiabatic demagnetization, first and second order Phase Transitions with examples, Clausius Clapeyron Equation and Ehrenfest equations (5 Lectures)

Maxwells Thermodynamic Relations: Derivations and applications of Maxwells Relations, Maxwells Relations:(1) Clausius Clapeyron equation, (2) Values of C_p-C_v , (3) Tds Equations, (4) Joule-Kelvin coefficient for Ideal and Van der Waal Gases, (5) Energy equations, (6) Change of Temperature during Adiabatic Process. (5 Lectures)

UNIT-III

Kinetic Theory of Gases

Distribution of Velocities: Maxwell-Boltzmann Law of Distribution of Velocities in an Ideal Gas and its Experimental Verification. Sterns Experiment. Mean, RMS and Most Probable Speeds. Degrees of Freedom. Law of Equipartition of Energy (No proof required). Specific heats of Gases. (5 Lectures)

Molecular Collisions: Mean Free Path. Collision Probability. Estimates of Mean Free Path. Transport Phenomenon in Ideal Gases: (1) Viscosity, (2) Thermal Conductivity and (3) Diffusion. Brownian motion and its Significance. (4 Lectures)

UNIT-IV

Real Gases: Behavior of Real Gases: Deviations from the Ideal Gas Equation. The Virial Equation. Andrews Experiments on CO_2 Gas. Critical Constants. Continuity of Liquid and Gaseous State. Vapour and Gas. Boyle Temperature. Van der Waals Equation of State for Real Gases. Values of Critical Constants. Law of Corresponding States. Comparison with Experimental Curves. P-V Diagrams. Joules Experiment. Free Adiabatic Expansion of a Perfect Gas. Joule-Thomson Porous Plug Experiment. Joule-Thomson Effect for Real and Van der Waal Gases. Temperature of Inversion. Joule-Thomson Cooling. (10 Lectures)

Reference Books:

1. Heat and Thermodynamics, M.W. Zemansky, Richard Dittman, 1981, McGraw-Hill.
2. A Treatise on Heat, Meghnad Saha, and B.N.Srivastava, 1958, Indian Press
3. Thermal Physics, S. Garg, R. Bansal and Ghosh, 2nd Edition, 1993, Tata McGraw-Hill
4. Modern Thermodynamics with Statistical Mechanics, Carl S. Helrich, 2009, Springer.
5. Thermodynamics, Kinetic Theory & Statistical Thermodynamics, Sears & Salinger. 1988, Narosa.

6. Concepts in Thermal Physics, S.J. Blundell and K.M. Blundell, 2nd Ed., 2012, Oxford University Press
7. Heat and Thermal Physics-Brijlal & Subramaiam (S.Chand Publication)2014
8. Thermal Physics– C. Kittel and H. Kroemer (McMillan Education India)2010

PHYSICS LAB-C:VI

20 Classes (2hr duration)

1. To determine Mechanical Equivalent of Heat, J, by Callender and Barnes constant flow method.
2. To determine the Coefficient of Thermal Conductivity of Cu by Searles Apparatus.
3. To determine the Coefficient of Thermal Conductivity of Cu by Angstroms Method.
4. To determine the Coefficient of Thermal Conductivity of a bad conductor by Lee and Charltons disc method.
5. To determine the Temperature Coefficient of Resistance by Platinum Resistance Thermometer (PRT).
6. To study the variation of Thermo-Emf of a Thermocouple with Difference of Temperature of its Two Junctions.
7. To calibrate a thermocouple to measure temperature in a specified Range using (1) Null Method, (2) Direct measurement using Op-Amp difference amplifier and to determine Neutral Temperature.
8. To determine J by Calorimeter.

Reference Books:

1. Advanced Practical Physics for students, B. L. Flint and H.T. Worsnop, 1971, Asia Publishing House
2. A Text Book of Practical Physics, I.Prakash & Ramakrishna, 11th Ed., 2011, Kitab Mahal
3. Advanced level Physics Practicals, Michael Nelson and Jon M. Ogborn, 4th Edition, reprinted 1985, Heinemann Educational Publishers
4. A Laboratory Manual of Physics for undergraduate classes,D.P.Khandelwal,1985, Vani Pub.

C-7: DIGITAL SYSTEMS AND APPLICATIONS

(Credits: Theory-04, Practicals-02)

Marks:100 (Theory:70, Practical: 30)

Theory: 40 Classes (1 hr. duration)

UNIT-I

Digital Circuits: Difference between Analog and Digital Circuits. Binary Numbers. Decimal to Binary and Binary to Decimal Conversion. BCD, Octal and Hexadecimal numbers. AND, OR and NOT Gates (realization using Diodes and Transistor). NAND and NOR Gates as Universal Gates. XOR and XNOR Gates and application as Parity Checkers. (5 Lectures)

Boolean algebra: De Morgan's Theorems. Boolean Laws. Simplification of Logic Circuit using Boolean algebra. Fundamental Products. Idea of Minterms and Maxterms. Conversion of a Truth table into Equivalent Logic Circuit by (1) Sum of Products Method and (2) Karnaugh Map. (5 Lectures)

UNIT-II

Data processing circuits: Basic idea of Multiplexers, De-multiplexers, Decoders, Encoders. (3 Lectures)

Arithmetic Circuits: Binary Addition. Binary Subtraction using 2's Complement. Half and Full Adders. Half & Full Subtractors, 4-bit binary Adder/Subtractor. (4 Lectures)

Timers: IC 555: block diagram and applications: Astable multivibrator and Monostable multivibrator. (3 Lectures)

UNIT-III

Integrated Circuits (Qualitative treatment only): Active & Passive components. Discrete components. Wafer. Chip. Advantages and drawbacks of ICs. Scale of integration: SSI, MSI, LSI and VLSI (basic idea and definitions only). Classification of ICs. Examples of Linear and Digital ICs. (5 Lectures)

Introduction to CRO: Block Diagram of CRO. Electron Gun, Deflection System and Time Base. Deflection Sensitivity. Applications of CRO: (1) Study of Waveform, (2) Measurement of Voltage, Current, Frequency, and Phase Difference. (5 Lectures)

UNIT-IV

Introduction to Computer Organization: Input/output Devices. Data storage (idea of RAM and ROM). Computer memory. Memory organization & addressing. Memory Interfacing. Memory Map. (4 Lectures)

Shift registers: Serial-in-Serial-out, Serial-in-Parallel-out, Parallel-in-Serial-out and Parallel-in-Parallel-out Shift Registers (only up to 4 bits). (2 Lectures)

Counters (4 bits): Ring Counter. Asynchronous counters, Decade Counter. Synchronous Counter. (4 Lectures)

Reference Books:

1. Digital Principles and Applications, A.P. Malvino, D.P. Leach and Saha, 7th Ed., 2011, Tata McGraw
2. Fundamentals of Digital Circuits, Anand Kumar, 2nd Edn, 2009, PHI Learning Pvt. Ltd.
3. Digital Circuits and systems, Venugopal, 2011, Tata McGraw Hill.
4. Digital Systems: Principles & Applications, R.J. Tocci, N.S. Widmer, 2001, PHI Learning

5. Logic circuit design, Shimon P. Vingron, 2012, Springer.
6. Digital Electronics, Subrata Ghoshal, 2012, Cengage Learning.
7. Microprocessor Architecture Programming & applications with 8085, 2002, R.S. Goankar, Prentice Hall.
8. Concept of Electronics: D.C.Tayal (Himalay Publication) 2011.
9. Electronics-V. K. Meheta (S. Chand Publication),2013
10. The Art of Electronics, P. Horowitz and W. Hill, CUP.

PHYSICS PRACTICAL-C:VII

20 Classes (2 hrs. duration)

1. To measure (a) Voltage, and (b) Time period of a periodic waveform using CRO.
2. To test a Diode and Transistor using a Multimeter.
3. To design a switch (NOT gate) using a transistor.
4. To verify and design AND, OR, NOT and XOR gates using NAND gates.
5. To design a combinational logic system for a specified Truth Table.
6. To convert a Boolean expression into logic circuit and design it using logic gate ICs.
7. To minimize a given logic circuit.
8. Half Adder, Full Adder and 4-bit binary Adder.
9. Half Subtractor, Full Subtractor, Adder-Subtractor using Full Adder I.C.
10. To build Flip-Flop (RS, Clocked RS, D-type and JK) circuits using NAND gates.
11. To build JK Master-slave flip-flop using Flip-Flop ICs
12. To build a 4-bit Counter using D-type/JK Flip-Flop ICs and study timing diagram.
13. To make a 4-bit Shift Register (serial and parallel) using D-type/JK Flip-Flop ICs.
14. To design an astable multivibrator of given specifications using 555 Timer.
15. To design a monostable multivibrator of given specifications using 555 Timer.

Reference Books:

1. Modern Digital Electronics, R.P. Jain, 4th Edition, 2010, Tata McGraw Hill.
2. Basic Electronics: A text lab manual, P.B. Zbar, A.P. Malvino, M.A. Miller, 1994, Mc-Graw Hill.

3. Microprocessor Architecture Programming and applications with 8085, R.S. Goankar, 2002, Prentice Hall.
4. Microprocessor 8085:Architecture, Programming and interfacing, A. Wadhwa, 2010, PHI Learning.

SEMESTER-IV

C-VIII: MATHEMATICAL PHYSICS-III

(Credits: Theory-04, Practicals-02)
 Marks:100 (Theory:70, Practical: 30)
 Theory: 40 Classes (1 hr. duration)

The emphasis of the course is on applications in solving problems of interest to physicists. Students are to be examined on the basis of problems, seen and unseen.

UNIT-I

Complex Analysis: Brief Revision of Complex Numbers and their Graphical Representation. Euler's formula, De Moivre's theorem, Roots of Complex Numbers. Functions of Complex Variables. Analyticity and Cauchy-Riemann Conditions. Examples of analytic functions. Singular functions: poles and branch points, order of singularity, branch cuts. Integration of a function of a complex variable. Cauchy's Inequality. Cauchy's theorem, Cauchy's Integral formula. Simply and multiply connected. (10 Lectures)

UNIT-II

Integrals Transforms: Laurent and Taylor's expansion. Residues and Residue Theorem. Application in solving Definite Integrals. Fourier Transforms: Fourier Integral theorem. Fourier Transform. Examples. Fourier transform of trigonometric, Gaussian, finite wave train & other functions. Representation of Dirac delta function as a Fourier Integral. (10 Lectures)

UNIT-III

Integrals Transforms: Fourier transform of derivatives, Inverse Fourier transform, Convolution theorem. Properties of Fourier transform (translation, change of scale, complex conjugation, etc.). Three dimensional Fourier transforms with examples. Application of Fourier Transforms to differential equations: One dimensional Wave and Diffusion/Heat Flow Equations. (10 Lectures)

UNIT-IV

Laplace Transforms: Laplace Transform (LT) of Elementary functions. Properties of LTs: Change of Scale Theorem, Shifting Theorem. LTs of Derivatives and Integrals of Functions, Derivatives and Integrals of LTs. LT of Unit Step function, Dirac Delta function, Periodic Functions. Convolution Theorem. Inverse LT. Application of Laplace Transforms to Differential Equations: Damped Harmonic Oscillator, Simple Electrical Circuits. (10 Lectures)

Reference Books:

1. Mathematical Methods for Physics and Engineers, K.F Riley, M.P. Hobson and S. J. Bence, 3rd ed., 2006, Cambridge University Press
2. Mathematical Methods for Physicists: Arfken, Weber, 2005, Harris, Elsevier.
3. Advanced Engineering Mathematics, E. Kreyszig (New Age Publication) 2011.
4. Mathematics for Physicists, P. Dennery and A. Krzywicki, 1967, Dover Publications
5. Complex Variables, A. S. Fokas & M. J. Ablowitz, 8th Ed., 2011, Cambridge Univ. Press

6. Complex Variables and Applications, J.W. Brown & R.V. Churchill, 7th Ed. 2003, Tata McGraw-Hill
7. First course in complex analysis with applications, D.G. Zill and P.D. Shanahan, 1940, Jones & Bartlett.
8. Mathematical Physics—H. K. Dass, Dr. Rama Verma (S. Chand Higher Academics) 6th Edition 2011.
9. Mathematical Physics C. Harper, (Prentice Hall India) 2006.
10. Mathematical Physics-Goswami (Cengage Learning) 2014
11. Mathematical Method for Physical Sciences - M. L. Boas (Wiley India) 2006
12. Introduction to the theory of functions of a complex variable- E.T.Copson (Oxford) Univ. Press, 1970

PHYSICS PRACTICAL-C:VIII

20 Classes (2 hrs. duration)

Scilab based simulations experiments based on Mathematical Physics problems like

1. Solve differential equations:

(i) $\frac{dy}{dx} = e^{-x}$ with $y = 0$ for $x = 0$. (ii) $\frac{dy}{dx} + e^{-xy} = x^2$. (iii) $\frac{d^2y}{dt^2} + 2\frac{dy}{dt} = -y$.

(iv) $\frac{d^2y}{dt^2} + e^{-t}\frac{dy}{dt} = -y$.

1 2. Dirac Delta Function: Evaluate $\int_{-\infty}^{\infty} \frac{e^{-x^2}}{\sqrt{2\pi\sigma^2}} (x+3) dx$ for $\sigma = 1, 0.1, 0.01$ and show it tends to 5.

3. Fourier Series: Program to $\sum_{n=1}^{\infty} (0.2)^n$. Evaluate the Fourier coefficients of a given periodic function (square wave)

4. Frobenius method and Special functions: $\int_{-1}^1 P_n(\mu)P_m(\mu) d\mu = \delta_{n,m}$. Plot $P_n(x)$, $J(x)$. Show recursion relation.

5. Calculation of error for each data point of observations recorded in experiments done in previous semesters (choose any two).

6. Calculation of least square fitting manually without giving weightage to error. Confirmation of least square fitting of data through computer program.

7. Evaluation of trigonometric functions e.g. $\sin \theta$, Given Bessels function at N — points, find its value at an intermediate point. Complex analysis: Integrate $1/(x^2 + 2)$ numerically and check with computer integration.

8. Integral transform: FFT of e^{-x^2} .

Reference Books:

1. Mathematical Methods for Physics and Engineers, K.F Riley, M.P. Hobson and S. J. Bence, 3rd ed., 2006, Cambridge University Press
2. Mathematics for Physicists, P. Dennery and A. Krzywicki, 1967, Dover Publications
3. Simulation of ODE/PDE Models with MATLAB, OCTAVE and SCILAB: Scientific and Engineering Applications: A. Vande Wouwer, P. Saucez, C. V. Fernandez. 2014 Springer ISBN: 978-3319067896
4. Scilab by example: M. Affouf, 2012. ISBN: 978-1479203444
5. Scilab (A free software to Matlab): H.Ramchandran, A.S.Nair. 2011 S.Chand & Company
6. Scilab Image Processing: Lambert M. Surhone. 2010 Betascript Publishing.

C-IX: ELEMENTS OF MODERN PHYSICS

(Credits: Theory-04, Practicals-02)

Marks:100 (Theory:70, Practical: 30)

Theory: 40 Classes (1 hr. duration)

UNIT-I

Atomic Spectra and Models: Inadequacy of classical physics, Brief Review of Black body Radiation , **Photoelectric effect**, Compton effect, dual nature of radiation, wave nature of particles. Atomic spectra, Line spectra of hydrogen atom, Ritz Rydberg combination principle. Alpha Particle Scattering, Rutherford Scattering Formula, Rutherford Model of atom and its limitations, Bohrs model of H atom, explanation of atomic spectra, correction for finite mass of the nucleus, Bohr correspondence principle, limitations of Bohr model, discrete energy exchange by atom, Frank Hertz Expt. Sommerfeld's Modification of Bohrs Theory. (11 Lectures)

UNIT-II

Wave Particle Duality: de Broglie hypothesis, Experimental confirmation of matter wave, Davis- son Germer Experiment, velocity of de Broglie wave, wave particle duality, Complementarity. Superposition of two waves, phase velocity and group velocity , wave packets ,Gaussian WavePacket , spatial distribution of wave packet, Localization of wave packet in time.

Time development of a wave Packet ; Wave Particle Duality, Complementarity . **Heisenberg Uncertainty Principle** ,Illustration of the Principle through thought Experiments of Gamma ray microscope and electron diffraction through a slit. Estimation of ground state energy of harmonic oscillator and hydrogen atom, non existence of electron in the nucleus. **Uncertainty and Complementarities**. (11 Lectures)

UNIT-III

Nuclear Physics: Size and structure of atomic nucleus and its relation with atomic weight; Impossibility of an electron being in the nucleus as a consequence of the uncertainty principle. Nature of nuclear force, NZ graph, **Liquid Drop model: semi-empirical mass formula and binding energy**,

Nuclear Shell Model and magic numbers. Radioactivity: stability of the nucleus; Law of radioactive decay; Mean life and half-life (8 Lectures)

UNIT-IV

Alpha decay; Beta decay- energy released, spectrum and Pauli's prediction of neutrino; Gamma ray emission, energy-momentum conservation: electron-positron pair creation by gamma photons in the vicinity of a nucleus.

Fission and fusion- mass deficit, relativity and generation of energy; Fission - nature of fragments and emission of neutrons. Nuclear reactor: slow neutrons interacting with Uranium 235; Fusion and thermonuclear reactions driving stellar energy (brief qualitative discussions). (10 Lectures)

Reference Books:

1. Concepts of Modern Physics, Arthur Beiser, 2002, McGraw-Hill.
2. Introduction to Modern Physics, Rich Meyer, Kennard, Coop, 2002, Tata McGraw Hill
3. Introduction to Quantum Mechanics, David J. Griffith, 2005, Pearson Education.
4. Physics for scientists and Engineers with Modern Physics, Jewett and Serway, 2010, Cengage Learning.
5. Quantum Mechanics: Theory & Applications, A.K.Ghatak & S.Lokanathan, 2004, Macmillan
6. Modern Physics Bernstein, Fishbane and Gasiorowicz (Pearson India) 2010
7. Quantum Physics of Atoms, Molecules, Solids, Nuclei and Particles – R. Eisberg (Wiley India), 2012.

(Additional Books for Reference)

8. Modern Physics, J.R. Taylor, C.D. Zafiratos, M.A. Dubson, 2004, PHI Learning.
9. Theory and Problems of Modern Physics, Schaum's outline, R. Gautreau and W. Savin, 2nd Edn, Tata McGraw-Hill Publishing Co. Ltd.
10. Quantum Physics, Berkeley Physics, Vol.4. E.H.Wichman, 1971, Tata McGraw-Hill Co.
11. Basic ideas and concepts in Nuclear Physics, K.Heyde, 3rd Edn., Institute of Physics Pub.
12. Six Ideas that Shaped Physics: Particle Behave like Waves, T.A.Moore, 2003, McGraw Hill
13. Modern Physics-Serway (CENGAGE Learnings) 2014
14. Modern Physics —Murugesan and Sivaprasad (S. Chand Higher Academics)
15. Physics of Atoms and Molecules Bransden (Pearson India) 2003

PHYSICS PRACTICAL-C:IX

20 Classes (2 hrs. duration)

1. Measurement of Planck's constant using black body radiation and photo-detector

2. Photo-electric effect: photo current versus intensity and wavelength of light; maximum energy of photo-electrons versus frequency of light
3. To determine work function of material of filament of directly heated vacuum diode.
4. To determine the Planck's constant using LEDs of at least 4 different colours.
5. To determine the wavelength of H-alpha emission line of Hydrogen atom.
6. To determine the ionization potential of mercury.
7. To determine the absorption lines in the rotational spectrum of Iodine vapour.
8. To determine the value of e/m by (a) Magnetic focusing or (b) Bar magnet.
9. To setup the Millikan oil drop apparatus and determine the charge of an electron.
10. To show the tunneling effect in tunnel diode using I-V characteristics.
11. To determine the wavelength of laser source using diffraction of single slit.
12. To determine the wavelength of laser source using diffraction of double slits.
13. To determine (1) wavelength and (2) angular spread of He-Ne laser using plane diffraction grating

Reference Books:

1. Advanced Practical Physics for students, B.L. Flint and H.T. Worsnop, 1971, Asia Publishing House
2. Advanced level Physics Practicals, Michael Nelson and Jon M. Ogborn, 4th Edition, reprinted 1985, Heinemann Educational Publishers
3. A Text Book of Practical Physics, I. Prakash & Ramakrishna, 11th Edn, 2011, Kitab Mahal

C-X: ANALOG SYSTEMS AND APPLICATIONS

(Credits: Theory-04, Practicals-02)
 Marks:100 (Theory:70, Practical: 30)
 Theory: 40 Classes (1 hr. duration)

UNIT-I

Semiconductor Diodes: P and N type semiconductors. Energy Level Diagram. Conductivity and Mobility, Concept of Drift velocity. PN Junction Fabrication (Simple Idea). Barrier Formation in PN Junction Diode. Static and Dynamic Resistance. Current Flow Mechanism in Forward and Reverse Biased Diode. Drift Velocity. Derivation for Barrier Potential, Barrier Width and Current for Step Junction. (5 Lectures)

Two-terminal Devices and their Applications: (1) Rectifier Diode: Half-wave Rectifiers.

Centre-tapped and Bridge Full-wave Rectifiers, Calculation of Ripple Factor and Rectification Efficiency, (2) Zener Diode and Voltage Regulation. Principle and structure of (1) LEDs, (2) Photodiode, (3) Solar Cell. (5 Lectures)

UNIT-II

Bipolar Junction transistors: n-p-n and p-n-p Transistors. Characteristics of CB, CE and CC Configurations. Current gains α and β Relations between α and β . Load Line analysis of Transistors. DC Load line and Q-point. Physical Mechanism of Current Flow. Active, Cutoff and Saturation Regions. (5 Lectures)

Amplifiers: Transistor Biasing and Stabilization Circuits. Fixed Bias and Voltage Divider Bias. Transistor as 2-port Network. h-parameter Equivalent Circuit. Analysis of a single-stage CE amplifier using Hybrid Model. Input and Output Impedance. Current, Voltage and Power Gains. Classification of Class A, B & C Amplifiers. (5 Lectures)

UNIT:III

Coupled Amplifier: RC-coupled amplifier and its frequency response. (4 Lectures)

Feedback in Amplifiers: Effects of Positive and Negative Feedback on Input Impedance, Output Impedance, Gain, Stability, Distortion and Noise. (2 Lectures)

Sinusoidal Oscillators: Barkhausen's Criterion for self-sustained oscillations. RC Phase shift oscillator, determination of Frequency. Hartley & Colpitts oscillators. (4 Lectures)

UNIT-IV

Operational Amplifiers (Black Box approach): Characteristics of an Ideal and Practical Op-Amp. (IC 741) Open-loop and Closed-loop Gain. Frequency Response. CMRR. Slew Rate and concept of Virtual ground. (5 Lectures)

Applications of Op-Amps: (1) Inverting and non-inverting amplifiers, (2) Adder, (3) Subtractor, (4) Differentiator, (5) Integrator, (6) Log amplifier, (7) Zero crossing detector (8) Wein bridge oscillator. (5 Lectures)

Reference Books:

1. Integrated Electronics, J. Millman and C.C. Halkias, 1991, Tata Mc-Graw Hill.
2. Electronics: Fundamentals and Applications, J.D. Ryder, 2004, Prentice Hall.
3. Solid State Electronic Devices, B.G. Streetman & S.K. Banerjee, 6th Edn., 2009, PHI Learning
4. Electronic Devices & circuits, S. Salivahanan & N.S. Kumar, 3rd Ed., 2012, Tata Mc-Graw Hill
5. OP-Amps and Linear Integrated Circuit, R. A. Gayakwad, 4th edition, 2000, Prentice Hall
6. Electronic circuits: Handbook of design & applications, U. Tietze, C. Schenk, 2008, Springer
7. Semiconductor Devices: Physics and Technology, S.M. Sze, 2nd Ed., 2002, Wiley India
8. Electronic Devices, 7/e Thomas L. Floyd, 2008, Pearson India
9. Concept of Electronics: D.C. Tayal (Himalay Publication) 2011
10. Electronic devices :Circuits and Applications :W.D. Stanley Prentice Hall

11. Electronics- V. K. Meheta (S. Chand Publication)2013
12. Electronic Circuits :L.Schilling and Velove: 3rd Ed Mc Graw Hill
13. ElectronicsRaskhit & Chattopadhyay (New age International Publication)2011
14. Electricity and Electronic-D.C.Tayal (Himalaya Pub.)2011
15. Electronic devices and circuits R.L. Boylstad (Pearson India) 2009.

PHYSICS PRACTICAL-C:X

20 Classes (2 hrs. duration)

1. To study V-I characteristics of PN junction diode, and Light emitting diode.
2. To study the V-I characteristics of a Zener diode and its use as voltage regulator.
3. Study of V-I & power curves of solar cells, and find maximum power point & efficiency.
4. To study the characteristics of a Bipolar Junction Transistor in CE configuration.
5. To study the various biasing configurations of BJT for normal class A operation.
6. To design a CE transistor amplifier of a given gain (mid-gain) using voltage divider bias.
7. To study the frequency response of voltage gain of a RC-coupled transistor amplifier.
8. To design a Wien bridge oscillator for given frequency using an op-amp.
9. To design a phase shift oscillator of given specifications using BJT.
10. To study the Colpitt's oscillator.
11. To design a digital to analog converter (DAC) of given specifications.
12. To study the analog to digital convertor (ADC) IC.
13. To design an inverting amplifier using Op-amp (741,351) for dc voltage of given gain
14. To design inverting amplifier using Op-amp (741,351) and study its frequency response
15. To design non-inverting amplifier using Op-amp (741,351) & study its frequency response
16. To study the zero-crossing detector and comparator
17. To add two dc voltages using Op-amp in inverting and non-inverting mode
18. To design a precision Differential amplifier of given I/O specification using Op-amp.
19. To investigate the use of an op-amp as an Integrator.
20. To investigate the use of an op-amp as a Differentiator.

21. To design a circuit to simulate the solution of a 1st/2nd order differential equation.

Reference Books:

1. Basic Electronics: A text lab manual, P.B. Zbar, A.P. Malvino, M.A. Miller, 1994, Mc-Graw Hill.
2. OP-Amps and Linear Integrated Circuit, R. A. Gayakwad, 4th edition, 2000, Prentice Hall.
3. Electronic Principle, Albert Malvino, 2008, Tata Mc-Graw Hill.
4. Electronic Devices & circuit Theory, R.L. Boylestad & L.D. Nashelsky, 2009, Pearson

SEMESTER-V

C-XI: QUANTUM MECHANICS AND APPLICATIONS

(Credits: Theory-04, Practicals-02)

Marks:100 (Theory:70, Practical: 30)

Theory: 40 Classes (1hr duration)

UNIT:I

Schrodinger equation & the operators: Time dependent Schrodinger equation and dynamical evolution of a quantum state; Properties of Wave Function. Interpretation of Wave Function Probability and probability current densities in three dimensions; Conditions for Physical Acceptability of Wave Functions. Normalization. Linearity and Superposition Principles. Hermitian operator, Eigen values and Eigen functions. Position, momentum and Energy operators; commutator of position and momentum operators; Expectation values of position and momentum. Wave Function of a Free Particle. (8 Lectures)

UNIT:II

Time independent Schrodinger equation: Hamiltonian, stationary states and energy eigen values; expansion of an arbitrary wave function as a linear combination of energy eigen functions; General solution of the time dependent Schrodinger equation in terms of linear combinations of stationary states; Application to spread of Gaussian wave-packet for a free particle in one dimension; wave packets, Fourier transforms and momentum space wave function; Position-momentum uncertainty principle. (6 Lectures)

UNIT:III

General discussion of bound states in an arbitrary potential: continuity of wave function, boundary condition and emergence of discrete energy levels; application to one-dimensional problem-square well potential; Quantum mechanics of simple harmonic oscillator-energy levels and energy eigen functions ground state, zero point energy & uncertainty principle. One dimensional infinitely rigid box- energy eigen values and eigen functions, normalization; Quantum dot as example; Quantum mechanical scattering and tunnelling in one dimension-across a step potential & rectangular potential barrier. (14 Lectures)

UNIT-IV

Atoms in Electric & Magnetic Fields: Electron angular momentum. Space quantization. Electron Spin and Spin Angular Momentum. Larmors Theorem. Spin Magnetic Moment. Stern- Gerlach Experiment. Zeeman Effect: Electron Magnetic Moment and Magnetic Energy, Gyromagnetic Ratio and Bohr Magneton.

Atoms in External Magnetic Fields: Normal and Anomalous Zeeman Effect. Paschen Back and Stark Effect (Qualitative Discussion only). (12 Lectures)

Reference Books:

1. A Text book of Quantum Mechanics, P. M.Mathews and K.Venkatesan, 2nd Ed., 2010, Mc-Graw Hill
2. Quantum Mechanics, Robert Eisberg and Robert Resnick, 2nd Edn., 2002, Wiley.
3. Quantum Mechanics, Leonard I. Schiff, 3rd Edn. 2010, Tata McGraw Hill.
4. Quantum Mechanics, G. Aruldas, 2nd Edn. 2002, PHI Learning of India.
5. Quantum Mechanics, Bruce Cameron Reed, 2008, Jones and Bartlett Learning. Quantum Mechanics: Foundations & Applications, Arno Bohm, 3rd Edn., 1993, Springer
6. Quantum Mechanics for Scientists & Engineers, D.A.B. Miller, 2008, Cambridge University Press
7. Quantum Physics-S. Gasiorowicz (Wiley India) 2013
8. Quantum Mechanics -J.L. Powell and B. Craseman (Narosa) 1988
9. Introduction to Quantum Mechanics- M.Das, P.K.Jena,(SriKrishna Prakashan)
10. Basic Quantum Mechanics A.Ghatak (Mc Millan India) 2012
11. Introduction to Quantum Mechanics R. Dicke and J. Wittke
12. Quantum Mechanics- Eugen Merzbacher, 2004, John Wiley and Sons, Inc.
13. Introduction to Quantum Mechanics, D.J. Griffith, 2nd Ed. 2005, Pearson Education
14. Quantum Mechanics, Walter Greiner, 4th Edn., 2001, Springer
15. Quantum Mechanics - F. Mandl (CBS) 2013
16. Cohen-Tannoudji, B Diu and F Lalo, Quantum Mechanics (2 vols) Wiley-VCH 1977

PHYSICS PRACTICAL-C:XI

20 Classes (2hr duration)

Use C/C++/Scilab for solving the following problems based on Quantum Mechanics like

1. Solve the s-wave Schrodinger equation for the ground state and the first excited state of the hydrogen atom:
Here, m is the reduced mass of the electron. Obtain the energy eigenvalues and plot the corresponding wavefunctions. Remember that the ground state energy of the hydrogen atom is -13.6 eV. Take $e = 3.795$ (eV)^{1/2}, $c = 1973$ (eV) and $m = 0.511 \times 10^6$ eV/c².
2. Solve the s-wave radial Schrodinger equation for an atom:
where m is the reduced mass of the system (which can be chosen to be the mass of an electron), for the screened coulomb potential Find the energy (in eV) of the ground state of the atom to an accuracy of three significant digits. Also, plot the corresponding wavefunction. Take $e = 3.795$ (eV)^{1/2}, $m = 0.511 \times 10^6$ eV/c², and $a = 3, 5, 7$. In these units $c = 1973$ (eV). The ground state energy is expected to be above -12 eV in all three cases.

3. Solve the s-wave radial Schrodinger equation for a particle of mass m :
For the anharmonic oscillator potential for the ground state energy (in MeV) of particle to an accuracy of three significant digits. Also, plot the corresponding wave function. Choose $m = 940 \text{ MeV}/c^2$, $k = 100 \text{ MeV fm}^{-2}$, $b = 0, 10, 30 \text{ MeV fm}^{-3}$ In these units, $c = 197.3 \text{ MeV fm}$. The ground state energy is expected to lie between 90 and 110 MeV for all three cases.
4. Solve the s-wave radial Schrodinger equation for the vibrations of hydrogen molecule:
Where is the reduced mass of the two-atom system for the Morse potential Find the lowest vibrational energy (in MeV) of the molecule to an accuracy of three significant digits. Also plot the corresponding wave function.
Take: $m = 940 \times 10^6 \text{ eV}/c^2$, $D = 0.755501 \text{ eV}$, $\alpha = 1.44$, $\rho = 0.131349$ Laboratory based experiments:
5. Study of Electron spin resonance- determine magnetic field as a function of the resonance frequency.
6. Study of Zeeman effect: with external magnetic field; Hyperfine splitting
7. To show the tunneling effect in tunnel diode using I-V characteristics.
8. Quantum efficiency of CCDs

Reference Books:

1. Schaum's outline of Programming with C++. J.Hubbard, 2000, McGraw-Hill Publication
2. Numerical Recipes in C: The Art of Scientific Computing, W.H. Press et al., 3rd Edn., 2007, Cambridge University Press.
3. An introduction to computational Physics, T.Pang, 2nd Edn., 2006, Cambridge Univ. Press
4. Simulation of ODE/PDE Models with MATLAB, OCTAVE and SCILAB: Scientific & Engineering Applications: A. Vande Wouwer, P. Saucez, C. V. Fernandez. 2014 Springer.
5. Scilab (A Free Software to Matlab): H. Ramchandran, A.S. Nair. 2011 S. Chand & Co.
6. Scilab Image Processing: L.M. Surhone. 2010 Betascript Publishing ISBN:978-6133459274

C-XII: SOLID STATE PHYSICS

(Credits: Theory-04, Practicals-02)
Marks:100 (Theory:70, Practical: 30)
Theory: 40 Classes (1 hr. duration)

UNIT:I

Crystal Structure: Solids- Amorphous and Crystalline Materials. Lattice Translation Vectors. Lattice with a Basis Central and Non-Central Elements. Unit Cell. Miller Indices. Types of Lattices, Reciprocal Lattice. Brillouin Zones. **Diffraction of X-rays by Crystals. Bragg's Law.** Atomic and

Geometrical Factor. (8 Lectures)

UNIT:II

Elementary Lattice Dynamics: Lattice Vibrations and Phonons: Linear **Monoatomic and Di-atomic Chains**. Acoustical and Optical Phonons. Qualitative Description of the Phonon Spectrum in Solids. Dulong and Petits Law, **Einstein and Debye theories of specific heat of solids. T3 law** (6 Lectures)

Magnetic Properties of Matter: Dia-, Para-, Ferri- and Ferromagnetic Materials. Classical Langevin Theory of diaand Paramagnetic Domains. Curies law, Weiss Theory of Ferromagnetism and Ferromagnetic Domains. (6 Lectures)

UNIT:III

Dielectric Properties of Materials: Polarization. Local Electric Field at an Atom. Depolar- ization Field. Electric Susceptibility. Polarizability. Clausius Mosotti Equation. Classical Theory of Electric Polarizability. (4 Lectures)

Lasers: Einsteins A and B coefficients. Metastable states. Spontaneous and Stimulated emissions. Optical Pumping and Population Inversion. Three-Level and Four-Level Lasers. **Ruby Laser and He-Ne Laser**. (4 Lectures)

UNIT-IV

Elementary band theory: Kronig Penny model. Band Gap. Conductor, Semiconductor (P and N type) and insulator. Conductivity of Semiconductor, mobility, Hall Effect. Measurement of conductivity (O4 probe method) & Hall coefficient. (8 Lectures)

Superconductivity: Experimental Results. Critical Temperature. Critical magnetic field. **Meissner effect. Type I and type II Superconductors**, Londons Equation and Penetration Depth. Isotope effect. Idea of BCS theory (No derivation).(4 Lectures)

Reference Books:

1. Introduction to Solid State Physics, Charles Kittel, 8th Edition, 2004, Wiley India Pvt. Ltd.
2. Elements of Solid State Physics, J.P. Srivastava, 2nd Edition, 2006, Prentice-Hall of India
3. Introduction to Solids, Leonid V. Azaroff, 2004, Tata Mc-Graw Hill
4. Solid State Physics, N.W. Ashcroft and N.D. Mermin, 1976, Cengage Learning
5. Solid-state Physics, H. Ibach and H. Luth, 2009, Springer
6. Elementary Solid State Physics, 1/e M. Ali Omar, 1999, Pearson India
7. Solid State Physics, M.A. Wahab, 2011, Narosa Publications
8. Solid State Physics S. O. Pillai (New Age Publication)
9. Solid State Physics- R.K.Puri & V.K. Babbar (S.Chand Publication)2013
10. Lasers and Non linear Optics B.B.Laud-Wiley Eastern.
11. LASERS: Fundamentals and Applications Thyagarajan and Ghatak (McMillanIndia), 2012

PHYSICS PRACTICAL-C:XII

20 Classes (2 hrs. duration)

1. Measurement of susceptibility of paramagnetic solution (Quinck's Tube Method)
2. To measure the Magnetic susceptibility of Solids.
3. To determine the Coupling Coefficient of a Piezoelectric crystal.
4. To measure the Dielectric Constant of a dielectric Materials with frequency
5. To determine the complex dielectric constant and plasma frequency of metal using Surface Plasmon resonance (SPR)
6. To determine the refractive index of a dielectric layer using SPR
7. To study the PE Hysteresis loop of a Ferroelectric Crystal.
8. To draw the BH curve of Fe using Solenoid & determine energy loss from Hysteresis.
9. To measure the resistivity of a semiconductor (Ge) with temperature by four-probe method (room temperature to 150 oC) and to determine its band gap.
10. To determine the Hall coefficient of a semiconductor sample.

Reference Books:

1. Advanced Practical Physics for students, B.L. Flint and H.T. Worsnop, 1971, Asia Publishing House.
2. Advanced level Physics Practicals, Michael Nelson and Jon M. Ogborn, 4th Edition, reprinted 1985, Heinemann Educational Publishers.
3. A Text Book of Practical Physics, I.Prakash & Ramakrishna, 11th Ed., 2011, Kitab Mahal
4. Elements of Solid State Physics, J.P. Srivastava, 2nd Ed., 2006, Prentice-Hall of India.

C-XIII: ELECTROMAGNETIC THEORY

(Credits: Theory-04, Practicals-02)

Marks:100 (Theory:70, Practical: 30)

Theory: 40 Classes (1 hr. duration)

UNIT:I

Maxwell Equations: Maxwells equations. Displacement Current. Vector and Scalar Potentials. Gauge Transformations: Lorentz and Coulomb Gauge. Boundary Conditions at Interface between Different Media. Wave Equations. Plane Waves in Dielectric Media. Poynting Theorem and Poynt- ing Vector. Electromagnetic (EM) Energy Density. Physical Concept of Electromagnetic Field Energy Density. (8 Lectures)

UNIT:II

EM Wave Propagation in Unbounded Media: Plane EM waves through vacuum and isotropic dielectric medium, transverse nature of plane EM waves, refractive index and dielectric constant, wave impedance.

Propagation through conducting media, relaxation time, skin depth. Electrical conductivity of ionized gases, plasma frequency, refractive index, skin depth, application to propagation through ionosphere. (8 Lectures)

UNIT:III

EM Wave in Bounded Media: Boundary conditions at a plane interface between two media. Reflection & Refraction of plane waves at plane interface between two dielectric media-Laws of Reflection & Refraction. Fresnel's Formulae for perpendicular & parallel polarization cases, Brewster's law. Reflection & Transmission coefficients. Total internal reflection, evanescent waves. Metallic reflection (normal Incidence).

Optical Fibres: Numerical Aperture. Step and Graded Indices (Definitions Only). Single and Multiple Mode Fibres (Concept and Definition Only). (12 Lectures)

UNIT-IV

Polarization of Electromagnetic Waves: Description of Linear, Circular and Elliptical Polarization. Propagation of E.M. Waves in Anisotropic Media. Symmetric Nature of Dielectric Tensor. Fresnel's Formula. Uniaxial and Biaxial Crystals. Light Propagation in Uniaxial Crystal. Double Refraction. Polarization by Double Refraction. Nicol Prism. Ordinary & extraordinary refractive indices. Production & detection of Plane, Circularly and Elliptically Polarized Light. Phase Retardation Plates: Quarter-Wave and Half-Wave Plates. Babinet Compensator and its Uses. Analysis of Polarized Light.

Rotatory Polarization: Optical Rotation. Biot's Laws for Rotatory Polarization. Fresnel's Theory of optical rotation. Calculation of angle of rotation. Experimental verification of Fresnel's theory. Specific rotation. Laurent's half-shade polarimeter. (12 Lectures)

Reference Books:

1. Introduction to Electrodynamics, D.J. Griffiths, 3rd Ed., 1998, Benjamin Cummings.
2. Elements of Electromagnetics, M.N.O. Sadiku, 2001, Oxford University Press.
3. Introduction to Electromagnetic Theory, T.L. Chow, 2006, Jones & Bartlett Learning
4. Fundamentals of Electromagnetics, M.A.W. Miah, 1982, Tata McGraw Hill
5. Electromagnetic field Theory, R.S. Kshetrimayun, 2012, Cengage Learning
6. Electromagnetic Field Theory for Engineers & Physicists, G. Lehner, 2010, Springer
7. Electricity and Magnetism —D C Tayal (Himalaya Publication)2014
8. Introduction to Electrodynamics-A.Z.Capri & P.V.Panat (Alpha Science) 2002
9. Optics E.Hecht, (Pearson India) **(Additional Books for Reference)**
10. Electromagnetic Fields & Waves, P.Lorrain & D.Corson, 1970, W.H.Freeman & Co.

11. Electromagnetics, J.A. Edminster, Schaum Series, 2006, Tata McGraw Hill.
12. Electromagnetic field theory fundamentals, B. Guru and H. Hiziroglu, 2004, Cambridge University Press
13. Electromagnetic Theory-A. Murthy (S. Chand Publication)2014
14. Classical Electrodynamics, J. D. Jackson (Wiley India)

PHYSICS PRACTICAL-C:XIII

20 Classes (2 hrs. duration)

1. To verify the law of Malus for plane polarized light.
2. To determine the specific rotation of sugar solution using Polarimeter.
3. To analyze elliptically polarized Light by using a Babinets compensator.
4. To study dependence of radiation on angle for a simple Dipole antenna.
5. To determine the wavelength and velocity of ultrasonic waves in a liquid (Kerosene Oil, Xylene, etc.) by studying the diffraction through ultrasonic grating.
6. To study the reflection, refraction of microwaves
7. To study Polarization and double slit interference in microwaves.
8. To determine the refractive index of liquid by total internal reflection using Wollastons air-film.
9. To determine the refractive Index of (1) glass and (2) a liquid by total internal reflection using a Gaussian eyepiece.
10. To study the polarization of light by reflection and determine the polarizing angle for air- glass interface.
11. To verify the Stefan's law of radiation and to determine Stefans constant.
12. To determine the Boltzmann constant using V-I characteristics of PN junction diode.

Reference Books:

1. Advanced Practical Physics for students, B.L. Flint and H.T. Worsnop, 1971, Asia Publishing House.
2. Advanced level Physics Practicals, Michael Nelson and Jon M. Ogborn, 4th Edition, reprinted 1985, Heinemann Educational Publishers
3. A Text Book of Practical Physics, I.Prakash & Ramakrishna, 11th Ed., 2011, Kitab Mahal
4. Electromagnetic Field Theory for Engineers & Physicists, G. Lehner, 2010, Springer

C-XIV: STATISTICAL MECHANICS

(Credits: Theory-04, Practicals-02)

Marks:100 (Theory:70, Practical: 30)

Theory: 40 Classes (1 hr. duration)

UNIT:I

Classical Statistics: Macrostate & Microstate, Elementary Concept of Ensemble, Microcanonical, Canonical and grand canonical ensemble. Phase Space, Entropy and Thermodynamic Probability, Maxwell-Boltzmann Distribution Law, Partition Function, Thermodynamic Functions of an Ideal Gas, Classical Entropy Expression. (12 Lectures)

UNIT:II

Gibbs Paradox, Sackur Tetrode equation, Law of Equipartition of Energy (with proof) Applications to Specific Heat and its Limitations, Thermodynamic Functions of a Two-Energy Levels System, Negative Temperature.(8 Lectures)

UNIT:III

Radiation: Properties of Thermal Radiation. Blackbody Radiation. Pure temperature dependence. Kirchhoffs law. Stefan-Boltzmann law: Thermodynamic proof. Radiation Pressure. Wiens Displacement law. Wiens Distribution Law. **Sahas Ionization Formula. Rayleigh-Jeans Law. Ultraviolet Catastrophe.** Plancks Law of Blackbody Radiation: Experimental Verification. Deduction of (1) Wiens Distribution Law, (2) Rayleigh-Jeans Law, (3) Stefan-Boltzmann Law, (4) Wiens Displacement law from Plancks law.(12 Lectures)

UNIT=IV

Quantum Statistics: Identical particles, macrostates and micro states. Fermions and Bosons, **Bose Einstein distribution function and Fermi-Dirac Distribution function.** Bose-Einstein Condensation, Bose deviation from Planck's law, Effect of temperature on F-D distribution function, degenerate Fermigas, Density of States, Fermi energy.(8 Lectures)

Reference Books:

1. Statistical Mechanics-R.K.Pathria & Paul D. Beale (Academic Press) 3rd Edition (2011)
2. Statistical Physics, Berkeley Physics Course, F. Reif, 2008, Tata McGraw-Hill
3. Statistical and Thermal Physics, S. Lokanathan and R.S. Gambhir. 1991, Prentice Hall
4. Thermodynamics, Kinetic Theory and Statistical Thermodynamics, Francis W. Sears and Gerhard L. Salinger, 1986, Narosa.
5. Modern Thermodynamics with Statistical Mechanics, Carl S. Helrich, 2009, Springer
6. An Introduction to Statistical Mechanics & Thermodynamics, R.H. Swendsen, 2012, Oxford Univ. Press.
7. An introduction to Equilibrium Statistical Mechanics: Palash Das (I.K.International Publication) 2012
8. Statistical Physics - F. Mandl (CBS) 2012

9. Statistical Physics of Particles-M. Kardar (CUP 2007)

PHYSICS PRACTICAL-C:XIV

20 Classes (2 hrs. duration)

Use C/C++/Scilab for solving the problems based on Statistical Mechanics like

1. Plot Plancks law for Black Body radiation and compare it with Weins Law and Raleigh- Jeans Law at high temperature (room temperature) and low temperature.
2. Plot Specific Heat of Solids by comparing (a) Dulong-Petit law, (b) Einstein distribution function, (c) Debye distribution function for high temperature (room temperature) and low temperature and compare them for these two cases
3. Plot Maxwell-Boltzmann distribution function versus temperature.
4. Plot Fermi-Dirac distribution function versus temperature.
5. Plot Bose-Einstein distribution function versus temperature.

Reference Books:

1. Elementary Numerical Analysis, K.E. Atkinson, 3 r d Edn. 2007, Wiley India Edition
2. Statistical Mechanics, R.K. Pathria, Butterworth Heinemann: 2nd Ed., 1996, Oxford Univer- sity Press.
3. Thermodynamics, Kinetic Theory and Statistical Thermodynamics, Francis W. Sears and Gerhard L. Salinger, 1986, Narosa.
4. Modern Thermodynamics with Statistical Mechanics, Carl S. Helrich, 2009, Springer
5. Simulation of ODE/PDE Models with MATLAB, OCTAVE and SCILAB: Scientific and En- gineering Applications: A. Vande Wouwer, P. Saucez, C. V. Fernndez. 2014 Springer ISBN: 978-3319067896
6. Scilab by example: M. Affouf, 2012. ISBN: 978-1479203444
7. Scilab Image Processing: L.M.Surhone. 2010, Betascript Pub., ISBN: 978- 6133459274

Discipline Specific Elective (DSE)
(4 papers including the Project) DSE-1 to
DSE-4 (6 Credits each)

CLASSICAL DYNAMICS
(Credits: Theory-05, Tutorial-01) Theory: 50
Classes (1 hr. duration)

The emphasis of the course is on applications in solving problems of interest to physicists. Students are to be examined on the basis of problems, seen and unseen.

UNIT-I

Classical Mechanics of Point Particles: Generalised coordinates and velocities. Hamilton's Principle, Lagrangian and Euler-Lagrange equations. Applications to simple systems such as coupled oscillators. Canonical momenta & Hamiltonian. **Hamilton's equations of motion.** Applications: Hamiltonian for a harmonic oscillator, particle in a central force field. **Motion of charged particles in external electric and magnetic fields.** (25 Lectures)

UNIT-II

Special Theory of Relativity: Postulates of Special Theory of Relativity. **Lorentz Transformations.** Minkowski space. The invariant interval, light cone and world lines. Space-time diagrams. **Time-dilation, length contraction & twin paradox.** Four-vectors: space-like, time-like & light-like. Four-velocity and acceleration. Metric and alternating tensors. Four-momentum and energy-momentum relation. Doppler effect from a four vector perspective. Concept of four-force. **Conservation of four-momentum.** Relativistic kinematics. **Application to two-body decay of an unstable particle.** (25 Lectures) **Reference Books:**

1. Classical Mechanics, H.Goldstein, C.P. Poole, J.L. Safko, 3rd Edn. 2002, Pearson Education.
2. Mechanics, L. D. Landau and E. M. Lifshitz, 1976, Pergamon.
3. Classical Mechanics: An introduction, Dieter Strauch, 2009, Springer.
4. Solved Problems in classical Mechanics, O.L. Delange and J. Pierrus, 2010, Oxford Press
5. Classical Mechanics-J. C.Upadhyay (Himalaya Publication) 2014
6. Classical Dynamics of Particles and Systems S. T. Thornton (Cengage Learning) 2012
7. Introduction to Classical Mechanics-R. K. Takwale, S.Puranik-(Tata Mc Graw Hill)
8. Classical Mechanics-M. Das, P.K.Jena, M. Bhuyan, R.N.Mishra (Srikrishna Prakashan)

NUCLEAR & PARTICLE PHYSICS
(Credits: Theory-05, Tutorials-01) Theory: 50
Classes (1 hr. duration)

UNIT-I

General Properties of Nuclei: Constituents of nucleus and their Intrinsic properties, quantitative facts about mass, radii, charge density (matter density), binding energy, average binding energy and its variation with mass number, main features of binding energy versus mass number curve, N/A plot, angular momentum, parity, magnetic moment, electric moments, nuclear excited states. **Nuclear Models:** Liquid drop model approach, semi empirical mass formula and significance of its various terms, condition of nuclear stability, two nucleon separation energies, evidence for nuclear shell structure, nuclear magic numbers, basic assumption of shell model,

Radioactivity decay: (a) α -decay: basics of α -decay processes, theory of α -emission, Gamow factor, Geiger Nuttall law. (b) β -decay: energy kinematics for β -decay, positron emission, electron capture, neutrino hypothesis. (c) Elementary idea of Gamma decay.

Nuclear Reactions: Types of Reactions, Conservation Laws, kinematics of reactions, Q-value, (25 Lectures)

UNIT-II

Detector for Nuclear Radiations: Gas detectors: estimation of electric field, mobility of particle, for ionization chamber and GM Counter. Basic principle of Scintillation Detectors and construction of photo-multiplier tube (PMT). Semiconductor Detectors (Si and Ge) for charge particle and photon detection (concept of charge carrier and mobility), neutron detector.

Particle Accelerators: Van-de Graaff generator (Tandem accelerator), Linear accelerator, Cyclotron, Synchrotrons.

Particle physics: Particle interactions; basic features, types of particles and its families. Symmetries and Conservation Laws: energy and momentum, angular momentum, parity, baryon number, Lepton number, Isospin, Strangeness and charm. Elementary ideas of quarks and gluons. (25 Lectures)

Reference Books:

1. Introductory nuclear Physics by Kenneth S. Krane (Wiley India Pvt. Ltd., 2008).
2. Concepts of nuclear physics by Bernard L. Cohen. (Tata Mcgraw Hill, 1998).
3. Introduction to High Energy Physics, D.H. Perkins, Cambridge Univ. Press
4. Introduction to Elementary Particles, D. Griffith, John Wiley & Sons
5. Basic ideas and concepts in Nuclear Physics - An Introductory Approach by K. Heyde (IOP-Institute of Physics Publishing, 2004).
6. Theoretical Nuclear Physics, J.M. Blatt & V.F. Weisskopf (Dover Pub.Inc., 1991)
7. Atomic and Nuclear Physics -A. B. Gupta, Dipak Ghosh. (Books and Allied Publishers)
8. Physics of Atoms and Molecules Bransden (Pearson India) 2003
9. Subatomic Physics - Henley and Gracia (World Scientific) 2012

10. Introduction to Nuclear and Particle Physics-A.Das and T.Ferbel (World Scientific)

11. Radiation detection and measurement, G.F. Knoll (John Wiley & Sons, 2000).

COMPUTATIONAL PHYSICS

(Credits: Theory-05, Tutorials-01) Theory: 50
Classes (1 hr. duration)

The aim of this course is not just to teach computer programming and numerical analysis but to emphasize its role in solving problems in Physics.

- Highlights the use of computational methods to solve physical problems
- Use of computer language as a tool in solving physics problems (applications)
- Course will consist of hands on training on the Problem solving on Computers.

UNIT-I

Introduction: Importance of computers in Physics, paradigm for solving physics problems for solution. Usage of linux as an Editor. **Algorithms and Flowcharts:** Algorithm- Definition, properties and development. Flowchart- Concept of flowchart, symbols, guidelines, types. Examples: Cartesian to Spherical Polar Coordinates, Roots of Quadratic Equation, Sum of twomatrices, Sum and Product of a finite series, calculation of $\sin(x)$ as a series, algorithm for plotting (1) lissajous figures and (2) trajectory of a projectile thrown at an angle with the horizontal.

Scientific Programming: Some fundamental Linux Commands (Internal and External com- mands). Development of FORTRAN, Basic elements of FORTRAN: Character Set, Constants and their types, Variables and their types, Keywords, Variable Declaration and concept of instruction and program. Operators: Arithmetic, Relational, Logical and Assignment Operators. Expressions: Arithmetic, Relational, Logical, Character and Assignment Expressions. Fortran Statements: I/O Statements (unformatted/formatted), Executable and Non-Executable Statements, Layout of For- tran Program, Format of writing Program and concept of coding, Initialization and Replacement Logic. Examples from physics problems. (25 Lectures)

UNIT-II

Control Statements: Types of Logic (Sequential, Selection, Repetition), Branching Statements (Logical IF, Arithmetic IF, Block IF, Nested Block IF, SELECT CASE and ELSE IF Ladder state- ments), Looping Statements (DO-CONTINUE, DO-ENDDO, DOWHILE, Implied and Nested DO Loops), Jumping Statements (Unconditional GOTO, Computed GOTO, Assigned GOTO) Sub- scripted Variables (Arrays: Types of Arrays, DIMENSION Statement, Reading and Writing Arrays), Functions and Subroutines (Arithmetic Statement Function, Function Subprogram and Subroutine), RETURN, CALL, COMMON and EQUIVALENCE Statements), Structure, Disk I/O Statements, open a file, writing in a file, reading from a file. Examples from physics problems.

Programming:

1. Exercises on syntax on usage of FORTRAN
2. To print out all natural even/ odd numbers between given limits.
3. To find maximum, minimum and range of a given set of numbers.
4. To find a set of prime numbers and Fibonacci series.

(25 Lectures)

Reference Books:

1. Introduction to Numerical Analysis, S.S. Sastry, 5th Edn., 2012, PHI Learning Pvt. Ltd.
2. Computer Programming in Fortran 77. V. Rajaraman (Publisher: PHI).
3. Schaums Outline of Theory and Problems of Programming with Fortran, S Lipsdutz and A Poe, 1986Mc-Graw Hill Book Co.
4. Computational Physics: An Introduction, R. C. Verma, et al. New Age International Publish- ers, New Delhi(1999)
5. A first course in Numerical Methods, U.M. Ascher and C. Greif, 2012, PHI Learning
6. Elementary Numerical Analysis, K.E. Atkinson, 3 rd Edn., 2007, Wiley India Edition.

NANO MATERIALS & APPLICATIONS

**(Credits: Theory-05, Tutorial-01) Theory: 50
Classes (1 hr. duration)**

UNIT-I

Nanoscale Systems: Length scales in physics, Nanostructures: 1D, 2D and 3D nanostructures (nanodots, thin films, nanowires, nanorods), Band structure and density of states of materials at nanoscale, Size Effects in nano systems, Quantum confinement: Applications of Schrodinger equation- Infinite potential well, potential step, potential box, quantum confinement of carriers in 3D, 2D, 1D nanostructures and its consequences.

Synthesis Of Nanostructure Materials: Top down and Bottom up approach, Photolithogra- phy. Ball milling. Gas phase condensation. Vacuum deposition. Physical vapor deposition (PVD): Thermal evaporation, E-beam evaporation, Pulsed Laser deposition. Chemical vapor deposition (CVD). Sol-Gel. Electro deposition. Spray pyrolysis. Hydrothermal synthesis. Preparation through colloidal methods. MBE growth of quantum dots. (25 Lectures)

UNIT-II

Characterization: X-Ray Diffraction. Optical Microscopy. Scanning Electron Microscopy. Trans- mission Electron Microscopy. Atomic Force Microscopy. Scanning Tunneling Microscopy.

Applications: Applications of nanoparticles, quantum dots, nanowires and thin films for photonic devices (LED, solar cells). Single electron devices (no derivation). CNT based transistors. Nano- material Devices: Quantum dots heterostructure lasers, optical switching and optical data storage. Magnetic quantum well; magnetic dots - magnetic data storage. Micro Electromechanical Systems (MEMS), Nano Electromechanical Systems (NEMS). (25 Lectures)

Reference books:

1. C.P. Poole, Jr. Frank J. Owens, Introduction to Nanotechnology (Wiley India Pvt. Ltd.).
2. S.K. Kulkarni, Nanotechnology: Principles & Practices (Capital Publishing Company)

3. K.K. Chattopadhyay and A. N. Banerjee, Introduction to Nanoscience and Technology (PHI Learning Private Limited).
4. Richard Booker, Earl Boysen, Nanotechnology (John Wiley and Sons).
5. M. Hosokawa, K. Nogi, M. Naita, T. Yokoyama, Nanoparticle Technology Handbook (Elsevier, 2007).
6. Bharat Bhushan, Springer Handbook of Nanotechnology (Springer-Verlag, Berlin, 2004).
7. Nanotechnology- Rakesh Rathi (S Chand & Company, New Delhi)

BIO-PHYSICS

**(Credits: Theory-05, Tutorials-01) Theory: 50
Classes (1 hr. duration)**

UNIT-I

Building Blocks & Structure of Living State: Atoms and ions, molecules essential for life, what is life. Living state interactions: Forces and molecular bonds, electric & thermal interactions, electric dipoles, Casimir interactions, domains of physics in biology.

Heat Transfer in bio-materials: Heat Transfer Mechanism, The Heat equation, Joule heating of tissue.

Living State Thermodynamics: Thermodynamic equilibrium, first law of thermodynamics and conservation of energy. Entropy and second law of thermodynamics, Physics of many particle systems, Two state systems, continuous energy distribution, Composite systems, Casimir contribution of free energy, Protein folding and unfolding. (25 Lectures)

UNIT-II

Open systems and chemical thermodynamics: Enthalpy, Gibbs Free Energy and chemical potential, activation energy and rate constants, enzymatic reactions, ATP hydrolysis & synthesis, Entropy of mixing, The grand canonical ensemble, Hemoglobin.

Diffusion and transport: Maxwell-Boltzmann statistics, Fick's law of diffusion, sedimentation of Cell Cultures, diffusion in a centrifuge, diffusion in an electric field, Lateral diffusion in membranes, Navier-Stokes equation, low Reynolds Number Transport, Active and passive membrane transport. **Fluids:** Laminar and turbulent fluid flow, Bernoulli's equation, equation of continuity, venturi effect, Fluid dynamics of circulatory systems, capillary action.

Bio-energetics and Molecular motors: Kinesins, Dyneins, and microtubule dynamics, Brownian motion, ATP synthesis in Mitochondria, Photosynthesis in Chloroplasts, Light absorption in biomolecules, vibrational spectra of bio-biomolecules. (25 Lectures)

Reference Books:

1. Introductory Biophysics, J. Claycomb, JQP Tran, Jones & Bartlett Publishers
2. Aspects of Biophysics, Hugh S W, John Wiley and Sons.
3. Essentials of Biophysics by P Narayanan, New Age International.

4. Molecular Biophysics- P.K.Banarjee (S. Chand Publication), 2014.
5. Essentials of Biophysics : P. Narayanan, (New Age International, New Delhi), 2005 .
6. Biophysics: An introduction : Rodney Cotterill, John Wiley and Sons Ltd, 2002.
7. Biophysics- Dr.G.R.Chatwal (Himalaya Pub.),2011.

**Project Work (Credits:
06) (Compulsory)**

SKILL ENHANCEMENT COURSE
(Credit: 04 each)- SEC-1 and SEC-2

1- Communicative English and English Writing Skill(Compulsory) (Credits: 02)
Theory: 20 Classes (1 hr.duration)

2-BASIC INSTRUMENTATION SKILLS
(Credits: 02)
Theory: 20 Classes (1 hr. duration)

This course is to get exposure with various aspects of instruments and their usage through hands-on mode. Experiments listed below are to be done in continuation of the topics.

UNIT-I

Basic of Measurement: Instruments accuracy, precision, sensitivity, resolution range etc. Errors in measurements and loading effects.

Multimeter: Principles of measurement of dc voltage and dc current, ac voltage, ac current and resistance. Specifications of a multimeter and their significance.

Electronic Voltmeter: Advantage over conventional multimeter for voltage measurement with respect to input impedance and sensitivity. Principles of voltage, measurement (block diagram only). Specifications of an electronic Voltmeter/ Multimeter and their significance.

AC millivoltmeter: Type of AC millivoltmeters: Amplifier- rectifier, and rectifier- amplifier. Block diagram ac millivoltmeter, specifications and their significance.

Cathode Ray Oscilloscope: Block diagram of basic CRO. Construction of CRT, Electron gun, electrostatic focusing and acceleration (Explanation only no mathematical treatment), brief discussion on screen phosphor, visual persistence & chemical composition. Time base operation, synchronization. Front panel controls. Specifications of a CRO and their significance. Use of CRO for the measurement of voltage (dc and ac frequency, time period. Special features of dual trace, introduction to digital oscilloscope, probes. Digital storage Oscilloscope: Block diagram and principle of working. (10 Lectures)

UNIT-II

Signal Generators and Analysis Instruments: Block diagram, explanation and specifications of low frequency signal generators. pulse generator, and function generator. Brief idea for testing, specifications. Distortion factor meter, wave analysis.

Digital Instruments: Principle and working of digital meters. Comparison of analog & digital instruments. Characteristics of a digital meter. Working principles of digital voltmeter.

Digital Multimeter: Block diagram and working of a digital multimeter. Working principle of time interval, frequency and period measurement using universal counter/ frequency counter, time- base stability, accuracy and resolution. (10 Lectures)

The test of lab skills will be of the following test items:

1. Use of an oscilloscope.
2. CRO as a versatile measuring device.
3. Circuit tracing of Laboratory electronic equipment,
4. Use of Digital multimeter/VTVM for measuring voltages
5. Circuit tracing of Laboratory electronic equipment,
6. Winding a coil / transformer.
7. Study the layout of receiver circuit.
8. Trouble shooting a circuit
9. Balancing of bridges

Laboratory Exercises:

1. To observe the loading effect of a multimeter while measuring voltage across a low resistance and high resistance.
2. To observe the limitations of a multimeter for measuring high frequency voltage and currents.
3. To measure Q of a coil and its dependence on frequency, using a Q- meter.
4. Measurement of voltage, frequency, time period and phase angle using CRO.
5. Measurement of time period, frequency, average period using universal counter/ frequency counter.
6. Measurement of rise, fall and delay times using a CRO.
7. Measurement of distortion of a RF signal generator using distortion factor meter.
8. Measurement of R, L and C using a LCR bridge/ universal bridge.

Open Ended Experiments:

1. Using a Dual Trace Oscilloscope.
2. Converting the range of a given measuring instrument (voltmeter, ammeter).

Reference Books:

1. A text book in Electrical Technology - B L Theraja - S Chand and Co.
2. Performance and design of AC machines - M G Say ELBS Edn.
3. Digital Circuits and systems, Venugopal, 2011, Tata McGraw Hill.
4. Logic circuit design, Shimon P. Vingron, 2012, Springer.

5. Digital Electronics, Subrata Ghoshal, 2012, Cengage Learning.
6. Electronic Devices and circuits, S. Salivahanan & N. S.Kumar, 3rd Ed., 2012, Tata Mc-Graw Hill.
7. Electronic circuits: Handbook of design and applications, U.Tietze, Ch.Schenk, 2008, Springer
8. Electronic Devices, 7/e Thomas L. Floyd, 2008, Pearson India.

3-RENEWABLE ENERGY & ENERGY HARVESTING

(Credits: 02)

Theory: 20 Classes (1hr duration)

The aim of this course is not just to impart theoretical knowledge to the students but to provide them with exposure and hands-on learning wherever possible.

UNIT-I

Fossil fuels and Alternate Sources of energy: Fossil fuels and nuclear energy, their limitation, need of renewable energy, non-conventional energy sources. An overview of developments in Offshore Wind Energy, Tidal Energy, Wave energy systems, Ocean Thermal Energy Conversion, solar energy, biomass, biochemical conversion, biogas generation, geothermal energy tidal energy, Hydroelectricity.

Solar energy: Solar energy, its importance, storage of solar energy, solar pond, non plate collector, solar distillation, solar cooker, solar green houses, solar cell, absorption air conditioning. Need and characteristics of photovoltaic (PV) systems, PV models and equivalent circuits, and sun tracking systems.(10 Lectures)

UNIT-II

Wind Energy harvesting: Fundamentals of Wind energy, Wind Turbines and different electrical machines in wind turbines, Power electronic interfaces, and grid interconnection topologies.

Ocean Energy: Ocean Energy Potential against Wind and Solar, Wave Characteristics and Statistics, Wave Energy Devices. Tide characteristics and Statistics, Tide Energy Technologies, Ocean Thermal Energy, Osmotic Power, Ocean Bio-mass. Geothermal Energy: Geothermal Resources, Geothermal Technologies.

Hydro Energy: Hydropower resources, hydropower technologies, environmental impact of hydro power sources. (10 Lectures)

Reference Books:

1. Non-conventional energy sources - G.D Rai - Khanna Publishers, New Delhi
2. Solar energy - M P Agarwal - S Chand and Co. Ltd.
3. Solar energy - Suhas P Sukhative Tata McGraw - Hill Publishing Company Ltd.
4. Godfrey Boyle, Renewable Energy, Power for a sustainable future, 2004, Oxford University Press, in association with The Open University.
5. Dr. P Jayakumar, Solar Energy: Resource Assesment Handbook, 2009

6. J.Balfour, M.Shaw and S. Jarosek, Photovoltaics, Lawrence J Goodrich (USA).

7. [http://en.wikipedia.org/wiki/Renewable energy](http://en.wikipedia.org/wiki/Renewable_energy).

4-APPLIED OPTICS

(Credits: 02)

THEORY: 20 Classes (1 hr. duration)

Theory includes only qualitative explanation. Minimum five experiments should be performed covering minimum three sections.

UNIT-I

Sources and Detectors: Lasers, Spontaneous and stimulated emissions, Theory of laser action, Einsteins coefficients, Light amplification, Characterization of laser beam, He-Ne laser, Semiconductor lasers.

Elementary ideas of Fourier Optics.

Concept of Spatial frequency filtering, Fourier transforming property of a thin lens. (10 Lectures)

UNIT-II

Holography

Basic principle and theory: coherence, resolution, Types of holograms, white light reflection hologram, application of holography in microscopy, interferometry, and character recognition.

Photonics: Fibre Optics

Optical fibres and their properties, Principal of light propagation through a fibre, The numerical aperture, Attenuation in optical fibre and attenuation limit, Single mode and multimode fibres, Fibre optic sensors: Fibre Bragg Grating. (10 Lectures)

Reference Books:

1. Fundamental of optics, F. A. Jenkins & H. E. White, 1981, Tata McGraw Hill.
2. LASERS: Fundamentals & applications, K.Thyagrajan & A.K.Ghatak, 2010, Tata McGraw Hill
3. Fibre optics through experiments, M.R.Shenoy, S.K.Khijwania, et.al. 2009, Viva Books.
4. Nonlinear Optics, Robert W. Boyd, (Chapter-I), 2008, Elsevier.
5. Optics, Karl Dieter Moller, Learning by computing with model examples, 2007, Springer.
6. Optical Systems and Processes, Joseph Shamir, 2009, PHI Learning Pvt. Ltd.
7. Optoelectronic Devices and Systems, S.C. Gupta, 2005, PHI Learning Pvt. Ltd.
8. Optical Physics, A.Lipson, S.G.Lipson, H.Lipson, 4th Edn., 1996, Cambridge Univ. Press.
9. Optics E.Hecht, (Pearson India).

GENERIC ELECTIVE (GE) (Minor-Physics)
For other Departments/Disciplines-(Credit: 06 each)

**GE:I-MECHANICS & PROPERTIES OF MATTER, OSCILLATION & WAVES,
THERMAL PHYSICS, ELECTRICITY, MAGNETISM & ELECTRONICS**

(Credits: Theory - 04, Practicals 02)

Theory: 40 classes (1 hr. duration each)-Full Marks: 70

UNIT-I: Mechanics & Properties of Matter

Moment of Inertia Parallel axis and perpendicular axis theorem, M.I. of a Solid sphere and Solid cylinder, Gravitational potential and field due to a thin spherical shell and a solid sphere at external points and internal points. Relation among elastic constants, depression at free end of a light cantilever. Surface tension, pressure difference across a curved membrane, viscous flow, Poiseulle's formula. (8 classes) 14 Marks

UNIT-II: Oscillation and Waves

Simple harmonic motion, damped harmonic motion, under damped, over damped and critically damped motion, Forced vibration, Resonance. Wave equation in a medium, Velocity of Longitudinal waves in an elastic medium and velocity of transverse wave in a stretched string. Composition of SHM, Lissajous figures for superposition of two orthogonal simple harmonic vibrations (a) with same frequency, (b) frequency with 2:1. (8 classes) 14 Marks

UNIT-III: Thermal Physics

Entropy, change in entropy in reversible and irreversible process, Carnot engine and its efficiency. Carnot Theorem, Second law of thermodynamics, Kelvin-Planck, Clausius formula. Thermal conductivity, differential equation for heat flow in one dimension. Maxwell thermodynamic relation (statement only), Clausius-Clapeyron equation. Black body radiation, Planck radiation formula (No derivation). (8 classes) 14 Marks

UNIT-IV: Electricity and Magnetism

Gauss law of electrostatics, use of Gauss law to compute electrostatic field due to a linear charge distribution. Magnetic induction B, Lorentz force law. Biot-Savart's law, Magnetic induction due to long straight current carrying conductor, and in the axis of a current carrying circular coil. Ampere's Circuital law, its differential form. The law of electromagnetic equations, its differential and integral form. Maxwell's electro-magnetic equations and their physical significance.

Growth and decay of currents in LR and RC circuits, time constant, alternating currents in RC, RL and LCR circuits, impedance, power factor, resonance. (8 classes) 14 Marks

UNIT-V: Electronics

Extrinsic and intrinsic semiconductors, P-type and N-type semiconductors. PN-Junction as rectifier, Half wave and Full wave rectifiers (Bridge type), efficiency, ripple factor, use of RC, LC, and filters, working of PNP and NPN transistors, transistor configurations in CE and CB circuits and relation between α and β . JFET, its operation and characteristics of V-I curve. (8 classes) 14 Marks

Reference Books:

1. Properties of Matter D.S. Mathur (S. Chand Publication).
2. Heat and Thermodynamics A.B. Gupta & H.B. Ray (New Central Book Agency).
3. Sound M. Ghosh (S. Chand Publication).
4. Introduction to Electrodynamics D.I. Griffith (Prentice Hall of India).
5. Foundations of Electronics Chattopadhyaya and Rakshit.
6. Physics of Degree students Vol.I M. Das, P.K. Jena, M. Bhuyan, D.K. Rout (Srikrishna Prakashan).
7. Physics of Degree students Vol.I M. Das, P.K. Jena, M. Bhuyan, and others (Srikrishna Prakashan).
8. University Physics Sears, Zemansky, H.D. Young (Addison Wesley).

GE:I LAB.

20 classes (2 hours duration each)-Full Marks: 30

1. Measurement of length (or diameter) using Vernier calipers, Screw gauge and travelling microscope.
2. To determine the moment of inertia of a fly wheel.
3. To determine the Young's modulus Y of a wire by Searls method.
4. To determine the modulus of rigidity of a wire by Maxwells needle/Torsion Pendulum (Dynamic method).
5. To determine g by bar pendulum.
6. To determine the elastic constants of a wire by Searls method.
7. To determine the value of Y of a rubber by using travelling microscope.
8. To determine the Rigidity of modulus by static method.
9. To determine the frequency of a telescope by using Sonometer.
10. Verification of Laws of Vibration of a string by using Sonometer.
11. To compare capacitances using DeSauty bridge.
12. To determine the Law of resistance by using Foster bridge.
13. To determine the Mechanical equivalent of heat J by Callender and Barnes constants flow method.
14. To determine the J by Joules Calorimeter.
15. To determine the coefficient of viscosity of water by Capillary flow method (Poiseilles method).
16. Compare the specific heat of two liquids by method of Cooling.

Reference Books:

1. Advanced Practical Physics for students, B.L.Flint & H.T.Worsnop, 1971, Asia Publishing House B.B. Swain.
2. A Laboratory Manual of Physics for Undergraduate Classes, D.P.Khandelwal (1985), VaniPublication.
3. A Text book of Practical Physics, Indu Prakash and Ramakrishna, 11th Edition (2011), Kitab Mahal, New Delhi.

GE:II-OPTICS, SPECIAL THEORY OF RELATIVITY, ATOMIC PHYSICS, QUANTUM MECHANICS & NUCLEAR PHYSICS

(Credits: Theory - 04, Practicals 02) Theory:
40 classes (1hr duration each)-Full Marks: 70

UNIT-I: Optics-I

Elementary ideas of monochromatic aberrations and their minimization, chromatic aberration, achromatic combination. Theory of formation of Primary and Secondary rainbow. Condition of interference. Coherent sources. Youngs Double Slit experiment. Biprism and measurement of wave length of light of by it. Colour of thin films and Newtons rings. Fresnel and Fraunhofer diffraction, diffraction by Single slit Plane transmission grating.(8 classes) 14 Marks

UNIT-II: Optics-II and Relativity

Electromagnetic nature of light, polarized and unpolarized light, polarization by reflection and refraction. Brewsters Law, Malus Law, Double refraction. Ordinary and extraordinary rays. Galilean transformation, Newtonian relativity and its limitation, Michelson Morley experiment and its consequence, postulates of special theory of relativity. Lorentz transformation, length contraction, time dilation, relativistic mass and momentum, mass energy relation.(8 classes) 14 Marks

UNIT-III: Atomic Physics

Inadequacy of classical physics, brief outline of Rayleigh Jeans theory and Plancks quantum theory of radiation, particle nature of electromagnetic radiation photo electric effect, Compton effect, dual nature of radiation, wave nature of particles, de-Broglie hypothesis, matter wave, wave-particle duality, Davisson-Germer experiment.

Bohrs theory of Hydrogen atom, explanation of Hydrogen Spectra correction for finite mass of the nucleus. Bohrs correspondence principle, limitations of Bohrs theory. Discrete energy, exchange by atom Frank Hertz experiment.(8 classes) 14 Marks

UNIT-IV: Quantum Mechanics

Heisenbergs Uncertainty relation. Time dependent Schrodingers wave equation in one dimension and three dimensions. The physical interpretation of the wave function. Probability density and probability current density. Equation of continuity. Normalization of the Wave function, Expectation value of an observable, Ehrenfests theorem.

Time independent Schrodingers wave equation in one dimension particle in a box, energy eigen values and eigen functions.(8 classes) 14 Marks

UNIT-V: Nuclear Physics

Properties of the nucleus Charge, Size, Spin, Magnetic Moment, Mass, Mass defect, Binding energy, Packing fraction, Nuclear force, and its characteristics features. Radioactive decay laws, average life, half life, nuclear fission, nuclear fusion, Linear accelerators, and cyclotron.(8 classes) 14 Marks

Reference Books:

1. Principles of Optics A.B. Gupta.
2. Fundamentals of Optics Jenkins and White.
3. Relativity R. Resnick.
4. Modern Physics H.S. Mani and G.K. Meheta.

5. Quantum Mechanics J.L. Powel and B. Craseman.
6. Atomic and Nuclear Physics Gupta and Ghosh (Books and allied).
7. Physics of Degree students Vol. III M. Das, P.K. Jena and others (SrikrishnaPrakashan).
8. Physics of Degree students Vol. IV M. Das, P.K. Jena and others (SrikrishnaPrakashan).
9. Concept of Modern Physics Arthur Beiser (Mc-graw Hill) (2009).
10. University Physics Sears, Zemansky, H.D. Young (Addison Wesley).

GE:II LAB.

20 classes (2 hours duration each)-Full Marks: 30

1. Determination of Horizontal component of Earths magnetic field and magnetic moment of a bar magnet using deflection and oscillation magnetometer.
2. Determination of E.C.E. of a Copper by taking 3 readings.
3. Familiarization with Schuster focusing and determination of angle of prism.
4. Determination of Refractive index of the material of a prism using Sodium light.
5. To determine the wavelength of light using plane diffraction grating.
6. To determine the wavelength of light using Newtons ring.
7. Determination of refractive index of (a) glass and (b) liquid by using travelling microscope.
8. Determination of radius of curvature of a convex/concave mirror by using Kohlrauschs method.
9. To determine the magnifying power of a given telescope.
10. Verification of inverse square law of magnetism by using a deflection magnetometer.
11. To draw the static characteristics of a P-N junction diode.
12. Obtain the static characteristics of a P-N-P / N-P-N transistor / Triode Valve.
13. To determine the reduction factor of a tangent Galvanometer.
14. Variation of magnetic field along the axis of a circular coil carrying current.
15. To study the characteristics of a series RC circuit.

Reference Books:

1. Advanced Practical Physics for students, B.L.Flint & H.T.Worsnop, 1971, Asia Publishing House.
2. A Laboratory Manual of Physics for Undergraduate Classes, D.P.Khandelwal (1985), VaniPublication.
3. A Text book of Practical Physics, Indu Prakash And Ramakrishna, 11th Edition (2011), Kitab Mahal, New Delhi.

PHYSICS(PASS)

SEMESTER-I

DSC 1A: MECHANICS

(Credits: Theory-04, Practicals-02) Theory:
40 Classes (1 hr. duration)-Marks: 70

UNIT-I

Vectors: Vector algebra. Scalar and vector products. Derivatives of a vector with respect to a parameter. (2 Lectures)

Ordinary Differential Equations: 1st order homogeneous differential equations. 2nd order homogeneous differential equations with constant coefficients. (2 Lectures)

Laws of Motion: Frames of reference. Newtons Laws of motion. Dynamics of a system of particles. Centre of Mass. (4 Lectures)

Momentum and Energy: Conservation of momentum. Work and energy. Conservation of energy. Motion of rockets. (2 Lectures)

Rotational Motion: Angular velocity and angular momentum. Torque. Conservation of angular momentum. (3 Lectures)

Gravitation: Newtons Law of Gravitation. Motion of a particle in a central force field (motion is in a plane, angular momentum is conserved, areal velocity is constant). Keplers Laws (statement only). Satellite in circular orbit and applications. Geosynchronous orbits. Basic idea of global positioning system (GPS). Weightlessness. Physiological effects on astronauts. (7 Lectures)

UNIT-II

Oscillations: Simple harmonic motion. Differential equation of SHM and its solutions. Kinetic and Potential Energy, Total Energy and their time averages. Damped oscillations. (6 Lectures) **Elasticity:**

Hooke's law - Stress-strain diagram - Elastic moduli-Relation between elastic constants - Poissons Ratio-Expression for Poissons ratio in terms of elastic constants - Work done in stretching and work done in twisting a wire - Twisting couple on a cylinder - Determination of Rigidity modulus by static torsion - Torsional pendulum-Determination of Rigidity modulus and moment of inertia - q , η and σ by Searles method. (8 Lectures)

Special Theory of Relativity: Constancy of speed of light. Postulates of Special Theory of Relativity. Length contraction. Time dilation. Relativistic addition of velocities. (6 Lectures)

Note: *Students are not familiar with vector calculus. Hence all examples involve differentiation either in one dimension or with respect to the radial coordinate.*

Reference Books:

1. University Physics. F.W. Sears, M.W. Zemansky and H.D. Young, 13/e, 1986. Addison- Wesley
2. Mechanics Berkeley Physics, v.1: Charles Kittel, et. al. 2007, Tata McGraw-Hill.

3. Physics Resnick, Halliday & Walker 9/e, 2010, Wiley
4. University Physics, Ronald Lane Reese, 2003, Thomson Brooks/Cole.
5. Properties of Matter - D.S. Mathur (S.Chand publication) 2013
6. Mechanics- D.C.Tayal (Himalaya Publication) 2013
7. Classical Dynamics of Particles and Systems S. T. Thornton (Cengage Learning) 2012
8. Analytical Mechanics-Fowles (Cengage Learnings) 2014

DSC 1A-LAB: MECHANICS

20 Classes (2 hrs. duration)-Marks:30

1. Measurements of length (or diameter) using vernier caliper, screw gauge and travelling microscope.
2. To determine the Height of a Building using a Sextant.
3. To determine the Moment of Inertia of a Flywheel.
4. To determine the Young's Modulus of a Wire by Optical Lever Method.
5. To determine the Modulus of Rigidity of a Wire by Maxwells needle.
6. To determine the Elastic Constants of a Wire by Searles method.
7. To determine g by Bar Pendulum.
8. To determine g by Katers Pendulum.
9. To study the Motion of a Spring and calculate (a) Spring Constant, (b) g.

Reference Books:

1. Advanced Practical Physics for students, B.L. Flint and H.T. Worsnop, 1971, Asia Publishing House.
2. Advanced level Physics Practicals, Michael Nelson and Jon M. Ogborn, 4th Edition, reprinted 1985, Heinemann Educational Publishers.
3. A Text Book of Practical Physics, Indu Prakash and Ramakrishna, 11th Edition, 2011, Kitab Mahal, New Delhi.

SEMESTER-II

DSC 1B: ELECTRICITY, MAGNETISM AND EMT

(Credits: Theory-04, Practicals-02) Theory:
40 Classes (1 hr. duration)-Marks:70

UNIT-I

Vector Analysis: Scalar and Vector product, gradient, divergence, Curl and their significance, Vector Integration, Line, surface and volume integrals of Vector fields, Gauss-divergence theorem and Stoke's theorem of vectors (statement only). (8 Lectures)

Electrostatics: Electrostatic Field, electric flux, Gauss's theorem of electrostatics. Applications of Gauss theorem- Electric field due to point charge, infinite line of charge, uniformly charged spherical shell and solid sphere, plane charged sheet, charged conductor. Electric potential as line integral of electric field, potential due to a point charge, electric dipole, uniformly charged spherical shell and solid sphere. Calculation of electric field from potential. Capacitance of an isolated spherical conductor. Parallel plate, spherical and cylindrical condenser. Energy per unit volume in electrostatic field. Dielectric medium, Polarisation, Displacement vector. Gauss's theorem in dielectrics. Parallel plate capacitor completely filled with dielectric. (12 Lectures)

UNIT-II

Magnetism:

Magnetostatics: Biot-Savart's law and its applications- straight conductor, circular coil, solenoid carrying current. Divergence and curl of magnetic field. Magnetic vector potential. Ampere's circuital law. Magnetic properties of materials: Magnetic intensity, magnetic induction, permeability, magnetic susceptibility. Brief introduction of dia-, para- and ferromagnetic materials. (6 Lectures)

Electromagnetic Induction: Faraday's laws of electromagnetic induction, Lenz's law, self and mutual inductance, L of single coil, M of two coils. Energy stored in magnetic field. (4 Lectures)

Maxwell's equations and Electromagnetic wave propagation: Equation of continuity of current, Displacement current, Maxwell's equations, Poynting vector, energy density in electro- magnetic field, electromagnetic wave propagation through vacuum and isotropic dielectric medium, transverse nature of EM waves, polarization. (10 Lectures)

Reference Books:

1. Electricity and Magnetism, Edward M. Purcell, 1986, McGraw-Hill Education
2. Electricity & Magnetism, J.H. Fewkes & J.Yarwood. Vol. I, 1991, Oxford Univ. Press
3. Electricity and Magnetism, D C Tayal, 1988, Himalaya Publishing House.
4. University Physics, Ronald Lane Reese, 2003, Thomson Brooks/Cole.
5. D.J.Griffiths, Introduction to Electrodynamics, 3rd Edn, 1998, Benjamin Cummings.
6. Electricity and Magnetism- K.K Tewari (S. Chand Higher Academics)2013
7. Electricity and Magnetism -D. C. Tayal (Himalay Pub.)2014

DSC 1B-LAB: ELECTRICITY, MAGNETISM AND EMT

20 Classes (2 hrs. duration)-Marks:30

1. To use a Multimeter for measuring (a) Resistances, (b) AC and DC Voltages, (c) DC Current, and (d) checking electrical fuses.
2. Ballistic Galvanometer:
 - (i) Measurement of charge and current sensitivity
 - (ii) Measurement of CDR
 - (iii) Determine a high resistance by Leakage Method

- (iv) To determine Self Inductance of a Coil by Rayleighs Method. 3. To compare capacitances using DeSautys bridge.
4. Measurement of field strength B and its variation in a Solenoid (Determine dB/dx) 5. To study the Characteristics of a Series RC Circuit.
6. To study a series LCR circuit LCR circuit and determine its (a) Resonant frequency, (b) Quality factor
7. To study a parallel LCR circuit and determine its (a) Anti-resonant frequency and (b) Quality factor Q
8. To determine a Low Resistance by Carey Fosters Bridge.
9. To verify the Thevenin and Norton theorems.
10. To verify the Superposition, and Maximum Power Transfer Theorems.

Reference Books:

1. Advanced Practical Physics for students, B.L.Flint & H.T.Worsnop, 1971, Asia Publishing House.
2. Advanced level Physics Practicals, Michael Nelson and Jon M. Ogborn, 4th Edition, reprinted 1985, Heinemann Educational Publishers
3. A Text Book of Practical Physics, I.Prakash & Ramakrishna, 11th Ed.2011, Kitab Mahal

SEMESTER-III

DSC 1C: THERMAL PHYSICS AND STATISTICAL MECHANICS

(Credits: Theory-04, Practicals-02) Theory:

40 Classes (1 hr. duration)-Marks: 70

UNIT-I

Laws of Thermodynamics: Thermodynamic Description of system: Zeroth Law of thermo- dynamics and temperature. First law and internal energy, conversion of heat into work, Various Thermodynamical Processes, Applications of First Law: General Relation between CP and CV, Work Done during Isothermal and Adiabatic Processes, Compressibility and Expansion Coefficient, Reversible and irreversible processes, Second law and Entropy, Carnots cycle & theorem, Entropy changes in reversible & irreversible processes, Entropy-temperature diagrams, Third law of thermo- dynamics, Unattainability of absolute zero. (10 Lectures)

Thermodynamical Potentials: Enthalpy, Gibbs, Helmholtz and Internal Energy functions, Maxwells relations and applications - Joule-Thompson Effect, Clausius- Clapeyron Equation, Ex- pression for (CP CV), CP/CV, TdS equations. (10 Lectures)

UNIT-II

Kinetic Theory of Gases: Derivation of Maxwells law of distribution of velocities and its exper- imental verification, Mean free path (Zeroth Order), Transport Phenomena: Viscosity, Conduction and Diffusion (for vertical case), Law of equipartition of energy (no derivation) and its applications to specific heat of gases; mono-atomic and diatomic gases. (10 Lectures)

Theory of Radiation: Blackbody radiation, Spectral distribution, Concept of Energy Density,

Derivation of Planck's law, Deduction of Wiens distribution law, Rayleigh- Jeans Law, Stefan Boltzmann Law and Wiens displacement law from Plancks law. (6 Lectures)

Statistical Mechanics: Maxwell-Boltzmann law - distribution of velocity - Quantum statistics- Phase space - Fermi-Dirac distribution law - electron gas - Bose-Einstein distribution law - photon gas - comparison of three statistics. (4 Lectures)

Reference Books:

1. Thermal Physics, S. Garg, R. Bansal and C. Ghosh, 1993, Tata McGraw-Hill.
2. A Treatise on Heat, Meghnad Saha, and B.N. Srivastava, 1969, Indian Press.
3. Thermodynamics, Enrico Fermi, 1956, Courier Dover Publications.
4. Thermodynamics, Kinetic theory & Statistical thermodynamics, F.W.Sears and G.L. Salinger. 1988, Narosa
5. University Physics, Ronald Lane Reese, 2003, Thomson Brooks/Cole.
6. Thermal and Statistical Physics —M. Das , P. K. Jena and others (Sri Krishna Prakashan)
7. Heat and Thermal Physics-Brijlal & Subramaiaam (S.Chand Publication)2014
8. Thermal Physics– C. Kittel and H. Kroemer (McMillan Education India)2010
9. Thermodynamics & Statistical Physics-J.K.Sharma, K.K.Sarkar (Himalaya Pub.)2014

DSC 1C-LAB: THERMAL PHYSICS AND STATISTICAL MECHANICS

20 Classes (2 hrs. duration)-Marks:30

1. To determine Mechanical Equivalent of Heat, J, by Callender and Barnes constant flow method.
2. Measurement of Plancks constant using black body radiation.
3. To determine Stefans Constant.
4. To determine the coefficient of thermal conductivity of Cu by Searles Apparatus.
5. To determine the Coefficient of Thermal Conductivity of Cu by Angstroms Method.
6. To determine the coefficient of thermal conductivity of a bad conductor by Lee and Charltons disc method.
7. To determine the temperature co-efficient of resistance by Platinum resistance thermometer.
8. To study the variation of thermo emf across two junctions of a thermocouple with temperature.
9. To record and analyze the cooling temperature of an hot object as a function of time using a thermocouple and suitable data acquisition system.
10. To calibrate Resistance Temperature Device (RTD) using Null Method/Off- Balance Bridge.

Reference Books:

1. Advanced Practical Physics for students, B.L.Flint & H.T.Worsnop, 1971, Asia Publishing House.

2. A Text Book of Practical Physics, Indu Prakash and Ramakrishna, 11th Edition, 2011, Kitab Mahal, New Delhi.
3. A Laboratory Manual of Physics for Undergraduate Classes, D.P.Khandelwal, 1985, Vani Publication.

SEMESTER-IV

DSC 1D: WAVES AND OPTICS

(Credits: Theory-04, Practicals-02) Theory:
40 Classes (1hr duration)-Marks: 70

UNIT-I

Fluids: Surface Tension- Synclastic and anticlastic surface - Excess of pressure - Application to spherical and cylindrical drops and bubbles - variation of surface tension with temperature - Jaegers method. Viscosity - Rate flow of liquid in a capillary tube - Poiseuilles formula - Determination of coefficient of viscosity of a liquid - Variations of viscosity of liquid with temperature- lubrication. (6 Lectures)

Sound: Simple harmonic motion - forced vibrations and resonance - Fouriers Theorem - Application to saw tooth wave and square wave - Intensity and loudness of sound - Decibels - Intensity levels - musical notes - musical scale. Acoustics of buildings: Reverberation and time of reverberation - Absorption coefficient - Sabines formula - measurement of reverberation time - Acoustic aspects of halls and auditoria. (6 Lectures)

Superposition of Two Perpendicular Harmonic Oscillations: Graphical and Analytical Methods. Lissajous Figures (1:1 and 1:2) and their uses. (2 Lectures)

Waves Motion- General: Transverse waves on a string. Travelling and standing waves on a string. Normal Modes of a string. Group velocity, Phase velocity. Plane waves. Spherical waves, Wave intensity. (2 Lectures)

Wave Optics: Electromagnetic nature of light. Definition and Properties of wave front. Huygens Principle. (2 Lectures)

UNIT-II

Interference: Interference: Division of amplitude and division of wavefront. Youngs Double Slit experiment. Lloyds Mirror and Fresnels Biprism. Phase change on reflection: Stokes treatment. Interference in Thin Films: parallel and wedge-shaped films. Fringes of equal inclination (Haidinger Fringes); Fringes of equal thickness (Fizeau Fringes). Newtons Rings: measurement of wavelength and refractive index. (10 Lectures)

Michelsons Interferometer: (1) Idea of form of fringes (no theory needed), (2) Determination of wavelength, (3) Wavelength difference, (4) Refractive index, and (5) Visibility of fringes. (2 Lectures)

Diffraction: Fraunhofer diffraction- Single slit; Double Slit. Multiple slits and Diffraction grating. Fresnel Diffraction: Half-period zones. Zone plate. Fresnel Diffraction pattern of a straight edge, a slit and a wire using half-period zone analysis. (7 Lectures)

Polarization: Transverse nature of light waves. Plane polarized light production and analysis. Circular and elliptical polarization. (3 Lectures)

Reference Books:

1. Fundamentals of Optics, F.A Jenkins and H.E White, 1976, McGraw-Hill
2. Principles of Optics, B.K. Mathur, 1995, Gopal Printing
3. Fundamentals of Optics, H.R. Gulati and D.R. Khanna, 1991, R. Chand Publications
4. University Physics. F.W. Sears, M.W. Zemansky and H.D. Young. 13/e, 1986. Addison- Wesley.

DSC 1D-LAB: WAVES AND OPTICS

20 Classes (2 hrs. duration)-Marks: 30

1. To investigate the motion of coupled oscillators.
2. To determine the Frequency of an Electrically Maintained Tuning Fork by Melde's Experiment and to verify $2T$ Law.
3. To study Lissajous Figures.
4. Familiarization with Schuster's focussing; determination of angle of prism.
5. To determine the Coefficient of Viscosity of water by Capillary Flow Method (Poiseuille's method).
6. To determine the Refractive Index of the Material of a Prism using Sodium Light.
7. To determine Dispersive Power of the Material of a Prism using Mercury Light.
8. To determine the value of Cauchy Constants.
9. To determine the Resolving Power of a Prism.
10. To determine wavelength of sodium light using Fresnel Biprism.
11. To determine wavelength of sodium light using Newton's Rings.
12. To determine the wavelength of Laser light using Diffraction of Single Slit.
13. To determine wavelength of (1) Sodium and (2) Spectral lines of the Mercury light using plane diffraction Grating
14. To determine the Resolving Power of a Plane Diffraction Grating.
15. To measure the intensity using photosensor and laser in diffraction patterns of single and double slits.

Reference Books:

1. Advanced Practical Physics for students, B.L. Flint and H.T. Worsnop, 1971, Asia Publishing House.
2. Advanced level Physics Practicals, Michael Nelson and Jon M. Ogborn, 4th Edition, reprinted 1985, Heinemann Educational Publishers
3. A Text Book of Practical Physics, Indu Prakash and Ramakrishna, 11th Edition, 2011, Kitab Mahal, New Delhi.

DISCIPLINE SPECIFIC ELECTIVE(DSE)

(Select Two Papers).

DSE: DIGITAL AND ANALOG CIRCUITS AND INSTRUMENTATION

(Credits: Theory-04, Practicals-02)

Theory: 40 Lectures-Marks: 70

UNIT-1:

Digital Circuits

Difference between Analog and Digital Circuits. Binary Numbers. Decimal to Binary and Binary to Decimal Conversion, AND, OR and NOT Gates (Realization using Diodes and Transistor). NAND and NOR Gates as Universal Gates. XOR and XNOR Gates. (5 Lectures)

De Morgan's Theorems. Boolean Laws. Simplification of Logic Circuit using Boolean Algebra. Fundamental Products. Minterms and Maxterms. Conversion of a Truth Table into an Equivalent Logic Circuit by (1) Sum of Products Method and (2) Karnaugh Map. (5 Lectures)

UNIT-2:

Semiconductor Devices and Amplifiers:

Semiconductor Diodes: p and n type semiconductors. Barrier Formation in PN Junction Diode. Qualitative Idea of Current Flow Mechanism in Forward and Reverse Biased Diode. PN junction and its characteristics. Static and Dynamic Resistance. Principle and structure of (1) LEDs (2) Photodiode (3) Solar Cell. (5 Lectures)

Bipolar Junction transistors: n-p-n and p-n-p Transistors. Characteristics of CB, CE and CC Configurations. Current gains α and β . Relations between α and β . Load Line analysis of Transistors. DC Load line and Q-point. Active, Cutoff, and Saturation Regions. Voltage Divider Bias Circuit for CE Amplifier. h-parameter Equivalent Circuit. Analysis of a single-stage CE amplifier using Hybrid Model. Input and Output Impedance. Current, Voltage and Power Gains. Class A, B, and C Amplifiers. (10 Lectures)

UNIT-3:

Operational Amplifiers (Black Box approach):

Characteristics of an Ideal and Practical Op-Amp (IC 741), Open-loop & Closed-loop Gain. CMRR, concept of Virtual ground. Applications of Op-Amps: (1) Inverting and Non-inverting Amplifiers, (2) Adder, (3) Subtractor, (4) Differentiator, (5) Integrator, (6) Zero Crossing Detector. (7 Lectures)

Instrumentations:

Introduction to CRO: Block Diagram of CRO. Applications of CRO: (1) Study of Waveform, (2) Measurement of Voltage, Current, Frequency, and Phase Difference. (3 Lectures)

Power Supply: Half-wave Rectifiers. Centre-tapped and Bridge Full-wave Rectifiers Calculation of Ripple Factor and Rectification Efficiency, Basic idea about capacitor filter, Zener Diode and Voltage Regulation (5 Lectures)

Reference Books:

1. Integrated Electronics, J. Millman and C.C. Halkias, 1991, Tata Mc-Graw Hill.
2. Electronic devices and circuits, S. Salivahanan and N.Suresh Kumar, 2012, Tata Mc-Graw Hill.
3. Microelectronic Circuits, M.H. Rashid, 2ndEdn.,2011, Cengage Learning.
4. Modern Electronic Instrumentation & Measurement Tech., Helfrick & Cooper, 1990, PHI Learning
5. Digital Principles & Applications, A.P.Malvino, D.P.Leach & Saha, 7th Ed.,2011, Tata Mc- Graw Hill
6. Fundamentals of Digital Circuits, A. Anand Kumar, 2nd Edition, 2009, PHI Learning Pvt. Ltd.
7. OP-AMP and Linear Digital Circuits, R.A. Gayakwad, 2000, PHI Learning Pvt. Ltd.

DSC-LAB: DIGITAL AND ANALOG CIRCUITS AND INSTRUMENTATION

20 Classes (2 hrS. duration)-Marks:30

1. To measure (a) Voltage, and (b) Frequency of a periodic waveform using a CRO.
2. To verify and design AND, OR, NOT and XOR gates using NAND gates.
3. To minimize a given logic circuit.
4. Half adder, Full adder and 4-bit Binary Adder.
5. Adder-Subtractor using Full Adder I.C.
6. To design an astable multivibrator of given specifications using 555 Timer.
7. To design a monostable multivibrator of given specifications using 555 Timer.
8. To study IV characteristics of PN diode, Zener and Light emitting diode.
9. To study the characteristics of a Transistor in CE configuration.
10. To design a CE amplifier of a given gain (mid-gain) using voltage divider bias.
11. To design an inverting amplifier of given gain using Op-amp 741 and study its frequency response.
12. To design a non-inverting amplifier of given gain using Op-amp 741 and study its Frequency Response.
13. To study a precision Differential Amplifier of given I/O specification using Opamp.
14. To investigate the use of an op-amp as a Differentiator.
15. To design a Wien Bridge Oscillator using an op-amp.

Reference Books:

1. Basic Electronics: A text lab manual, P.B.Zbar, A.P.Malvino, M.A.Miller, 1994,Mc-Graw Hill.
2. Electronics: Fundamentals and Applications, J.D. Ryder, 2004, Prentice Hall.
3. OP-Amps and Linear Integrated Circuit, R. A. Gayakwad, 4th edition, 2000, Prentice Hall.
4. Electronic Principle, Albert Malvino, 2008, Tata Mc-Graw Hill.

DSE: SOLID STATE PHYSICS
(Credits: Theory-04, Practicals-02)
Theory: 40 Lectures-Marks: 70

Prerequisites: Knowledge of Elements of Modern Physics

UNIT-1:

Crystal Structure: Solids-Amorphous and Crystalline Materials. Lattice Translation Vectors. Lattice with a Basis Central and Non-Central Elements. Unit Cell. Miller Indices. Reciprocal Lattice. Types of Lattices. Brillouin Zones. Diffraction of X-rays by Crystals. Bragg's Law. Atomic and Geometrical Factor. (8 Lectures)

Elementary Lattice Dynamics: Lattice Vibrations and Phonons-Linear Monoatomic and Di-atomic Chains. Acoustical and Optical Phonons. Qualitative Description of the Phonon Spectrum in Solids. Dulong and Petits Law, Einstein and Debye theories of specific heat of solids. T₃ law (6 Lectures)

Magnetic Properties of Matter: Dia-, Para-, Ferri- and Ferromagnetic Materials. Classical Langevin Theory of dia and Paramagnetic Domains. Quantum Mechanical Treatment of Paramagnetism. Curie's law, Weiss's Theory of Ferromagnetism and Ferromagnetic Domains. Discussion of B-H Curve. Hysteresis and Energy Loss. (8 Lectures)

UNIT-II

Dielectric Properties of Materials: Polarization. Local Electric Field at an Atom. Depolarization Field. Electric Susceptibility. Polarizability. Clausius-Mosotti Equation. Classical Theory of Electric Polarizability. Normal and Anomalous Dispersion. Cauchy and Sellmeier relations. Langevin-Debye equation. Complex Dielectric Constant. Optical Phenomena. Application: Plasma Oscillations, Plasma Frequency, Plasmons. (6 Lectures)

Elementary band theory: Kronig-Penney model. Band Gaps. Conductors, Semiconductors and insulators. P and N type Semiconductors. Conductivity of Semiconductors, mobility, Hall Effect, Hall coefficient. (6 Lectures)

Superconductivity: Experimental Results. Critical Temperature. Critical magnetic field. Meissner effect. Type I and type II Superconductors, London's Equation and Penetration Depth. Isotope effect. (6 Lectures)

Reference Books:

1. Introduction to Solid State Physics, Charles Kittel, 8th Ed., 2004, Wiley India Pvt. Ltd.
2. Elements of Solid State Physics, J.P. Srivastava, 2nd Ed., 2006, Prentice-Hall of India
3. Introduction to Solids, Leonid V. Azaroff, 2004, Tata Mc-Graw Hill
4. Solid State Physics, N.W. Ashcroft and N.D. Mermin, 1976, Cengage Learning
5. Solid-state Physics, H. Ibach and H. Luth, 2009, Springer
6. Elementary Solid State Physics, 1/e M. Ali Omar, 1999, Pearson India

7. Solid State Physics, M.A. Wahab, 2011, Narosa Publications

DSC LAB: SOLID STATE PHYSICS

20 Classes (2 hrs. duration)-Marks: 30

1. Measurement of susceptibility of paramagnetic solution (Quinck's Tube Method).
2. To measure the Magnetic susceptibility of Solids.
3. To determine the Coupling Coefficient of a Piezoelectric crystal.
4. To measure the Dielectric Constant of a dielectric Materials with frequency.
5. To determine the complex dielectric constant and plasma frequency of metal using Surface Plasmon resonance (SPR).
6. To determine the refractive index of a dielectric layer using SPR.
7. To study the PE Hysteresis loop of a Ferroelectric Crystal.
8. To study the BH curve of iron using a Solenoid and determine the energy loss.
9. To measure the resistivity of a semiconductor (Ge) crystal with temperature by four-probe method (room temperature to 150 oC) and to determine its band gap.
10. To determine the Hall coefficient of a semiconductor sample.

Reference Books:

1. Advanced Practical Physics for students, B.L. Flint and H.T. Worsnop, 1971, Asia Publishing House.
2. Advanced level Physics Practicals, Michael Nelson and Jon M. Ogborn, 4th Edition, reprinted 1985, Heinemann Educational Publishers
3. A Text Book of Practical Physics, I.Prakash & Ramakrishna, 11th Edn., 2011, Kitab Mahal
4. Elements of Solid State Physics, J.P. Srivastava, 2nd Ed., 2006, Prentice-Hall of India

DSE: ELEMENTS OF MODERN PHYSICS

(Credits: Theory-04, Practicals-02)

Theory: 40 Lectures-Marks: 70

UNIT-I

Plancks quantum, Plancks constant and light as a collection of photons; Photoelectric effect and Compton scattering. De Broglie wavelength and matter waves; Davisson-Germer experiment.(6 Lectures)

Problems with Rutherford model-instability of atoms and observation of discrete atomic spectra; Bohr's quantization rule and atomic stability; calculation of energy levels for hydrogen like atoms and their spectra. (4 Lectures)

Position measurement-gamma ray microscope thought experiment; Wave-particle duality, Heisenberg uncertainty principle- impossibility of a particle following a trajectory; Estimating minimum energy of a confined particle using uncertainty principle; Energy-time uncertainty principle. (4 Lectures)

Two slit interference experiment with photons, atoms & particles; linear superposition principle as a consequence; Matter waves and wave amplitude; Schrodinger equation for non-relativistic particles; Momentum and Energy operators; stationary states; physical interpretation of wavefunction, probabilities and normalization; Probability and probability current densities in one dimension. (8 Lectures)

UNIT-II

One dimensional infinitely rigid box-energy eigenvalues and eigenfunctions, normalization; Quantum dot as an example; Quantum mechanical scattering and tunnelling in one dimension - across a step potential and across a rectangular potential barrier. (8 Lectures)

Size and structure of atomic nucleus and its relation with atomic weight; Impossibility of an electron being in nucleus as a consequence of the uncertainty principle. Nature of nuclear force, NZ graph, semi-empirical mass formula and binding energy. (4Lectures)

Radioactivity: stability of nucleus; Law of radioactive decay; Mean life and half-life; α decay; β decay-energy released, spectrum and Pauli's prediction of neutrino; γ -ray emission.(4 Lectures) Fission and fusion-mass deficit, relativity and generation of energy; Fission - nature of fragments and emission of neutrons. Nuclear reactor: slow neutrons interacting with Uranium 235; Fusion and thermonuclear reactions. (2 Lectures)

Reference Books:

1. Concepts of Modern Physics, Arthur Beiser, 2009, McGraw-Hill.
2. Modern Physics, J.R. Taylor, C.D. Zafiratos, M.A. Dubson,2009, PHI Learning
3. Six Ideas that Shaped Physics:Particle Behave like Waves, Thomas A. Moore, 2003, McGraw Hill
4. Quantum Physics, Berkeley Physics,Vol.4. E.H. Wichman, 2008, Tata McGraw-Hill Co.
5. Modern Physics, R.A. Serway, C.J. Moses, and C.A.Moyer, 2005, Cengage Learning

DSC LAB: ELEMENTS OF MODERN PHYSICS

20 Classes (2 hrs. duration)-Marks: 30

1. To determine value of Boltzmann constant using V-I characteristic of PN diode.
2. To determine work function of material of filament of directly heated vacuum diode.
3. To determine the ionization potential of mercury.
4. To determine value of Plancks constant using LEDs of at least 4 different colours.
5. To determine the wavelength of H-alpha emission line of Hydrogen atom.
6. To determine the absorption lines in the rotational spectrum of Iodine vapour.
7. To study the diffraction patterns of single and double slits using laser and measure its intensity variation using Photosensor & compare with incoherent source Na.
8. Photo-electric effect: photo current versus intensity and wavelength of light; maximum energy of photo-electrons versus frequency of light.
9. To determine the value of e/m by (a) Magnetic focusing or (b) Bar magnet.

10. To setup the Millikan oil drop apparatus and determine the charge of an electron.

Reference Books:

1. Advanced Practical Physics for students, B.L. Flint and H.T. Worsnop, 1971, Asia Publishing House.
2. Advanced level Physics Practicals, Michael Nelson and Jon M. Ogborn, 4th Edition, reprinted 1985, Heinemann Educational Publishers
3. A Text Book of Practical Physics, Indu Prakash and Ramakrishna, 11th Edition, 2011, Kitab Mahal, New Delhi.

SKILL ENHANCEMENT COURSE(Four)

(Credit: 02 each)-SEC:1 to SEC:4

1. COMMUNICATIVE ENGLISH & ENGLISH WRITINGSKILL(Compulsory)

(Credits: Theory-02)

2. COMPUTATIONAL PHYSICS

(Credits: Theory-02) Theory:
20 Classes (1 hr. duration)

UNIT-I

Introduction: Importance of computers in Physics, paradigm for solving physics problems for solution. Usage of linux as an Editor. Algorithms and Flowcharts: Algorithm: Definition, properties and development. Flowchart: Concept of flowchart, symbols, guidelines, types. Examples: Cartesian to Spherical Polar Coordinates, Roots of Quadratic Equation, Sum of a finite series.

Scientific Programming: Development of FORTRAN, Basic elements of FORTRAN: Character Set, Constants and their types, Variables and their types, Keywords, Variable Declaration and concept of instruction and program. Fortran Statements: I/O Statements (unformatted/formatted), Executable and Non-Executable Statements, Layout of Fortran Program, Format of writing. (10 Lectures)

UNIT-II

Control Statements: Types of Logic (Sequential, Selection, Repetition), Branching Statements (Logical IF, Arithmetic IF, Block IF, Nested Block IF, SELECT CASE and ELSE IF Ladder statements), DO Loop Statements, Jumping Statements (Unconditional GOTO, Computed GOTO, Assigned GOTO) Subscripted Variables (Arrays: Types of Arrays, DIMENSION Statement, Reading and Writing Arrays), Functions and Subroutines (Arithmetic Statement Function, Function Subprogram and Subroutine), RETURN, CALL Statements), open a file, writing in a file, reading from a file.

Programming:

1. Exercises on syntax on usage of FORTRAN.
2. To print out all natural even/ odd numbers between given limits.
3. To find maximum, minimum and range of a given set of numbers.
4. To find a set of prime numbers and Fibonacci series. (10 Lectures)

Reference Books:

1. Introduction to Numerical Analysis, S.S. Sastry, 5th Edn., 2012, PHI Learning Pvt. Ltd.
2. Computer Programming in Fortran 77. V. Rajaraman (Publisher: PHI).
3. Schaums Outline of Theory and Problems of Programming with Fortran, S Lipsdutz and A Poe, 1986Mc-Graw Hill Book Co.

4. Computational Physics: An Introduction, R. C. Verma, et al. New Age International Publishers, New Delhi(1999).
5. A first course in Numerical Methods, U.M. Ascher and C. Greif, 2012, PHI Learning.
6. Elementary Numerical Analysis, K.E. Atkinson, 3 r d Edn., 2007, Wiley India Edition.

3. BASIC INSTRUMENTATION SKILLS

(Credits: Theory-02) Theory: 20
Classes (1 hr. duration)

This course is to get exposure with various aspects of instruments and their usage through hands-on mode. Experiments listed below are to be done in continuation of the topics.

UNIT-I

Basic of Measurement: Instruments accuracy, precision, sensitivity, resolution range etc. Errors in measurements and loading effects. Multimeter: Principles of measurement of dc voltage and dc current, ac voltage, ac current and resistance. Specifications of a multimeter and their significance.

Electronic Voltmeter: Advantage over conventional multimeter for voltage measurement with respect to input impedance and sensitivity. Principles of voltage, measurement (block diagram only). Specifications of an electronic Voltmeter/ Multimeter and their significance.

AC millivoltmeter: Type of AC millivoltmeters: Amplifier- rectifier, and rectifier- amplifier. Block diagram ac millivoltmeter, specifications and their significance.

Cathode Ray Oscilloscope: Block diagram of basic CRO. Construction of CRT, Electron gun, electrostatic focusing and acceleration (Explanation only no mathematical treatment), brief discussion on screen phosphor, visual persistence & chemical composition. Time base operation, synchronization. Front panel controls. Specifications of a CRO and their significance.

Use of CRO for the measurement of voltage (dc and ac frequency, time period. Special features of dual trace, introduction to digital oscilloscope, probes. Digital storage Oscilloscope: Block diagram and principle of working. (10 Lectures)

UNIT-II

Signal Generators and Analysis Instruments: Block diagram, explanation and specifications of low frequency signal generators. pulse generator, and function generator. Brief idea for testing, specifications. Distortion factor meter, wave analysis.

Digital Instruments: Principle and working of digital meters. Comparison of analog & digital instruments. Characteristics of a digital meter. Working principles of digital voltmeter.

Digital Multimeter: Block diagram and working of a digital multimeter. Working principle of time interval, frequency and period measurement using universal counter/ frequency counter, time- base stability, accuracy and resolution. (10 Lectures)

The test of lab skills will be of the following test items:

1. Use of an oscilloscope.
2. CRO as a versatile measuring device.

3. Circuit tracing of Laboratory electronic equipment.
4. Use of Digital multimeter/VTVM for measuring voltages,
5. Circuit tracing of Laboratory electronic equipment.
6. Winding a coil / transformer.
7. Study the layout of receiver circuit.
8. Trouble shooting a circuit.
9. Balancing of bridges.

Laboratory Exercises:

1. To observe the loading effect of a multimeter while measuring voltage across a low resistance and high resistance.
2. To observe the limitations of a multimeter for measuring high frequency voltage and currents.
3. To measure Q of a coil and its dependence on frequency, using a Q- meter.
4. Measurement of voltage, frequency, time period and phase angle using CRO.
5. Measurement of time period, frequency, average period using universal counter/ frequency counter.
6. Measurement of rise, fall and delay times using a CRO.
7. Measurement of distortion of a RF signal generator using distortion factor meter.
8. Measurement of R, L and C using a LCR bridge/ universal bridge.

Open Ended Experiments:

1. Using a Dual Trace Oscilloscope.
2. Converting the range of a given measuring instrument (voltmeter, ammeter).

Reference Books:

1. A text book in Electrical Technology - B L Theraja - S Chand and Co.
2. Performance and design of AC machines - M G Say ELBS Edn.
3. Digital Circuits and systems, Venugopal, 2011, Tata McGraw Hill.
4. Logic circuit design, Shimon P. Vingron, 2012, Springer.
5. Digital Electronics, Subrata Ghoshal, 2012, Cengage Learning.
6. Electronic Devices and circuits, S. Salivahanan & N. S.Kumar, 3rd Ed., 2012, Tata Mc-Graw Hill.
7. Electronic circuits: Handbook of design and applications, U.Tietze, Ch.Schenk, 2008, Springer.
8. Electronic Devices, 7/e Thomas L. Floyd, 2008, Pearson India.

4. RENEWABLE ENERGY AND ENERGY HARVESTING

(Credits: Theory-02) Theory:
20 Classes (1 hr. duration)

The aim of this course is not just to impart theoretical knowledge to the students but to provide them with exposure and hands-on learning wherever possible.

UNIT-I

Fossil fuels and Alternate Sources of energy: Fossil fuels and nuclear energy, their limitation, need of renewable energy, non-conventional energy sources. An overview of developments in Offshore Wind Energy, Tidal Energy, Wave energy systems, Ocean Thermal Energy Conversion, solar energy, biomass, biochemical conversion, biogas generation, geothermal energy tidal energy, Hydroelectricity.

Solar energy: Solar energy, its importance, storage of solar energy, solar pond, non plate collector, solar distillation, solar cooker, solar green houses, solar cell, absorption air conditioning. Need and characteristics of photovoltaic (PV) systems, PV models and equivalent circuits, and sun tracking systems. (10 Lectures)

UNIT-II

Wind Energy harvesting: Fundamentals of Wind energy, Wind Turbines and different electrical machines in wind turbines, Power electronic interfaces, and grid interconnection topologies.

Ocean Energy: Ocean Energy Potential against Wind and Solar, Wave Characteristics and Statistics, Wave Energy Devices.

Tide characteristics and Statistics, Tide Energy Technologies, Ocean Thermal Energy, Osmotic Power, Ocean Bio-mass.

Geothermal Energy: Geothermal Resources, Geothermal Technologies.

Hydro Energy: Hydropower resources, hydropower technologies, environmental impact of hydro power sources.(10 Lectures)

Reference Books:

1. Non-conventional energy sources - G.D Rai - Khanna Publishers, New Delhi
2. Solar energy - M P Agarwal - S Chand and Co. Ltd.
3. Solar energy - Suhas P Sukhative Tata McGraw - Hill Publishing Company Ltd.
4. Godfrey Boyle, Renewable Energy, Power for a sustainable future, 2004, Oxford University Press, in association with The Open University.
5. Dr. P Jayakumar, Solar Energy: Resource Assesment Handbook, 2009
6. J.Balfour, M.Shaw and S. Jarosek, Photovoltaics, Lawrence J Goodrich (USA).
7. [http://en.wikipedia.org/wiki/Renewable energy](http://en.wikipedia.org/wiki/Renewable_energy).

5. APPLIED OPTICS

(Credits: Theory-02) Theory:

20 Classes (1 hr. duration)

Theory includes only qualitative explanation. Minimum five experiments should be performed covering minimum three sections.

UNIT-I

Sources and Detectors: Lasers, Spontaneous and stimulated emissions, Theory of laser action, Einsteins coefficients, Light amplification, Characterization of laser beam, He-Ne laser, Semiconductor lasers.

Elementary ideas of Fourier Optics: Concept of Spatial frequency filtering, Fourier trans- forming property of a thin lens. (10 Lectures)

UNIT-II

Holography

Basic principle and theory: coherence, resolution, Types of holograms, white light reflection hologram, application of holography in microscopy, interferometry, and character recognition. **Photonics:** Fibre Optics, Optical fibres and their properties, Principal of light propagation through a fibre, The numerical aperture, Attenuation in optical fibre and attenuation limit, Single mode and multimode fibres, Fibre optic sensors: Fibre Bragg Grating. (10 Lectures)

Reference Books:

1. Fundamental of optics, F. A. Jenkins & H. E. White, 1981, Tata McGraw hill.
2. LASERS: Fundamentals & applications, K.Thyagrajan & A.K.Ghatak, 2010, Tata McGraw Hill
3. Fibre optics through experiments, M.R.Shenoy, S.K.Khijwania, et.al. 2009, Viva Books
4. Nonlinear Optics, Robert W. Boyd, (Chapter-I), 2008, Elsevier.
5. Optics, Karl Dieter Moller, Learning by computing with model examples, 2007, Springer.
6. Optical Systems and Processes, Joseph Shamir, 2009, PHI Learning Pvt. Ltd.
7. Optoelectronic Devices and Systems, S.C. Gupta, 2005, PHI Learning Pvt. Ltd.
8. Optical Physics, A.Lipson, S.G.Lipson, H.Lipson, 4th Edn., 1996, Cambridge Univ. Press.

ZOOLOGY(HONOURS)

SEMESTER-I

C:1-DIVERSITY AND EVOLUTION OF NON-CHORDATA (PROTISTA TO PSEUDOCOELOMATES)

(Credits:6, Theory-4, Practical-2) Lectures:
60 (Theory:40, Practical:20) Max.
Marks:100 (Theory:70, Practical:30)

UNIT-I: Kingdom Protista

General characteristics and classification up to classes; Life cycle, pathogenicity and prophylaxis of *Plasmodium vivax*, *Trypanosoma gambiense* and *Entamoeba histolytica*; Locomotion and reproduction in Protista.

UNIT-II: Phylum Porifera and Ctenophora

General characteristics and classification up to classes; Canal system in sponges; General characteristics and evolutionary significance; Evolution of Parazoa and Metazoa.

UNIT-III: Phylum Cnidaria

General characteristics and classification up to classes; Metagenesis in *Obelia*; Polymorphism in Cnidaria; Corals and coral reefs.

UNIT-IV: Phylum Platyhelminthes

General characteristics and classification up to classes; Life cycle, pathogenicity and prophylaxis of *Faciola hepatica* and *Taenia solium*; Parasitic adaptations.

UNIT-V: Phylum Nematelminthes

General characteristics and classification up to classes; Life cycle, pathogenicity and prophylaxis of *Ascaris lumbricoides* and *Wuchereria Bancrofti*; Parasitic adaptations.

Note: Classification to be followed from “ Barnes RD (1982) Invertebrate Zoology; 5th Edition.”

PRACTICAL

Kingdom Protista

1. Morphology of *Paramecium*, Binary fission and Conjugation in *Paramecium*.
2. Life stages of *Plasmodium vivax*, *Trypanosoma gambiense* and *Entamoeba histolytica* (Slides/Microphotographs).
3. Examination of pond water for protists.

Phylum Porifera

4. Study of *Sycon* (including T.S. and L.S.), *Hyalonema*, and *Euplectella*.
5. Temporary mounts of spicules, gemmules and sponging fibres.

Phylum Cnidaria

6. Study of *Obelia*, *Physalia*, *Millepora*, *Aurelia*, *Ephyra* larva, *Tubipora*, *Corallium*, *Alcyonium*, *Gorgonia* and *Metridium* (including T.S. and L.S.).

Phylum Ctenophora

7. Any one specimen/slide.

Phylum Platyhelminthes

8. Study of adult *Fasciola hepatica*, *Taenia solium* and their life stages (Slides/microphotographs).

Phylum Nematelminthes

9. Study of adult *Ascaris lumbricoides*, *Wuchereria bancrofti* and their life stages (Slides/microphotographs).

Note: Classification to be followed from “ Barnes RD (1982) Invertebrate Zoology; 5th Edition.”

Recommended Books:

1. Arora MP (2006) Non-Chordata-I. 1st edition. Himalaya Publishing House, New Delhi.
2. Arora MP (2008) Non-Chordata-II. 1st edition. Himalaya Publishing House, New Delhi.
3. Barnes RD (1982) Invertebrate Zoology. 6th Edition. Holt Saunders International Edition.
4. Barnes RSK, Calow P, Olive PJW, Golding DW & Spicer JI (2002) The Invertebrates: A New Synthesis. 3rd Edition. Blackwell Science, USA.
5. Barrington EJW (1979) Invertebrate Structure and Functions. 2nd Edition. ELBS and Nelson.
6. Boradale LA and Potts EA (1961) Invertebrates: A Manual for the use of Students. Asia Publishing Home.
7. Jordan EL and Verma PS (1963) Invertebrate Zoology. Revised Edition. S. Chand, New Delhi.
8. Mohanty PK (2000) Illustrated Dictionary of Biology. Kalyani Publishers, Ludhiana.

C:2-PERSPECTIVES IN ECOLOGY AND BIOSTATISTICS

(Credits:6, Theory-4, Practical-2) Lectures:

60 (Theory:40, Practical:20) Max.

Marks:100 (Theory:70, Practical:30)

UNIT-I: Introduction to Ecology and Ecosystem

Relevance of studying ecology; History of ecology; Laws of limiting factors; Detailed study of temperature and light as physical factors; Types of ecosystem; Food chain, Detritus and grazing food chains; Food web; Energy flow through the ecosystem; Ecological pyramids.

UNIT-II: Population

Unitary and modular populations; Unique and group attributes of population: Density, natality, mortality, life tables, fecundity tables, survivorship curves, age ratio, sex ratio, dispersal and dispersion; Exponential and logistic growth, equation and patterns, r and K strategies, Population regulation-density-dependent and independent factors; Population interactions, Gause's Principle with laboratory and field examples; Lotka-Volterra equation for competition and Predation, functional and numerical responses.

UNIT-III: Community

Community characteristics: dominance, diversity, species richness, abundance, stratification; Ecotone and edge effect; Ecosystem development (succession) with example and Theories pertaining to climax community; Nutrient and biogeochemical cycle, Nitrogen cycle and Sulphur cycle.

UNIT-IV: Conservation of Biodiversity

Types of biodiversity, its significance, loss of biodiversity; Conservation strategies (in situ and ex situ); Endangered species concept; Role of ZSI, WWF, IUCN; Wildlife (Protection) Act, 1972.

UNIT-V: Biostatistics

Concept, definition and scope of biostatistics, biological data, sampling techniques, measures of central tendency (mean, median and mode), measures of dispersion, hypothesis and testing of hypothesis

(chi square test, t test and Z test), correlation and regression analysis; Data analysis using EXCEL programme.

PRACTICAL

1. Study of life tables and plotting of survivorship curves of different types from the hypothetical/real data provided.
2. Determination of population density in a natural/hypothetical community by quadrat method and calculation of Shannon-Weiner diversity index for the same community.
3. Study of an aquatic ecosystem: fauna and flora Measurement of area, temperature, turbidity/penetration of light, determination of pH, and Dissolved Oxygen content (Winklers method), Chemical Oxygen Demand and free CO₂.
4. Report on a visit to National Park/Biodiversity Park/Wildlife sanctuary.
5. Determination of mean, median, mode and standard deviation of biological data.

Recommended Books

1. Colinvaux PA (1993) Ecology. II Edition. John Wiley and Sons, Inc., USA.
2. Dash MC (1993) Fundamentals of Ecology. McGraw Hill Book Company, New Delhi.
3. Joshi N and Joshi PC (2012) Ecology and Environment. 1st Edition. Himalaya Publishing House, New Delhi.
4. Odum EP (2008) Fundamentals of Ecology. Indian Edition. Brooks/Cole.
5. Ricklefs, R.E., (2000). Ecology. 5th Edition. Chiron Press.
6. Robert Leo Smith Ecology and field biology Harper and Row.
7. Singh JS, Gupta SR and Singh SP (2014) Ecology, Environmental Science and Conservation. S. Chand, New Delhi.
8. Chainy, GBN, Mishra G and Mohanty PK. Basic Biostatistics, Kalyani Publisher.

C:3-DIVERSITY AND EVOLUTION OF NON-CHORDATA (COELOMATE NONCHORDATES)

(Credits:6, Theory-4, Practical-2) Lectures:
60 (Theory:40, Practical:20) Max.
Marks:100 (Theory:70, Practical:30)

UNIT-I: Phylum Annelida

General characteristics and classification up to classes; Evolution of Coelom; Metamerism and Excretion in Annelida.

UNIT-II: Phylum Arthropoda

General characteristics and classification up to classes; Vision in Arthropoda; Respiration in Arthropoda; Moulting in insects, Metamorphosis in insects; Social life in insects (bees and termites) and Larval forms in Crustacea.

UNIT-III: Phylum Onychophora

General characteristics and evolutionary significance and affinities of Peripatus.

UNIT-IV: Phylum Mollusca

General characteristics and classification up to classes; Respiration in Mollusca; Torsion and detorsion in Gastropoda; Pearl formation in bivalves and Evolutionary significance of trochophore larva.

UNIT-V: Phylum Echinodermata

General characteristics and classification up to classes; Water-vascular system in Asterozoa; Larval forms in Echinodermata and Evolutionary significance (Affinities with Chordates).

Note: Classification to be followed from “ Barnes, R.D. (1982). Invertebrate Zoology, 5th Edition, Holt Saunders International Edition.”

PRACTICAL

Phylum Annelida

1. Study of Aphrodite, Nereis, Sabella, Terebella, Serpula, Chaetopterus, Pheretima and Hirudinaria.
2. T.S. through pharynx, gizzard, and typhlosolar intestine of earthworm.
3. T.S. through crop of leech.

Phylum Arthropoda

4. Study of Limulus, Palamnaeus, Palaemon, Daphnia, Balanus, Sacculina, Cancer, Eupagurus, Scolopendra, Julus, termite, louse, honeybee, silk moth, wasp and dragon fly. **Phylum Onychophora**
5. Any one specimen/slide.

Phylum Mollusca

6. Study of Chiton, Dentalium, Pila, Doris, Helix, Unio, Ostrea, Mytilus, Loligo, Sepia, Octopus and Nautilus and Cypraea (cowrie).

Phylum Echinodermata

7. Study of echinoderm larvae.
8. Study of Pentaceros, Asterias, Ophiura, Clypeaster, Echinus, Echinocardium, Cucumaria and Antedon.

Note: Classification to be followed from “ Barnes, R.D. (1982). Invertebrate Zoology, 5th Edition, Holt Saunders International Edition.”

Recommended books

1. Arora MP (2006) Non-Chordata-I. 1st edition. Himalaya Publishing House, New Delhi.
2. Arora MP (2008) Non-Chordata-II. 1st edition. Himalaya Publishing House, New Delhi.
3. Barnes RD (1982) Invertebrate Zoology. 6th Edition. Holt Saunders International Edition.
4. Barnes RSK, Calow P, Olive PJW, Golding DW & Spicer JI (2002) The Invertebrates: A New Synthesis. 3rd Edition. Blackwell Science, USA.
5. Barrington EJW (1979) Invertebrate Structure and Functions. 2nd Edition. ELBS and Nelson.
6. Boradale LA and Potts EA (1961) Invertebrates: A Manual for the use of Students. Asia Publishing Home.
7. Jordan EL and Verma PS (1963) Invertebrate Zoology. Revised Edition. S. Chand, New Delhi.
8. Mohanty PK (2000) Illustrated Dictionary of Biology. Kalyani Publishers, Ludhiana.

C:4-PHYSIOLOGY: LIFE SUSTAINING SYSTEMS

(Credits:6, Theory-4, Practical-2) Lectures:
60 (Theory:40, Practical:20) Max.
Marks:100 (Theory:70, Practical:30)

UNIT-I: Digestive System

Structural organization, histology and functions of gastrointestinal tract and its associated glands; Mechanical and chemical digestion of food; Absorptions of carbohydrates, lipids, proteins, water, minerals and vitamins; Role of gastrointestinal hormones on the secretion and control of enzymes of gastrointestinal tract.

UNIT-II: Respiratory System

Histology of trachea and lung; Mechanism of respiration, Pulmonary ventilation; Respiratory volume and capacity; Transport of oxygen in the blood; Oxygen- hemoglobin and myoglobin, dissociation curve and the factors influencing it; Carbon monoxide poisoning; Carbon dioxide transport in the blood; buffering action of blood and haemoglobin and Control of respiration.

UNIT-III: Excretory System

Structure of kidney and its histological details; Renal blood supply; Mechanism of urine formation and its regulation and Regulation of acid-base balance.

UNIT-IV: Blood

Components of blood and their functions; Structure and functions of haemoglobin; Haemopoiesis; Haemostasis, Coagulation of blood and Disorders of blood.

UNIT-V: Heart

Structure of heart; Coronary circulation; Structure of conducting and working of myocardial fibers; Origin and conduction of cardiac impulses functions of AV node; Cardiac cycle; Cardiac output and its regulation-Frank-Starling Law of the heart; Nervous and chemical regulation of heart rate; Blood pressure and its regulation and Electrocardiogram.

PRACTICAL

1. Enumeration of red blood cells using haemocytometer.
2. Estimation of haemoglobin using Sahli's haemoglobinometer.
3. Preparation of haemin and haemochromogen crystals.
4. Recording of blood pressure using a Sphygmomanometer.
5. Examination of sections of mammalian oesophagus, stomach, duodenum, ileum, rectum liver, trachea, lung and kidney.

Recommended Books

1. Arey LB (1974) Human Histology. 4th Edition. W.B. Saunders, USA.
2. Chatterjee CC (2008) Human Physiology. Vol. I and II. Medical Allied Agency, Kolkata.
3. Guyton AC and Hall JE (2006) Textbook of Medical Physiology. 9th Edition. W.B. Saunders Company, Philadelphia.
4. Tortora GJ and Derrickson B (2012) Principles of Anatomy & Physiology. 13th Edition John Wiley and sons, USA.
5. Victor PE (2008) diFiores Atlas of Histology with Functional Correlations. 12th Edition, Lippincott W. & Wilkins, USA.

C:5-DIVERSITY AND DISTRIBUTION OF CHORDATA

(Credits:6, Theory-4, Practical-2) Lectures:
60 (Theory:40, Practical:20) Max.
Marks:100 (Theory:70, Practical:30)

UNIT-I: Protochordata and Origin of Chordates

General characters of Hemichordata, Urochordata and Cephalochordata; Study of larval forms in protochordates; Retrogressive metamorphosis in Urochordata; Dipleurula concept and the Echinoderm theory of origin of chordates.

UNIT-II: Introduction to Vertebrata and Agnatha

Advanced features of vertebrates over Protochordata; General characters and classification of cyclostomes up to class; Structural peculiarities and affinities of Petromyzon and Myxine.

UNIT-III: Pisces and Amphibia

General characters of Chondrichthyes and Osteichthyes and classification up to order; Migration; Osmoregulation and Parental care in fishes; Scales in fishes; Origin of Tetrapoda (Evolution of terrestrial ectotherms); General characters and classification up to order and Parental care in Amphibians.

UNIT-IV: Reptilia and Aves

General characters and classification up to order; Skull in Reptilia; Affinities of Sphenodon; Poison apparatus and Biting mechanism in snakes; General characters and classification up to order; Principles and aerodynamics of flight, Flight adaptations; Archaeopteryx- a connecting link and Migration in birds.

UNIT-V: Mammals and Zoogeography

General characters and classification up to order; Affinities of Prototheria and Metatheria; Dentition in mammals; Adaptive radiation with reference to locomotory appendages; Zoogeographical realms; Theories pertaining to distribution of animals and Distribution of vertebrates in different realms.

PRACTICAL

Protochordata

1. Balanoglossus, Herdmania, Branchiostoma and Colonial Urochordata.
2. Sections of Balanoglossus through proboscis and branchiogenital regions.
3. Sections of Amphioxus through pharyngeal, intestinal and caudal regions.
4. Permanent slide of spicules of Herdmania.

Agnatha

5. Petromyzon and Myxine.

Fishes

6. Sphyrna, Pristis, Trygon, Torpedo, Chimaera, Notopterus, Mystus, Heteropneustes, Hippocampus, Exocoetus, Echeneis, Anguilla, Tetradon, Diodon, Anabas and Flat fish.

Amphibia

7. Ichthyophis/Ureotyphlus, Necturus, Duttaphrynus, Polypedates, Hyla, Alytes and Salamandra.

Reptiles

8. Chelone, Trionyx, Hemidactylus, Varanus, Uromastix, Chamaeleon, Draco, Ophiosaurus, Bungarus, Vipera, Naja, Hydrophis, Zamenis and Crocodylus.
9. Key for Identification of poisonous and non-poisonous snakes.

Aves

10. Study of six common birds from different orders.
11. Types of beaks and claws.
12. Types of feathers.

Mammalia

13. Sorex, Bat (Insectivorous and Frugivorous), Funambulus, Loris, Herpestes and Hemiechenis.

Recommended Books

1. Agarwal VK (2011) Zoology for degree students. S. Chand, New Delhi.
2. Arora MP (2006) Chordata-1. 1st Edition. Himalaya Publishing House, New Delhi.
3. Hall BK and Hallgrímsson B (2008) Strickberger's Evolution. 4th Edition. Jones and Bartlett Publishers Inc., USA.
4. Jordan EL and Verma PS (1963) Chordate Zoology. Revised Edition. S. Chand, New Delhi.
5. Young JZ (2004) The Life of Vertebrates. 3rd Edition. Oxford University Press, USA.

C:6-PHYSIOLOGY CONTROLLING AND COORDINATING SYSTEM

(Credits:6, Theory-4, Practical-2) Lectures:

60 (Theory:40, Practical:20) Max.

Marks:100 (Theory:70, Practical:30)

UNIT-I: Tissues and Glands, Bone and cartilage

Structure, location, function and classification of Epithelial tissue, Connective tissue, Muscular tissue, Nervous tissue; Types of glands and their functions; Structure and types of bones and cartilages; Ossification, bone growth and resorption.

UNIT-II: Nervous System

Structure of neuron, resting membrane potential; Origin of action potential and its propagation across the myelinated and unmyelinated nerve fibers; types of synapses, Synaptic transmission; Neuromuscular junction; Reflex action and its types, Reflex arc and Physiology of hearing and vision.

UNIT-III: Muscle

Histology of different types of muscle; Ultra structure of skeletal muscle; Molecular and chemical basis of muscle contraction; Characteristics of muscle twitch; Motor Unit, summation and tetanus.

UNIT-IV: Reproductive System

Histology of male and female reproductive systems; Puberty; Physiology of reproduction of male and female; Methods of contraception (depicted through flow chart).

UNIT-V: Endocrine System

Functional Histology of endocrine glands – pineal, pituitary, thyroid, parathyroid, thymus, pancreas, adrenals; Hormones secreted by them and their mechanism of action; Gonadal hormones; Classification of hormones; Regulation of their secretion; Mode of hormone action; Signal transduction pathways utilized by steroidal and non-steroidal hormones; Hypothalamus (neuroendocrine gland), principal nuclei involved in neuroendocrine control of anterior pituitary and endocrine system and Placental hormones.

PRACTICAL

1. Demonstration of the unconditioned reflex action (Deep tendon reflex such as knee jerk reflex).
2. Preparation of temporary mounts: Squamous epithelium, Striated muscle fibres and nerve cells.
3. Examination of sections of mammalian skin, Cartilage, Bone, Spinal cord, Nerve cell, Pituitary, Pancreas, Testis, Ovary, Adrenal, Thyroid and Parathyroid.

Recommended Books

1. Arey LB (1974) Human Histology. 4th Edition. W.B. Saunders, USA.

- Chatterjee CC (2008) Human Physiology. Vol. I and II. Medical Allied Agency, Kolkata.
- Guyton AC and Hall JE (2006) Textbook of Medical Physiology. 9th Edition. W.B. Saunders Company, Philadelphia.
- Tortora GJ and Derrickson B (2012) Principles of Anatomy & Physiology. 13th Edition John Wiley and sons, USA.
- Victor PE (2008) diFiore Atlas of Histology with Functional Correlations. 12th Edition, Lippincott W. and Wilkins, USA.

C:7-COMPARATIVE ANATOMY OF VERTEBRATES

(Credits:6, Theory-4, Practical-2) Lectures:

60 (Theory:40, Practical:20) Max.

Marks:100 (Theory:70, Practical:30)

UNIT-I: Integumentary System and Skeletal System

Structure, functions and derivatives of integument; Axial and appendicular skeletons; Jaw suspension in vertebrates.

UNIT-II: Digestive and Respiratory System

Alimentary canal and associated glands; Skin, gills, lungs and air sacs and Accessory respiratory organs in fishes.

UNIT-III: Circulatory System

General plan of circulation; Evolution of heart and aortic arches.

UNIT-IV: Urinogenital System

Succession of kidney; Evolution of urinogenital ducts and Types of mammalian uteri.

UNIT-V: Nervous System and Sense Organs

Comparative account of brain; Autonomic nervous system; Spinal Nerves; Spinal cord; Cranial nerves in Mammals; Classification of receptors; visual receptors, chemoreceptors and mechanoreceptors.

PRACTICAL

- Study of placoid, cycloid and ctenoid scales through permanent slides/photographs.
- Disarticulated skeleton of Frog, Varanus, Fowl and Rabbit.
- Carapace and plastron of turtle or tortoise.
- Mammalian skulls (One herbivorous and one carnivorous animal).

Recommended Books

- Hilderbrand M and Gaslow GE. Analysis of Vertebrate Structure. John Wiley and Sons., USA.
- Kardong KV (2005) Vertebrates Comparative Anatomy, Function and Evolution. 4th Edition. McGraw-Hill Higher Education, New York.
- Kent GC and Carr RK (2000) Comparative Anatomy of the Vertebrates. 9th Edition. The McGraw-Hill Companies, New York.
- Weichert CK and William Presch (1970) Elements of Chordate Anatomy. Tata McGraw Hill, New York.

C:8-BIOCHEMISTRY OF METABOLIC PROCESSES

(Credits:6, Theory-4, Practical-2) Lectures:
60 (Theory:40, Practical:20) Max.
Marks:100 (Theory:70, Practical:30)

UNIT-I: Biomolecules

Structures and properties of important mono-, di- and polysaccharides; Fatty acids, triglycerides and steroids; and amino acids and proteins.

UNIT-II: Carbohydrate Metabolism

Glycolysis; Citric acid cycle; pentose phosphate pathway; Gluconeogenesis; Shuttle systems (Malate-aspartate shuttle, Glycerol 3-phosphate shuttle); Glycogenolysis; Glycogenesis.

UNIT-III: Lipid Metabolism

β -oxidation of saturated fatty acids with even and odd number of carbon atoms; Biosynthesis of palmitic acid and Ketogenesis and its regulation.

UNIT-IV: Protein Metabolism

Catabolism of amino acids: Transamination, Deamination; Urea cycle; Fate of C-skeleton of Glucogenic and Ketogenic amino acids.

UNIT-V: Enzymes and Oxidative Phosphorylation

Kinetics and Mechanism of action of enzymes; Inhibition of enzyme action; Allosteric enzymes; Oxidative phosphorylation in mitochondria; Respiratory chain, ATP synthase, Inhibitors and Uncouplers.

PRACTICAL

1. Identification of unknown carbohydrates in given solutions (Starch, Sucrose, Lactose, Galactose, Glucose, Fructose).
2. Colour tests of functional groups in protein solutions.
3. Action of salivary amylase under optimum conditions.
4. Effect of pH on the action of salivary amylase.
5. Effect of temperature on the action of salivary amylase.
6. Estimation of total protein in given solutions by Lowrys method.

Recommended Books

1. Berg JM, Tymoczko JL and Stryer L (2007) Biochemistry. 6th Edition, W.H. Freeman and Co., New York.
2. Cox MM and Nelson DL (2008) Lehninger Principles of Biochemistry. 5th Edition. W.H. Freeman and Co., New York.
3. Devesena T (2014) Enzymology. 2nd Edition. Oxford University Press, UK.
4. Hames BD and Hooper NM (2000) Instant Notes in Biochemistry. 2nd Edition. BIOS Scientific Publishers Ltd., U.K.
5. Murray RK, Bender DA, Botham KM, Kennelly PJ, Rodwell VW and Well PA (2009) Harpers Illustrated Biochemistry. 28th Edition. International Edition. The McGraw-Hill Companies Inc., New York.

C:9-CELL BIOLOGY

(Credits:6, Theory-4, Practical-2) Lectures:
60 (Theory:40, Practical:20) Max.
Marks:100 (Theory:70, Practical:30)

UNIT-I: Cells and Plasma Membrane

Prokaryotic and Eukaryotic cells; Mycoplasma; Virus, Viroids, Virions and Prions; Various models

of plasma membrane; Transport across membranes; Cell junctions: Occluding junctions (Tight junctions), Anchoring junctions (desmosomes), Communicating junctions (gap junctions) and Plasmodesmata.

UNIT-II: Endomembrane System, Mitochondria and Peroxisomes

The Endoplasmic Reticulum; Golgi apparatus; Mechanism of vesicular transport; Lysosomes; Structure and function of mitochondria: Chemi-osmotic hypothesis; Semiautonomous nature of mitochondria; Endosymbiotic hypothesis and Peroxisomes.

UNIT-III: Cytoskeleton and Nucleus

Structure and functions of intermediate filament, microtubules and microfilaments; Ultra structure of nucleus; Nuclear envelope: Structure of nuclear pore complex; Chromosomal DNA and its packaging; Structure and function of Nucleolus.

UNIT-IV: Cell Cycle and Cell Signaling

Cell cycle, Regulation of cell cycle; Signaling molecules and their receptors.

UNIT-V: Apoptosis and Cancer

Extrinsic (Death Receptor) Pathway and Intrinsic (Mitochondrial) Pathway; Growth and development of tumors and Metastasis.

PRACTICAL

1. Gram's staining technique for visualization of prokaryotic cells.
2. Study various stages of mitosis from permanent slides.
3. Study various stages of meiosis from permanent slides.
4. Study the presence of Barr body in human female blood cells/cheek cells. (Preparation of permanent slides).
5. Cytochemical demonstration (Preparation of permanent slides).
 - (i) DNA by Feulgen reaction.
 - (ii) Mucopolysaccharides by PAS reaction.
 - (iii) Proteins by Mercurobromophenol blue.
 - (iv) DNA and RNA by Methyl Green Pyronin.

(In practical examination, 05 marks should be of permanent slide submission; one mark each for DNA, PAS, Proteins, MGP and Barr body slide.)

Recommended Books

1. Becker WM, Kleinsmith LJ, Hardin J and Bertoni G P (2009) The World of the Cell. 7th Edition. Pearson Benjamin Cummings Publishing, San Francisco.
2. Bruce Albert, Bray Dennis, Levis Julian, Raff Martin, Roberts Keith and Watson James (2008) Molecular Biology of the Cell. 5th Edition. Garland publishing Inc., New York.
3. Cooper GM and Hausman RE (2009) The Cell: A Molecular Approach. 5th Edition. ASM Press, Washington D.C.
4. De Robertis EDP and De Robertis EMF (2006) Cell and Molecular Biology. 8th Edition. Lippincott Williams and Wilkins, Philadelphia.
5. Karp G (2010) Cell and Molecular Biology: Concepts and Experiments. 6th Edition. John Wiley and Sons. Inc., USA.

C:10-PRINCIPLES OF GENETICS

(Credits:6, Theory-4, Practical-2) Lectures:
60 (Theory:40, Practical:20) Max.
Marks:100 (Theory:70, Practical:30)

UNIT-I: Mendelian Genetics and its Extension

Principles of inheritance; Incomplete dominance and co-dominance; Multiple alleles, Lethal alleles; Epistasis; Pleiotropy; Sex-linked inheritance.

UNIT-II: Linkage, Crossing Over and Chromosomal Mapping

Linkage and crossing over; Cytological basis of crossing over; Molecular mechanisms of crossing over; Recombination frequency as a measure of linkage intensity; Two factor and three factor crosses; Interference and coincidence and Somatic cell hybridization.

UNIT-III: Mutations

Gene mutations; Chromosomal mutations: Deletion, duplication, inversion, translocation; Aneuploidy and polyploidy; Induced versus spontaneous mutations; Backward and forward mutations; Suppressor mutations; Molecular basis of mutations in relation to UV light and chemical mutagens; Detection of mutations: CLB method, attached X method and DNA repair mechanisms.

UNIT-IV: Sex Determination and Quantitative Genetics

Chromosomal mechanisms of sex determination; Sex-linked, sex-influenced and sex limited characters; Polygenic inheritance and Transgressive variation.

UNIT-V: Extra-chromosomal Inheritance

Criteria for extra-chromosomal inheritance; Antibiotic resistance in Chlamydomonas; Mitochondrial mutations and Maternal effects.

PRACICAL

1. To study the Mendelian laws and gene interactions and their verification by Chi square analyses using seeds/beads/Drosophila.
2. Identification of various mutants of Drosophila.
3. To calculate allelic frequencies by Hardy-Weinberg Law.
4. Linkage maps based on data from crosses of Drosophila.
5. Study of human karyotype (normal and abnormal).
6. Pedigree analysis of some human inherited traits.
7. Preparation of polytene chromosomes from larva of Chironomous/Drosophila.
8. To study mutagenicity in Salmonella/E. coli by Ames test.

Recommended Books

1. Gardner EJ, Simmons MJ, Snustad DP (2008) Principles of Genetics. 8th Edition. Wiley India.
2. Griffiths AJF, Wessler SR, Lewontin RC and Carroll SB. Introduction to Genetic Analysis. 9th Edition. W. H. Freeman and Co., NewYork.
3. Klug WS, Cummings MR, Spencer CA and Palladino MA (2012) Concepts of Genetics. 10th Edition. Pearson Education, Inc., USA.
4. Russell PJ (2009) Genetics- A Molecular Approach. 3rd Edition. Benjamin Cummings, USA.
5. Snustad DP and Simmons MJ (2012) Principles of Genetics. 6th Edition. John Wiley and Sons Inc., USA.
6. Verma PS and AgarwalVK (2010) Genetics. 9th Edition. S. Chand, New Delhi.

C:11-DEVELOPMENTAL BIOLOGY

(Credits:6, Theory-4, Practical-2) Lectures:
60 (Theory:40, Practical:20) Max.
Marks:100 (Theory:70, Practical:30)

UNIT-I: Introduction

History and basic concepts: Epigenesis, preformation, Mosaic and regulative development; Discovery of induction; Cell-Cell interaction; Pattern formation; Differentiation and growth; Differential gene expression; Cytoplasmic determinants and asymmetric cell division.

UNIT-II: Early Embryonic Development

Gametogenesis (Spermatogenesis, Oogenesis); Types of eggs; Egg membranes; Fertilization: Changes in gametes, monospermy and polyspermy; Planes and patterns of cleavage; Early development of frog and chick up to gastrulation; Fate maps; Embryonic induction and organizers.

UNIT-III: Late Embryonic Development

Fate of germ layers; Extra-embryonic membranes in birds; Implantation of embryo in humans and Placenta (Structure, types and functions of placenta).

UNIT-IV: Post Embryonic Development

Metamorphosis: Changes, hormonal regulations in amphibians; Regeneration: Modes of regeneration (epimorphosis, morphallaxis and compensatory regeneration); Ageing: Concepts and models.

UNIT-V: Implications of Developmental Biology

Teratogenesis: Teratogenic agents and their effects on embryonic development; *in vitro* Fertilization; Stem cell culture and Amniocentesis.

PRACTICAL

1. Study of whole mounts and sections of developmental stages of frog through permanent slides: Cleavage stages, blastula, gastrula, neurula, tail-bud stage, tadpole (external and internal gill stages).
2. Study of whole mounts of developmental stages of chick through permanent slides: Primitive streak (13 and 18 hours), 21, 24, 28, 33, 36, 48, 72, and 96 hours of incubation (Hamilton and Hamburger stages).
3. Study of developmental stages (above mentioned) by raising chick embryo in the laboratory.
4. Study of the developmental stages and life cycle of *Drosophila* from stock culture.
5. Study of different types of placenta.
6. Project report on *Drosophila* culture/chick embryo development.

Recommended Books

1. Balinsky BI and Fabian BC (1981) An Introduction to Embryology. 5th Edition. International Thompson Computer Press.
2. Gilbert SF (2010) Developmental Biology. 9th Edition. Sinauer Associates, Inc., USA.
3. Kalthoff (2008) Analysis of Biological Development. 2nd Edition. McGraw-Hill, New York.
4. Wolpert L, Beddington R, Jessell T, Lawrence P, Meyerowitz E and Smith J (2002) Principles of Development. 1st Edition, Oxford University Press, New York.

C:12-MOLECULAR BIOLOGY

(Credits:6, Theory-4, Practical-2)

Lectures: 60 (Theory:40, Practical:20)

Max. Marks:100 (Theory:70, Practical:30)

UNIT-I: Nucleic Acids and DNA Replication

Salient features of DNA double helix; Watson and Crick model of DNA; DNA denaturation and renaturation; DNA topology - linking number and DNA topoisomerases; Cot curves; Structure of RNA, tRNA and DNA and RNA associated proteins; DNA Replication in prokaryotes and eukaryotes; Mechanism of DNA replication; Role of proteins and enzymes in replication; Licensing factors; Semiconservative, bidirectional and semi-discontinuous replication; RNA priming; Replication of circular and linear ds-DNA and replication of telomeres.

UNIT-II: Transcription

RNA polymerase and transcription Unit; Mechanism of transcription in prokaryotes and Eukaryotes; Synthesis of rRNA and mRNA; Transcription factors and regulation of transcription.

UNIT-III: Translation

Genetic code, Degeneracy of the genetic code and Wobble Hypothesis; Process of protein synthesis in prokaryotes: Ribosome structure and assembly in prokaryotes, fidelity of protein synthesis, aminoacyl tRNA synthetases and charging of tRNA; Proteins involved in initiation, elongation and termination of polypeptide chain; Inhibitors of protein synthesis; Difference between prokaryotic and eukaryotic translation.

UNIT-IV: Post Transcriptional Modifications and Processing of Eukaryotic RNA Structure of globin mRNA; Split genes: concept of introns and exons, splicing mechanism, alternative splicing, exon shuffling, and RNA editing.

UNIT-V: Gene Regulation and Regulatory RNAs

Transcription regulation in prokaryotes: Principles of transcriptional regulation with examples from lac operon and trp operon; Transcription regulation in eukaryotes: Activators, repressors, enhancers, silencers elements; Gene silencing, Genetic imprinting; Ribo-switches, RNA interference, miRNA and siRNA.

PRACTICAL

1. Study of DNA replication using Photographs or slides and special cases, e.g., Polytenyusing permanent slides of polytene chromosomes.
2. Preparation of liquid culture medium (LB) and raise culture of *E. coli*.
3. Estimation of the growth kinetics of *E. coli* by turbidity method.
4. Preparation of solid culture medium (LB) and growth of *E. coli* by spreading and streaking.
5. Demonstration of antibiotic sensitivity/resistance of *E. coli* to antibiotic pressure and interpretation of results.
6. Quantitative estimation of salmon sperm/calf thymus DNA using colorimeter (Diphenylamine reagent) or spectrophotometer (A260 measurement).
7. Quantitative estimation of RNA using Orcinol reaction.

Recommended Books

1. Becker WM, Kleinsmith LJ, Hardin J and Bertoni GP (2009) The World of the Cell. 7th Edition. Pearson Benjamin Cummings Publishing, San Francisco.
2. Bruce Alberts, Alexander Johnson, Julian Lewis, Martin Raff, Keith Roberts, Peter Walter (2008) Molecular Biology of the Cell, 4th Edition. Garland publishing Inc., New York.
3. Cooper GM and Hausman RE (2007) The Cell: A Molecular Approach. 4th Edition, ASM Press, USA.
4. De Robertis EDP and De Robertis EMF (2006) Cell and Molecular Biology. 8th Edition; Lippincott Williams and Wilkins, Philadelphia.

5. Karp G (2010) Cell and Molecular Biology: Concepts and Experiments. 6th Edition; John Wiley and Sons. Inc., USA.

C:13-IMMUNOLOGY

(Credits:6, Theory-4, Practical-2) Lectures:
60 (Theory:40, Practical:20) Max.
Marks:100 (Theory:70, Practical:30)

UNIT-I: Immune System and Immunity

Historical perspective of Immunology, Early theories of Immunology, Haematopoiesis, Cells and organs of the Immune system; Anatomical barriers, Inflammation, Cell and molecules involved in innate immunity, Adaptive immunity (Cell mediated and humoral), Passive: Artificial and natural Immunity, Active: Artificial and natural Immunity and Immune dysfunctions.

UNIT-II: Antigens

Antigenicity and immunogenicity, Immunogens, Adjuvants and haptens, Factors influencing immunogenicity, B and T -Cell epitopes.

UNIT-III: Immunoglobulins

Structure and functions of different classes of immunoglobulins, Antigen-antibody interactions, Immunoassays, Polyclonal sera, Monoclonal antibodies and Hybridoma technology.

UNIT-IV: Major Histocompatibility Complex and Complement System

Structure and functions of endogenous and exogenous pathway of antigen presentation; Components and pathways of complement activation.

UNIT-V: Cytokines, Hypersensitivity and Vaccines

Properties and functions of cytokines; Cytokine-based therapies; Gell and Coombs classification and Brief description of various types of hypersensitivities; Types of vaccines: Recombinant vaccines and DNA vaccines.

PARCTICAL

1. Demonstration of lymphoid organs.
2. Ouchterlony's double immuno-diffusion method.
3. Determination of ABO blood group.
4. Preparation of single cell suspension of splenocytes from chick spleen, cell counting and viability test.
5. ELISA/ dot Elisa (using kit).
6. Principles, experimental set up and applications of immuno-electrophoresis, RIA, F.

Recommended Books

1. Abbas KA and Lichtman HA (2003) Cellular and Molecular Immunology. 5th Edition. Saunders Publication, Philadelphia.
2. David M, Jonathan B, David RB and Ivan R (2006) Immunology. 7th Edition. Elsevier Publication, USA .
3. Kindt TJ, Goldsby RA, Osborne BA and Kuby J (2006) Immunology. 6th Edition. W.H. Freeman and Company, New York.

C:14-EVOLUTIONARY BIOLOGY

(Credits:6, Theory-4, Practical-2) Lectures:
60 (Theory:40, Practical:20) Max.
Marks:100 (Theory:70, Practical:30)

UNIT-I: History of Life, theories of Evolution and Extinction

Chemogeny, Biogeny, RNA World, Major Events in History of Life; Lamarckism; Darwinism; Neo-Darwinism; Background of extinction, Mass extinction (Causes, Names of five major extinctions, K-T extinction in detail) and Role of extinction in evolution.

UNIT-II: Evidences of Evolution

Fossils and its types; Dating of fossils, Phylogeny of horse and human; Molecular evidences (Globin gene families as an example) and Molecular clock concept.

UNIT-III: Processes of Evolutionary Change

Organic variations; Isolating mechanisms; Natural selection (Industrial melanism, Pesticide/Antibiotic resistance); Types of natural selection (Directional, Stabilizing, Disruptive), Sexual Selection and Artificial selection.

UNIT-IV: Principles of population genetics

Concept of gene pool, Gene frequencies equilibrium frequency (Hardy-Weinberg equilibrium), Shift in gene frequency without selection Genetic drift, Mutation pressure and Gene flow and Shifts in gene frequencies with selection.

UNIT-V: Species Concept and Evolution above species level

Biological concept of species (Advantages and Limitations); Sibling species, Polymorphic species, Polytypic species, Ring species; Modes of speciation (Allopatric, Sympatric); Macro-evolutionary Principles (Darwins Finches); Convergence, Divergence and Parallelism.

PRACTICAL

1. Study of fossil evidences from plaster cast models and pictures.
2. Study of homology and analogy from suitable specimens/ pictures.
3. Demonstration of changing allele frequencies with and without selection.
4. Construction of cladogram based on morphological characteristics.
5. Construction of phylogenetic tree with bioinformatics tools (Clustal X and Phylip).
6. Interpretation of phylogenetic trees.

Recommended Books

1. Barton NH, Briggs DEG, Eisen JA, Goldstein DB and Patel NH (2007) Evolution. Cold Spring Harbour Laboratory Press.
2. Campbell NA and Reece JB (2011) Biology. 9th Edition. Pearson Education Inc., NewYork.
3. Douglas JF (1997) Evolutionary Biology. Sinauer Associates,USA.
4. Hall BK and Hallgrimsson B (2008) Evolution. 4th Edition. Jones and Bartlett Publishers,USA.
5. Pevsner J (2009) Bioinformatics and Functional Genomics. 2nd Edition. Wiley-Blackwell, USA.
6. Ridley M (2004) Evolution. 3rd Edition. Blackwell Publishing, USA.

DISCIPLINE SPECIFIC ELECTIVE

DSE:1-ANIMAL BEHAVIOUR

(Credits:6, Theory-4, Practical-2) Lectures:
60 (Theory:40, Practical:20) Max.
Marks:100 (Theory:70, Practical:30)

UNIT-I: Introduction and Mechanisms of Behaviour

Origin and history of Ethology; Brief profiles of Karl von Frisch, Ivan Pavlov, Konrad Lorenz, Niko Tinbergen; Proximate and ultimate behavior; Objective of behaviour, Behaviour as a basis of evolution; Behaviour as a discipline of science; Innate behaviour, Instinct, Stimulus filtering, Sign stimuli and Code breakers.

UNIT-II: Patterns of Behaviour

Reflexes: Types of reflexes, reflex path, characteristics of reflexes (latency, after discharge, summation, fatigue, inhibition) and its comparison with complex behavior.

Orientation: Primary and secondary orientation; kinesis-orthokinesis, klinokinesis; taxistropotaxis and klinotaxis and menotaxis (light compass orientation) and mnemotaxis.

Learning: Associative learning, classical and operant conditioning, Habituation and Imprinting.

UNIT-III: Social Behaviour

Insects society; Honey bee: Society organization, polyethism, foraging, round dance, waggledance, Experiments to prove distance and direction component of dance, learning ability in honey bee, formation of new hive/queen; Reciprocal altruism, Hamiltons rule and inclusive fitness with suitable examples.

UNIT-IV: Sexual Behaviour

Asymmetry of sex, Sexual dimorphism, Mate choice, Intra-sexual selection (male rivalry), Inter-sexual selection (female choice), Infanticide, Consequences of mate choice for female fitness, Sexual conflict for male versus female parental care and Courtship behaviour in three spine stickleback.

UNIT-V: Biological Clocks

Circadian rhythm, Tidal rhythm, Lunar rhythm, Advantages of biological clocks, Jet lag and Entrainment.

PRACTICAL

1. To study different types of animal behaviour such as habituation, social life, courtship behaviour in insects, and parental care from short videos/movies and prepare a short report.
2. To study nests and nesting habits of the birds and social insects.
3. To study the behavioural responses of wood lice to dry condition.
4. To study behavioural responses of wood lice in response to humid condition.
5. To study geotaxis behaviour in earthworm.
6. To study the phototaxis behaviour in insect larvae.
7. Visit to Forest/ Wild life Sanctuary/Biodiversity Park/Zoological Park to study behavioural activities of animals and prepare a short report.

Recommended Books

1. David McF. Animal Behaviour. Pitman Publishing Limited, London, UK.
2. John A (2001) Animal Behaviour. 7th Edition. Sinauer Associate Inc., USA.
3. Manning A and Dawkins MS. An Introduction to Animal Behaviour. Cambridge University Press, USA.
4. Paul WS and John A (2013) Exploring Animal Behaviour. 6th Edition. Sinauer Associate Inc., Massachusetts, USA.

DSE:2-ECONOMIC ZOOLOGY

(Credits:6, Theory-4, Practical-2) Lectures:
60 (Theory:40, Practical:20) Max.
Marks:100 (Theory:70, Practical:30)

UNIT-I: Bee-keeping and Bee Economy (Apiculture)

Varieties of honey bees and Bee pasturage; Setting up an apiary: Langstroths/Newton's hive, bee veil, brood and storage chambers, iron frames and comb sheets, drone excluder, rearing equipments, handling of bees, artificial diet; Diseases of honey bee, American and European Foulbrood, and their management; Honey extraction techniques; Physicochemical analysis of honey; Other beneficial products from bee; Visit to an apiculture institute and honey processing Units.

UNIT-II: Silk and Silk Production (Sericulture)

Different types of silk and silkworms in India; Rearing of Bombyx mori, Rearing racks and trays, disinfectants, rearing appliances, black boxing, Chawki rearing, bed cleaning, mountages, harvesting of cocoons; Silkworm diseases: Pebrine, Flacherie, Grasserie, Muscardine and Aspergillosis, and their management; Silkworm pests and parasites: Uzi fly, Dermestid beetles and their management; Silk reeling techniques and Quality assessment of silk fibre.

UNIT-III: Aquaculture I

Brood stock management; Induced breeding of fish; Management of hatchery of fish; Management of nursery, rearing and stocking ponds; Preparation and maintenance of fish aquarium; Preparation of compound diets for fish; Role of water quality in aquaculture; Fish diseases: Bacterial, viral and parasitic; Preservation and processing of harvested fish; Fishery by-products.

UNIT-IV: Aquaculture II

Prawn farming; Culture of crab; Pearl culture and Culture of air breathing fishes.

UNIT-V: Dairy and Poultry Farming

Introduction; Indigenous and exotic breeds; Rearing, housing, feed and rationing; Commercial importance of dairy and poultry farming; Varietal improvement techniques; Diseases and their management; Dairy or poultry farm management and business plan; Visit to any dairy farm or Poultry farm.

* Submission of report on anyone field visits mentioned above.

PRACTICAL

1. Study of different types of bees (Queens, Drones and Worker bees).
2. Study of different types of silk moths.
3. Study of different types of pearls.
4. Study of different types of fish diseases.
5. Identification of different types of scales in fishes.
6. Study of different types of fins.
7. Study of different modified structures of fishes (Saw of sawfish, Hammer of hammer head fish, tail of sharks etc.)
8. Identification of various types of natural silks.

Recommended Books

1. Dhyani Singh Bisht, Apiculture, ICAR Publication.
2. Dunham RA (2004) Aquaculture and Fisheries Biotechnology Genetic Approaches. CABI publications, U.K.
3. Hafez ESE (1962) Reproduction in Farm Animals. Lea and Fabiger Publishers.
4. Knobil E and Neill JD (2006) The Physiology of Reproduction. Vol. 2. Elsevier Publishers, USA.
5. Prost PJ (1962) Apiculture. Oxford and IBH, New Delhi.

6. Singh S. Beekeeping in India, Indian council of Agricultural Research, New Delhi.
7. Srivastava CBL (1999) Fishery Science and Indian Fisheries. Kitab Mahal publications, India.

DSE:3-MICROBIOLOGY

(Credits:6, Theory-4, Practical-2) Lectures:
60 (Theory:40, Practical:20) Max.
Marks:100 (Theory:70, Practical:30)

UNIT-I:

History of Microbiology; Microbial World Characterization, Classification and identification of microbes.

UNIT-II:

Prokaryotes: General morphology and classification of bacteria, their characters and economic importance; Gram-positive and Gram-negative bacteria.

UNIT-III:

Eukaryotes: General morphology of Protista and Fungi classification and economic importance.

UNIT-IV:

Viruses: structure, genome, replication cycle; Epidemiology of infectious diseases with reference of human hosts Bacterial (Tuberculosis), Viral (Hepatitis), Protozoan (Amoebiasis) and Fungal (any one) disease.

UNIT-V:

Microbe interactions-Immune Responses-Antibiotics and other chemotherapeutic agents; Applied microbiology in the fields of food, agriculture, industry and environment.

PRATICAL

1. Cleaning of glasswares, sterilisation principle and methods - moist heat - dry heat and filtration methods.
2. Media preparation: Liquid media, Solid media, Agar slants, Agar plates. Basal, enriched, selective media preparation - quality control of media, growth supporting properties, sterility check of media.
3. Pure culture techniques: Streak plate, pour plate and decimal dilution.
4. Cultural characteristics of microorganisms: Growth on different media, growth characteristics and description and demonstration of pigment production.
5. Staining techniques: Smear preparation, simple staining, Grams staining, Acidfast staining and staining for meta chromatic granules.
6. Morphology of microorganisms.
7. Antibiotic sensitivity testing: Disc diffusion test - Quality control with standard strains.
8. Physiology characteristics: IMViC test, H₂S, Oxidase, catalase, urease test, Carbohydrate fermentation, Maintenance of pure culture, Paraffin method, Stab culture and maintenance of mold culture.

Recommended Books

1. Ahsan J and Sinha SP (2010) A Hand book on Economic Zoology. S Chand, NewDelhi.
2. Arora DR and Arora B (2001) Medical Parasitology.2nd Edition.CBS Publications and Distributers.
3. Atwal AS (1993) Agricultural Pests of India and South East Asia. Kalyani Publishers, Ludhiana.
4. Dubey RC and Maheshwari DK (2013) A Textbook of Microbiology. S. Chand, New Delhi.
5. Dunham RA (2004) Aquaculture and Fisheries Biotechnology Genetic Approaches. CABI publications.
6. Pelczar MJ, Chan ECS and Krieg NR (1993) Microbiology.5th Edition, Tata McGraw Hill Publishing Co.Ltd.

7. Pradhan, S (1983) Insect Pests of Crops. National Book Trust of India, New Delhi.
8. Shukla, G.S. and Upadhya, V.B. (2013) Economic Zoology. 5th Edition, Rastogi Publications, Meerut.

DSE:4-PROJECT WORK
(Credits:6, Max. Marks:100)

SKILL ENHANCEMENT COURSES(SEC)

SEC:1-COMMUNICATIVE ENGLISH & ENGLISH WRITING SKILL

(Compulsory)

(Credits: 02) Theory: 20 Classes (1hr duration)

SEC:2-PUBLIC HEALTH AND HYGIENE

(Credits:2)

Lectures:30, Max. Marks:50

UNIT-I:

Scope of Public health and Hygiene; nutrition and health; classification of foods; Nutritional deficiencies; Vitamin deficiencies.

UNIT-II:

Pollution: water pollution, air pollution, soil pollution, noise pollution, thermal pollution and radioactive pollution.

UNIT-III:

Environment and Health hazards; Environmental degradation and health hazards due to pollutants.

UNIT-IV:

Communicable diseases and their control measures such as Measles, Polio, Chikungunya, Rabies, Plague, Leprosy and AIDS.

UNIT-V:

Non-Communicable diseases and their preventive measures such as Hypertension, Coronary Heart diseases, Stroke, Diabetes, Obesity and Mental ill-health.

Recommended Books

1. Arora DR and Arora B (2001) Medical Parasitology.2nd Edition.CBS Publications and Distributers.
2. Dubey RC and Maheshwari DK (2013) A text book of Microbiology. S. Chand, New Delhi.
3. Pelczar MJ, Chan ECS and Krieg NR (1993) Microbiology.5th Edition. Tata McGraw Hill Publishing Co. Ltd.

GENERIC ELECTIVE PAPERS(GE)

Credits: 06 each)

GE-1: ANIMAL DIVERSITY (NON-CHORDATE), PHYSIOLOGY AND ENDOCRINOLOGY

(Credits:6, Theory-4, Practical-2) Lectures:
60 (Theory:40, Practical:20) Max.
Marks:100 (Theory:70, Practical:30)

General characteristics and classification up to classes and study of types mentioned

UNIT-I:

Protozoa: Paramecium with reference to structure and reproduction.

Porifera: Structure of Sycon and Canal system in sponges.

Cnidaria: Structure, reproduction and life cycle of Aurelia.

UNIT-II:

Platyhelminthes: Structure, reproduction and life cycle of Fasciola.

Nemathelminthes: Structure, reproduction and life cycle of Ascaris.

Annelida: Structure, digestion and excretion of Hirudinaria.

UNIT-III:

Arthropoda: External morphology, digestive and excretory system of Palaemon.

Mollusca: Morphology and respiration of Pila.

Echinodermata: Morphology and water vascular system of Asterias.

UNIT-IV: Mammalian Physiology

Digestion, Respiration, Transport of respiratory gases, Structure of heart and cardiac cycle, Composition and clotting of blood, Blood group, Structure of neuron and transmission of nerve impulse, Structure of skeletal muscle and muscle contraction.

UNIT-V: Endocrinology

Structure and function of Pituitary, Thyroid and Gonads.

Note: Classification to be followed from " Barnes RD (1982) Invertebrate Zoology. 5th Edition."

PRACTICAL

Experiment (Physiology) Estimation of haemoglobin concentration in man, Estimation of casein in milk, Estimation of lipid in any given sample.

Endocrinology slides as mentioned in syllabus Museum Specimens and slides Slides: Morphology of Paramecium, Binary fission and Conjugation in Paramecium. Section through Sycon, Spicules and Gemmules of sponge, Ephyra larva.

Museum specimens: Spongilla, Sycon, Gorgonia, Physallia, Porpita, Penatulla, Nereis, Aphrodite, Sacculina, Eupagurus, Chiton, Aplysia, Octopus, Starfish, sea-Urchin, sea Cucumber.

Recommended Books

1. Arora MP (2006) Non-Chordata-I. 1st edition. Himalaya Publishing House, New Delhi.
2. Arora MP (2008) Non-Chordata-II. 1st edition. Himalaya Publishing House, New Delhi.

3. Barnes RD (1982) Invertebrate Zoology. 6th Edition. Holt Saunders International Edition.
4. Barnes RSK, Calow P, Olive PJW, Golding DW & Spicer JI (2002) The Invertebrates: A New Synthesis. 3rd Edition. Blackwell Science, USA.
5. Barrington EJW (1979) Invertebrate Structure and Functions. 2nd Edition. ELBS and Nelson.
6. Boradale LA and Potts EA (1961) Invertebrates: A Manual for the use of Students. Asia Publishing Home.
7. Jordan EL and Verma PS (1963) Invertebrate Zoology. Revised Edition. S. Chand, New Delhi.
8. A text book of medical Physiology. Guyton and Hall.
9. Human physiology. Chatterjee.
10. Principle of Anatomy and Physiology. Tortora and Derrickson.
11. A book of Physiology and Functional Histology, A K berry.
12. Mohanty PK (2000) Illustrated Dictionary of Biology. Kalyani Publishers, Ludhiana.

GE-2: ANIMAL DIVERSITY (PROTOCHORDATA, CHORDATA), DEVELOPMENTAL BIOLOGY AND IMMUNOLOGY

(Credits:6, Theory-4, Practical-2) Lectures:
60 (Theory:40, Practical:20) Max.
Marks:100 (Theory:70, Practical:30)

UNIT-I: Protochordata and Origin of Chordates

General characters of Hemichordata, Urochordata and Cephalochordata; Structure, Digestive system, Respiratory and reproduction in Balanoglossus, Herdmania and Amphioxus.

UNIT-II: Pisces and Amphibia

General characters of Chondrichthyes and Osteichthyes and classification up to order; Digestive and reproductive system in Scoliodon General characters and classification of amphibian up to order, Circulatory and Nervous system (Brain and Cranial nerves).

UNIT-III: Reptilia, Aves and Mammals

Urogenital system of Calotes; Respiratory system of Pigeon and Flight adaptation in Birds; Digestive and Nervous System (Brain and Cranial nerves) of rabbit.

UNIT-IV: Developmental Biology

Gametogenesis, structure of gametes, Mechanism of fertilization, Types of Cleavage, Development of Amphioxus and frog up to formation of three germ layers.

UNIT-V: Immunology

Innate and acquired immunity, Antigens, structure and function of immunoglobulins, Antigen- Antibody interaction, Vaccines.

PRACTICAL

Immunology: Blood Grouping

Museum specimens: Balanoglossus, Herdmania, Amphioxus, Exocoetus, Hippocampus, Anabas, Ambystoma, Axolotl larva, Polypedates, Ichthyophis, Draco, Chelone, Trionyx, Hemidactylus, Varanus, Chamaeleon, Sea snake, Cobra, Viper, Krait, Pigeon, Crow, Bat, Rat.

Slides: Sections through Balanoglossus and Amphioxus; Tissue sections through Liver, Pancreas; Embryological slides of frog.

Bones: Amphibia and mammals.

Recommended Books

1. Agarwal VK (2011) Zoology for degree students. S. Chand, NewDelhi.
2. Arora MP (2006) Chordata-1. 1st Edition. Himalaya Publishing House, New Delhi.
3. Hall BK and Hallgrimsson B (2008) Strickbergers Evolution. 4th Edition. Jones and Bartlett Publishers Inc., USA.
4. Jordan EL and Verma PS (1963) Chordate Zoology. Revised Edition.S. Chand, New Delhi.
5. Young JZ (2004) The Life of Vertebrates. 3rd Edition. Oxford University Press, USA.
6. Kindt TJ, Goldsby RA, Osborne BA, Immunology.
7. Gilbert SF, Developmental Biology.

GE-3: FOOD, NUTRITION AND HEALTH

(Credits:6, Theory-4, Practical-2) Lectures:
60 (Theory:40, Practical:20) Max.
Marks:100 (Theory:70, Practical:30)

UNIT-I:

Food; Diet; Nutrient; Vitamins; Disorders due to deficiency of vitamins; Synthetic foods and drinks.

UNIT-II:

Functions of food; Components of food; Nutrients (Macro and micronutrients): their biochemical role and dietary sources; Food groups and the concept of a balanced diet; Causes of food spoilage; Food adulteration; Nutrition through the life cycle- Physiological considerations, nutrient needs and dietary pattern for various groups adults, pregnant and nursing mothers, infants, preschool and school children, adolescents and elderly.

UNIT-III:

Nutritional Biochemistry Carbohydrates, Lipids, Proteins - Definition, Classification, Structure and properties Significance of acid value, iodine value and saponification value of lipids; Essential and Non-essential amino acids; Enzymes- Definition, Classification, Properties; Coenzymes Vitamins- Fat-soluble and Water-soluble vitamins; their Structure and properties Minerals- Iron, calcium, phosphorus, iodine, selenium and zinc and their properties.

UNIT-IV:

Introduction to health- Definition and concept of health; Major nutritional deficiency Diseases: Protein Energy Malnutrition; Life style related diseases- hypertension, diabetes mellitus, and obesity- their causes and prevention through dietary or lifestyle modifications. Social health problems- smoking, alcoholism, drug dependence and Acquired Immuno Deficiency Syndrome (AIDS); Common ailments- cold, cough, fevers, diarrhoea, constipation: their causes and dietary treatment.

UNIT-V:

Food hygiene, Potable water- sources and methods of purification, Food and Water Borne Infections.

PRACTICAL

1. To detect adulteration in a) Ghee b) Sugars c) Tea leaves and d) Turmeric.
2. To determine absorbed oil content in fried foods.
3. Estimation of lactose in milk.
4. Ascorbic acid estimation in food by titrimetry.
5. Estimation of calcium in foods by titrimetry.

6. Preparation of temporary mounts of various stored grain pests.
7. Project- Undertake computer aided diet analysis and nutrition counselling for different age groups. OR Identify nutrient rich sources of foods, their seasonal availability and price; study of Nutrition labelling on selected foods.

Recommended Books

1. Bamji MS, Rao NP and Reddy V (2009) Text Book of Human Nutrition. Oxford & IBH Publishing Co. Pvt Ltd.
2. Jain P et al. (2007) Poshan vaswasthya ke mool siddhant (Hindi). 1st Ed. Academic Pratibha.
3. Lakra P and Singh MD (2008) Text book of Nutrition and Health. 1st Edition. Academic Excellence.
4. Manay MS, Shadaksharaswamy (1998) Food-Facts and Principles. New Age International (P) Ltd.
5. Mohanty PK (2000) Illustrated Dictionary of Biology. Kalyani Publishers, Ludhiana.
6. Mudambi SR and Rajagopal MV (2007) Fundamentals of Foods, Nutrition and Diet Therapy. 5th Edition. New Age International Publishers.
7. Srilakshmi B (2002) Nutrition Science. New Age International (P) Ltd.
8. Srilakshmi B (2007) Food Science. 4th Edition. New Age International (P) Ltd.
9. Swaminathan M (1986) Handbook of Foods and Nutrition. 5th Edition. BAPPCO.
10. Wardlaw GM, Hampl JS (2007) Perspectives in Nutrition. 7th Edition. McGraw Hill.

GE-4: BIOTECHNOLOGY: MICROBES TO ANIMALS

(Credits:6, Theory-4,
Practical-2) Lectures:
60 (Theory:40,
Practical:20) Max.
Marks:100 (Theory:70,
Practical:30)

UNIT-I: Introduction

Concept and scope of Biotechnology; Importance of biotechnology and Application of biotechnology.

UNIT-II: Techniques in Gene Manipulation

Restriction and modifying enzymes, Cloning vectors and Expression vectors, Transformation techniques, Identification of recombinants, Construction and screening of DNA libraries; Molecular analysis of DNA, RNA and proteins (i.e., Southern, Northern and Western blotting), DNA sequencing (Sanger's method and automation), Polymerase Chain Reaction, Microarrays, DNA fingerprinting and RAPD.

UNIT-III: Microbes in Biotechnology

Growth kinetics of microbes, Applications of microbes in industry (Concept of primary and secondary metabolites, Fermentation/Bioreactors, Downstream processing), Bioremediation and Biosensing.

UNIT-IV: Transgenic Animal

Production of transgenic animals: Retroviral method, DNA microinjection method, embryonic stem cell method, nuclear transplantation; Applications of transgenic animals; Knockout mice; Transgenic livestock and Transgenic fish.

UNIT-V: Biotechnology and Human Welfare

Animal cell technology: Concept of expressing cloned genes in mammalian cells, Recombinant DNA in health (Recombinant insulin and human growth hormone), Production of recombinant vaccines, Gene therapy: in vitro, in-vivo and ex-vivo. Ethical issues concerning: Transgenesis, Bio safety and Intellectual Property Rights.

PRACTICAL

1. Isolation of genomic DNA from E. coli and analyze it using agarose gel electrophoresis.
2. Isolation of plasmid DNA (pUC 18/19) and analyse it using agarose gel electrophoresis.
3. Transformation of E. coli (pUC 18/19) and calculation of transformation efficiency.
4. Restriction digestion of lambda (λ) DNA using EcoR1 and Hind III.
5. DNA ligation (lambda DNA EcoR1/Hind III digested).
6. Construction of restriction digestion maps from data provided.
7. Study of Southern blot hybridization and PCR; Analysis of DNA fingerprinting (Dry Lab).
8. Project on Animal Cell Culture.

Recommended Books

1. Beauchamp TI and Childress JF (2008) Principles of Biomedical Ethics. 6th Edition. Oxford University Press, USA.
2. Brown TA (1998) Molecular Biology Labfax II: Gene Cloning and DNA Analysis. 2nd Edition. Academic Press, USA.
3. Glick BR and Pasternak JJ and Patten CL (2009) Molecular Biotechnology-Principles and Applications of Recombinant DNA. 4th Edition. ASM press, Washington, USA.
4. Griffiths AJF, Miller JH, Suzuki DT, Lewontin RC and Gelbart WM (2009) An Introduction to Genetic Analysis. 9th Edition. W.H. Freeman and Co., USA.
5. Snustad DP and Simmons MJ (2009) Principles of Genetics. 5th Edition, John Wiley and Sons Inc., USA.
6. Watson JD, Myers RM, Caudy A and Witkowski JK (2007) Recombinant DNA-Genes and Genomes- A Short Course. 3rd Edition, Freeman and Co., USA.

**UTKAL UNIVERSITY COURSES OF STUDIES,
REGULATIONS & SYLLABUS FOR THE
MASTER OF ARTS IN
SOCIAL WORK
(2015 - 2016)**

**Nayagarh Autonomous College
Nayagarh**

**COLOUR SCHEME OF MAPPING THE SYLLABI FOR
ENTREPRENEURSHIP, EMPLOYABILITY AND SKILL
DEVELOPMENT**

	Skill Development
	Employability
	Entrepreneurship
	All the three
	Skill Development and Employability
	Skill Development and Entrepreneurship
	Employability and Entrepreneurship

**UTKAL UNIVERSITY REGULATION
For the
M.A. in SOCIAL WORK (MSW) EXAMINATIONS
(Semester Scheme)**

REGULATIONS

1. Introduction:

1.1. The two year post graduate degree course leading to the Master of Arts in Social Work (MSW) of Utkal University shall be spread over a period of two academic years. Each academic year comprises of two semesters namely the Odd and Even Semester.

1.2. A candidate for the Master of Social Work shall be required to pass the following

examinations.

- End Semester Examination – I
- End Semester Examination – II
- End Semester Examination – III
- End Semester Examination – IV
- Internal Assessment for Fieldwork in semesters I – IV
- External Examination for Fieldwork in semesters I – IV
- Internal Assessment for Dissertation in semester IV
- External Examination for Dissertation in semester IV

- 1.3. A candidate shall be eligible to appear for the oncoming semester courses subsequent to the first semester University examinations respectively irrespective of declaration of the results in the previous semester but.
- 1.4. Candidate who fails in the odd semester examinations shall be eligible to appear for the examination in which s/he has failed in the next odd semester and vice versa.
- 1.5. Students who have failed in a semester or are desirous to improve their performance will be allowed a single chance in the subsequent semester examination of the following year. Thus in no case the course completion will go beyond three years.

- 1.6. A candidate for the Master of Arts in Social Work Examination shall be required to enroll himself / herself under these conditions as a student in one of the colleges affiliated to this University.

2. Admission Criteria:

- 2.1. Any person who has passed the Under Graduate Degree in any subject with a minimum of 50% marks (General candidates) and 45% marks (SC/ST/OBC candidates) from an examination conducted by a recognized University is eligible to be admitted to the 1st Semester of this course. Students from SC/ST/OBC background have to apply with valid caste certificate.

3. Duration:

- 3.1 Odd semester shall be from July to December (I and III Semesters).
- 3.2 Even semester shall be from January to June (II and IV).
- 3.3 There shall be not less than 90 working days for each semester. This excludes the days for the conduct of University end semester examinations and other holidays.
- 3.4 A student would be required to complete the course within a maximum of three (Ref. 1.5 above) academic years from the date of admission.

4. Course:

Each course is well designed under lectures / tutorials / fieldwork / seminar / assignments / report writing so that it achieves the goals of effective teaching and learning needs of the students.

5. Contents in the Courses of Study:

- 5.1 The Master of Social Work programme of study consists of a number of contents. The term 'course' is applied to indicate a logical part of the subject matter of the programme and is invariably equivalent to the subject matter of a 'Paper' in the conventional sense. The following are the various categories of courses suggested for the Master of Social Work programme.
- 5.2 There are six Foundation papers.
- 5.3 Core compulsory papers comprise of twenty two courses. These are compulsory for all students.

- 5.4 There are eleven elective courses spread over two semesters III and IV. Out of the given electives student can choose any two of his or her interest for study in the respective semester.

6. Attendance:

Students must have 75% of attendance in each theory paper and 100% attendance in fieldwork and in related assignments. This is mandatory for appearing in the examination.

7. Examinations:

- 7.1 There shall be examinations at the end of each semester.
- 7.2 Examination for odd semesters shall be conducted in the month of November – December.
- 7.3 Examination for the even semesters shall be held in the month of May – June.
- 7.4 A candidate who does not pass the examination in any of the papers shall be permitted to appear in such failed papers in the subsequent examination to be held either in November – December or May – June as the case may be.

8. Pass Marks and Classification of Successful Candidates

- 8.1 Aggregate marks for passing the examination of the Degree of Master of Arts in Social Work (MSW) shall be the sum total of the aggregate of all the four semester Examinations taken together.
- 8.2.1 Divisions will be awarded on the basis of Utkal University Regulations for the M.A. Examination.
- 8.2.2 A candidate to be considered as Pass has to secure a minimum of 50% marks in the Field Work. Each of the field-work components namely Observation Visits, Concurrent Field Work in Community and Agency settings, Rural Camp and Block Placement has to be compulsorily completed to be considered as Pass.
- 8.3.a If a candidate is marked absent in a sitting(s) of an examination, such a candidate shall have to reappear in that paper (s) of the course in order to be considered as having completed the course.

.b If a candidate does not complete the requisite field-work days in a semester and does not appear for Field Work evaluation, Field Work Seminar and Viva Voce then he/she will be considered as not having completed the course and thereby ineligible to receive the M.A. degree.

8.3.b A candidate failing to secure a minimum of 30% in any Compulsory and a minimum of 50% in the Practical (Field Work - Ist, IInd & IIIrd & IVth) either in the First, Second, Third or Final examination of this University may be allowed to appear in those papers in not more than one chance (examination) immediately following that examination for which he/she was registered, in order to clear the back paper(s) on the payment of prescribed fees.

COURSE STRUCTURE UNDER THE SEMESTER SYSTEM – MSW

Semester – I

Paper	Course Code	Course Title	Credit	Total Instruction Hours	Marks
01	SWFC – 01	Foundations of Social Work: History, Philosophy, Ethics, and Theories in Social Work	4	60	100
02	SWFC – 02	Social Science Concepts I: social structure, social institutions and social change	4	60	100
03	SWFC – 03	Social Science Concepts II: Political Judicial and Economic System,	4	60	100
04	SWFC – 04	Social Science Concepts III: Poverty, Inequality and Social Exclusion	4	60	100
05	SWFC – 05	Social Science Concepts IV: Psychological Concepts, Human Behavior and Relationships	4	60	100
06	SWFC – 06	Orientation Visit Group Lab Concurrent Field Work	8	120	200
TOTAL			28	420	700

Semester – II

Paper	Course Code	Course Title	Credit	Total Instruction Hours	Marks
07	SWCP - 01	Working with Individuals	2	30	50
08	SWCP - 02	Working with Groups	2	30	50
09	SWCP - 03	Working with Communities	4	60	100
10	SWCP - 04	A Human Rights Approach to Social Work Practice	4	60	100
11	SWCP - 05	Social Welfare Administration	4	60	100
12	SWCP - 06	Social Work Research and Statistics	4	60	100
13	SWCP - 07	Concurrent Field Work + Rural Camp	8	120	200
TOTAL			28	420	700

Semester – III

Paper	Course Code	Course Title	Credit	Total Instruction Hours	Marks
14	SWCP - 08	Child Protection and Child Rights	4	60	100
15	SWCP - 09	Social Work with Women: Issues of gender and development	4	60	100
16	SWCP - 10	Ethnic Sensitive Social Work Practice in India	4	60	100
17	SWCP - 11	Rights of persons with Disabilities and their Rehabilitation.	4	60	100
18	SWCP - 12	Community Health and Social Workers	4	60	100
19	SWCP - 13	Social Management	4	60	100
20	SWCP - 14	Concurrent Field Work	8	140	200
21	SWEP – 01 SWEP – 02 SWEP – 03 SWEP - 04 SWEP - 05 SWEP - 06 (Any One)	School Social Work Working with Women Working with Alcoholics and Substance Abusers Correctional Social Work Counseling in Social Work Social Work with the Elderly	2	30	50
TOTAL			34	530	850

Semester – IV

Paper	Course Code	Course Title	Credit	Total Instruction Hours	Marks
22	SWCP - 15	Development Theories and Strategies: Issues Challenges and Responses	4	60	100
23	SWCP - 16	Social Work Practice in Rural Areas	4	60	100
24	SWCP - 17	Social Work Practice in Urban Areas: Migration, Unorganized Labour and Livelihoods	4	60	100
25	SWCP - 18	Social Policy, Planning and Implementation	4	60	100
26	SWCP - 19	Development Communication	4	60	100
27	SWCP - 20	Sustainable Agriculture	4	60	100
28	SWCP - 21	Dissertation: Research Project	4	70	100
29	SWCP - 22	Concurrent Field Work + Block Placement	2	340	100
30	SWEP - 07 SWEP - 08 SWEP - 09 SWEP – 10 SWEP – 11 (Any One)	Entrepreneurship Development NGO Management Project Management Disaster Management People Centred Advocacy.	2	30	50
TOTAL			34	740	850

Examination Question Paper Pattern:

There shall be three types of questions – Essay / Descriptive, Short Answer & Objective.

Distribution of Marks for courses carrying 100 Marks:

Five Essay type questions carrying 12 Marks each

(Out of a choice of seven) (Answer in 700 – 1000 Words) 5 x 12 Marks = 60
Marks

Four short type questions carrying 6 Marks each

(Out of a choice of six) (Answer in 150 – 200 Words) 4 x 6 Marks = 24
Marks

Eight objective type questions carrying 2 Marks each

(Out of a choice of ten) (Answer in one or two sentences) 8 x 2 Marks = 16
Marks

Social Work Practice (Fieldwork):

Fieldwork is an integral component of the course of Master of Social Work. A student shall have to undertake his/her fieldwork for 20 hours in every week in the semester. Students shall do the fieldwork under the guidance of a faculty supervisor. Fieldwork is mandatory for all students of social work.

Field Work Schedule:

Sl. No.	Semester	Field Practicum Component	Duration	Credits
1	SWFC - 06 MSW(I)	1. Observation Visit	10 Organizations	2
		2. Concurrent Fieldwork (Community Placement)	20 hrs/week (16 hrs in the field + 4 hrs report writing)	6
2	SWCP- 07	1. Concurrent Fieldwork (Community Placemen)	20 hrs/week (16 hrs in the field +	6

	MSW (II)		4hrs report writing).	
		2. Rural Camp	10 days	2
3	SWCP- 14 MSW (III)	1. Concurrent Fieldwork (Agency Placement)	20 hrs/week (16 hrs in the field + 4hrs report writing).	8
4	SWCP- 22 MSW (IV)	1. Concurrent Fieldwork (Agency Placement)	20 hrs/week (16hrs in the field + 4 hrs report writing).	2
		2. Block Placement	One Month before the end of the semester	2

Evaluation of Fieldwork: Regulation of Fieldwork:

At the end of each semester, the Chairman of the Board of studies shall call for the submission of the Field Work Attendance Record of the students, Field Work Report files of the students, the Fortnightly Reports on the students and the Self Evaluation Report of the students. This is to facilitate the external examiners to mark the performance.

Fieldwork carries 200 marks in Semester1, 2&3 and 100 marks in Semester 4. It is divided into internal and external.

The internal evaluation carries 50% marks and it shall be evaluated by the Faculty Supervisor on the basis of field-work records, practical fieldwork and reports.

The external carry 50% marks and it shall be evaluated by the external examiners on the basis of fieldwork seminar and practical knowledge gained by the student. The external examiner shall be any person authorized by the Chairman of the Board of studies for Social Work of Utkal University.

The minimum pass mark in the fieldwork shall be 50% in both the internal and the external examinations taken together in each semester. Both these marks together will comprise the university mark for field-work.

Field Work Assessment: [SL. No. 1 and 2 will be evaluated internally. Sl. No.3, 4 & 5 will be evaluated by an external examiner appointed by the Utkal University]

Sl. No.	Criteria for Assessment	Weightage In %
1	Field Work Reports	25%
2	Fortnightly Reports by Faculty	25%
3	Self-Evaluation Report by student	25%
4	Field Work Seminar	15%
5	Viva Voce	10%
	Total	100%

Evaluation of the Dissertation:

Students to practice Social Work Research Methodology shall submit a Dissertation in any area of their interest by working on a research project under the supervision of a faculty supervisor.

Total marks assigned for project work shall be 100. This total mark is distributed equally among internal and external evaluations. The internal marks of 50 and external marks of 50 shall be calculated in the basis of the Objective, Methodology, Analysis, Findings, Presentation and Viva-Voce. It is mandatory that it be the original work of the student.

HARD CASE RULE

The Hard Case Rule mentioned on the item No.5.2.4 (I,II,&III) in the correction ship No-1222 of Utkal University as amendments to the Regulation governing 2 Years Degree Course (Master of Arts, Science, Commerce Examinations) effective for the students admitted to such courses during the Academic 2002-2003 and 2003-2004,

shall be applicable to all the Compulsory and theory papers of Ist, IInd Year Examinations while computing the Final result of Master of Social Work Examinations. In case of any new regulation added to the Hard Case Rule by the University for 2 year Degree Course (Master of Arts, Science, Commerce Examinations) shall be applicable to the 2 years Degree Course of Master of Social Work.

REGULATION FOR FIELD-WORK

Introduction:

The student of the M.A in Social Work through field work practice is supposed to be committed to the people and social institutions in which they are placed. They are expected to serve individuals, families and communities through effective practice guided by qualified field-work supervisors (with MSW degrees) and by the social-work faculty in each college affiliated to this university.

Goals of Field Work:

1. To critically assess their own roles in field-work by conducting themselves ethically and professionally and by utilizing supervision & self-reflection.
2. To develop knowledge, skills and values required to engage in quality practice with individuals, families, groups, organizations and communities.
3. To demonstrate their ability to engage practically in problem solving as change agents in a variety of settings.
4. To demonstrate knowledge and ability to apply social theories and theories of human behavior and conceptual frameworks to assess, intervene and evaluate social work practice in the individuals, families and groups.
5. To recognize and understand various forms of discrimination and oppression as they apply to members of diverse groups and communities and advocate for social and economic justice for individuals, families, groups and communities.

Semester – I:

Observation Visits: 10 social work / welfare agencies have to be compulsorily visited. In each observation visit to an agency of community organization the student must be exposed to different field Situations. This observation visit will provide an opportunity to have an exposure and orientation to the services being offered by various Organisations/ Social institutions/ Agencies and open communities such as slums / rural settings as a response to community member's needs.

Understanding the Community: To understand the dynamics of the communities specifically the slum and the rural setting. This would imply comprehending the Socio-Cultural dynamics, economic and health status, being familiar with the problems of the communities, their causes, and observing how the people respond to such situations.

Semester – II:

Work with Individuals: Students shall be placed in slums or villages. They need to identify any issue affecting an individual and apply the principles and process of social case work. Similarly two separate case work should be done. The report should reflect learning derived from these two case work.

Work with Groups: Students shall be placed in slums or villages. They need to identify groups, study them well and carefully identify dysfunction if any in them and apply the principles and process of social group work.

Students may also start new groups such as Self Help Groups, children groups, Youth Clubs, integrated groups for person with disabilities, widows groups, senior citizens, adolescent girls group, study groups and etc. The purpose of this group formation is to learn group interaction, goal setting and group dynamics. The students should demonstrate principles and processes of group work. The reports should reflect on the learning derived out of it.

Community Organisation: Students shall be placed in a slum or village in a team of 4. Students shall be trained to demonstrate the skills and process of community organization. Each team shall identify a community issue along with the participation of the people and organize a programme that aims at resolving the community issue. The purpose of this fieldwork is to ensure students learning on community organization through demonstration and also for the students to learn to work in a team.

Rural Camp: All students shall compulsorily participate in a rural camp. This camp provides ample opportunity to learn about the community through experiences of living with them. It is to be a continuous 10 days camp and students and teachers are expected to stay in the rural area for all the 10 days continuously.

Semester – III:

Understanding Formation and Management of Social Welfare Agencies: Each student shall be linked with an agency promoting social welfare. These agencies may be either Governmental or Non-Governmental or Privately managed Corporate houses. Reports of students should reflect on their learning related to the above mentioned areas. Daily Report, Consolidated fieldwork report should be submitted by every student individually. Students will work under a Faculty Supervisor and Agency Supervisor.

- To provide an opportunity to work with social welfare agencies.
- To understand the agency as an organization, its structure, functions, activities sources of funding and management.

Semester – IV:

Students shall be directed to learn about the formation, legal formalities, taxation related formalities, project formulation, resources mobilization techniques, project management, Documentation, POSDCORB, Evaluation, Need Analysis, Problem Tree Analysis, Logical Frame Analysis and so on.

- To develop an understanding of the problem and opportunities in an organisational setting.
- To develop an understanding of the problems and opportunities of the organisation and the methods they adopt to respond to their environment.

Block Placement (On the Job Training): The students of Social Work will be assigned an agency. This agency setting should be located anywhere within or out of the State. Students will work in the agency and obtain on the job training experience. This training lasts for a continuous 25 days prior to the semester examination. It is compulsory for all.

Course Title: HISTORY, PHILOSOPHY, ETHICS AND THEORIES IN SOCIAL WORK

Course Code: SWFC – 01

Level: MSW (I)

Objectives:

- To understand the historical development of the philosophy of Social Work and its emergence as a profession.
- To understand the ethical and value base of Social Work.
- To bring clarity to the basic concepts of Social Work.
- To briefly introduce Social Theory relevant to Social Work practice.

Unit I: History and Evolution of Social Work Practice

History of Social Welfare in the West (UK and USA): The Elizabethan Poor Law (1601), Charity Organisation Society (1869) Settlement House Movement, The Poor Law Commission of (1905), Beveridge Report (1941); The development of Social Work as a profession; Development of the definition of Social Work; (From Charity to Human Rights and Social Justice); History of Social Work education in India: YMCA School of Social Work Lucknow, TISS Mumbai, Delhi School of Social Work

New Delhi; Voluntary Social Work in India.

Unit II: Philosophy of Social Work and Social Work Ethics

The Traditional religious doctrine of Charity; Scientific Naturalism; Liberalism; Scientific Charity; The ideological base of the Welfare state. (with specific reference to the Indian Constitution); Gandhian ideals in Social Work Practice in India; Ambedkar's ideals in Social Work Practice in India; Professional Code of Ethics: IFSW and IASSW code of Ethics; The meta-ethical dimension of Social Work Ethics; Ethical Dilemmas in specific contexts.

Unit III: Basic Concepts in Social Work

Social Work: Concepts, Definitions, Objectives & Functions, and Methods; Contributions of Social Sciences to Social Work; Traditional Social Work and

Radical Social Work; Social Service and Social Welfare Service; Social Welfare and Social Security; Social Reform and Social Justice ; Human Rights and Human Development; Social Inclusion & Empowerment; Social Change and Social Development; Social Action and Social Movements

Unit IV: Theories relevant to Social Work Practice

Social Welfare Theory: Emile Durkheim, Herbert Spencer and Max Weber; Social Justice Theory: Distributive and Retributive Justice, Rawls Theory of Justice, Nozick's Theory of Social Justice; Radical and Marxist perspective in Social Work: L. Althusser; Anti-discriminatory and Anti-oppressive Perspective; Communication Theory: J. Habermas, Erving Goffman; Critical Theory: J. Adorno; Structure Theory: Anthony Giddens & P. Bourdieu; The Ecological Perspective; The Generalist Perspective.

Reading List:

- Beilharz, Peter (Ed) (1991): Social Theory: A Guide to Central Thinkers.
- Elliot, Anthony (Ed) (2010): The Routledge Companion to Social Theory.
- Payne, Malcolm(1997), Modern Social Work Theory and Social Work Practice.
- Mulally, Robert P. (1993), structural Social Work: Ideology, Theory and Practice.
- Reamer, G.G.(2013), Social Work Values and Ethics.
- Hugman, Richard and Smith, David(Ed)(1995) Ethical Issues in Social Work.
- Tnattner, Walter I. (1998) From Poor law to Welfare State: A History of Social Welfare in America.
- Reisch, Michael (2002), The Road not Taken: A History of Radical Social Work in the United States.
- Zastow, C(2009) Introduction to Social Work and Social Welfare: Empowering People.
- Pierson, John(), Understanding Social Work: History and Context.
- Hering.S and Waaldijk (Eds); History of Social Work in Europe(1900-1960)
- Basanquet, Helen Dendy, Social Work in London, 1869-1912; A History of the Charity Organization Society.
- Queen, S.A, Social Work in the Light of History.

Course Title: SOCIAL SCIENCE CONCEPTS - I: SOCIAL STRUCTURE, SOCIAL INSTITUTIONS AND SOCIAL CHANGE

Course Code: SWFC – 02

Level: MSW (I)

Objectives:

- This introductory course seeks to familiarize the students with Sociology as a social science and the basic concepts necessary in understanding the social and cultural processes. It is organized in such a way that even students without previous exposure to sociology could acquire an interest in the subject and follow it. Understand the role of individual in the society and importance of various social Institutions and their impact. Get a scientific insight about the social structure, stratification and issues related to caste & class. Develop clarity about social issues and challenges in the social work field.

Unit – I: Basic Concepts

- Sociological Concepts: Society, Community, Association and Institution, social organisation.
- Social Group: Meaning, Types: Primary, Secondary, In-group - Out-group, formal and informal group, pressure group and reference group.
- Tradition: Little Tradition and Great Tradition, Parochialisation and Universalization.

Unit - II: Social structure and culture

- Concept of Social Structure and function.
- Social stratification: varna, caste, class, occupation, tribe and gender.
- Social Interaction and Social Processes: Associative and Dissociative Social Processes
- Culture: definition and types, norms & values, patterns of culture, culture and personality.

Unit - III: Social institutions and Socialisation

- Marriage and Family: Characteristics, types and functions, Rules of Marriage.

- Kinship: Meaning, Definition, Types, Functions.
- Social Process: Socialisation, Acculturation, Enculturation, Assimilation, Resocialisation, Anticipatory, Adult socialisation and agency of socialisation.
- Status and Role: Multiple Roles, Role Set, Status Set, Role Conflict.

Unit – IV: Social change and Mobility

- Concepts, processes and theories of social change,
- Meaning and nature of Social change,
- Factors of social change: Sanskritisation, Westernisation, Modernisation, Orthogenetic and Heterogenetic factors of social change; Social Mobility: Horizontal & Vertical,

Reading List:

- Abraham Francis, Contemporary Sociology, Oxford University Press, 2006.
- Ahuja Ram, Indian Social System, Rawat Publication, Jaipur, 1993
- Ahuja Ram, Social Problems in India, Rawat Publication, Jaipur, 1997
- Ahuja Ram, Society in India, Rawat Publication, New Delhi, 2010
- Kuppaswamy, Social Change in India, 1998
- Beteille, Andre, *Sociology: Essays on Approaches and Method*, New Delhi: OUP, 2002
- Bose, N.K. 1967, Culture and Society in India, Bombay: Asia Publishing House.
- Bottomore, T.B.: *Sociology: A Guide to Problems and Literature*, Blackie and Sons, Bombay, 1986.
- Desai, A.R. (Ed), *Rural Sociology in India*, Popular Praakashan, 2008
- Dube S C, *Indian Society*. New Delhi: NBT 1995
- Dube, S.C. 1995, *Indian Village* (London : Routledge)
- Dumont L, *Homo Hierarchicus : The Caste System and its Implications*, Chicago University Press, 1970
- Gupta Dipankar (ed). *Social Stratification*, New Delhi: Oxford University Press, 1991

- Jodhka, S.S. (ed), *Village Society*, New Delhu: Orient BlackSwan, 2012
- Karve, Irawati, 1961 : *Hindu Society : An Interpretation*(Poona : Deccan-College)
- Kothari, Rajni, *Caste in Indian Politics in Manoranjan Mohanty* (ed.) *Class, Caste, Gender: Readings in Indian Government and Politics*, New Delhi, Sage. 2004
- Maclver & Page, *Society, Introductory Analysis*, MacMillan, Delhi, 2001.
- Madan & Majumdar, *An Introduction to Social anthropology*, Mayur, 1999.
- Madan, Vandana. *Village in India*, India: OUP, 2003.
- Mandelbaum David,G, *Society in India*, Popular Prakashan, 2008
- Mukherjee Ramakrishna, *Sociology of Indian Sociology*, Allied Publishers, 1979
- Satish Deshpande, "*Contemporary India A Sociological View*", Viking Publishers, New Delhi, 2003.
- Singer Milton, B, *When a Great Tradition Modernises. An Anthrapological Approach to Indian Civilization*, Praeger Publishers, 1972
- Srinivas, M.N, *Caste and its New Avatar*, Penguin, 1996
- Srinivas, M.N. 1963: *Social Change in Modern India* (California, Berkeley: University of California Press).
- Srinivas, M.N. *Caste in Modern India and Other Essays*, Bombay Asia Publishing House, 1962
- Uberoi, Petricia, *Family Kinship and marriage in India*, OUP, 2005

Course Title: SOCIAL SCIENCE CONCEPTS II: POLITICAL JUDICIAL AND ECONOMIC SYSTEM

Course Code: SWFC - 03

Level: MSW (I)

Objectives:

1. To impart knowledge about the political institutions that regulate people's life and promote their interests.
2. To Understand the basic economic concepts, principles, theories & its application in social work profession.
3. To Understand and analyze economic problems on social work perspective.

Unit - I: System of Governance

- Indian Constitution: Objective(Preamble) Characteristic Features and Amendment Process, Fundamental Rights, Fundamental Duties and Directive Principles of State Policy.
- Indian Political System: Parliamentary Democracy, Federalism and Issue of State Autonomy, Coalition Government and Role of Bureaucracy in Administration.
- India- A Welfare State: Social Policy and Social Legislation, Increasing Partnership between Government Agencies and Private Voluntary Organization.
- Judiciary: Judicial Review, Judicial activism and P.I.L.

Unit – II: Social structure and Democratic Process

- Features of Indian Democracy: Multiparty System, Role of National Parties, Regional Parties and Pressure Groups.
- Grassroots Democracy: Panchayati Raj System and Empowerment
- Issues Concerning Religion, Language, Caste, Problem of Gender, Illiteracy and Reservation.
- Institutions: Bureaucracy, National Planning, Election and Participation.
- Socio-Political Movements: Peasant Movement, Trade Union Movement, Tribal Movement, Women's Movement, and Dalit Movement

Unit – III: Development Economic

- Development Economics: Meaning Nature and Significance, Contemporary Development, Problems: Poverty and Inequality.
Economic Systems: Capitalism, Socialism, Mixed Economy – Definitions, Features, Advantages and Disadvantages.
- Rural and Urban economy: Nature and structure of rural economy; rural financial structure-formal and informal; Regional Rural Banks Policy and Planning concerning development of rural area.
Urban economic growth: State and local policies; and urban poverty-policy responses.

Unit – IV: Indian Economy and Financial Institutions

- Indian economy: Nature and Characteristics
Inflation and Over population: Meaning, magnitude, causes and consequences;
Programmes for alleviation of poverty and unemployment.

- Economic Planning and Reforms: Rationale, Features and Objectives; Globalization, Privatization and Liberalization and their impact on Agriculture and Marginalized sections of India.
Meaning and concept of Free trade, Special Economic Zone and its impact on Indian social concerns.
- Financial Institutions: National and International Financial Institutions and their Role in Social Welfare- World Bank, International Monetary Fund (IMF), Reserve Bank of India (RBI), World Economic Forum, NABARD, Commercial Banks; Role of Non Bank Financial Institutions; and National and International Funding agency for social development.

Reading List:

- Kashyap Subhash(ed), 1993, Perspective on the Constitution, Shipra Publication, Delhi.
- Basu D. D., 1992, Introduction to the Constitution of India, Prentice Hall of India Pct. Ltd., New Delhi.
- Kaushik Sushila, 1993, Women and Panchayati Raj, Har Anand publication, New Delhi.
- Kulkarni P.D, Social Policy and Social Development in India.
- Reed Elaw, Social Welfare Administration.
- ND Kumble, Ashish, Deprived Castes and Their Struggle for quality, Publishing House, New Delhi.
- Murthy(ED),Planning for Change- Council for Social Development , Aspects of Social Development.
- Setty Krishna, K.R. Chaitanya, Fundamental Rights and Socio Economic Justice in the Constitution, Publishing House, Allahabad.
- Singh M.P. and Roy Himanshu, Indian Political System, Structures, Policies, Development, 1995, Jnanada Prakashan (P & D), New Delhi.
- Misra & Puri : Advanced economic theory
- Mitchell A Seligson & John T Passé Smith, Development & Underdevelopment- The political economy of global inequality
- Agarwal A.N., Indian economy- Problems of development & planning
- A Vaidyanathan : India's economic reforms & development
- Patel Surendra J: Indian economy towards the 21st century

- Lekhi R.K.: The Economics of Development and Planning
- Dhar P.K.: Indian Economy: Its Growing Dimensions
- Datt Rudra & KPM Sundharam: (2004), Indian Economics Theory: S, Chand & Co New Delhi.
- K.G Karmakar, Rural Credit And Self Help Groups: Microfinance Needs and Concepts in India: Sage publication.
- Thakur S.N., (1988): Economic theory of profile of Indian Economy: Deep & Deep Publication, New Delhi.

Course Title: SOCIAL SCIENCE CONCEPTS III: POVERTY, INEQUALITY AND SOCIAL EXCLUSION

Course Code: SWFC – 04

Level: MSW (I)

Objectives:

- To develop clarity and understanding on the various perspectives about the concept of poverty, Inequality and social exclusion.
- To discuss policy interventions that aim to reduce poverty, inequality and exclusion.

Unit – I: Understanding Poverty

- Concept of Poverty, Different types of poverty: relative, absolute, material and social; culture of poverty, theories of poverty; Deprivation.
- Poverty Measurement: Indicators of poverty, PQLI, HDI, Poverty lines.
- Anti-poverty programmes in India.

Unit – II: Understanding Inequality

- Equality, inequality, capability, post-industrial structuralism, norm of structural exclusion, inequality and globalization;
- Bases of inequality in India: religion, caste, ethnicity, gender, disability, merit, region, language, culture, migrants.
- Diversity & Inequality: Socio-cultural and geological analysis

Unit – III: Understanding Social Exclusion

- Definitions and Concepts, Evolution of the concept of Social Exclusion; Dimensions of Social Exclusion, Theories of Social Exclusion;
- Social Exclusion and the role of: Religion, Race, Caste, Ethnicity; Gender; and Disability.
- Relationship of Social Exclusion and Discrimination

UNIT – IV:

- Social policy response to combat Poverty. Inequality and Social Exclusion in India.
- The role of social work in addressing issues of poverty, inequality and social exclusion.

Reading List:

- Sen, Amartya 2000 Social Exclusion: Concept, Application and Scrutiny. Social Development Papers NO.1. Asian Development Bank.
- Sen, Amartya "Poverty as Capability Deprivation," chapter 4 in Development as Freedom, OUP, 2000.
- Sullivan, Elizabeth 2002 Social Exclusion, Social Identity and Social Capital: Reuniting the Global, the Local and the Personal. De Montfort University, UK.
- Silver, Hilary and S.M. Miller 2003 Social Exclusion: The European Approach to Social Disadvantage. Indicators.2.2: 1-17.
- Haan, Arjan de 2001 Social Exclusion: Enriching the Understanding of Deprivation. Institute of Development Studies and Poverty Research Unit, University of Sussex. Sussex. UK
- O'Brien, D, Joanna Wilkes, Arjan de Haan, Simon Maxwell Poverty and Social Exclusion in North and South. Institute of Development Studies and Poverty Research Unit, University of Sussex. Sussex. UK.
- Kabeer, Naila 2006 Social Exclusion and the MDGs. The Challenge of 'Durable Inequalities' in the Asian Context. Institute of Development Studies and Overseas Development Studies Institute.
- Beall, Jo 2002 Globalization and Social Exclusion in Cities: Framing the Debate with Lessons from Africa and Asia. Development Studies Institute, LSEP, London.
- Chebolu, Radha Mohan 2007 Corporate Quotas: The Myth Action'. Pravartak. 2:2: 159-165.
- Saith, Ruhi 2001 Social Exclusion: The Concept and Application to Developing Countries. QEH Working Paper Series -72.
- Loury, G.C 2000 Social Exclusion and Ethnic Groups: The Challenge to Economics. Annual World Bank Conference on Development Economics 1999. The International Bank for Reconstruction and Development! The World Bank.

- Jenkins, Robert 2006 Social Exclusion of Scheduled Caste Children from Primary Education in India; UNICEF India. New Delhi.
- Sen, Amartya 1992 Inequality Re-examined, New Delhi Oxford University Press.
- Byrne, David 1999 Social Exclusion. Buckingham: Open University Press.

Course Title: SOCIAL SCIENCE CONCEPTS IV: PSYCHOLOGICAL CONCEPTS, HUMAN BEHAVIOUR AND RELATIONSHIPS

Course Code: SWFC – 05

Level: MSW (I)

Objectives:

- To understand the concept of human behavior
- To understand the basic concepts and factors of human behavior
- To understand the relevance of psychology in social work
- To understand the concept of personality and its application in social work education

UNIT – I: Nature and Scope of Psychology

Meaning and definition of psychology – Schools of psychology: Structural, Functional and Behaviourist, Importance of psychology in social work practice, Factors influencing Human Behaviour-Heredity, Environment and Self

UNIT – II: Human growth and development

Human growth and development: Meaning and principles; Social, Emotional, Cognitive and Physical Stages in Life Span approach from Conception to Old Age: characteristics, needs, tasks and problems at each stage.

UNIT – III: Personality

Meaning of personality, Theories of personality: Trait and Type theories; important concepts of the contributions of Freud, Jung, Adler, Maslow and Ericson: factors influencing personality Development Psychological Processes in Behaviour: Perception, Emotion, Motivation, Attitude; Processes of Adjustment: Concept and Factors; Coping Mechanism, Defence Mechanism

UNIT – IV: Theories of Human Development

Psychoanalytic theory: Psycho-sexual theory by Freud, Psycho-social theory by Erickson.

Behavioural theory: Classical conditioning by I P Pavlov, Operant.

Humanistic theory: Abraham Maslow and Carl Rogers, Alfred Adler. Cognitive theory: Jean Piaget's theory

Reading List:

Davidoff.L.L.: Introduction to Psychology, Auckland; McGraw Hill Inc:1881

Morgan, C.T.& King, R.A:Introduction to psychology New York.

Weix;J.R& Schopler J: McGraw Hill;7th Ed.,1986.

Munn,N.A.:psychology-The fundamentals of human Behaviour;London;

Hurlock E. B: Developmental psychology, New Delhi, Tata McGraw Hill 5th Ed.1971

Rayner, Eric: Human Development, London; George Allen and Unwin, 1978.

Sareswathi T.S, Dutta R: Development psychology in India, Delhi; Sage publications, 1987.

Kuppusamy B: An Introduction to social Psychology; Bombay; Media Promoters and pub.Pvt.Ltd., 1980.

Coleman, J.C: Abnormal Psychology and Modern Life

Fair-weather George W.: Social Psychology Treating in Mental Illness, Sydney, John Wiley and Sons

Course Title: WORKING WITH INDIVIDUALS

Course Code: SWCP – 01

Level: MSW (II)

Objectives:

- To develop theoretical knowledge and understanding about working with individuals
- To critically examine the application of social case work method in human

personality and development.

Unit - I: Basics of Case Work

Social Case Work: nature, assumptions, values and principles. Components of social case work: person, place, problem & process. History of social case work.

Unit – II: Client Worker Relationship

Need and importance of Relationship: nature and ways to establish. Psychoanalytical theory. Ego - functions and defense mechanisms. Concept of Human needs, stress, social role and adaptation

Unit – III: Process of Case Work

Process of social case work- study, assessment, goal formation, planning, treatment, evaluation, termination. Techniques of social case work: interviewing, support, encouragement, clarification, correcting perception, reality orientation; resource mobilization, home visit, interpretation, topical shift, logical reasoning, crisis intervention, burnout. Transference and Counter-Transference and its use in case work. Supportive techniques. Referral: its use in social case work. Recording: types and format.

Unit – IV: Models of Case Work

Models of social case Work practice: Problem solving, Psycho- social, Task oriented. Rational Emotive Therapy in social case work. Discussion on role of case worker from the records in school, family and marriage settings. Presentations and discussions on cases and practical questions.

Readings List:

Banarjee, G.R. TISS Series 23. Papers on Social Work: An Indian Perspective; Tata Institute of Social Sciences, Mumbai. TISS(Series 23).

Batra, Sushma & Marlin Taber, 1996. Social strains of Globalization in India, Mittal Publication, New Delhi.

Biestek, F.P. 1970. The Case Work Relationship: London: Unwin University Books, Impression.

Bogo, Mario, 2006-07. Social Work Practice: Concepts, Processes and Interviewing. Columbia University Press-2006. Indian Reprint by Rawat Publication : New Delhi,2007.

Friedlander, W.A. 1964. Concepts and Methods of Social "Work, New Delhi: Prentice Hall of India Pvt. Ltd.

Fisher, J, 1978. Effective Case Work Practice: An Effective Approach, New York McGraw Hill Book Co.

Florence, H., 1964. Case Work: A Psycho social therapy, Random House, New York.

Farard, M.L. & N.K. Hunnybun, 1962 The Case Work's use of relationship London, Tavistock. Pub.

Goldstein, H., 1970. Social Work Practice: A Unitary Approach, Carolina: Univ. of S. Carolina Press.

Grace, Methew, 1992. Introduction to School Case Work, Tata Institute of Social Sciences, Mumbai.

Hamilton, G., 1946. Principles of Social Case recording, New York: Columbia University Press.

Himilton, Gordon, 1959. Theory & Practice of Social Case Work, New York: Columbia University Press, VI Ed.

Husband. E.(ed) New Developments in Social Case Work Reading in Social Work, Vol. III, London: Georque Allen & unwin Ltd.

Mishra, P.D., 1985. Samajik Vijyaktik Sewa Karya (Hindi) Uttar Pradesh Hindi Sansthan, Lucknow.

Perlman, 1957 Social Case Work-A Problem solving Process, Chicago: The University of Chicago Press, V Impression.

Pathak, S.H. 1966. Records in Social Case Work, Delhi School of Social Work, Delhi.

Pinkus, Helen, 1971. Case Records for Teaching Purposes, Faculty as social Work, M.S. University, Baroda.

Roberts R.W. Nee, R.H. 1972 Theories of Social Case Work, the Uni. Of Chicago Press, Chicago, London.

Reid, W.K. & Anne W. Shyne, 1969 Brief and Extended Case Work: New York: Columbia Uni. Press.

Scott Briar and Henry Miller, 1971 Problems and issues in social Case Work: Columbia University Press, New York.

Timmis, N., 1964. Social Case Work: Principles and Practice, London; Rout ledge and Kegan Paul.

Timmis, N., 1972. Recording in Social Work, London, Rout ledge & Kegan Paul.

Terner, F (Ed) 1974. Social Work Treatment, New York: The Free Press.

Upadhyay, R.K. 1991. Samajik Vijyaktik Karya (Hindi) Haryana Sahitaya Academy, Chandigarh.

Upadhyay, R.K. 1993. Indian Philosophical Concepts in Clinical Social work, Kurukshetra Press, Kurukshetra.

Upadhyay, R.K. 2003. Social Case Work, Rawat publications, New Delhi, Jaipur.

Course Title: WORKING WITH GROUPS

Course Code: SWCP – 02

Level: MSW (II)

Objectives:

- To understand theoretical knowledge of social group work.
- To understand group work as an instrument of change/development in individual in groups.
- To understand the relevance of group work in different settings.

Unit – I: Social Group Work:

Definition, objectives and scope - Models of Social Group Work- Historical Development of Group Work, Principles of Group Work, Values, Significance, Limitation of social group work practice in India.

Social Groups and Development: Definition, Characteristics, Types of Groups and Functions of a Group - Basic Human Needs met by Groups at Different Stages of Group Development - Group Process : Bond, Acceptance, Isolation, Rejection, Sub- Group Formation, Withdrawal, Behaviour Contagion, Conflict and Control.

Unit – II: Approaches to the Practices of Group Work:

Group Therapy, Group Psychotherapy, Use of Home Visits and Collateral Contacts. Leadership: Concepts, Definition, Characteristics, Functions, Qualities of Leader, Types and Theories of Leadership, Training for Leadership - Sociometry and Sociogram - Group Work Supervision: Meaning, Purpose and Functions. Skills of social group worker.

Unit – III: Group Work Programme Planning:

Meaning and Definition of Programme, Principles and Process of Programme Planning and the place of Agency in Programme Planning - Programme Laboratory: Values and Techniques (Games, Singing, Dancing, Dramatics, Street play, Puppetry, Group Discussions, Excursion, Psychodrama, Socio drama, Role play, and Brain Storming); Rural Camp: Planning, Organizing, Executing, Evaluating and Reporting.

Unit – IV: Group Work Recording:

Meaning, Purpose, Principles, types of group work recording; Steps and Criteria for Good Group Work. Application of Group Work Methods in Different Settings: Community Settings, Medical and Psychiatric Settings, De-Addiction Centres, Correctional Institutions, Schools, Industries, Physically Handicapped and Aged Homes.

Reading List:

Alissi, A.S.1990 Perspectives on Social Group Work Practice: A Book of Readings, New York, The Free Press.

Balgopal, P.R. and Vassil. Groups in social Work- An Ecological Perspective, New York, Macmillan Publishing Co. Inc.

Bhatt, P.M.1970 Records of Group Work Practice in India, faculty of Social Work, M.S. University, Baroda.

Brandler S & Roman CP 1999 Group work, Skills and Strategies for Effective Interventions, New York. The Haworth Press.

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Garland, J.A.(Ed) 1992. Group Work Reaching Out: People, Places and Power, New York, The Haworth Press.

Garwin, C 1987. Contemporary Group Work, New York Prentice- Hall Inc.

Golpelwar, Banmala, 2007 social Group Work, Indian Institute of Youth welfare, Nagpur.

Kemp, C.G. 1970. Perspectives on the Group Process, Boston: Houghton Mifflin C.

Klein, A.F.1970. Social Work Through Group Process,: School of Social Welfare- Albany: State University of New York.

Konopka, G 1963. Social Group Work: A Helping Process, Englewood Cliff, NJ Prentice Hall, Inc.

Kurland, R & Salmon, R 1998. Teaching a Methods Course in Social Work with Groups Alexandria: Council on Social Work Education.

Middleman, R, R 1968. The Non- Verbal Methods in Working with Groups.

Northen, H 1969. Social Work with Groups, New York: Columbia University Press.

Pepell, C.P & Rothman B. Social Work with Groups, New York: The Haworth Press.

Sundel, M, Glasser, P sari, Individual change Through Small R., Vinter, 1985 Groups. The Free Press.

Samuel, T. Gladhing 1999. Group Work: A Counseling Specility, Simon& Schaster, NJ Printice Hall Inc.

Siddiqui H.Y.2005. Group Work, theories and Practice, Rawat Publication New Delhi.

Toseland RW 1998. An introduction to Group Work Prectice, New York Macmillan Publication Co.

Trecker, Harleigh B 1990. Social Group Work: Principles and Practice, New York: Association Press.

Wilson, G. Ryland, G 1949. Social Group Work Practice, Boston: Houghton Mifflin, Co

Course Title: WORKING WITH COMMUNITIES

Course Code: SWCP– 03

Level: MSW (II)

Objectives:

- To provide theoretical and conceptual understanding of community organization as a method in social work.
- To practice and critically examine the steps and process of community organization in various community setting.

Unit – I: Community and Community Organisation

Community: Concept, characteristics, types and functions. Understanding of community organisation practice: Definition, values, ethics and principles; Historical development of community organisation practice; Community organization as a method of social work intervention; Role and skills of Community Organizer

Unit – II: Models and Strategies of Community Organization

Models and Strategies of Community Organization - Locality Development Model - Social Planning Model - Social Action Model - Select methods of public interest mobilization, litigation, protests and demonstrations, Dealing with authorities, Public Relations, Planning, Monitoring and Evaluation - Roles in different models attributes and attitude.

Unit – III: Community Organization Practice in the Context of Various Settings

Health, Education, Residential institutions, Livelihood and work, Natural resource management, Sustainable development, Working with tribal and Dalit populations, in rural and urban communities, Displaced population and rehabilitation, Community organization in disaster preparedness and response, Peace building and national integration .

Unit – IV: Social Action

Social work and social action, History of social action in India, Radical or emancipatory social work; Rights based approach, Different forms of protest, various contributions to the theory of social action (Lees, Saul Alinsky, Paulo Friere, Mahatma Gandhi's (Sarvodaya and Siddique) Strategies for social action from various social movements.

Reading List:

- Gangrade, K. D. 1971. Community Organization in India, Mumbai; Parkashan, 1971.
- Karamer, R.M. & Spech, H. Reading in Community Organization Practice-Hall Inc. Englewood Cliffs, 1983.
- Murphy C. G.: Community Organization Practice, Boston; Houghton Mifflin Co. Ross, 1954
- Patil, S.H. Community Dominance & Political Modernization; Mittal Publication; New Delhi; 2002.
- Rashmi Dewas & R. Community Participation & Empowerment in Primary Education; Mittal Publication New Delhi; 2003.
- Sengupta, P.K.; Community Organization Process in India, Kiran Publishers, 1976.
- Selgen, S. Empowerment & Social Development Issues in Community Participation; Mittal Publication: New Delhi; 2005.
- Speech, H & Karmer: R.M; 1969 Reading in Community; Englewood Cliffs: Prentice Hall.
- Surya Rao: Under Development with community initiative retrospect & prospect: mittal Publication: New Delhi, 2000.

- Zastrow Charles: 1978. Introduction to social Welfare Institution Social Problems, services & Current Issues (Social work Community Practices Part-3 Chapter-10) Ontario: The Dorsey Press.
- Butcher H. 2007: Critical community Practice.
- Kothari M 2006: Development and Social Action, Rawat Publication, New Delhi.
- Grundy M : Community Work, Rawat Publication, New Delhi,
- Siddiqui. H.V., Social Action in India.

Course Title: A HUMAN RIGHTS APPROACH TO SOCIAL WORK PRACTICE

Course Code: SWCP – 04

Level: MSW (II)

Objectives:

- To understand Human Rights and engage in critical self-reflection and correction for professional development.
- To recognize the extent to which a culture's structures and values may oppress, marginalize, exclude and enhance power and privilege.
- To engage in processes that advance social and economic justice.
- To critically analyse how the intersection of Human Rights Values with Social Work influences practice

UNIT I: Introduction to Human Rights

- Historical evolution and normative framework of the Universal Human Rights System: The UN Charter, Universal Declaration of Human Rights, the ICCPR and ICESCR.
- The generations of Rights
- UN vs National perspectives: Issues of cultural relativism: Rights and Duties, Rights of Indigenous Peoples and Rights of the Scheduled Tribes, Racial discrimination and Caste based discrimination, Right to Self-determination.

UNIT II: Human Rights in the Indian Constitution: Interpretation and Application

- The Preamble, the Fundamental Rights and the Directive Principles of State Policy;
- Special provisions for vulnerable groups: Scheduled Castes, Scheduled Tribes, Women, Religious, cultural and linguistic minorities.

- Role of the Judiciary in responding to Human Rights issues in India: The case of Niyamgiri, Reservations to OBCs, Women's issues, etc
- Role of the National Commissions on: Human Rights, Women, Scheduled Castes, Scheduled Tribes, Minorities, Backward Classes.
- Role of Human Rights NGOs.

UNIT III: Monitoring Human Rights

- Who monitors human Rights?: Social Work Professionals, Medical Professionals, the Police, Lawyers and Judges;
- How to monitor? : prisons, trials, hospitals, cemeteries, vulnerable groups;
- How to investigate? : practical steps on gathering evidence;
- How to report? : How to write a report, How to take a statement, How to collate evidence;
- Commissions of Enquiry; the NHRC
- International and National Reporting and Complaints Procedure.

UNIT IV: Human Rights in Social Work Practice

- The elements of the Human Rights approach and its value to Social Work: Respecting principles of Equality and non-Discrimination; incorporating the Gender perspective.
- The Right to Development: Application to International Agencies and NGOs; ensuring participation of service users; accountability of service providers and empowerment of all stakeholders.
- Applying Human Rights approach to Advocacy in the context of Social Work: Legislation; funds to respond to identified social needs; follow-up; public campaigns; networking.

Reading List:

- Youth for Human Rights (2010). What are human rights?
<http://www.youthforhumanrights.org/what-are-human-rights.html>
- Ife, J. (2001). Local and global practice: Relocating social work as a human rights profession in the new global order. *European Journal of Social Work*, 4(1), 5-15.

- United Nations. (1948). The Universal Declaration of Human Rights. Retrieved from <http://www.un.org/en/documents/udhr/>
- United Nations. (1994). Human rights and social work: A manual for schools of social work
 - and the social work profession. Geneva: United Nations Centre for Human Rights.
- Ife, J. (2012). Human Rights and Social Work: Towards Rights based Practice, CUP: London.
- Reichert, E. (2011). Social Work and human Rights: A Foundation for policy and practice, Columbia University Press.
- Lundy, Colleen (2011). Social Work, Social Justice and Human Rights: A Structural Approach to Practice. University of Toronto Press.
- Mullaly, Bob. () Challenging Oppression and Confronting Privilege, OUP.
- Wronka, Joseph. M. () Human Rights and Social Justice: Social Action and Service for the Helping and Health Professions, Sage publications.
- Hokenstad, Healy, M. and Segal, Uma A (2013). Learning to Teach, Teaching to Learn.

Course Title: SOCIAL WELFARE ADMINISTRATION

Course Code: SWCP – 05

Level: MSW (II)

Objectives:

- To have conceptual clarity about social welfare Administration.
- To understand the principles, structure and functioning of the social welfare Administration system in India.
- To understand the role of voluntary agencies/NGOs in social welfare administration.

Unit – I: Concept: Administration

- Evolution, Meaning Nature, Bureaucratic Human Relations, Philosophy of Social

Welfare Administration, Distinction between Welfare Administration and Public Administration.

- Structure of Social Welfare Administration in India: Departmental Administration in the Government of India; Ministry of Social Justice and Empowerment; Ministry of Women & child Development; Ministry of Rural Development; etc.

Unit – II: Principles and Techniques

- Planning: meaning and process.
- Organizing: Meaning, types of organizational structure, Delegation and Decentralization, Personnel Policy of the organization.
- Staffing: Recruitment and selection process, Terms and conditions of service Probation, confirmation, promotion, Human Relations in Social Welfare Agencies,
- Budgeting: Formulation, controlling mechanism, Problems of budgeting in welfare agencies.
- Commitment of Personnel.

Unit – III: Voluntary Agencies/NGOs

- Voluntary agencies/NGOs in Social Welfare: mandate, role and functioning.
- Administrative structure of voluntary Agencies/NGOs: General Body, Board of Management / Executive Committee, Directors, Secretary Policy formulation, Fund raising, public relations, challenges.
- Voluntary Organizations in the Welfare Section: Helpage India, Child Relief and you, Spastic Society of Northern India, etc.

Unit – IV: Institutions of Social Welfare

- Structure & functions of Central Social Welfare Board.
- State Social Welfare Advisory Board.
- Rehabilitation Council of India
- National Commission for Scheduled Tribes, National Commission for Scheduled Castes, National Commission for Minorities, etc.
- National Institute of Social Defense.

- National Institute of Public Cooperation & Child Development (NIPCCED) etc.
- Welfare Schemes of the various departments of the government of Odisha and the Department for SC,ST, OBC and Minorities Development.

Reading List:

- Choudhry Paul, Social Welfare Administration
- Sharma Urmila & Sharma S K: Public Administration, Atlantic Publishers and Distributors New Delhi.
- Arora Ramesh K. and Goyal rajni, 1995, Indian Public Administration Institutions and Issues: Viswa Prakashan, New Delhi.
- Ramachandran Padma, 1996, Public Administration in India: National Book Trust New Delhi.

Course Title: SOCIAL WORK RESEARCH AND STATISTICS

Course Code: SWCP-06

Level: MSW (II)

Objectives:

- To develop understanding about the components involved in the social work research methodology.
- To improve the ability to link between practice, research, theory and their role in enriching one another.
- To make students understand the importance of statistical tools and techniques and help them to arrive at better research conclusion.

Methods of Social Work Research

Unit-I

Social Work Research: Meaning and Objective. Ethical, Political and cultural context of Social Work research. Social Work research fields: professional practices research, contextual research, system research, trend research, community based participatory research. Qualitative vs. Quantitative research. Research process:

Feasibility issues influencing the research process. Research problems, questions, variables and hypotheses: Conceptualisation and operationalization. Critiquing knowledge bases and reviewing the literature.

Unit-II

Research Design: Matching design to purpose. Designs for evaluating policies, programs & practices: Single Subject Design, Case studies, Survey design, Experimental and Quasi experimental design. Finding research subjects: Sampling: Probability and non probability sampling. Sources of data and data collection techniques: Observation, Interview, Questionnaire, Focus Group Discussion, Brain storming, Delphi method and Projective techniques. Writing research abstract and research report: components of research report.

Methods of Data Analysis

Unit-III

Qualitative Analysis: Thematic analysis, Content analysis, Triangulation, *Phenomenology, and Hermeneutical Analysis*. Quantitative Analysis: Choosing and Understanding Statistical Tests: Levels of Measurement, Descriptive Statistics- Measures of Central Tendency: Mean Median and Mode, Measures of Dispersion: Standard deviation and variances.

Unit-IV

Inferential Statistics and Hypothesis Testing: Correlation and regression analysis, hypothesis testing and test of significance. Bi-variate Statistics: t-tests, ANOVA and Chi Square. Introduction to SPSS for analyzing quantified data. Critical Reflections in Data Analysis: looking for anomalies, discussing findings, analyzing limitations and biases of the study and considering future directions for research.

Reading List:

Anderson, J. Durston H. S & Pooram (1992) Thesis and Assignment Writing; Wiley Eastern Ltd, New Delhi.

Baper, L.T. (1998) Doing Social Research, McGraw Hill, Singapore.

Bryman, Alan & Duncan Cramer (1990) Qualitative data analysis for Social Scientists, Rutledge, London.

Denzin, K Norman & Lincoln, S Yuonna., (1998), Collecting and Interpreting Qualitative Materials, Sage publications, New Delhi.

Denzin, K Norman & Lincoln, S Yuonna.(2000), Hand book of qualitative research, Sage publications, Thousand Oaks.

Gupta, S. P (1992) Elementary Statistical methods sultan chand & sons, New Delhi.

Goode & Hatt (1981) Methods in Social Research, McGraw Hill, New Delhi.

Laldas, D.K (2000) Practice of Social Research, Rawat, Jaipur.

Nachmias & Nachmias (1981) Research methods in the Social Sciences; St. Martin"s press, New York.

Richard, G., et al, (2003) Scaling Procedure –issues and applications, Sage, Thousand Oaks.

Rubin & Bobbie (1993) Research Methods for Social Work, Brooks/Cole publishing Company, California.

Fundamentals of Research Methodology and Statistics by Y. K Singh , New Age International

C.R.Kothari, Research Methodology.

Mukarji Nath Ravindra, Social Research and Statistics, Vivek Prakashan, Delhi.

Kapoor B.K. & Gupta, S.C., Fundamental of Statistics, S. Chand Publication, New Delhi.

Ramchandran, P. Social Work Research And Statistics, Bombay : Allied Publishers

Gupta, S.P, Statistical Methods, Sultan Chand & Sons

Swain A.K.P.C, A First Course in Statistics With Applications, Kalyani Publishers

Patri, D., Statistical Methods, Kalyani Publishers

Bhatnagar, O.P. Reserach Methods And Measurements In Behavioral And Social Sciences, New Delhi, Agri Cole Publishing Academy

Dwivedi R.S. Research Methods in Behavioral Sciences. Delhi, Macmillan

D'cruz, Jones, Social Work Research

Ahuja Ram, Research Methods

SPSS for Social Scientists By Robert L. Miller, Ciaran Action, Deirdie A. Fullerton And John Maltby.

The SPSS Book: A Student Guide To The Statistical Package For The Social Sciences By Matthew J Zagumny

SPSS For Windows Step-By-Step: A Simple Guide And Reference By Paul Mallery And Darren George

Discovering Statistics Using SPSS by Andy Field

Drake, Brett, and Melissa Jonson-Reid. 2007. *Social work research methods: From conceptualization to dissemination*. Boston: Allyn and Bacon.

Grinnell, Richard M., and Yvonne A. Unrau, eds. 2007. *Social work research and evaluation: Quantitative and qualitative approaches*. 8th ed. New York: Oxford Univ. Press.

Rubin, Allen, and Earl R. Babbie. 2007. *Essential research methods for social work*. Belmont, CA: Thomson Brooks Cole.

Rubin, Allen, and Earl R. Babbie. *Research Methods for Social Work*. 6th ed. Belmont, CA: Thomson Brooks Cole, 2008.

Light, R. J., and D. B. Pillemer. 1984. *Summing up: The science of reviewing research*. Cambridge, MA: Harvard Univ. Press.

Course Title: CHILD PROTECTION AND CHILD RIGHTS

Course Code: SWCP – 08

Level: MSW (III)

Objectives:

- To understand the situation of children in India
- To understand the national & international efforts for child welfare
- To know the child related laws.
- To know the programmes & services for child welfare
- To understand & acquire the skills for working with children

Unit – I: Child Rights

Concept of Child Welfare and Child Rights; Demographic profile of the child in India, UN convention on the Rights of the Child, National Policy for Children(1974), National Policy on Education(1986), National Nutrition Policy (1993), National Charter for Children (2004), National Plan of Action for Children (2005) Changing trends in child welfare and protection services.

Unit - II: Problems of the Child and the response of Social Work

Social Work with: Street children, destitute, delinquent, abandoned, orphaned, child with disabilities, sexually abused child, child labour, child trafficking, children affected by natural calamity, HIV/AIDS affected and infected children, child prostitute, children in

poverty, the girl child, truant children, runaway children.

Health Problems: Causes of infant mortality and morbidity; Common childhood diseases; Development delay; Child Nutrition; Nutritional problems: PEM, Micro-nutrient deficiencies disorders, Mineral and vitamin deficiencies, Nutritional guidelines on infant and young child feeding.

Unit – III: Legal Provisions for child protection

The Constitution of India: Articles 14,15,15 (3),19 910 9a0, 21,21 (a),23,24,39(e),39(f); The Indian Penal Code, 1860: Feticide (Section 315 and 316), Infanticide (section 315), Abatement of Suicide (section 305), Exposure and Abandonment (section 317), kidnapping and Abduction (section 360 to 369),Procurement of Minor Girls (section 366-A), Selling of girls for Prostitution (section 372,373), Rape (Section 376), Unnatural sex(section 377); The Pre-natal diagnostic Techniques (Regulation and Prevention of Misuse) Act, 1994; The Juvenile Justice (Care and Protection of Children) Act, 2000; The Immoral Traffic (Prevention) Act, 1956; Child Labour (Prohibition and Regulation) Act, 1986; The Prohibition of child Marriage Act, 2006; The Commission for the Protection of child Rights Act, 2005; Protection of Children Against Sexual Offences Act,2012.

Unit - IV: Social work practice with children

Child guidance clinics; School social work; Child counselling; Life skills training; Child help lines; Adoption services; International and national NGOs working with children: UNICEF, CARE, CRY, SOS-Children's Villages.

Reading List:

- Banerjee, B. G. (1987) Child Development and Socialisation, New Delhi : Deep & Deep Publication
- Baroocha, Pramila Pandit (1999) Hand book on Child, New Delhi : Concept Publishing Com.
- Bhalla, M. M. (1985) Studies in Child Care, Delhi : Published by NIPCCD
- Bhangana. Vinita (2005) Adoption in India.
- Chaturvedi, T. N. (1979) Administration for Child Welfare, Admin, New Delhi : Indian Institute of Pub.
- Choudhari, D. Paul (1980) Child Welfare / Development, Delhi : Atma Ram & Sons.
- Deshpabhu, Rashmi (2001) Child Development & Nutrition Management, Jaipur : Book Enclave
- Ghathia, Joseph (1999) Child Prostitution in India, New Delhi : Concept Publishing Company
- Hugh, Jolly (1981) Diseases of Children, Oxford, London, Edinburgh : The English Language book society and Blackwell Scientific Publications

- Hurlock, Elizabeth B. (1968) Child Development, New Delhi : Tata McGraw Hill Pub; Com; Ltd.
- Rani, Asha (1986) Children in Different situations in India- A Review, TISSS.
- UNICEF, State of Worlds Children Annual Report
- Venkatesan S.(2004) Children with Developmental Disabilities.

Course TITLE: SOCIAL WORK WITH WOMEN: ISSUES OF GENDER AND DEVELOPMENT

Course Code: SWCP – 09

Level: MSW (III)

Objectives

- Develop an ability among students to analyze the position of women in rural and tribal society and the role of the social worker thereof.
- To develop an understanding of problems specific to women.
- To be introduced to legislative protection of women.
- To understand the concept of gender in various areas of social work practice.

UNIT-I: Construction of Gender

- Socio-Cultural Concepts: Gender, Sex, Patriarchy, Masculinity and Feminism.
- Women and Society: Status of Women in Indian society (Urban, Rural, Tribal and Dalits):
- Role of Women in Socio- Economic life: Family, Marriage, Religion, Caste, Tribe, Economy, Health and Education, Environment , Women and Media

UNIT-II: Issues and Challenges of Women in India and Odisha

- Problems of Women: Dowry, Domestic Violence, Crime against Women, Immoral Trafficking, Prostitution etc.
- Maternal Health Issues: Maternal Morbidity, Maternal Mortality, Infant Mortality, Female foeticide, Women's reproductive health and rights; and Changing concepts of Motherhood: Surrogate motherhood; Family Planning: Objectives and methods.
- Community based mental health programmes with a focus on mental health needs of women.

UNIT-III: State and Women

- Social Legislation for Women : Property Rights Act under the Hindu Succession Act,1956(Sect 6,14,15,16), Property Rights of Muslim Law, Dowry Prohibition Act,1961, Family Courts 1984, The Pre-conception and Pre-natal Diagnostic Techniques(Prohibition of Sex Selection) Act 1994, The

Protection of Women from Domestic Violence Act,2005, The Indecent Representation of Women(Prohibition)Act, 1986

- Social Policies regarding Women: National Health Policy, National Education Policies,
- Provisions, Schemes and Programmes for women empowerment.

UNIT-IV: Women's Development and Social Work

- Concept of engendering Social Work and the role of the Social Worker.
- Applications of Social Work methods for Women empowerment and Development.
- Political Empowerment of Women: Participation of Women in National Movements; Women in National and Regional politics, Panchayati Raj Institutions and Urban Local bodies.

Reading List:

- Brook E and Davis, Ann (1985) Women, The family and Social Work, London.
- Samanta, R.K (2005) Empowering Rural Women and Issues, Opportunities and Approaches, B.R world of books
- Saxena,S(2005) Crimes against Women and Protective laws, Deep and Deep Publications, Pvt.Ltd. New-Delhi
- Paul chowdhry, D Women welfare and Development(A Source Book) Inter-India Publication, New-Delhi 1991
- Agarwal Sushila, Status of Women, Print well Publisher, New-delhi.
- Bodra Gomati, Empowerment of Tribal Women
- Baig, Tara Ali Women In India, Ministry of information and Broadcasting, Govt. Of India Publication Division, New Delhi
- Agrawal Bina, Gender And Legal Rights in Landed Property in India, Kali for Women.
- Bhargava V. Durvar, Mental Health from a Gender Perspective, Sage publication.
- Gore,M.S: Urbanisation & family Change, popular Prakashan, Bombay, 1986.
- Agarwal, R.K. Hindu Law-central Law Agency, Allahabad.
- Adhikari, A.K and Pramanik: Gender inequality and Women's empowerment, Abhijeet Publication,2006
- Sikligar, P.C:Empowerment of Tribal Women, Jaipur Mangal Deep Publications,2006.

Course Title: ETHNIC SENSITIVE SOCIAL WORK PRACTICE IN INDIA

Course Code: SWCP - 10

Level: MSW (III)

Objectives:

- To tune Social Work Practice to the values and dispositions related to the social background of the client and the behavior of the larger social system, to work towards social justice and human liberation.

UNIT – I: What is Ethnic Sensitive Practice (ESP) in Social Work?

- Definition, conceptual formulation and perspectives on ethnic sensitive practice.
- Assumptions and principles for ethnic-sensitive practice.
- The layers of understanding in ethnic sensitive practice.
- Ethnic sensitive practice with displaced populations, migrants, families, communities, students, etc.

UNIT – II: The Ethnic Scenario in India

- The Schedule Tribes (ST), particularly vulnerable tribal groups (PVTGs) and Denotified Tribes: Demographic profile, their education, health, employment and economic status.
- The Scheduled Castes (SC) and other Backward Castes (OBC): Demographic profile, their education, health, employment and economic status.
- An analysis of the caste system, and the practice of untouchability.
- Ethnic based discrimination in India with respect to public services, government schemes and employment programmes etc.
- An analysis of industrialization, urbanization, liberalization, privatization, globalization, development projects and their impact on STs and SCs land alienation, loss of forest rights, displacement, socio-cultural loss, poverty and impoverishment, indebtedness, psychological issues.

UNIT – III: Constitutional Safeguards Legal Provisions and Policies

- The Preamble, The Directive principles of state policy ensuring social safeguards: Articles 17,23,24,25,(2)(b); Economic safeguards: Articles 46, 23, 24, 244, 275(I), fifth schedule, sixth schedule; Education and cultural safeguards: Articles 15 (4), 29 (i), 350 A; Political safeguards: Articles 164 (I), 330, 332, 334, 371 A, 371 B, 371 C, 371 C, 371 F, 371 G, 371 H. Service Safeguards; Article 16 (4), 16(4a), 335, 320 (4); To ensure these safeguards Articles 338 and 338A provide for two statutory commissions: The National commission for Scheduled Castes and the National Commission for Scheduled Tribes.
- Protective Legislations: The Protection of Civil Rights (PCR) Act 1955; The Scheduled Castes and Scheduled Tribes (Prevention of Atrocities): POA Act, 1989; The Orissa Scheduled Areas Transfer of immovable property (by ST) Regulation (1956); The Orissa Land Reforms Act (1960)
- Schemes of the Ministry of social justice and empowerment; Scheduled Caste Sub Plan (SCSP) and Schedule Tribe Sub Plan (STSP) introduced since the sixth Five Year Plan.

UNIT – IV: Strategies for Social Workers to Work for Social Justice and Rights

- Identifying the sources and dynamics of injustice, discrimination and oppression.
- Adopting the layers of understanding in ESP in all fields of social work practice.
- Adopting 'radical' change oriented methods such as: advocating human rights, affirming core social work values, affirming politics of social justice and human liberation, facilitating critical consciousness, participatory-democratic egalitarian social movements.

Reading List:

- Denove.W and Schlesinger E.G, (1999) Ethnic-Sensitive Social Work Practice.
- Yil. David. G, (1998), Confronting Injustice and Oppression.
- Thorat S.K. (2009) Dalits in India: Search for a Common Destiny.
- Thorat S.K. and Newman Kathernic S., (2010) Blocked by Caste: Economic Discrimination and Social Exclusion in Modern India.
- Constitution of India

- Website of Ministry of Social Justice and Empowerment, Government of India.
- Munshi. Indra, (2007) Adivasi Life Stories: Contexts, Constraints, Choices, Rawat Publication.
- Jain, P.C. 1991. Social Movements among Tribals, New Delhi: Rawat Publications.
- Singh K.S. (ed.). Tribal Movements in India, Vol. I & II;
- Singh, J.P. & Vyas. M.N. Tribal Development: Past Efforts and New Challenges.
- Alinsky Saul, Rules for Radicals. Vintage Books Edition, 1972
- VirginiusXaxa (2003), "Tribes in India," The Oxford India Companion to Sociology and Social Anthropology, (Ed) Veena Das, New Delhi: Oxford University Press,
- Baviskar, Amita. 1997. "Tribal Politics and the Discourses of Environmentalism," Contributions to Indian Sociology, Volume 31, Number 2.
- Abbi, Anvita. 2102. Chapter 13, "Declining Adivasi Knowledge Systems and Killing of Linguistic Diversity," Social Exclusion and Adverse Inclusion: Development and Deprivation of Adivasis In India, (Editors) Dev Nathan and VirginiusXaxa, Oxford University Press, 2012.
- Jean Dreze, Meera Samson and Satyajit Singh. 1997. Chapter 2, "Resettlement Politics and Tribal Interests," Dam and the Nation: Displacement and Resettlement in the Narmada Valley. New Delhi: Oxford University Press.
- Dev, Nathan. 2012. Chapter 17, "Displacement and Reconstruction of Livelihoods," and Chapter 18, "Community Representatives" Views on Development Processes," Social Exclusion and Adverse Inclusion: Development and Deprivation of Adivasis in India, (Editors) Dev Nathan and VirginiusXaxa, Oxford University Press, 2012.
- Xaxa, Virginius. 2008 "Protective Discrimination: Why the Scheduled Tribes Lag Behind the Scheduled Castes," State, Society and Tribes, New Delhi: Pearson Education.

Course Title: RIGHTS OF PERSONS WITH DISABILITIES AND THEIR REHABILITATION

Course Code: SWCP – 11

Level: MSW (III)

Objectives:

- To facilitate basic understanding about person living with disability
- To disseminate information about the variety of policies and programmes targeting to include persons with disabilities.
- To develop understanding on the possible rehabilitation measures.
- To develop insight into the workable models of interventions for inclusion of persons with disabilities.

UNIT – I: Understanding Disability

- Definition, types, magnitude and causes of disabilities.
- Approaches towards disability; medical, psychological, economic-vocational, socio-political, human rights and capabilities.
- Examining the impact of disability on the quality of life of persons with disabilities in the context of their family, society and environment.
- Issues related to their daily living, education, sexuality, integration, employment, interpersonal relationships, marriage and the need for social work intervention.

UNIT – II: Role of the Social Worker in the Rehabilitation and Inclusion of the Disabled

- Assessment treatment and rehabilitation of persons with disabilities through a multi-disciplinary team including the social worker.
- Inclusion of persons with disabilities in schools and educational institutions.
- Skill development and vocational rehabilitation of persons with disabilities.
- Equality of opportunity and treatment in employment and occupation of persons with disabilities.

UNIT – III: International Initiatives and National Legislations and Policies for the Empowerment of persons with disabilities

- UN Initiatives: UN convention on the rights of persons with disabilities 2006; Un standard rules on the equalization of opportunities for persons with disabilities (1993); and Darter Framework for Action.
- ILO Initiatives for enhancing support to vulnerable groups including the disabled: Global employment agenda(2003); Declaration on social justice for fair globalization 92008); Global jobs pact (2009); ILO code of practice on managing disability in the workplace (2002)
- National Legislations: Rehabilitation Council of India Act, 1992; Persons with disabilities (equal opportunities, Protection of rights and full participation Act, 1995; National Trust for Welfare of Persons with Autism, Cerebral Palsy, Mental Retardation and Multiple Disability Act, 1999; The Rights of Persons with Disabilities Bill, 2011.
- National Policies:
 - National Policy for Persons with Disabilities (2006): Physical rehabilitation, Educational rehabilitation and Economic rehabilitation.
 - Guidelines for: Issue of disability certificates; evaluation of various disabilities and procedure for certification; space standards for barrier free built environment for disabled and elderly persons.
 - Identified posts for persons with disabilities -2007.

UNIT – IV: Role of Social Work

- Intervention strategies at individual level: counselling, building support groups, assertiveness training;
- Intervention strategies at family level: Parent counselling, parent training and family crisis intervention.
- Intervention strategies at community level: Community education, community based rehabilitation
- Intervention strategies at policy making level: Advocacy in legislative and policy making bodies; research and influencing public opinion.

Reading List:

- Ministry of Social Justice and Empowerment;
http://www.socialjusticenic.in/policies_acts3.php

- Bhumali.Anil,(2009) Rights of disabled women and children in India, serials publications, New Delhi.
- Hans. Asha and patri.A (2003) Women Disability and Identity sage, New Delhi
- Mukhrjee, Manjumohan(2006) Problems of Disabled People, Associated Publishes, India.
- Kanna. G.N. (2001), Disability Studies in India-Retrospect's and prospects Gyan Publishing house, New Delhi.
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- O'Reilly, A. (2007) The right to decent work of persons with disabilities (geneva ILO)
- Davis, Lennard. J. (1997) The Disability Studies Reader, Routage, NY
- Shapiro, Joseph P. (1993) No Pity: People with Disabilities Forging a New civil Rights Movements.

Course Title: COMMUNITY HEALTH AND SOCIAL WORKERS

Course Code: SWCP – 12

Level: MSW (III)

Objectives:

- To understand the basic concepts related to Health and its importance.
- Identify and understand the changing health needs of ever-changing community and organize relevant effective interventions for amelioration of health problem.
- To develop students' appreciation and a commitment to healthy and socially just ways of living.
- To develop student's knowledge and understanding about ways of enhancing personal and community health and wellbeing.

UNIT – I: Concepts of Health & Nutrition

- Definition & type (Physical & Mental) of health and its dimensions; appreciation of health as relative concept; determinants of health, changing concepts of health.
- Characteristics of agent, host and environmental factors in health and disease.
- Health situation in India and Odisha-especially the demography, mortality and morbidity profile and the existing health facilities in health services.
- Mental Health- concept, community based mental health programmes.
- Nutrition- definition, concept, balance diet nutritive values and food items.
- Genetically Engineered and modified foods.

- Nutritional Assessment and monitoring.

UNIT – II Epidemiology

- Epidemiology: definition, concepts and its role in health and disease, public health-concept & importance
- Definition of the terms used in describing disease, transmission and control.
- Epidemiology of specific diseases: Communicable and non-communicable diseases, symptoms causes and prevention of disease caused by virus: measles, chickenpox, polio, & leprosy, disease caused by bacteria: diphtheria, typhoid, tuberculosis, plague, dengue, hepatitis. disease caused by parasites: Malaria, scabies, intestinal worms. Preventive & Social Medicine: concept, meaning, programmes for controlling communicable diseases.

UNIT – III Environmental Health

- Awareness of the concept of safe and wholesome water.
- Awareness of the requirements of a sanitary source of water.
- Understanding the methods of purification of water on small scale with stress on chlorination of water.
- Disposal of solid waste, liquid waste, both in the context of urban and rural conditions in the country.
- Problems in the disposal of refuse, sullage and sewage.
- Role of social worker in environmental health.

UNIT – IV Community Health and Role of Social Work

- Primary Health Care Services: organizations & functions
- Medical Social Work: meaning nature & scope
- Health Care in Rural and Urban areas of Odisha:
- Role & Functions of Social Worker in hospital setting and community health: individual, family and community level; communication tools and techniques.

Reading List:

- Park J. E. and Park K.: Textbook of Preventive and social Medicine Banarasi Das Bharat Publishers, Jabalpur.
- Bedi, Yash Pal (1979) Social Preventive Medicine, Atma Ram and Sons; New Delhi.
- VHAI – State of India's Health.
- Shah. Ghanshyam (1997) Public Health and Urban Development, Sage; New Delhi.

- Werne. David (1994) where there is no Doctor, VHAJ.
- Sinha. A.K, (ed) (1997) Human Health and Environment, Vol. I & II, APH Publishers: New Delhi.
- John Webb (2002) Medical Social Work: The Reference Book, Trafferd Publishing.
- Gehlert, Sarah and Browne. Teri (Ed) (2011) Handbook of Health Social Work Wiley Publication.

Course Title: SOCIAL MANAGEMENT

Course Code: SWCP – 13

Level: MSW (III)

Objectives:

- To understand the eco system of communities and their market landscape to help community based organizations engage with a market based economy.
- To help build the capability needs of communities towards self reliance through sustainable community enterprises.
- To help gain fundamental principles of Management.

Unit I: Understanding the community and deciphering the market

- The village social structure: relationship between social groups, communication patterns, processes of exclusion and inclusion, culture and Social value base.
- Identifying community resources: social capital, natural resources, common- property resources, education, health & employment status.
- Institutions in the community: Social institutions, formal community based institutions for eg: clubs, SHGs, village Council, etc; PRI; Administrative Structure from Block to District level; Educational Institutions; Health and Medical Institutions
- The local market economy: Money Lenders, Small & Large traders, entrepreneurs, corporations and companies; key factors of Local Market Economy: Market Boundaries; Market Values; Market Values Chains.
- Need Assessment and mapping of village resources, producers and institutions study of the community.

Unit II: Operations and Marketing Management

- Operations Management in the context of community based enterprises- organizations: product design, process selection and design, capacity decisions, location and layout decisions, sowing, transformation and storage, quality of inputs and finished products, material handling and logistics.
- Farm, Forest and Livestock resources and their conversion to products: process & risks involved. Tools for process mapping and mapping a supply chain.
- Agricultural Products: Types and issues, value addition, pricing and distribution; Agricultural Product Buyers: Retail and Wholesaler, Consumers, Customers and key buyer characteristics.
- Key aspects of sales, marketing and planning; Negotiation and selling techniques.

Unit III: Accounting and Finance

- Accounting: Need, Meaning and objectives; role of an accountant; uses of accounting information; Origin and analysis of business transactions; accounting equation.
- Financial Statements: Balance sheet, Income statement; Recording business transactions: Double entry system, the T-accounts, principles and conventions of accounting, journal entries.
- Books of accounts: Cash book, ledger, sales register, etc; posting of transactions in books
- Trial balance: closing and balancing of accounts; locating and correcting errors; preparation of balance.
- Bank transactions and bank reconciliation: need for reconciliation, causes of difference in passbook and cash book balance, procedure for bank reconciliation statement.
- Distribution of profit: determination of distributable surplus; basis of distribution.

Unit IV: Planning and Budgeting

- Levels of Planning: Village level, cluster level community enterprise / organization level
- Planning for distribution of responsibilities among community based leaders / coordinators / facilitators.
- Planning for Product basket, their local value addition for greater shelf-life and for sale in local markets.
- Planning for marketing.
- Developing proposals considering resources, cost and time budget.
- Planning for Resource Generation: Internal resource generation and from external institutions Government Departments, Banks, Public and Private, NGOs and INGOs
- Planning for improving technical capabilities.

- Planning for allied services like Health, Education, etc.

Reading List:

- Implementing Community Enterprise system for Sustainability of Agricultural Communities: A Manual, Nayak, Amar KJR (2012)
- A Proposal for Holistic Development at a GP Level for Long Term sustainability of Small and Marginal Farmers/Producers in the GP. Amar KJR Nayak (2011)
- Ongoing Programmes & Schemes of the State Government and the Central Government, Rabindra Kumar Gouda (2012)

Course Title: SOCIAL WORK IN SCHOOLS

Course Code: SWEP – 01

Level: MSW III

Objectives:

- To understand the Rights of the Child in the context of schools.
- To acquire necessary understanding and skills to work with children in schools.

UNIT I: Conceptual framework for Social Work Practice in Schools

- Conceptual Perspectives: Social Learning Theory, General Systems Theory, Ecological Perspective
- Models of intervention: Traditional Clinical Model, The School Change model, The Community School Model, Social Interaction Model, School-Community- Pupil Relations Model

UNIT II: Context of Social Work Practice in Schools: Legislations and Policies

- UN Rights of the Child, Commission for Protection of Child Rights Act, 2005
- Constitution of India, Article 21 A, National Policy on Education (1986), National Curriculum Framework for School Education (2000), Right to Education Act (2009)
- Constitutional provisions for the education of SC, ST and religious, cultural and

linguistic minorities, policies and programmes of the Government.

- Inclusive Education policies in the V Year Plans, Integrated Education for Disabled Children (IEDC), District primary Education Programme (DPEP), Sarva Shiksha Abhijan (SSA)

UNIT III: Social Justice Issues in School

- Dealing with stereotype, bias and discrimination;
- Intervention for the vulnerable populations i.e., Challenged children, SC, ST and minority;
- Dealing with the 'Achievement gap' i.e, difference in performance between students of vulnerable and privileged backgrounds.

UNIT IV: The Role of the Social Worker

- Services to students: Dealing with social or behavioural problems (Depression, Truancy, Aggression, Trauma, Substance Abuse, Sexual Activity), poor attendance, drop-out, poor performance, offences against children.
- Services to teachers: Teacher support groups, teacher training, teaching stress;
- Services to families: Providing parent support, consultation, parenting skill classes, family programming; organizing financial support for vulnerable families;
- Services to the community: Community outreach, community involvement, village Education Councils.

Reading List:

- Allen- Meares, P., Washington, R. O., & Welsh, B. L. (1996). Social Work Services in schools. 2nd ed. Boston: Allyn & Bacon.
- Dupper. David, (2003). School Social Work: Skills and Intervention for Effective Practice, John Wiley and Sons, NJ.
- Bye. Lynn and Alvarez. Michelle (2006). School Social Work: Theory to Practice, Cengage Learning.
- Germaine. Carel B and Bloom Martin (2008). Human Behaviour in the Social Environment: An Ecological View. Columbia University Press, New York.
- Greene. Roberta R,(2010) Human Behavior Theory and Social Work Practice (Modern Applications of Social Work), Transaction Publishers, New Brunswick, New Jersey.
- Journal of School Social Work(JSSW), Chennai, India.

- NCPCR, Protection of Children against Corporal Punishment in Schools and Institutions,
- http://www.ncpcr.gov.in/Reports/Protection_of_Children_against_Corporal_Punishment_in_Schools_and_Institutions_December_2008.pdf
- NCERT (2000). *Assessment of Needs for Inclusive Education: Report of the First Regional Workshop for SAARC Countries*. New Delhi: NCERT
- Mohapatra, C. S. (2004). *Disability Management in India: Challenges & Commitments*. New Delhi: National Institute for the Mentally Handicapped (NIMH) and the Indian Institute of Public Administration.
- Mishra, A. (2000). "India: Special Education", in C.R. Reynolds, and F.E. Janzen (eds), *Encyclopedia of Special Education: A Reference for the Education of the Handicapped and other Exceptional Children and Adults*, 2e. USA: John Wiley and Sons
- Ministry of Social Justice and Empowerment of India. *Annual Report* (latest), New Delhi: GOI
- Ministry of Human Resources Development (MHRD). *Annual Report* (latest). New Delhi: GOI
- Ministry of Human Resources Development (2000). *Sarva Shiksha Abhiyan : Framework for Implementation*, Department of Elementary Education & Literacy, New Delhi; GOI
- Five Year Plans: <http://www.planningcommission.nic.in/plans/planrel/fiveYr/7th/vol2/7v2ch10.html>.
- Department of Education (1986). *National Policy on Education*, 1986. New Delhi: MHRD, GOI
- Department of Education (2000). *Sarva Shiksha Abhiyan: A Programme for Universal Elementary Education*. New Delhi: MHRD, GOI.

Course Title: WORKING WITH WOMEN

Course Code: SWEP – 02

Level: MSW III

Objectives

- Develop an ability among students to analyze the position of women in rural and tribal society
- Acquire understanding on problems relating to women

- Develop in them a critical understanding about the schemes related to women

Unit-1

Status of women in rural and tribal community - in the context of family

marriage, religion and economy. Sexual division of labor its impact on health, education, illiteracy, adjustment, malnutrition, early marriages.

Unit-2

Problems relating to women – dowry, domestic violence, crimes against women, female feticide, child prostitution, exploitation and abuse of domestic female lab our.

Unit-3

Women in local self government with special reference to women in decision making. Impact of 73 amendment, development schemes and women's situations, case studies of DRDA, ICDS, SHGs.

Unit -4

Role of media in projecting the images of women, women in the media- print media, radio, films, television, and advertisement and publicity, Media and self employed women

Reading List:

- Paul chowdhry, D. Women welfare and development (A source book) ; Inter-India Publication, New Delhi -1991
- Sushila Agarwal , Status Of Women Printwell publishers, Jaipur, 1988
- Pandit, S.K. Women in Society, Rawat Publications, New Delhi 1998
- Brook E and Davis, Ann (1985) Women, The family and Social Work, London.
- Samanta, R.K (2005) Empowering Rural Women and Issues, Opportunities and Approaches, B.R world of books
- Saxena, S(2005) Crimes against Women and Protective laws, Deep and Deep Publications, Pvt.Ltd. New-Delhi
- Paul chowdhry, D Women welfarae and Development(A Source Book) Inter-India Publication, New-Delhi 1991
- Agarwal Sushila, Status of Women, Print well Publisher, New-delhi.
- Bodra Gomati, Empowerment of Tribal Women
- Baig, Tara Ali Women In India, Ministry of information and Broadcasting, Govt. Of India Publication Division, New Delhi
- Agrawal Bina, Gender And Legal Rights in Landed Property in India, Kali for

Women.

- Bhargava V. Durvar, Mental Health from a Gender Perspective, Sage publication.
- Gore, M.S: Urbanisation & family Change, popular Prakashan, Bombay, 1986.
- Agarwal, R.K. Hindu Law-central Law Agency, Allahabad.
- Adhikari, A.K and Pramanik: Gender inequality and Women's empowerment, Abhijeet Publication, 2006
- Sikligar, P.C: Empowerment of Tribal Women, Jaipur Mangal Deep Publications, 2006.

Course Title: Working with Alcoholics and Substance Abusers

Course Code: SWEP – 03

Level: MSW (III)

Objectives:

- To facilitate basic understanding about substance abuse
- To disseminate information about addiction to alcohol.
- To develop understanding about the role of social worker in rehabilitation.
- To develop insight into the role of counseling among alcoholics and substance abusers.

UNIT – I: Basics on Substance Abuse

- Substance abuse and dependence: Meaning, Definition, nature and extent of the problem in India and Odisha.
- Types of Addictive Substances: Natural, Synthetic, Narcotics, Stimulants and depressants.
- Symptoms, short term and long term impact of substance abuse.

UNIT – II: Addiction to Alcohol

- Alcohol dependence and Alcoholism: Causes, symptoms, long-term and short-term effects.
- Impact of Alcoholism on Individual, Community and Family.
- Concept of social drinking, alcoholic and relapse.

- Phases of alcohol addiction.
- Social and economic implications of addiction.
- Alcoholism among Youth-causes and remedies.

UNIT – III: Role of Social Workers in rehabilitation

- Role of Social Worker in Preventive, curative and Rehabilitative services for substance abusers.
- Multidisciplinary Approach services for substance abusers.
- Legislation Provisions and Government programmes to control drug abuse in India.

UNIT – IV: Role of counseling

- Concepts of counselling and its association with addiction; approaches to counseling: Psychoanalytical, client centred therapy. Indigenous approaches of help and self help: Yoga, Meditation, Attitude and Values, Counselling as an treatment method for substance abusers.

Reading List:

- Chopra, R.N. and Chopra, F.C., 1965: Drug Addiction with Special Reference to India, New Delhi Council of Scientific and Industrial Research.
- National Institute of Social Defence, Govt. of India, 1992: Drug Abuse.
- Single, Eric. Et. Al, 2003: International Guidelines for Estimating the Costs of Substance Abuse and Addiction.
- Delaney and Eisen Berg, 1973: The counseling Process.
- Singh, Chandra Paul, 2000 Alcohol and Drug Dependence Among Industrial Worker, Delhi Shipra Publications.
- Kaur, Ravneet and Gulati, J.k., 2007: Drug Abuse: Trends and issues, International Marketing Conference on Marketing & Society, IIMK.
- Ahuja, R, College Youth and Drug Abuse: A Sociological Study of Nature and Incidence of Drug Abuse among College and University Students, University of Rjasthan Jaipur

- Gupta, R. Punjab a drugged State, Meditrack.
- Chopra, L.C. and R.N., Chopra 1957,; The use of Cannabis Drugs in Inda. Bulletin on narcotics (United Nations Publication)
- Mohan, D.A.K. Pravakar and P.N. Sharma: Prevalence and pattern of drug abuse among Delhi University students, Indian Journal of Medical Research.
- Ropar, C 2006: Social Use, abuse and addiction-site of the author University of Tekas, Austin.
- Horgan C. Substance abuse: The Nation's number one health Problem, Princeton NJ; The Robert Wood Johnson Foundation.

Course Title: CORRECTIONAL SOCIAL WORK

Course Code: SWEP – 04

Level: MSW (III)

Objectives:

- To understand crime and delinquency as a social problem.
- To study and understand the basic elements of correctional methods and approaches.
- To gain knowledge of legal provisions.
- To study and identify the practices of non-institutional services.
- To acquire skills of correctional social work and understand the role of professional social workers in correctional institutions.

Unit- 1: Crime in the context of Social problem

- Crime: Concept, Theories of Causation, Classification of crime and approaches to deal with crime and criminals.
- Crime in India and Odisha: crime against women, crime against children, Atrocities against Scheduled Castes and Scheduled tribes; Emerging patterns and trends.
- Juvenile Delinquency: Concept, Demography, Theories of causation and approaches to delinquency prevention.

Unit- 2: Criminology and Criminal Justice System

- Concept of criminology; Social, Psychological and Legal approaches
- Courts and correctional administration. Hierarchy of courts functions and powers. Lok Adalats, Lokayukta, Legal Aid, Functions of Law Commission. Analysis of the Criminal Justice System: Police, Judiciary, Prisons and Correctional Services.

Unit -3: Correctional Administration and Services

- Institutional services: Prison, observation homes, special homes, beggar homes, rescue homes, short-stay homes, protective homes, half-way homes, de-addiction centers.
- Community based corrections and non-institutional services: Early diversion and de-institutionalization, probation and parole, adoption, foster care, child guidance centers, family counselling, crisis intervention, after-care rehabilitation and reintegration of offenders; community po.

Unit- 4: Correctional Social Work

- Definition, history, philosophy: Retribution, Restitution, General Deterrence, Special Deterrence Incapitation, Just Desserts ,objectives, methods and approaches of contemporary correctional social work: Probation and Parole, Alternative to Capital Punishment.
- Correctional Social Work in India; role of professional social workers in correctional institution, crime prevention and rehabilitation of offenders: supervision, surveillance and counselling; skills unique to correctional social work; limitations of correctional social work.

Reading List:

- Gupta, M.C. & K. Chockalingam, J. Guha Roy (2001) Child Victims of Crime: Problems and Perspectives. New Delhi, Gyan Publishing house.
- Ahuja Ram. (1996) Youth and Crime. Jaipur, Rawat Publications.
- Tripathy, P. C. (2000) Crime against Working Women, APH Publishing Co., New Delhi.
- Dabir, Neela & Nigudjar, Mohua. (2005) Children in Conflict with Law. Mumbai, TISS.
- Coleman, Clive. (2000) Introducing Criminology, Willan Publication, UK

- Ahuja, Ram. (2000) Criminology, Rawat Publication, New Delhi
- Siegal, Larry J. (2000) Criminology, Wadsworth Thomson Learning, New Delhi
- Schmalleger, Frank. (1999) Criminology Today: An Integrative Introduction 2nd edition, Prentice Hall, New Delhi
- Alan Vand, K. Criminal Justice System – Readings
- Mehraj-ud-din, Mir, (1984) Crime and Criminal Justice System in India, Deep & Deep Publications, New Delhi
- Choudhuri, Mrinmaya. (1995) Languishing for Justice: Being a Critical Survey of Criminal Justice System, Datt Sons, Nagpur
- Chakrabarti, N. K. [Ed.] (1997) Administration of Criminal Justice (Vol.1.). New Delhi. Deep and Deep Publications.
- Robert M Carter, Daniel Glaser, Leslie T Wilkins, (1985) Correctional Institutions, Harper & Row Publishers Inc.
- Siddique, A. (1983) Criminology, Lucknow, Eastern Book Co.
- Smykla, J. Community based Corrections.
- Bartollas Clemens, (1985) Correctional Treatment: Theory and Practice, Prentice hall, New Jersey
- Panakal, J. J & Gokhale, S. D. (1989) Crime and Corrections in India, Mumbai, TISS

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Course Title: COUNSELLING IN SOCIAL WORK

Course Code: SWEP – 05

Level: MSW (III)

Objectives:

- To develop a holistic understanding of counseling as a tool for help
- To acquire knowledge of various approaches, their theoretical under-pinning for goals, values, process and techniques
- To develop skills of application to real life situations
- To develop ability to recognize and synthesize attitudes and values the enhance investment of self in the counselor's role

- To develop ability to use the tools/scales in various settings

Unit – I:

Introduction to Counseling: Meaning, Definition, Need and importance of counseling and professional counseling. Basic principles of Counseling: Participation, Individualization, Confidentiality, communication, acceptance, self confidence, self awareness and other principles governing the counseling relationship. Components of effective counseling: Personality of the counselor's skills – Role and functions of the counselors in schools, industries, family, hospital and rehabilitation institution

Unit – II:

Types of counseling – Individual and group Counseling, Family Counseling, Marital Counseling, Student Counseling and Industrial Counseling, E-Counseling: concept, conditions and importance of E-counseling; Techniques of group counseling, strategies and structure – barriers to effective counseling sessions; Counseling evaluation.

Unit – III:

Theories of counseling: Psychoanalytic, Adlerian, Client centered, Behavioural, Rational emotive, Reality, Gestalt, Transactional analysis and eclectic Theories.

Unit – IV:

Counseling process, Interview and its significance in counseling – Use of observation in counseling and understanding of emotions in counseling. Transference and counter transference. The following standardized tests must be practiced in counseling settings. Personality, intelligence, interpersonal relations, stress, anger, self esteem, anxiety, assertiveness, depression, adjustment, mental health and family intensive. Counseling in different settings: HIV/AIDS counseling, Alcohol and Substance dependence counseling and Trauma counseling.

Reading List:

- Burnett. J. : Counseling with young people
- Fred Machinery : Counseling for personal Adjustment
- Shestroi Everlett, Brammer M. Lawrence : The dynamics of counseling process.
- Tpbbert, E.L. Introduction to counseling

- Colin Fertham, Controversis in psycho therapy and counseling, Sage publications, New Delhi, 1999.
- Kathryn Geldard & David Geldard, Counseling Children, A practical Introduction, Sage publication, New Delhi, 1997.
- Fullmer, D.W. & Bernard H.W: Counseling content and process
- Harms E & Schreiber : Handbook of counseling Techniques
- Kennedt. E : On becoming a counselor – A basic Guides for non-professional counselors, Macmillan, New Delhi.
- Development theories of E.B. Harlock and Robert kegan Psychological theory(Eric Erickson, Need Hierarchy (Maslow's) Cognitive theory (Jean Piaget)

Course Title: SOCIAL WORK WITH THE ELDERLY

Course Code: SWEP – 06

Level: MSW (III)

Objectives:

- To study the basic characteristics about the elderly population
- To understand the development tasks associated with the elderly population.
- To know the various services provided at institution dealing with the elderly.
- To link social work methods in promoting welfare among the elderly.

UNIT – I: Basics about elderly

Gerontology – Definition and scope. Status of Elders in India & Odisha:- Demographic, social, cultural and economic aspects. Needs and problems of elders. Role of elders in family. Issues of Elderly in health, occupation, income retirement planning, property rights, gender issues and family supports. Constitutional guaranteed rights and policy on older persons.

UNIT – II: Developmental tasks

Developmental tasks in elderly: Issues in health care, changes in family structure, coping with aging process, challenges due to changing physiological, economic, safety, status

in the family and other issues, Healthy aging, quality of life, coping with demise of the life partner, bereavement, resolving one's death, and any other.

UNIT – III: Developmental services for the elderly

Institutional care settings for elderly: General hospitals, geriatric wards, home based care, homes for the aged, nursing homes, Day care centres, hobby centres, elder helpline, facilities for homeless elderly. Constitutional guaranteed rights and National policies on older persons. Role of National and International agencies providing developmental services to elders.

UNIT – IV: Social Work Interventions for the elderly

- Role of Social Worker in providing the legal and governmental welfare services to elders.
- Social Work intervention through Social Case Work, Social Group Work, Community Organisation and Social Welfare administration.

Reading List:

- Bali . P. Arun, 2001 Care of the Elderly in India. Shimla, Indian Institute of Advanced Studies.
- Chatterjee, S.C., Patna, Discourses on aging and Dying. New Delhi, and K.P., Charian, V. 2008., Sage Publications
- Dandekar, Kumudini. 1996 The Elderly In India, New Delhi, Sage Publications.
- Desai, Murli and Raju, Gerontological Social Work in India – Some Siva (Ed.) 2000. issues and Perspectives. Delhi, BR Publishing House,.
- Dey, A. B (Ed.) 2003 Ageing in India: Situation Analysis and Planning for the Future. New Delhi / WHO and AIIMS.
- Emmatty, Leena. M. 2008 An insight into Dementia Care in India. New Delhi, Sage Publications.
- Hurlock, Elizabeth. 1981 Developmental Psychology. 5th Edition. New Delhi, Tata McGraw Hill Publications.
- Khan M.Z. 1989 Voluntary Welfare Services for the Aged, Dept. of Social Work, New Delhi, Jamia Milia Islamia.

- Rajan, Irudaya.S., India's Elderly, New Delhi, Sage Publications. 1999.

JOURNALS.

- Indian Journal of Gerontology, C-207, Manu Marg, Tilak Nagar, Jaipur.
- R & D Journal of Helpage India . C-14, Qutab Institutional Area, New Delhi.

Course Title: DEVELOPMENT THEORIES AND STRATEGIES: ISSUES CHALLENGES AND RESPONSES

Course Code: SWCP –15

Level: MSW (IV)

Objectives:

- To be acquainted with the development discourse.
- To gain a critical understanding of the theories, models and approaches to development.
- The role of the state and the response of non-state actors to development.

Unit – I: What is Development?

- The concepts of: development, growth, human development, social development and sustainable development.
- Core values of development; Measuring development: per capita income, PQLI, choice and access, HDI, seer's criteria.
- Development and colonialism: continuity and divergence; persistence of global inequalities and dominance.

Unit - II: Theories and Models of Development

- Modernization Theory;
- Dependency Theory;
- Neoliberalism;
- Developmental State;
- Post Development

Unit - III: Theories and Approaches to Development

- Human Development;
- Capabilities Approach;

- Women, Gender and Development: WID, WAD, GAD.
- Participatory Development;
- Good Governance;
- Institutional Turn

Unit - IV: The Role of NGOs and Civil Societies and Social Movements in Development

- The failure of state-market-international aid institutions.
- NGO's and new-liberalism; Relationship of NGOs with INGOs; NGOs and the State; NGOs and the gap between theory and praxis.
- The role of Civil society in development and its relationship with the state in the Indian Context.
- The challenge of social movement to development in India.
- The Social worker as scholar- activist-practitioner.

Reading List:

- Cohen, Michael and Robert Shenton. 1995. "The Invention of Development." Pp. 27-43 in Jonathan Crush(ed), Power of Development. London and New York: Routledge.
- Esteva, Gustavo. 1991. "Development." Pp. 1-23 in Wolfgang Sachs (ed), The Development Dictionary. London: Zed Books
- Rist, Gilbert. 2002. "Definitions of Development." Pp. 8-24 in The History of Development: From Western Origins to Global Faith. London and New York: Zed Books.
- Seers, Dudley. 1972. "What are we trying to Measure?" Journal of Development Studies 8(3):21-36
- Myrdal, Gunnar. 1974. "What is Development?" Journal of Economic Issues 8(4):729-736.
- Wallerstein, I. 1984. "The Development of the Concept of Development." Sociological Theory 2:102-116
- Kothari, Uma. 2005. "From colonial administration to development studies: a post-colonial critique of the history of development studies," Pp. 47-66 in Uma Kothari (ed), A Radical History of Development Studies: Individuals, Institutions and

Ideologies. London: Zed Books

- Cooke, Bill. 2003. "A new continuity with colonial administration: participation in development management." *Third World Quarterly* 24(1):47-61
- Deutsch, Karl. 1961. "Social Mobilization and Political Development." *The American Political Science Review* 55(3):493-514.
- Lerner, Daniel. 1958. *The Passing of Traditional Society: Modernizing the Middle East*. New York: The Free Press.
- Levy, Marion. 1965. "Patterns (Structures) of Modernization and Political Development." *Annals of the American Academy of Political and Social Science* 358:29-40.
- Bernstein, Henry. 1971. "Modernization Theory and the Sociological Study of Development," *Journal of Development Studies* 7(2):141-60.
- Eisenstadt, S. N. 1974. "Studies of Modernization and Sociological Theory." *History and Theory* 13(3):225-252.
- Huntington, Samuel. 1971. "The Change to Change: Modernization, Development and Politics." *Comparative Politics* 3(3):283-322.
- Tipps, D. C. 1973. "Modernization Theory and the Comparative Study of Societies: A Critical Perspective." *Comparative Studies in Society and History* 15(2):199-226
- Amin, Samir. 1972. "Underdevelopment and dependence in Black Africa: Origins and Contemporary Forms," *Journal of Modern African Studies*. 10(4): 503-524.
- Cardoso, Fernando Enrique. 1972. "Dependency and development in Latin America." *New Left Review* 74(July/August):83-95.
- Frank, Andre Gunder. 1969. "The development of underdevelopment" *Monthly Review* 18(4):17-31.
- Chilcote, Ronald H. 1974. "Dependency: A Critical Synthesis of the Literature." *Latin American Perspectives* 1(1):4-29.
- Friedmann, H. and J Wayne. 1977. "Dependency Theory: A Critique." *Canadian*

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- Frank, Andre Gunder. 1974. "Dependence is Dead, Long Live Dependence and the Class Struggle: An Answer To Critics." *Latin American Perspectives*. 1(1):87-106.
- Smith, Tony. 1979. "The Underdevelopment of Development Literature: The Case of Dependency Theory." *World Politics*. 31(2):247-288.
- Harvey, David. 2005. *A Brief History of Neoliberalism*. Oxford: Oxford University Press. (Read pages 1-6.)
- Lal, Deepak. 1985. "The misconceptions of 'development economics'." *Finance and Development* 22(2):10-13.
- Peet, Richard. 2003. "Globalism and Neoliberalism." Pp. 1-23 in *Unholy Trinity: The IMF, World Bank and*
- WTO. London and New York: Zed Book
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- Against the Grain." *African Studies Review*
- Evans, Peter. 2005. "The Challenges of the 'Institutional Turn': Interdisciplinary Opportunities in Development Theory." Pp. 90-116 in Victor Nee and Richard Swedberg (eds), *The Economic Sociology of Capitalist Institutions*.
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- Raka Ray, Mary Fainsod Katzenstein (ed) 2005. *Social Movements in India: Poverty, Power, and Politics*, Rowman and Littlefield Publishers Inc.
- Shah, Ghanshyam (2004) *Social Movements in India; A review of literature*, Sage, India.
- Srivastava, S.K. (1988) *Social Movements for Development*, South Asia Books
- Rajagopal (2007) *International Law from Below: Development, Social Movements and Third World Resistance*, CUP

Course Title: SOCIAL WORK PRACTICE IN RURAL AREAS

Course Code: SWCP – 16

Level: MSW (IV)

Objectives

- To understand the issues faced by social workers in rural areas.
- To understand the skills necessary to practice in rural settings.
- To be acquainted with government plans and programmes for rural development in Odisha.

Unit – I: Rural Community Characteristics

Resources: natural resource, human resource, economic resources; Demography; Social structure; power structure; Political structure; Structure of rural economy; Governance structure; Presence of industries and external agencies; Indigenous knowledge systems; Needs of Rural communities: poverty landlessness, indebtedness, unemployment, migration, ill health, illiteracy, social exclusion, discrimination,

agriculture, forests.

Challenges to Rural Communities: Urbanization; deteriorating agriculture; changing land use SEZ; corporatization of agriculture and marginalization of small land holders; issues arising out of globalization.

Unit - II: Rural Development

Concept: nature, scope and significance; Approaches to Rural Development: Rural reconstruction approach, community development approach, sectoral development approach, area-specific and target group-oriented approach, economic development with social justice approach: Integrated rural development approach.

Rural local self government: Origin and development of the Panchayati Raj system in India; Salient features of 73rd Constitutional Amendment; Issues of Panchayati Raj: reservation, financial management, participation of political parties; Panchayati Raj institutions in Odisha- structure and functions. Five Year Plans and Rural Development Programmes. Poverty alleviation programmes in rural areas- MGNREGA, NRLM etc. Role of NABARD in Rural Development.

Unit - III: The Tribal Development Issue

Concept of Tribes, Indigenous peoples and Aborigines; Situational Analysis of Scheduled Tribes in Odisha: land, food security, employment/livelihood, displacement, migration, human development indices.

Scheduled Areas: Issues and Governance; Overview from Panchsheel, Tribal Sub- Plan and Special Component Plan; Other Significant Acts regarding Forest Rights, Resettlement and Rehabilitation.

Unit - IV: Response of Social Work

Building sustainable communities: identifying strengths, weaknesses and threats; Generalist Model of Social Work Practice: work with individuals, families, systems, clusters at the communities level; Cultural Competency: understanding the value system, diversity, cultivating sensitivity, gaining trust and building relationships; Advocating Social Justice: working with the oppressed and marginalized, reducing stereotypes/discrimination based on gender, caste, ethnic background; Political advocacy: analysing policies and programmes, working for reform of polices, increasing access and better service delivery of public services.

Reading List:

- Dubey, S.C. 1995. India's Changing Villages;

- Ganguli, B.N. 1973. Gandhi's Social Philosophy. Delhi: Vikas Publishing House;
- Gore, M.S. 1993. The Social Context of Ideology: Ambedkar's Social & Political Thought. New Delhi: Sage
- Kumar, Girish 2006, Local Democracy in India: Interpreting Decentralization, Sage Publications;
- Prasad, B. 2003. Rural Development: Concept, Approach and Strategy
- Sainath, P. One Hundred years of Drought
- Pandey, A.K. 1997. Tribal Society in India, New Delhi. Manak Publishing Ltd
- Agrawal, A.N. 2001. Indian Economy; Nature, Problems and Progress, Vikas Biraj Prakash, New Delhi
- Chamber. Robert, 1983, Rural Development: Putting the last First, Harlow, Longman.
- Datt and Sundaram, 2002, Indian Economy, S.Chand and Co, New Delhi.
- Desai, A.R., 1995 Rural Sociology in India, ISAE, Bombay
- Dube, S.C., 1965 India's changing Villages, RKP, London
- Dubashi, P.R., 2000 Rural development Administration in India, Mumbai.
- Riley John. M, 1995. Stakeholders in Rural Development, Sage: New Delhi
- Sachinanda and Purendu, 2001, 2001, Fifty years of Rural Development in India, Firma KLM Pvt. Ltd, Kolkata.

Course Title: SOCIAL WORK PRACTICE IN URBAN AREAS: MIGRATION, UNORGANISED LABOUR AND LIVELIHOODS

Course Code: SWCP-17

Level: MSW (IV)

Objectives:

- Sensitize the students to the need and problems of urban communities;
- Develop a critical understanding among the students about the programmes of urban development

Unit - I:

Urban Communities - Features and characterization; Concept of Urban, Urbanism
Urbanization – concept, causes and factors responsible for Urbanization; Urbanization
in India – Historical development, Characteristics of clusters town, city, metropolis,
suburbs, Satellite town, etc, Classification of cities. Growth of Urban settlement.

Urbanization and its impact on socio – economic development. Urbanization and
structure of Caste. Concept of Slums Dwellers, Pavement Dwellers and Refugees, their
characteristics and Problems. Changing Face of Urban communities: Infrastructural
development, Growing heterogeneity, merging of fringe villages, the “global city” and
socio-cultural and economic implications. Issues, Implications and Challenges

Unit - II:

Urban Problems – Congestion and overcrowding, Housing and slums, Environment
pollution, lack of inadequate civic amenities, etc. - causes, magnitude, impact, etc.,
Measures for alleviating these problems.

Urban Development – Meaning, need, scope and Historical evolution; planning policy
and programmes viz; slum clearance and slum improvement, Housing and Urban
development corporation; Major urban development authorities in Odisha. Urban
Community Development Programmes.

Unit – III:

Urban Informal sector Organised and Unorganised labour: Unorganised labour issues:
Migrant workers, Debt Bondage and child labour, Wage Structure and Components of
Wages of the unorganised labour, International and national labour scenario - ILO, WTO,
Privatization and role of the State: Social Security Programmes for the unorganised
labour.

Concept of Migration and characteristic of Migrants, Impact of Migration, Pattern of
Migration to cities in India.

Unit - IV:

Concept and scope of livelihood, caste and traditional livelihoods; natural resource crisis
and its impact on the livelihood of people: ecological, socio-cultural and economic
dimensions; Gender, caste and age implications on livelihood. Urban poverty and
livelihood issues; Social Work with urban communities – recent developments and future

perspectives.

Reading List:

- Aziz Abdul: Urban Poor and Urban Informal Sector, Ashish Publishing House, New Delhi, 1984.
- Bharadwai, R.K: Urban Development in India, National Book Trust, New Delhi, 1962.
- Bose Ashish: Studies in India's Urbanization (1901 to 1971), Tata McGraw Hill, New Delhi, 1973.
- Cullingworth, J.B: Problems of Urban Society, Vol 1 The Social Framework of Planning, London – George Allen and Unwin Ltd, 1973.
- Desai A.R and Pillai, S.D.(Eds): Slums and Urbanization, Popular Prakashan, Bombay.
- Diddee, Jaymala and Rangaswamy, Vimla (Eds): Urbanization – Trends Perspectives and Challenges, Rawat Publications, Jaipur 1993.
- Gangrade, K.D.: Community Organization in India, Popular Prakashan, Bombay, 1971.

Course Title: SOCIAL POLICY, PLANNING AND IMPLEMENTATION

Course Code: SWCP -18

Level: MSW (IV)

Objectives:

- Gain knowledge of policy analysis and the policy formulation process.
- Acquire skills in critical analysis of social policies and development plans.
- Develop an understanding of social policy in the perspective of national goals as stated in the Constitution, particularly with reference to fundamental right; and the directive principles of state policy.
- Critically understand the concept, content and process of social development.
- Develop the capacity to identify linkages among social needs, problems development issues and policies.
- Locate strategies and skills necessary for social development and reinforce

values of social justice, gender justice and equality.

Unit - I: Social Policy and Constitution: Concept of social policy, sectoral policies and social services- Relationship between social policy and social development-Values underlying social policy and planning based on the Constitutional provisions(i.e. the Directive Principles of State Policy and Fundamental Rights) and the Human Rights- Different models of social policy and their applicability to the Indian situation.

Unit - II: Sectoral Social Policies in India: Evolution of social policy in India in a historical perspective- Different sectoral policies and their implementation, e.g. Policies concerning education, health, social welfare, women, children, welfare of backward classes, social security, housing, youth, population and family welfare, environment and ecology, urban and rural development, tribal development and poverty alleviation.

Unit - III: Social Planning: Concept of social planning- Scope of social planning- the popular restricted view as planning for social services and the wider view as inclusive of all sectoral planning to achieve the goals fo social development-Indian planning in a historical perspective- The constitutional position of planning in India. The legal status of the planning commission- Coordination between centre and state, need for decentralization- Pancyati Raj, people participation.

Unit - IV: Social Policy Implementation and Social Work:

- Role of social policy in the Indian Development process: land reforms, PDS, employment, education, reservations.
- The social policy implementing structure in India; the lack of an integrated approach or convergence of development schemes and programmes.
- Role of social workers in social policy implementation.
- Do social workers have a major impact on social policy Implementation?

Reading List:

- Bagci, A.K. 1982 Political Economy of Underdevelopment, Cambridge; Cambridge University Press.
- Bandyopadhyay, D.1997 “People’s Participation in Planning: Kerala Experiment”,

Economic and Political Weekly, Sept. 24, 2450-54.

- Bhanti, R. 1993 Social Policy and Development in Rajasthan, Udaipur: Himnashu Publication.
- Bujmer, M,et.al., 1989 The Goals of Social Policy, London: UnwinHyman.
- Chakraborty,S.1987 Development Planning- Indian Experience, Oxford: Claredon Press.
- Dandekar, V.M. 1994 “ Role of Economic Planning in India in the 1990s & Beyond”, Economic and Political Weekly, Vol.29,No.24,1457-1464.
- Desai, V.1988 Rural Development (Vol.I) Mumbai: Himalaya Publishing House.
- Dimitto, D.M. 1991 Social Welfare: Politics and Public Policy, New Jersey: Prentice-Hall.
- Ganapathy, R.S. and Others 1985 Public policy and Policy Analysis In India, Delhi: Sage Publications.
- Ghosh, A. 1992 Planning In India: The Challenge for the Nineties, New Delhi: Sage Publications.
- Government of India Five Year Plan Documents (latest), New Delhi.
- Gupta, S.P. 1993 “ Planning and Liberalization”, Economic and Political Weekly, Vol.28 No.43, Oct.23,2349-2355.
- Jacob, K.K. 1992 Social Development Perspectives Hebsur, R.K. (Ed.) Social Intervention For Justice, Bombay: TISS.
- Huttman, E.D. 1981 Introduction to Social Policy, New York: McGraw-Hill.
- International Labour Office. 1973 Multinational Enterprises and Social Policy, Geneva, ILO.
- Jones, K.Et.al.,1983 Issues in Social Policy, London: ROutledge & Kegan paul.
- Joshi, P.C. 1976 Land Reform in India Kahn, A.E. 1973 Social Policy and Social Services, New York: Random House.
- Kulkarni, P.D, 1979 Social Policy and Social Development in India, Madras: Association of Schools of Social Work in India.
- Kulkarni, P.D.1952 Social Policy in India, New York: McGraW- Hill Book

Company.

- Kulkarni, P.D. 1975 Social Policy in India, Bombay, Tata Institute of Social Sciences.
- Leonard, P. 1997 Postmodern Welfare: Reconstructing an Emancipatory Project, London: Sage.
- Lindblom, C.E. 1980 The Policy-making Process, New Jersey; Prentice-Hall.
- Livingstone, A. 1969 Social Policy in Developing Countries, London: Routledge & Kegan Paul.
- Madison, B. Q. 1980 The Meaning of Social Policy, London: Croom Helm.
- Macpherson, S. 1980 Social Policy in the Third World, London: Wheat-sheat Brooks.
- Macpherson, S. 1982 Social Policy in the Third World, New York: John Wiley and Sons.
- Mathur, K. Bjorkman Top Policy Makers in India, New Delhi: Concept Publishing Co.
- Meadows, D.H. 1972 The Limits to Growth, New York: University Books.
- Mishra, R. 1977 Society and Social Policy, London: Macmillan Ltd.
- Mukherjee, N. 1993 Participatory Rural Appraisal; Methodology and Applications, New Delhi: Concept Publishers.
- Mundle, S. 1993 participatory Rural Appraisal: Methodology and Applications, New Delhi: Concept Publishers.
- Milliard, M. and Spicker. 1998 Social Policy in a Changing Society, London: Routledge.
- Philips, D.R. and Health and Development, London: Routledge and Verhasselt Yola (Eds) 1994 Kegan Paul.
- Rao, D.B. (Ed.) 1998 World Summit for Social Development Rao, V. "Social Policy: The Means and Ends Question" Indian Journal of Public Administration, Vol.50 No.1 Jan.-March, 1994.
- Rao, V. and Mander, H. An Agenda for Caring: Intervention for the Marginalized, New Delhi: VHA.
- Rastogi, P.N. 1992 Policy Analysis and Problem-Solving for Social Systems, New

Delhi: Sage Publications.

- Roychaudhury, T. 1982 The Cambridge Economic History of India, Vol.I&II, New Delhi: Cambridge University.
- Roy, Sumit 1997 “Globalisation, Structural Change and Poverty”, Economic and Political Weekly, Aug. 16-23, 2117-2132.
- Sachs, W. 3997 Development Dictionary Singh, R.R. (Ed.) 1995 Whither Social Development? New Delhi: ASSWI.
- Singh, Y 1972 Modernization of Indian Tradition, Delhi: Thomas Press. Spicker, Paul 1998 Principles of Social Welfare: An Introduction to Thinking About the Welfare State, London:Routledge. The Probe Tean. 1999 Public Report on Basic Education in India New Association with Centre for Delhi: Oxford University Press. Development Economics
- Upadhyay, S.B. 1992 Urban Planning, Jaipur: Printwell. UNDP Human Development Reports, Oxford University Press.
- Vyasulu, V. Vani, B.P. 1997 “Development and Deprivation in Karnataka”, Economic and Political Weekly, Nov. 15 2970-2974.
- Weimer. D.L. and Policy Analysis: Concepts and Practice, New Vining, A.R. 1994 Jersey: Prentice-Hall.
- World Bank World Development Reports (Annual), Oxford University Press.
- Yadav, C.S. (Ed) 1986) Urban Planning and Policies- Part A, New Delhi: Concept Publishing Co. Encyclopedia of Social Sciences Encyclopedia of Social Work.
- De Haan, Anjan (20130 “The Social Policies of Emerging Economics: Growth and Welfare in China and India” IPC-JG working Paper No.110. Brasilia, International Policy Centre for Inclusive Growth.

Recommended Journals/Periodicals

- Alternatives; Development and Change; Economic and Political Weekly.

Course Title: DEVELOPMENT COMMUNICATION

Course Code: SWCP - 19

Level: MSW (IV)

Objectives :

- To study the basic issues in Communication.
- To learn about various channels of Communication
- To understand the channels of mass communication reaching to rural audience.

Unit : I

Development: meaning, concept, process and models of development – theories – origin – approaches to development, problems and issues in development, characteristics of developing societies, development dichotomies, gap between developed and developing societies. Development issues on national and regional and local level.

Unit : II

Development communication : meaning – concept – definition – philosophy – process – theories – role of media in development communication – strategies in development communication – social cultural and economic barriers – case studies and experience – development communication policy – strategies and action plans – democratic decentralization.

Unit : III

Communication with Individual Group, Traditional Communication: Streets play, Puppetry show & Folk media, Rural communication messages Development support communication: population and family welfare – health- education and society – environment and development – problems faced in development support communication.

Unit : IV

Writing development messages for rural audience: specific requirements of media writing with special reference to rural press, radio and television. Problems of Rural

Journalism, Farm Journals, Rural Press, Press Conference, Radio rural Forum, Role of Community Radio in Rural Communication.

Reading List:

Fernandes, Walter : Development with People, Indian Social Institute, New Delhi, 1988.

Jayaweera N. & Amunugama S. : Rethinking Development Communication, AMIC, Singapore, 1988.

Kumar, Kevel J. : Communication and Development : Communication Research Trends, Vol. 9, No.3, 1988.

Hoogvelt Ankie : The Third World in Global Development, Macmillan, London, 1982.

Hornik, Robert C : Development Communication : Information Agriculture and Nutrition in Third World, Longman, London/NY , 1988.

Melkote Srinivas : Communication for Development in the Third World – Theory and Practice, Prentice – Hall, New Delhi, 1991.

Sondhi, Krishan : Communication, Growth and Public Policy Breakthrough, New Delhi, 1983.

Schramm, Wilbur : Mass Media and National Development, Stanford UP, Stanford, 1964.

Course Title: SUSTAINABLE AGRICULTURE

Course Code: SWCP - 20

Level: MSW (IV)

Objectives:

- To Understand the Indian Agricultural Policy and the Crisis in Agriculture.
- To be acquainted with sustainable agricultural practices.
- To effectively respond to the problem of food and nutritional security at the level of the farmer/community.

Unit-I: Principles & Policy for Sustainable Agriculture

Social Work in Rural-Agro ecological Communities;

History & Evolution of Agricultural Practices;

Principles of Sustainable Agriculture;

Policy & Practice of Sustainable Agriculture;

Principles of Industrial Agriculture;

Policy & Practice of Industrial Agriculture.

Unit-II: Soil Health & Water Management Soil Health:

On Farm Biomass;

Cattle Dung;

Earth Worm;

Soil Health Enhancement Techniques;

Organic Carbon Measurement.

Water Management:

In-situ water conservation;

Methods to reduce flow of rain water;

Mulching;

Moisture Management.

Unit-III: Seeds & Cropping Pattern Seeds:

Seed in the context of a micro-ecosystem;

Significance of Diversity in Seed;

Types of Seeds;

Politics of Seed Control;

Techniques of preserving seeds with Farming Communities.

Cropping Pattern:

Multiple cropping patterns & Soil Health;

Soil-climate & cropping patterns;

Cropping Patterns as enhancing photosynthesis process.

Unit-IV: Integration & Ecological Agriculture

Integration of Agriculture:

Interrelated Activities of Agriculture;

Stages of Integration;

Processes of Integration;

Programs available for Integration.

Ecological Agriculture:

Principles of Ecological Agriculture;

Transition from Integrated Agriculture to Ecological Agriculture.

Reading List:

Randhawa M.S, A History of Agriculture in India, Vol. I, II, III & IV, ICAR.

Asian Agri-History Foundation (1999), Krishi Parashara, ISRISAT.

Subramaniam. C (1995) Hand of Destiny: The Green Revolution (Vol.2) Bharatiya Vidya Bhavan.

Shina Vandana, The Violence of the Green Revolution.

Roy. B. C, Chattopadhyay, G.N, And Tirado.R; Subsidising Food Crisis.
www.greenpeaceindia.org.

Howard. Albert, An Agricultural Testament, Other India Press.

Howard. Albert & Wad. Yeshwant D, The Waste Products of Agriculture- Their utilization as humus.

Howard. Albert and Berry. Wendell (1945), Soil and Health,
<http://www.journeytoforever.org/>

Fukuoka. M. (2009) The One Straw Revolution, OIB

Fukuoka. M. (1996). The Road Back to Nature: Regaining the Paradise Lost, OIB.

Dabholkar. S. A. (2001) Plenty for All, OIB.

Save. Bhasker, The Great Agricultural Challenge, OIB.

Green Foundation, Janadharya Seed Savers.

Green Foundation, Seed to Food.

Alvares. Claude (2009), The Organic Farming Sourcebook, Other India Press.

Course Title: DISSERTATION**Course Code: SWCP - 21****Level: MSW (IV)****Dissertation**

The student has to prepare and submit a dissertation under the guidance of a faculty. The student should exhibit ability to review relevant literature formulate a research question, choose appropriate methodology, develop data collection tools, analyze and interpret data and prepare the research report. The length of the dissertation excluding contents and Bibliography should not exceed ten thousand words.

Evaluation Criteria

Sl. No.	Item		Weightage
1	Choice of Topic Review of relevant literature	Scope, Research Potential Comprehension, quality, quantity	10
2	Objective and Hypothesis/Question	Relevance, clarity, relation to topic Research Design/Methodology Appropriateness, selection of variables sample and description	20
3	Tools Used	Appropriateness, use	10
4	Data analysis and interpretation	Scheme, Application of Statistical techniques, use of tables and figures relating findings to objectives and literatures, discussion on findings	20
5	Summary	Synthesis of findings Implications	10
6	Report Presentation	Cauterization, chapter size, structuring of paragraphs vocabulary, clarity, coherence, Bibliography	10
7	Viva-voce	Ability to explain the research process & defend research work	20
Total			100

Course Title: ENTREPRENEURSHIP

Course SWEP - 07

Level: MSW (IV)

Objectives

- To familiarize Social Work students to entrepreneurship
- To give them basic skills and competencies to encourage entrepreneurship through their Social Work practices.

Unit – I : What is Entrepreneurship?

Entrepreneurship- conceptual issues; Entrepreneurship and Development: Entrepreneurship motivating factors, competencies, performance and reward. Status of entrepreneurs in India, problems and concerns of entrepreneurs

Unit – II : How to be an Entrepreneurship?

Opportunity scouting and idea generation: creativity and innovation; the process of setting up a small business: Preliminary screening and detailed study of the feasibility of the business idea: financing/non-financing support agencies; Schemes of assistance from government and non-governmental agencies, policies/programs and procedures and the available schemes

Unit-III : Management Roles of an Entrepreneur

Management roles and functions in a small business; Designing and re-designing business process, location, layout, operations, planning and control. Issues of quality, productivity and environment; Managing business growth; Issues in marketing sales and distribution. Consortium marketing; competitive bidding/tender marketing negotiating with principal customers. Marketing Assistance, Subsidies and other Fiscal and monetary Incentives. National state level and grass-root level financial and non-financial institutions in support of small business development.

Unit – IV : Accounting

Principles of double-entry book-keeping: Journal entries, cash-book, pass book, and Bank Reconciliation Statement ledger account trail balance and preparation of final accounts: Trading and Profit and Loss Account; Balance-sheet. Brief introduction to Single-Entry system of record keeping. Sources of risk/venture capital, fixed capital, working capital and a basic awareness of financial services such as leasing and factoring

Reading list:

Sivakama Sundari, S. Entrepreneurship Development of Rural Women (Vol.I) Asian and Pacific for Transfer of technology, New Delhi.

Heggade, O.D. Developing rural women entrepreneurship, Mohit publications, New Delhi

Santhawali, A.Y. Entrepreneurship Development – Publications, Jaipur.

Bhide, Amar V. The Origin and Evolution of New Business, Oxford University Press, New York, 2000

Dollinger M.J., 'Entrepreneurship strategies and Resources', 3rd edition, Pearson Education, New Delhi 2006

Desai, Vasant Dr. (2004) Management of small scale enterprises New Delhi: Himalaya Publishing Company

Taneja, Gupta, Entrepreneur Development New Venture Creation: 2nd edition Galgotia Publishing Company

Holt, David H., Entrepreneurship: Strategies and Resources, Illinois , Irwin, 1955.

Panda, Shiba Charan, Entrepreneurship Development, New Delhi, Anmol Publications

Patel, V.G., The Seven Business Crises and How to Beat Them, Tata-Mcgraw, New Delhi, 1995

SIDBI Report on Small Scale Industries Sector[latest edition]

Verma, J.C., and Gurpal Singh, Small Business and Industry-A Handbook for Entrepreneurs, Sage, New Delhi, 2002

Course Title: NGO MANAGEMENT**Course Code: SWEP – 08****Level: MSW (IV)****Objectives:**

- To understand the role of NGOs in society
- To gain clarity about the operating environment of NGOs
- To understand the issues involved in the internal management of NGOs

Unit I: Introduction to NGOs

Definitions, History, Roles in Society; Description of the NGO sector; Theoretical Perspectives on Organization and Management of NGOs.

Unit II: The legality of NGOs in India

Societies Registration Act, 1860, Indian Trust Act, 1882, Cooperative Societies Act, 1912, Company Act, 1956 (Some Relevant Part), FCRA: Foreign Contribution Regulatory Act, Income tax Act 1961, Income Tax Exemption: Under Sections 11 and 12, Rebate under Sections 80G and 35AC of Income Tax Act.

Unit – III: The operating environment of NGOs

Understanding the environment in which NGOs function: Economic, Political, Socio-Cultural and Ideological macro level forces that influence NGOs, Globalization and Foreign aid system. Principal Players and their Relationships: Governments, Markets, NGOs, Donors; Importance of partnerships.

Unit – IV: Internal Management of NGOs

Governance structure, Vision and Mission; Internal management needs of a NGO; strategies/plans for action; Managing Resources: Human and Financial; Measuring performance, participation, evaluation; Accountability to multiple stakeholders; Ethical issues faced by NGO managers; Scaling up and sustainability of NGOs; creating a learning environment

Reading List:

Lewis, David. 2007. The Management of Non-Governmental Development Organizations, second edition. New York: Routledge.

Edwards, M. and Fowler, A. (2003) The Earthscan Reader on NGO Management. London: Earthscan Publications, Ltd.

Salamon, L.M. 1994. The Rise of the Nonprofit Sector. *Foreign Affairs* 74 (3): pp. 109–122

Lewis, D. 2007. *Advocacy and Service Delivery: Managing the Main NGO Activities in The Management of Non-governmental Development Organizations, Second Edition*

Fowler, A. 1997. *Understanding International Development in Striking a Balance: A Guide to Enhancing the Effectiveness of Non-governmental Organizations in International Development* London: Earthscan Publications, Ltd.,

Course Title: PROJECT MANAGEMENT

Course Code: SWEP – 09

Level: MSW (IV)

Objectives:

- To understand the fundamentals of Project management and how to initiate, plan, execute and close a project.

Unit - I: Fundamentals of Project Management

What is a Project? Definition, meaning, principles and types; What is project management? meaning, coverage and scope; Who is the project manager?; Project phases and knowledge areas. Planning and its importance; who should be involved in planning?

Unit - II: Initiating Projects and Project Identification

How to get a project started; Setting a mandate, finding a project sponsor and creating a project team: team dynamics and running meetings.

Project Identification: Needs assessment: listening, interviewing, focus group discussions, community mapping; Capacity assessment: human, social, natural, physical, economic, cultural

Unit - III: Planning and Executing Projects

Work Breakdown Schedule (WBS), Project estimating and scheduling techniques-sequencing tasks, identifying the path of the project, considering resources; Risk planning methods; Cost planning; Communications plan; final project plan.

Team management; identifying and involving all stakeholders, user groups, interest groups, beneficiaries, decision makers; Primary and Secondary stakeholders; levels of participation;

Unit - IV: Closing a Project

Closing of a successful project; stakeholder acceptance; writing a final report; Techniques of identifying lessons learned and their analysis; acknowledging successes and failures; and identifying areas for further projects.

Reading List:

Verzuh, Eric. The Fast Forward MBA in Project Management. Published by John Wiley and Sons, Inc.

Project Management Body of Knowledge, 5th Edition. Published by Project Management Institute (PMI)

Blackman, Rachel. 2003. Project Cycle Management. UK: Tearfund.

Preskill, Hallie and Russ-Eft, Darlene. 2005. Building Evaluation Capacity. London: Sage Publications.

Capezio, Peter. 2000. Powerful Planning Skills. Mumbai: Jaico Publishing House.

Smith, Steve. 2002. Plan to Win. New Delhi: Kogan Page India Pvt. Ltd.

Dale, Reidar. 2001. Evaluation Frameworks for Development Programmes and Projects. New Delhi: Sage Publications.

Loehle, Craig. 2000. Thinking Strategically. New Delhi: Foundation Books.

Padaki, Vijay. 1995. Development Intervention and Programme Evaluation. New Delhi: Sage Publications.

Course Title: CLIMATE CHANGE, DISASTER MANAGEMENT AND REHABILITATION

Course Code: SWEP –

10 Level: MSW (IV)

Objectives:

- To understand the challenges of Climate change
- To gain a comprehensive understanding of the Disaster Management Cycle.
- To get acquainted with Disaster Management Policies and Laws in India.

Unit I:

- **Climate Change:** Concept, nature and severity of climate change. Causes of climate change. Impact of climate change: globally in general and Odisha in particular. Greenhouse effect, climate change and disaster.
- **Disaster Management:** Definition, Types of disaster (natural and manmade disaster) mining disaster, tropical cyclone, storms, floods, lightning, forest fire, tsunami and earthquakes.

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Unit II:

- **Concepts associated with Climate Change and Disasters:** air pollution

and acid rain, ozone depletion, bio-diversity extinction, de-forestation and loss of biological diversity, land degradation, deserts and desertification, groundwater over exploitation, dryness and wildfires, population growth and explosion, habitat related problems.

- **Social Systems, Ecological Networks and Disasters:** a socio-political ecology of disasters, nature of human communities, community as an ecological network.

Unit III:

- **Disaster Management Cycle:** Disaster phase, Response phase, Recovery phase, Risk reduction phase, Preparedness phase.
- **The Process of Disaster Management:** mitigation, preparedness, response and recovery.
- **Majors Disasters in Odisha:** Flood, cyclone, drought, tsunami, etc
- **Disaster Management Programs and System in India:** Nation Disaster Management Act (2005), National Policy on Disaster Management (2009), Disaster Management in the Xth Five Year Plan onwards, different bodies National Disaster Management Agency (NDMA), State Disaster management Agency (SDMA), National Disaster Response Force (NDRF), National Institute of Disaster Management (NIDM), India Disaster Resource Network (IDRN). Community based disaster management and community based disaster management practices (case studies), The role of INGOs and NGOs.
- **Disaster Warning and Evacuation:** Factors influencing evacuation and some policy considerations, media and other sources of information, Phases of evacuation: Preparation, Decision

Unit IV:

- **Environmental Legislation and Regulations associated with Disaster Management:** Environment Policy of the Government of India: Five Year Plans, Environment Protection Act (1986), The Environment (Sitting for Industrial Projects) Rules (1999), The Indian Forest Act (1927 and Amendment 1984), The Indian Forest (Conservation) Act (1981), Coastal Regulation Zone Notification (1991).
- **Rehabilitation:** Need for rehabilitation, Government and Non-government programs for rehabilitation, role of NGOs for rehabilitation programmes, Critical review of programmes, Role of Social Work in minimizing the effects of disaster.

Reading List:

Anandha Kumar K.J and Ajinder Walia (2013) India Disaster Report, NIDM: New

Delhi.

Gupta. Anil K et, al (Ed) (2014). Training Module Mainstreaming Climate Change Adaptation and Disaster Risk Reduction into District Level Development Plans, NIDM : New Delhi.

Satendra and Kaushik. D (2013) Forest Fire Disaster Management NIDM: New Delhi.

Vogelbacher (2013) Flood Disaster Risk Management NIDM: New Delhi.

Kaushik. A.D. (2012) Flood Risk Mitigation and Management: A Training of Trainers Module, NIDM: New Delhi.

Course Title: People-Centered Advocacy

Course Code: SWEP – 11

Level: MSW (IV)

Objectives:

1. To acquire conceptual clarity and theoretical knowledge about linkages between state, civil society and market, governance and social policy processes
2. To acquire conceptual clarity about Social Advocacy as a method for bringing about social change to achieve equality and social justice goals enshrined in the Constitution using non-violent methods
3. To become aware of the democratic institutions, actors and the processes of democratic decision making
4. To acquire necessary skills for strategy planning to engage in Social Advocacy
5. To internalize values and attitudes necessary for working at micro, meso and macro levels and with diverse individuals and groups by following the Constitutional and democratic processes

Unit 1: Understanding People Centred Advocacy

- Politics in Social Advocacy and its role in democratic decision making
- Advocacy vis-à-vis Social Revolution and Social Action
- Relevance and importance of people centered advocacy and rights based approaches in India
- Power, politics and public arguments
- Personal and institutional benefits of Social Advocacy

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Unit 2: Role of Information, Networking and the Media in Advocacy

- Power of Information in People Centered Advocacy

- Identifying incidents, collecting information and framing issues
- Mobilizing support and importance of coalitions
- Role of organization and campaign strategies
- Building favorable public opinion and putting pressure on decision makers
- Understanding the politics of media and its role in consensus and conflict creation
- Developing material for the media and its diverse audience
- Exploring alternate media for pro-people advocacy

Unit 3: Advocacy with the Legislature and Executive

- Understanding channels between legislators and advocacy groups
- Knowing the actors within and outside legislative bodies
- Role of bureaucracy in policy making, operationalization and implementation.
- Finding policy hooks and political angles. Understanding phases of policy making
- Implications of transparency and accountability vis-à-vis elected representatives and the bureaucracy
- Practical tips and strategies for advocating with legislatures and the bureaucracy

Unit 4: Advocating with the Judiciary and with the reference to the International framework.

- Understanding central and state laws and function of various courts in India
- Role of Information and PILs in Judicial Advocacy
- Post 2015 agenda, post MDG frameworks
- Making post 2015 matter for socially excluded groups in India

Reading List

NCAS.resource material and documented case stories on People Centred Advocacy

Academic Year
2016-17

UTKAL UNIVERSITY








REGULATIONS & SYLLABUS UNDER GRADUATE PROGRAMME IN BACHELOR OF ARTS

(HONOURS & PASS)- CBCS PATTERN Effective from Admission Batch: 2016 - 2017
(Applicable to Autonomous Colleges)

SYLLABUS FOR B.A. (HONORS) ECONOMICS UNDER CHOICE BASED CREDIT SYSTEM OF UTKAL (2016-17) UNIVERSITY, BHUBANESWAR

Course Structure for B.A. (Honours) Economics

There are a total of fourteen economics core courses that students are required to take across six semesters. All the core courses are compulsory. In addition to core courses in economics, a student of B.A. (Honours) Economics will choose four Discipline Specific Elective

 Skill Development
 Employability
 Entrepreneurship
 All the three
 Skill Development and Employability
 Skill Development and Entrepreneurship
 Employability and Entrepreneurship

(DSE) Courses. The DSE Courses are offered in the fifth and sixth semesters and two such courses will be selected by a student from a set of courses specified for each of these semesters (Groups I and II in the attached table). It is recommended that each college should offer at least three DSE Courses in the fifth and sixth semesters to allow the students some minimal element of choice.

Contact Hours: Each course has 5 lectures and 1 tutorial (per group) per week. The size of a tutorial group is 8-10 students.

Note on Course Readings: The nature of several of the courses is such that only selected

readings can be specified in advance. Reading lists will be updated and topic-wise readings will be specified at regular intervals, ideally on an annual basis.

Course Structure for B.A. (Honours) Economics

Skill Enhancement Courses (SEC II)

1. Data Analysis and Computer Application
2. Financial Economics

Core Economics Course 1: INTRODUCTORY MICROECONOMICS

Course Description

This course is designed to expose the students to the basic principles of microeconomic theory. The emphasis will be on thinking like an economist and the course will illustrate how microeconomic concepts can be applied to analyze real-life situations.

Module 1: Exploring the subject matter of Economics

The Ten Principles of Economics: How people make decisions; Working of the economy as a whole; Thinking Like an Economist: The economist as Scientist – The scientific method: Observation, Theory and more observation; Role of assumptions; Economic Models; The economist as a policy advisor; Why economists disagree; Graphs in Economics

Module 2: Supply and Demand: How Markets Work, Markets and Welfare

The market forces of demand and supply – Markets and competition; The demand curve – Market vs individual demand curve; Shifts in demand curve; The supply curve – Market vs individual supply curve; Shifts in supply curve; Equilibrium between supply and demand and changes there in; Price elasticity of demand and its determinants; Computing price elasticity of demand; Income and cross elasticity of demand; The price elasticity of supply and its determinants; Computing price elasticity of supply; Consumer Surplus and Producer Surplus; Market efficiency and market failure.

Module 3: The Households

The Budget Constraint; Preferences – representing preferences with indifference curves; Properties of indifference curves; Two extreme examples of indifference curves; Optimisation – Equilibrium; Change in equilibrium due to changes in income, changes in price; Income and substitution effect; Derivation of demand curve; Three applications – Demand for giffen goods, wages and labour supply, Interest rate and household saving.

Module 4: The Firm and Market Structures

Cost concepts; Production and costs; The various measures of cost – Fixed and variable cost, average and marginal cost; Cost curves and their shapes; Costs in the short run and in the long run; Economies and diseconomies of scale. Firms in competitive markets – What is a competitive market; Profit maximisation and the competitive firm's supply curve; The marginal cost curve and the firm's supply decision; Firm's short-run decision to shut down; Firm's long-run decision to exit or enter a market; The supply curve in a competitive market – short run and long run; Monopoly - Why monopolies arise and public policy towards monopolies

Module 5: The Input Markets

The demand for labour – The production function and the marginal product of labour; Value of the marginal product of labour and demand for labour; Shifts in labour demand curve; The supply of labour – the trade-off between work and leisure; Shifts in the labour supply curve; Equilibrium in the labour market; Other factors of production: Land and capital; Linkages among factors of production.

Readings:

1. Principles of Economics, Gregory N Mankiw, 6e Cengage Learning India Private Limited,

New Delhi

2. William A McEachern and Simrit Kaur (2012): *Micro Econ: A South-Asian Perspective*, Cengage Learning India Private Limited, New Delhi.
3. Karl E. Case and Ray C. Fair (2007): *Principles of Economics*, 8th Edition, Pearson Education Inc.

Core Economics Course 2: MATHEMATICAL METHODS FOR ECONOMICS I

Course Description

This is the first of a compulsory two-course sequence. The objective of this sequence is to transmit the body of basic mathematics that enables the study of economic theory at the undergraduate level, specifically the courses on microeconomic theory, macroeconomic theory, statistics and econometrics set out in this syllabus. In this course, particular economic models are not the ends, but the means for illustrating the method of applying mathematical techniques to economic theory in general. The level of sophistication at which the material is to be taught is indicated by the contents of the prescribed textbook.

Module I: Preliminaries

Sets and set operations; relations; functions and their properties; Number systems

Module II: Functions of one real variable

Types of functions- constant, polynomial, rational, exponential, logarithmic; Graphs and graphs of functions; Limit and continuity of functions; Limit theorems

Module III: Derivative of a function

Rate of change and derivative; Derivative and slope of a curve; Continuity and differentiability of a function; Rules of differentiation for a function of one variable; Application- Relationship between total, average and marginal functions

Module IV: Functions of two or more independent variables

Partial differentiation techniques; Geometric interpretation of partial derivatives; Partial derivatives in Economics; Elasticity of a function – demand and cost elasticity, cross and partial elasticity

Module V: Matrices and Determinants

Matrices: concept, types, matrix algebra, transpose, inverse, rank; Determinants: concept, properties, solving problems using properties of determinants, solution to a system of equations - Cramer's rule and matrix inversion method.

Readings:

1. K. Sydsaeter and P. J. Hammond (2002): *Mathematics for Economic Analysis*. Pearson Educational Asia
2. A. C. Chiang and K. Wainwright (2005): *Fundamental Methods of Mathematical Economics*, McGraw Hill International Edition.
3. T. Yamane (2012): *Mathematics for Economists*, Prentice-Hall of India

Generic Elective I: Indian Economy

Course Description: This paper introduces the students to the essentials of Indian economy with an intention of understanding the basic feature of the Indian economy and its planning process. It also aids in developing an insight into the agricultural and industrial development of India. The students will understand the problems and policies relating to the agricultural and industrial sectors of India and current challenges of Indian economy.

Module I: Introduction to Indian Economy

Colonialism & British Rule: Exploitation and under-development in India; Basic features of India Economy; Indian Economy as a developing economy; Demographic trends in India - Size and growth of population, Occupational structure, Sex composition, Age structure and demographic dividend; Causes of population growth and population policy

Module II: Indian Agriculture

Role of agriculture in Indian Economy; Cause of low productivity, Green Revolution and Land Reforms, Agricultural Finance-Sources and Problems; Agricultural Marketing in India

Module III: Industrial Development in India

Role of Industrialisation in Indian Economy; Small Scale & Cottage Industries: Meaning, Role, Problems and Remedies; Industrial Policies of 1948, 1956, 1977 and 1991; Problems of Industrial Development in India; Industrial Sickness

Module IV: Service Sector in India

Growth & Contribution to GDP; Composition and relative importance of service sector; Factors determining growth of the sector; ICT and IT – Spread and Policy; Sustainability of services led growth

Module V: Current Challenges facing Indian Economy

Unemployment – Meaning; important employment Generation programmes, MGNREGS; Inequality in income distribution-Causes thereof; Government policy to check its growth

Basic Readings:

1. Kapila U. *Indian economy since Independence*. Academic Foundation, New Delhi
2. Misra, S. K. and Puri V. K. *Indian Economy — Its Development Experience*. Himalaya Publishing House, Mumbai
3. Dutt R. and Sundharam K. P. M. *Indian Economy*. S. Chand & Company Ltd., New Delhi.
4. Agarawala, A. N. *Indian Economy*, New Age Publications, New Delhi
5. Panagariya, Arvind (2008): *India: the Emerging Giant*, Oxford University Press, New York
6. Acharya, S. and Mohan, R. (Eds.) (2010): *India's Economy: Performance and Challenges*, Oxford University Press, New Delhi.
7. Ahluwalia, I. J. and Little, I. M. D. (Eds.) (1998): *India's Economic Reforms and Development: Essays for Manmohan Singh*, Oxford University Press, New Delhi.

Core Economics Course 3: INTRODUCTORY MACROECONOMICS

Course Description

This course aims to introduce the students to the basic concepts of Macroeconomics. Macroeconomics deals with the aggregate economy. This course discusses the preliminary concepts associated with the determination and measurement of aggregate macroeconomic variable like savings, investment, GDP, money, inflation, and the balance of payments.

Module I: Basic Concepts

Macro vs. Micro Economics; Why Study Macroeconomics? Limitations of Macroeconomics ; Stock and Flow variables, Equilibrium and Disequilibrium, Partial and General Equilibrium Statics – Comparative Statics and Dynamics ; National Income Concepts – GDP, GNP, NDP and NNP at market price and factor cost; Personal Income and Disposable personal Income; Real and Nominal GDP

Module II: Measurement of Macroeconomic Variables

Output, Income and Expenditure Approaches; Difficulties of Estimating National Income; National Income Identities in a simple 2- sector economy and with government and foreign trade sectors; Circular Flows of Income in 2, 3 and 4-sector economies; National Income and Economic Welfare ; Green Accounting.

Module III: Money

Evolution and Functions of Money, Quantity Theory of Money – Cash Transactions, Cash Balances and Keynesian Approaches, Value of Money and Index Number of Prices

Module IV: Inflation, Deflation, Depression and Stagflation

Inflation – Meaning, Causes, Costs and Anti-Inflationary Measures; Classical, Keynesian, Monetarist and Modern Theories of Inflation, Deflation- Meaning, Causes, Costs and Anti-Deflationary Measurers, Depression and Stagflation; Inflation vs. Deflation

Module V: Determination of National Income

The Classical Approach - Say's Law, Theory of Determination of Income and Employment with and without saving and Investment; Basics of Aggregate Demand and Aggregate Supply and Consumption- Saving – Investment Functions, The Keynesian Approach – Basics of Aggregate Demand and Aggregate Supply and Consumption, Saving, Investment Functions; The Principle of Effective Demand; Income Determination in a Simple 2-Sector Model; Changes in Aggregate Demand and Income- The Simple Investment Multiplier; Income Determination in a 3-Sector Model with the Government Sector and Fiscal Multipliers

Readings:

1. N. Gregory Mankiw (2010): *Macroeconomics*, 7th edition, Cengage Learning India Private Limited, New Delhi
2. Richard T. Froyen (2005): *Macroeconomics*, 2nd Edition, Pearson Education Asia, New Delhi.
3. Errol D'Souza (2009): *Macroeconomics*, Pearson Education Asia, New Delhi.

Core Economics Course 4: MATHEMATICAL METHODS FOR ECONOMICS II

Course Description

This course is the second part of a compulsory two-course sequence. This part is to be taught in Semester II following the first part in Semester I. The objective of this sequence is to transmit the body of basic mathematics that enables the study of economic theory at the undergraduate level, specifically the courses on microeconomic theory, macroeconomic theory, statistics and econometrics set out in this Syllabus. In this course, particular economic models are not the ends, but the means for illustrating the method of applying mathematical techniques to economic theory in general. The level of sophistication at which the material is to be taught is indicated by the contents of the prescribed textbook.

Module I: Linear models:

Input- Output Model: Basic concepts and structure of Leontief's open and static Input-Output model; solution for equilibrium output in a three industry model; The closed model

Module II: Second and higher order derivatives:

Technique of higher order differentiation; Interpretation of second derivative; Second order derivative and curvature of a function; Concavity and convexity of functions; Points of inflection

Module III: Differentials and total derivatives:

Differentials and derivatives; Total differentials; Rules of differentials; Total derivatives; Derivatives of implicit functions

Module IV: Single and multivariable optimisation:

Optimum values and extreme values; Relative maximum and minimum; Necessary versus sufficient conditions - First and Second derivative tests; Economic applications thereof, First and second order condition for extremum of multivariable functions; Convex functions and convex sets

Module V: Optimisation with Equality Constraints:

Effects of a constraint; Finding stationary value – Lagrange-Multiplier method (Two variable single constraint case only): First and second order condition; The Bordered Hessian determinant.

Readings:

1. K. Sydsaeter and P. J. Hammond (2002): *Mathematics for Economic Analysis*. Pearson Educational Asia
2. A. C. Chiang and K. Wainwright (2005): *Fundamental Methods of Mathematical Economics*, McGraw Hill International Edition.
3. T. Yamane (2012): *Mathematics for Economists*, Prentice-Hall of India

Generic Elective II: Indian Economy II

Course Description: This paper is the part II of Indian economy deals with the external sector, financial markets in India, Indian Public Finances and Economic Reforms. This paper also troughs some light on current challenges of Indian Economy.

Module I: External Sector in India

Trends, Composition & Direction in exports from and imports of India; Problems of Balance of Payment: Causes of deficit in BoP & measures to correct it; Trade Policy- Export Promotion Vs Import Substitution; Foreign Trade Policy of India; WTO and India

Module II: Financial Markets in India

Commercial Banking in India- Nationalisation of Banks; Lead bank scheme and branch expansion; RBI - Functions, Monetary Policy; Development Banking- IFCI, IDBI, SIDBI and NABARD

Module III: Indian Public Finance

Public Expenditure-Growth and Composition, Causes of Growth of Public Expenditure in India: Tax Revenue of Central and State Governments; Concept of VAT; Deficit Financing in India- Revenue, Budget, Fiscal and Primary Deficits; Purpose and Effects of Deficit Financing; India's Fiscal Policy-Objectives

Module IV: Economic Reforms, Globalisation in India, Foreign Capital and MNCs

Genesis of Reforms, Macroeconomic Stabilisation, Structural Reforms, Appraisal
Globalisation and its impact on the Indian Economy; Foreign Capital-Need, Components; MNCs – Reasons for Growth and Appraisal

Module V: Current Challenges Facing Indian Economy

Inflation – Causes, Consequences and Anti-inflationary Policy; Poverty – Poverty line and Estimates, Major Poverty Alleviation Programmes; Environmental Degradation – Growth and Environment; Population Growth and Environment; Environment Policy

Basic Readings:

1. Kapila U. *Indian economy since Independence*. Academic Foundation, New Delhi
2. Misra, S. K. and Puri V. K. *Indian Economy — Its Development Experience*. Himalaya Publishing House, Mumbai
3. Dutt R. and Sundharam K. P. M. *Indian Economy*. S. Chand & Company Ltd., New Delhi.
4. Agarawala, A. N. *Indian Economy*, New Age Publications, New Delhi
5. Panagariya, Arvind (2008): **India: the Emerging Giant**, Oxford University Press, New York
6. Acharya, S. and Mohan, R. (Eds.) (2010): **India's Economy: Performance and Challenges**, Oxford University Press, New Delhi.
7. Ahluwalia, I. J. and Little, I. M. D. (Eds.) (1998): **India's Economic Reforms and Development: Essays for Manmohan Singh**, Oxford University Press, New Delhi.

Core Economics Course 5: MICROECONOMICS I

Course Description

The course is designed to provide a sound training in microeconomic theory to formally analyze the behaviour of individual agents. Since students are already familiar with the quantitative techniques in the previous semesters, mathematical tools are used to facilitate understanding of the basic concepts; this course looks at the behaviour of the consumer and the producer and also covers the behaviour of a competitive firm.

Module I: Consumer Theory I

The market – Constructing a model; Optimisation and equilibrium; The demand curve and the supply curve; Market Equilibrium; The budget constraint and budget set; Changes in budget line; Effect of taxes, subsidy and rationing on budget set; Consumer Preferences – Indifference curves; Case of perfect substitutes, complements, neutrals, satiation, discrete goods; The marginal rate of substitution; Utility – Cardinal utility; Constructing a utility function; Marginal utility and MRS; Optimal choice and consumer demand; Estimating Utility Functions; Implications of the MRS condition; Choosing taxes; Demand – Normal and inferior goods; Income Offer Curve and Engel Curve; Ordinary goods and Giffen goods; The Offer Curve and the demand Curve; The inverse demand function.

Module II: Consumer Theory II

Slutsky Equation – The Substitution and Income Effects; Sign of Substitution Effect; The Total Change in Demand; Rates of Change; The Law of Demand; Another Substitution Effect; Compensated Demand Curves; Consumer's Surplus – Demand for a discrete good; Constructing utility from demand; Other interpretations of consumer's surplus; Approximating continuous demand; Interpreting the change in consumer's surplus; Producer's surplus; Calculating gains and losses

Module III: Production Theory

Marginal Productivity, Isoquant Maps and the Rate of Technical Substitution, Production with One Variable Input (labour) and with Two-Variable Inputs, Returns to Scale, Four Simple Production Function (Linear, Fixed Proportions, Cobb-Duglas, CES), Technical Progress

Module IV: Cost Functions

Definition of Costs, Cost Functions and its Properties, Shift in Cost Curves, Cost in the Short-Run and Long-Run, Long-Run versus Short-Run Cost Curves, Production with Two Outputs – Economies of Scope

Module V: Profit Maximisation

The Nature and Behaviour of Firms, Profit Maximization, Marginal Revenue, Short-Run Supply by Price-Taking Firm, Profit Functions and its Properties

Readings:

1. C. Snyder and W. Nicholson (2012): Microeconomic Theory: Basic Principles and Extensions, 11th Edition, Cengage Learning, Delhi, India.
2. R. S. Pindyck, D. N. Rubinfeld and P. L. Meheta (2009): Microeconomics, 7th Edition, Pearson, New Delhi.

3. H. R. Varian (2010): *Intermediate Microeconomics: A Modern Approach*, 8th Edition, W.W. Norton and Company/Affiliated East-West Press (India). The workbook by Varian and Bergstrom may be used for problems

Core Economics Course 6: MACROECONOMICS I

Course Description

This course introduces the students to formal modelling of a macro-economy in terms of analytical tools. It discusses various alternative theories of output and employment determination in a closed economy in the short run as well as medium run, and the role of policy in this context. It also introduces the students to various theoretical issues related to an open economy.

Module I: Consumption Function

Consumption – Income Relationship, Propensities to Consume and the Fundamental Psychological Law of Consumption; Implications of Keynesian Consumption Function; Factors Influencing Consumption Function; Measures to Raise Consumption Function; Absolute, Relative, Permanent and Life – Cycle Hypotheses

Module II: Investment Function

Autonomous and Induced Investment, Residential Investment and Inventory Investment, Determinants of Business Fixed Investment, Decision to Invest and MEC, Accelerator and MEI Theories of Investment.

Module III: Demand for and Supply of Money

Demand for Money – Classical, Neoclassical and Keynesian Approaches, The Keynesian Liquidity Trap and its Implications, Supply of Money – Classical and Keynesian Approaches, The Theory of Money Supply Determination and Money Multiplier, Measures of Money Supply in India

Module IV: Aggregate Demand and Aggregate Supply

Derivation of Aggregate Demand and Aggregate Supply Curves in the IS-LM Framework; Nature and Shape of IS and LM curves; Interaction of IS and LM curves and Determination of Employment, Output, Prices and Investment; Changes in IS and LM curves and their Implications for Equilibrium

Module V: Inflation, Unemployment and Expectations, and Trade Cycles

Inflation – Unemployment Trade off and the Phillips Curve – Short run and Long run Analysis; Adaptive and Rational Expectations; The Policy Ineffectiveness Debate; Meaning and Characteristics of Trade Cycles; Hawtrey's Monetary Theory, Hayek's Over-investment Theory and Keynes' views on Trade Cycles

Readings:

1. N. Gregory Mankiw (2010): *Macroeconomics*, 7th edition, Cengage Learning India Private Limited, New Delhi
2. Richard T. Froyen (2005): *Macroeconomics*, 2nd Edition, Pearson Education Asia, New Delhi.

3. Errol D'Souza (2009): *Macroeconomics*, Pearson Education Asia, New Delhi.

Core Economics Course 7: STATISTICAL METHODS FOR ECONOMICS

Course Description

This is a course on statistical methods for economics. It begins with some basic concepts and terminology that are fundamental to statistical analysis and inference. It is followed by a study and measure of relationship between variables, which are the core of economic analysis. This is followed by a basic discussion on index numbers and time series. The paper finally develops the notion of probability, followed by probability distributions of discrete and continuous random variables and introduces the most frequently used theoretical distribution, the Normal distribution.

Module I: Data Collection and measures of central tendency and dispersion

Basic concepts: population and sample, parameter and statistic; Data Collection: primary and secondary data, methods of collection of primary data; Presentation of Data: frequency distribution; cumulative frequency; graphic and diagrammatic representation of data; Measures of Central Tendency: mean, median, mode, geometric mean, harmonic mean, their relative merits and demerits; Measures of Dispersion: absolute and relative - range, mean deviation, standard deviation, coefficient of variation, quartile deviation, their merits and demerits; Measures of skewness and kurtosis.

Module II: Correlation Analysis

Correlation: scatter diagram, sample correlation coefficient - Karl Pearson's correlation coefficient and its properties, probable error of correlation coefficient, Spearman's rank correlation coefficient, partial and multiple correlation.

Module III: Regression Analysis

Two variable linear regression analysis - estimation of regression lines (Least square method) and regression coefficients - their interpretation and properties, standard error of estimate

Module IV: Time Series and Index Number

Time Series: definition and components, measurement of trend- free hand method, methods of semi-average, moving average and method of least squares (equations of first and second degree only), measurement of seasonal component; Index Numbers: Concept, price relative, quantity relative and value relative; Laspeyer's and Fisher's index, family budget method, problems in construction and limitations of index numbers, test for ideal index number.

Module V: Probability theory

Probability: Basic concepts, addition and multiplication rules, conditional probability; Random variables and their probability distribution; Mathematical expectations; Theoretical Distribution: normal distribution - Properties and uses, problems using area under standard normal curve

Recommended books:

- 1 Jay L. Devore (2010): *Probability and Statistics for Engineering and the Sciences*, Cengage learning, 2010.

2. S. C. Gupta (): *Fundamentals of Statistics*, Himalaya Publishing House, Delhi
3. Murray R. Spiegel (): *Theory & Problems of Statistics*, Schaum's publishing Series.

Core Economics Course 8: MICROECONOMICS II

Course Description

This course is a sequel to Microeconomics I. The emphasis will be on giving conceptual clarity to the student coupled with the use of mathematical tools and reasoning. It covers Market, general equilibrium and welfare, imperfect markets and topics under information economics.

Module I: Firm Supply and Equilibrium

Market Environments; Pure competition ; Supply decision of a competitive firm and Exceptions; Inverse Supply Function; Profits and Producer's Surplus; Long Run Supply Curve of a Firm; Long Run Average Costs; Short Run and Long Run Industry Supply; Industry Equilibrium in Short and Long Run; Meaning of Zero Profits; Economic Rent.

Module II: General equilibrium, efficiency and welfare

The Edgeworth Box; Trade; Pareto Efficient Allocations; Existence of equilibrium and efficiency; The Welfare Theorems and their implications; The Firm; Production and the Welfare Theorems ; Production possibilities, comparative advantage and Pareto efficiency

Module III: Monopoly

Barriers to Entry, Profit Maximization and Output Choice, Monopoly and resource Allocation, Monopoly, Product Quality and Durability, Price Discrimination, Second Degree Price Discrimination through Price Schedules, Regulation of Monopoly, Dynamic Vies of Monopoly

Module IV: Oligopoly

Oligopoly – Choosing a strategy; Quantity leadership – Problems of the follower and the leader; Price leadership; Comparing quantity leadership and price leadership; Simultaneous Quantity Setting; Example of Cournot Equilibrium; Simultaneous Price Setting; Collusion

Module V: Game Theory

The Payoff Matrix of a Game; Nash Equilibrium; Mixed Strategies ;The Prisoner's Dilemma; Repeated Games; Enforcing a cartel; Sequential Games; A Game of entry deterrence.

Readings:

1. C. Snyder and W. Nicholson (2012): *Microeconomic Theory: Basic Principles and Extensions*, 11th Edition, Cengage Learning, Delhi, India.
2. R. S. Pindyck, D. N. Rubinfeld and P. L. Meheta (2009): *Microeconomics*, 7th Edition, Pearson, New Delhi.
3. H. R. Varian (2010): *Intermediate Microeconomics: A Modern Approach*, 8th Edition, W.W. Norton and Company/Affiliated East-West Press (India). The workbook by Varian and Bergstrom may be used for problems.

Core Economics Course 9: MACROECONOMICS II

Course Description

This course is a sequel to Macroeconomics I. In this course, the students are introduced to the long run dynamic issues like growth and technical progress. It also provides the micro-foundations to the various aggregative concepts used in the previous course.

Module I: Financial Markets and Reforms

Features of Financial Markets, Functions of Financial Markets, Banks and Financial Markets, Adverse Selection and Moral Hazard, Risk and Supply of Credit, The Determination of Banks Asset Portfolio, Financial Repression and Major Financial Sector Reforms in India, Lessons from the Global Financial Crisis and the Policy Response in India

Module II: Open Economy Macroeconomics

Balance of payments- Concept, Equilibrium and Disequilibrium, Measures to Correct Disequilibrium, Determination of Foreign Exchange Rate- the PPP Theory and its Implications, Fixed vs. Flexible Exchange Rates, The Short-run open economy Model, the basic Mundell-Fleming Model. International Financial Markets

Module III: Modelling Economic Growth

The Basic Harrod- Domar Model, Joan Robinson and the Golden Rule of Capital Accumulation, The Basic Solow Model, Theory of Endogenous Growth – the Rudimentary A-K Model

Module IV: Macroeconomic Policy

The Goals of Macroeconomic Policy and of Policy Makers, The Budget and Automatic Fiscal Stabilisers, The Doctrine of Balanced Budget and Keynesian Objections; Concepts of Budget, Revenue and Fiscal Deficits, Fiscal Policy: Objectives and Limits to Discretionary Policy, The Crowding –Out Hypothesis and the Crowding – in Controversy Meaning, Scope and Objectives of Monetary Policy, Instruments of Monetary Policy, the Transmission Mechanism of Monetary Policy, Rules vs. Discretion in Monetary Policy, Implications of Targeting the Interest Rate, Limits to Monetary Policy

Module V: Schools of Macroeconomic Thought and the Fundamentals of Macroeconomic Theory and Policy

Classics, Keynes, Monetarists, New Classicals and New Keynesians: (i) Keynes vs. the Classics – Aggregate Demand and Aggregate Supply, Underemployment Equilibrium and Wage Price Flexibility, (ii) Monetarists and Friedman’s Reformulation of Quantity Theory, Fiscal and Monetary Policy: Monetarists vs. Keynesians, (iii) The New Classical View of Macroeconomics and the Keynesian Counter critique, (iv) The New Keynesian Economics with reference to the Basic Features of Real Business Cycle Models, the Sticky Price Model.

Readings:

1. N. Gregory Mankiw (2010): *Macroeconomics*, 7th edition, Cengage Learning India Private Limited, New Delhi
2. Richard T. Froyen (2005): *Macroeconomics*, 2nd Edition, Pearson Education Asia, New Delhi.
3. Errol D’Souza (2009): *Macroeconomics*, Pearson Education Asia, New Delhi.

Core Economics Course 10: Public Economics

Course Description

Public economics is the study of government policy from the points of view of economic efficiency and equity. The paper deals with the nature of government intervention and its implications for allocation, distribution and stabilization. Inherently, this study involves a formal analysis of government taxation and expenditures. The subject encompasses a host of topics including public goods, market failures and externalities.

Module I: Introduction to public finance

Public Finance: meaning and scope, distinction between public and private finance; public good versus private good; Principle of maximum social advantage; Market failure and role of government;

Module II: Public Expenditure

Meaning, classification, principles, cannons and effects, causes of growth of public expenditure, Wagner's law of increasing state activities, Peacock-Wiseman hypotheses

Module III: Public Revenue

Sources of Public Revenue; Taxation - meaning, cannons and classification of taxes, impact and incidence of taxes, division of tax burden, the benefit and ability to pay approaches, taxable capacity, effects of taxation, characteristics of a good tax system, major trends in tax revenue of central and state governments in India

Module III: Public Budget

Public Budget: kinds of budget, economic and functional classification of the budget; Balanced and unbalanced budget; Balanced budget multiplier; Budget as an instrument of economic policy.

Module V: Public Debt

Sources, effects, debt burden – Classical, Ricardian and other views, shifting - intergenerational equity, methods of debt redemption, debt management, tax versus debt;

Readings:

1. J. Hindriks and G. Myles (2006): *Intermediate Public Economics*, MIT Press.
2. R. A. Musgrave and P. B. Musgrave (1989): *Public Finance in Theory and Practices*. McGraw Hill
3. B. P. Herber (1975): *Modern Public Finance*.
4. B. Mishra (1978): *Public Finance*, Macmillan India limited.

Core Economics Course 11: INDIAN ECONOMY I

Course Description

Using appropriate analytical frameworks, this course reviews major trends in economic indicators and policy debates in India in the post-Independence period, with particular emphasis on paradigm shifts and turning points. Given the rapid changes taking place in India, the reading list will have to be updated annually.

Module I: Basic Characteristics of Indian Economy as a Developing Economy

Indian Economy in the Pre-British Period; The Structure and Organisation of Villages and Towns; Industries and Handicrafts in Pre-British India; Colonialism; Economic Consequences of British Rule; Decline of Handicrafts and Progressive Ruralisation; The Land System and Commercialisation of Agriculture; Industrial Transition; Colonial Exploitation and Impacts – Underdevelopment; Colonisation and Modernisation; State Policies and Economic Underdevelopment; The Current State of Indian Economy

Module II: Population and Human Development

Population Growth and Economic Development – size, growth and future of population; Causes of rapid population growth; Population and economic development; Population policy; Demographic issues – Sex and Age Composition of population; Demographic Dividend; Urbanisation and Migration; Human Resource Development – Indicators and importance of Human Resource Development; Education policy; Health and nutrition.

Module III: National Income in India – The Growth Story and Regional Disparities

Trends in national and per capita income; Changes in sectoral composition of national income; Regional disparities in Growth and Income; Savings and Investment and Economic Growth – The Linkage

Module IV: Economic Planning in India

Rationale, Features, Objectives, Strategies, Achievements and Assessment of Planning in India; Eleventh Five Year Plan – Objectives, Targets and Achievements; Twelfth Five Year Plan – Vision and Strategy; From Planning to NITI – Transforming India's Development Agenda.

Module V: Current Challenges

Poverty – Estimation and Trends, Poverty Alleviation Programs – MGNREGA, NRLM, SJSRY; Inequality – Measures and trends in India; Unemployment – Nature, Estimates, Trends, Causes and Employment Policy

Readings:

1. Indian Economy, VK Puri and SK Misra, Himalaya Publishing House, 31st Revised Edition
2. Indian Economy Datt and Sundharam, Gaurav Datt and Ashwani Mahajan, S Chand Publications, 7th Revised Edition
3. Indian Economy Since Independence, ed by Uma Kapila, Academic Foundation, Revised Nineteenth Edition 2008-09
4. The New Oxford Economics Companion to India, ed by K Basu and A Maertens, Oxford University Press, 2012
5. Economic Survey of India 2015-16, Ministry of Finance, GoI

6. NITI Ayog document- (Feb 8, 2015)

Core Economics Course 12: DEVELOPMENT ECONOMICS I

Course Description

This is the first part of a two-part course on economic development. The course begins with a discussion of alternative conceptions of development and their justification. It then proceeds to aggregate models of growth and cross-national comparisons of the growth experience that can help evaluate these models. The axiomatic basis for inequality measurement is used to develop measures of inequality and connections between growth and inequality are explored. The course ends by linking political institutions to growth and inequality by discussing the role of the state in economic development and the informational and incentive problems that affect state governance.

Module 1: Study of economic development:

Development Economics as a subject; economic growth and economic development; characteristics of underdeveloped countries – vicious cycle of poverty and cumulative causation; obstacles to economic development; measures of economic development – national and per capita income, basic needs approach, capabilities approach, three core values of development, PQLI, HDI, HPI, MDPI, GDI; capital formation and economic development

Module 2: Theories of Economic Growth and Development

Classical theory, Marxian theory; Schumpeterian theory; Rostow's stages of economic growth; Solow model and convergence with population growth and technical progress

Module 3: Poverty, Inequality and Development:

Concepts of poverty and inequality; Measuring poverty; Measuring Inequality – Lorenz curve and Kuznets' inverted U hypothesis; Growth, poverty and inequality; Economic characteristics of poverty groups (rural poverty, women and poverty, indigenous population and poverty); Policy options – some basic considerations

Module 4: Institutions and economic development:

Role of institutions in economic development; Characteristics of good institutions and quality of institutions; The pre-requisites of a sound institutional structure; Different measures of institutions – aggregate governance index, property rights and risk of expropriation; The role of democracy in economic development; Role of state; Role of markets and market failure; Institutional and cultural requirements for operation of effective private markets; Market facilitating conditions; Limitations of markets in LDCs; Corruption and economic development – tackling the problem of corruption

Module 5: Agriculture, Industry and Economic Development:

Role of agriculture; Transforming traditional agriculture; Barriers to agricultural development; Role of industrialization; Interdependence between agriculture and industries – A model of complementarities between agriculture and industry; terms of trade between agriculture and industry; functioning of markets in agrarian societies; interlinked agrarian markets

Readings:

1. Debraj Ray (2009): *Development Economics*, Oxford University Press.
2. Partha Dasgupta (2007): *Economics, A Very Short Introduction*, Oxford University Press.
3. Abhijit Banerjee, Roland Benabou and Dilip Mookerjee (2006): *Understanding Poverty*, Oxford University Press.
4. Amartya Sen (2000): *Development as Freedom*, OUP.
5. Daron Acemoglu and James Robinson (2006): *Economic Origins of Dictatorship and Democracy*, Cambridge University Press.
6. Robert Putnam (1994): *Making Democracy Work: Civic Traditions in Modern Italy*, Princeton University Press.
7. Todaro, Michael P and Stephen C Smith (2006): *Economic Development*, 8th Edition, Pearson
8. Thirlwall, A P (2011): *Economics of Development*, 9th Edition, Palgrave Macmillan

Core Economics Course 13: INDIAN ECONOMY II

Course Description

This course examines sector-specific policies and their impact in shaping trends in key economic indicators in India. It highlights major policy debates and evaluates the Indian empirical evidence. Given the rapid changes taking place in the country, the reading list will have to be updated annually.

Model I: Agricultural Development in India

Indian Agriculture: nature, importance, trends in agricultural production and productivity, factors determining production, land reforms, new agricultural strategies and green revolution, rural credit; Agricultural marketing and warehousing.

Module II: Industrial Development in India

Trends in industrial output and productivities; Industrial Policies of 1948, 1956, 1977 and 1991; Industrial Licensing Policies – MRTP Act, FERA and FEMA; Growth and problems of SSIs, Industrial sickness; Industrial finance; Industrial labour

Module III: Tertiary Sector and HRD

Tertiary Sector: growth and contribution of service sector to GDP of India, share of services in employment; Human development – concept, evolution, measurement; HRD: indication, importance, education in India, Indian educational policy; Health and Nutrition.

Module IV: External Sector

Foreign Trade: role, composition and direction of India's foreign trade, trends of export and import in India, export promotion versus import substitution; Balance of Payments of India; India's Trade Policies; Foreign Capital – FDI, Aid and MNCs.

Module IV: Indian Economy and Environment

Environmental Policies in India: The Environment (Protection) Act 1986, The Environment (Protection) Rules 1986, The National Forest Policy 1988, Policy statement for Abatement of Pollution 1992, National Conservation Strategy and Policy Statement on Environment and Development 1992, The National Environment Appellate Authority Act 1997, National Environmental Policy 2006; Global deal with Climate Change: Introduction, Intergovernmental Panel for Climate Change (IPCC), Impact of Climate Change on India, Global Response on Climate Change, Possible Role of India

Readings:

1. U. Kapila (2010): *Indian economy since Independence*. Academic Foundation, New Delhi
2. S. K. Misra and V. K. Puri (Latest Year): *Indian Economy — Its Development Experience*, Himalaya Publishing House, Mumbai
3. S. Chakraborty (): *Development Planning: The Indian Experience*. Clarendon Press.
4. R. Dutt and K. P. M, Sundharam (Latest Year): *Indian Economy*, S. Chand & Company Ltd., New Delhi.
5. A. Panagariya (2008): *India: the Emerging Giant*, Oxford University Press, New York
6. S. Acharya and R. Mohan (Eds.) (2010): *India's Economy: Performance and Challenges*, Oxford University Press, New Delhi.
7. I. J. Ahluwalia and I. M. D. Little (Eds.) (1998): *India's Economic Reforms and Development: Essays for Manmohan Singh*, Oxford University Press, New Delhi.

Core Economics Course 14: DEVELOPMENT ECONOMICS II**Course Description**

This is the second module of the economic development sequence. It begins with basic demographic concepts and their evolution during the process of development. The structure of markets and contracts is linked to the particular problems of enforcement experienced in poor countries. The governance of communities and organizations is studied and this is then linked to questions of sustainable growth. The course ends with reflections on the role of globalization and increased international dependence on the process of development.

Module 1: Population and Development

Demographic concepts : birth and death rates, age structure, fertility and its determinants, the Malthusian population trap and the microeconomic household theory of fertility; costs and benefits of population growth and the model of low level equilibrium trap; the seven negative consequences of population growth; the concept of optimum population; rural-urban migration – the Harris Todaro migration model and policy implications

Module 2: Dualism and economic development

Dualism – geographic, social and technological; the theory of cumulative causation; the regional inequalities in the context of economic development; the inverted U relationship; international inequality and the centre periphery thesis; dependency, exploitation and unequal exchange; the dualistic development thesis and its implications

Module 3: Environment and Development

Basic issues of environment and development – population, resources and the environment; poverty, economic growth, rural development, urban development and the environment; simple model of environment and economic activity; environmental degradation and externalities; common property resources, public goods and the free-rider problem; renewable and non-renewable resources; environmental values and their measurement; concept of sustainable development; basics of climate change

Module 4: Financing Economic Development

Saving, capital formation and economic development; rural financial intermediaries, micro credit and economic development; financial liberalisation, financial inclusion and economic

development; taxation, public borrowing and economic development; inflation, saving and growth – the Keynesian approach; foreign finance, investment and aid – controversies and opportunities; private foreign investment and private portfolio investment; growing role of non-governmental organisations

Module 5: Globalisation, international trade and economic development:

Trade and economic development; export led growth; trade liberalisation and growth of exports; terms of trade and economic growth – the Prebisch Singer Hypothesis; trade strategies for development – import substitution vs export promotion; international commodity agreements; trade vs aid.

Readings

1. Debraj Ray (2009): *Development Economics*, Oxford University Press.
2. Partha Dasgupta (2007): *Economics, A Very Short Introduction*, Oxford University Press.
3. Abhijit Banerjee, Roland Benabou and Dilip Mookerjee (2006): *Understanding Poverty*, Oxford University Press.
4. Thomas Schelling (1978): *Micromotives and Macrobehavior*, W. W. Norton.
5. Albert O. Hirschman (1970): *Exit, Voice and Loyalty: Responses to Decline in Firms, Organizations and States*, Harvard University Press.
6. Elinor Ostrom (1990): *Governing the Commons: The Evolution of Institutions for Collective Action*, Cambridge University Press.
7. Dani Rodrik (2011): *The Globalization Paradox: Why Global Markets, States and Democracy Can't Coexist*, Oxford University Press.
8. Michael D. Bordo, Alan M. Taylor and Jeffrey G. Williamson (ed.) (2003): *Globalization in Historical Perspective*, University of Chicago Press.
9. Todaro, Michael P and Stephen C Smith (2006): *Economic Development*, 8th Edition, Pearson
10. Thirlwall, A P (2011): *Economics of Development*, 9th Edition, Palgrave Macmillan

DSE Group I
DSEG 1.1: Economic History of India 1857-1947

Course Description

This course analyses key aspects of Indian economic development during the second half of British colonial rule. In doing so, it investigates the place of the Indian economy in the wider colonial context, and the mechanisms that linked economic development in India to the compulsions of colonial rule. This course links directly to the course on India's economic development after independence in 1947.

Module I: Introduction: Colonial India: Background and Introduction

Overview of colonial economy

Module II: Macro Trends

National Income; population; occupational structure

Module III: Agriculture

Agrarian structure and land relations; agricultural markets and institutions – credit, commerce and technology; trends in performance and productivity; famines

Module IV: Railways and Industry

Railways; the de-industrialisation debate; evolution of entrepreneurial and industrial structure; nature of industrialisation in the interwar period; constraints to industrial breakthrough; labor relations

Module V: Economy and State in the Imperial Context

The imperial priorities and the Indian economy; drain of wealth; international trade, capital flows and the colonial economy – changes and continuities; government and fiscal policy

Readings:

1. Lakshmi Subramanian, *"History of India 1707-1857"*, Orient Blackswan, 2010, Chapter 4.
2. Sumit Guha, 1991, Mortality decline in early 20th century India', *Indian Economic and Social History Review (IESHR)*, pp 371-74 and 385-87.
3. Tirthankar Roy, *The Economic History of India 1857-1947*, Oxford University Press, 3rd edition, 2011.
4. J. Krishnamurty, *Occupational Structure*, Dharma Kumar (editor), The Cambridge Economic History of India, Vol. II, (henceforth referred to as CEHI), 2005, Chapter 5.
5. Irfan Habib, *Indian Economy 1858-1914*, A People's History of India, Vol.28, Tulika, 2006.
6. Ira Klein, 1984, —When Rains Fail: Famine relief and mortality in British India||, *IESHR* 21.
7. Jean Dreze, *Famine Prevention in India in Dreze and Sen (eds.) Political Economy of Hunger*, WIDER Studies in Development Economics, 1990, pp.13-35
8. John Hurd, *Railways*, CEHI, Chapter 8, pp.737-761.
9. Rajat Ray (ed.), *Entrepreneurship and Industry in India*, 1994.
10. AK Bagchi, —Deindustrialization in India in the nineteenth century: Some theoretical implications, *Journal of Development Studies*, 1976.
11. MD Morris, *Emergence of an Industrial Labour Force in India*, OUP 1965, Chapter 11,

Summary and Conclusions.

12. K.N. Chaudhuri, *Foreign Trade and Balance of Payments*, CEHI, Chapter 10.
13. B.R. Tomlison, 1975, *India and the British Empire 1880-1935*, IESHR, Vol.XII.
14. Dharma Kumar, *The Fiscal System*, CEHI, Chapter 12.
15. Basudev Chatterjee, *Trade, Tariffs and Empire*, OUP 1992, Epilogue.

DSEG 1.2 INTRODUCTORY ECONOMETRICS

Course Description

This course provides a comprehensive introduction to basic econometric concepts and techniques. It covers statistical concepts of hypothesis testing, estimation and diagnostic testing of simple and multiple regression models. The course also covers the consequences of and tests for misspecification of regression models.

Module I: Introduction

Definition, Nature and scope of econometrics; Theoretical Probability Distributions: Normal distribution; chi-square, t- and F-distributions and their uses

Module II: Sampling

Basic concepts of sampling: Probability and non-probability sampling; Types of sampling. Theory of Estimation: Estimation of parameters; properties of estimators – small sample and asymptotic properties; point and interval estimation

Module III: Hypothesis Testing

Testing of hypotheses: defining statistical hypotheses; Simple and composite hypotheses; Null and alternative hypothesis; Type I and Type II errors, Critical region; Neyman-Pearson lemma; Power of a test.

Module IV: Linear Regression Analysis

Two variable linear regression model – Assumptions; Least square estimates, Variance and co- variance between Least square estimates; BLUE properties; Standard errors of estimates; Co- efficient of determination; Inference in a two variable linear regression model; ANOVA; Forecasting.

Module V: Violation of Classical Assumptions

Heteroscedasticity, multicollinearity and auto-correlation: Meaning, consequences, tests and remedies.

Reading List:

1. Johnston (1991), "Econometric Methods", Mc Graw Hill Book Co
2. Koutsoyiannis, A, (1992) "Introduction to Econometrics" OUP
3. Dougherty, C. (1992) "Introduction to Econometrics" OUP.
4. Kmenta, J (1997); "Elements of Econometrics", University of Michigan Press
5. Gujarati, D & Sangeetha (2007); "Basic Econometrics", Mc Graw Hill Book Co.

DSEG 1.3: Odisha Economy

Course Description

Using appropriate analytical frameworks, this course reviews major trends in economic indicators and policy debates in Odisha in pre- and post-Independence period, with particular emphasis on paradigm shifts and turning points. Given the rapid changes taking place in Odisha, the reading list will have to be updated annually.

Module I: Odisha Economy before 1947

Orissa's Economy in the Nineteenth Century: Benevolence or Exploitation, Forces of Nature, Animal Power, The Company Steps in, Public Works and Public Health, Education, Disintegration of Village Economy, New Social Environment, Changing Position of Social Classes, The Moneylenders, The Borrowers, Money-flows from Village to Metropolis, Pauperization of Peasantry, The Wage Earners, Demographic Changes, Profiting from Rural Adversity; Diarchy in 1919 and Separation of Provincial Finances from Central Government in 1937; Emergence of Federal Finance (Ref.: Das 1976a and 1976b, GoO 2016).

Module II: Macro Economy of Odisha

A macro glance of Odisha economy: aggregate income, broad sectoral decomposition, performance of districts, employment, child labour and bonded labour, employment programmes, consumption expenditure, cost of living; Odisha State public finances (Chapter 14 and 15 of Ref 1; & Chapter 2 and 9 of Ref 2)

Module III: Agriculture Sector Development in Odisha

Agriculture: land ownership and land tenure, agricultural wages and rural unemployment, production and productivity of major crops, agricultural inputs, agricultural policy; Animal Husbandry; Fisheries (Chapter 1 to 3 of Ref 1; & Chapter 3 of Ref 2)

Module IV: Industry, Infrastructure and Environment

Industry: Investment, industrial policy, and the growth of large industries, mining and quarrying; Construction; tertiary sector: tourism, transport and power; Water Resources, Forest Resources (Chapter 4 to 8 of Ref 1; & Chapter 4 & 5 of Ref 2)

Module V: Social Sector in Odisha

Poverty: income poverty and inequality; health sector: outcomes, infrastructure, finance, public health, NRHM; education: Literacy, Primary education, secondary education, higher education, SSA; human development (Chapter 9 to 13 of Ref 1; & Chapter 7 & 8 of Ref 2)

Reading List:

1. Nayak, P., Panda, S. C., Pattanaik, P. K. (2016): **The Economy of Odisha: A Profile**, Oxford University Press, New Delhi
2. GoO (2012): **Odisha Economic Survey 2015-16**, Planning and Convergence Department, Directorate of Economics and Statistics, Government of Odisha, Bhubaneswar
3. GoO (2004): *Human Development Report 2004 Orissa*, Planning and Coordination Department, Government of Odisha, Bhubaneswar
4. Mahapatro, S. B. (1980): Inter-Industry Wage Differentials in Orissa: An Empirical

- Analysis, *Indian Journal of Industrial Relations*, 15(4): 525-536.
5. Vyasulu, V. and Arun, A. V. (1997): Industrialisation in Orissa: Trends and Structure, *Economic and Political Weekly*, 32(22): M46-M53.
 6. Das, Binod S. (1976a): Orissa's Economy in the Nineteenth Century, *Social Scientist*, 4(11): 32-46.
 7. Das, Binod S. (1976b): Orissa's Economy in the Nineteenth Century: Part Two, *Social Scientist*, 4(12): 38-50.
 8. GoO (2016): Commemorative Volume on 80 Years Odisha Budget: Since 1936-37, CEFT-XIMB and Department of Finance, Government of Odisha
 9. Mohanti, K. K. and Padhi, S. (1995): Employment Situation of Tribal Population in Orissa: 1981 Census Data, *Economic and Political Weekly*, 30(29): 1879-1882.
 10. Nair, K. R. G. (1993): New Economic Policy and Development of Backward Regions: A Note on Orissa, *Economic and Political Weekly*, 28(19): 939-941.
 11. Mohanty, B. (1993): Orissa Famine of 1866: Demographic and Economic Consequences, *Economic and Political Weekly*, 28(1/2): 55-66.
 12. Haan, A. de and Dubey, A. (2005): Poverty, Disparities, or the Development of Underdevelopment in Orissa, *Economic and Political Weekly*, 40(22/23): 2321-2329.
 13. Samal, K. C. (1998): Poverty Alleviation after Post-Liberalisation: Study of a Tribal Block in Orissa, *Economic and Political Weekly*, 33(28): 1846-1851
 14. Nayak, P. and Chatterjee, B. (1986): Disguised Unemployment in Agriculture: A Case Study of Rural Orissa, *Indian Journal of Industrial Relations*, 21(3): 310-334.

DSEG 1.4: Research Methodology

Course Description

The course is to develop a research orientation among the students and to acquaint them with fundamentals of research methods. Specifically, the course aims at introducing them to the basic concepts used in research and to scientific social research methods and their approach. It includes discussions on sampling techniques, research designs and techniques of analysis.

Module I: Basics of Research

Introduction to Research: Meaning, Objectives, Motivation, Types, Approaches, Significance, Research Process, Criteria of Good Research; Qualities of a Good Researcher, Research as a Career

Module II: Research Problem

Defining the Research Problem: What is a Research Problem? Selecting the Problem, Necessity of Defining the Problem, Technique Involved in Defining a Problem; Research Design: Meaning, Need, Features of a Good Design, Important Concepts Relating to Research Design, Different Research Designs, Basic Principles of Experimental Designs

Module III: Measurement and Scaling Technique

Measurement in Research, Measurement Scales, Sources of Error in Measurement, Tests of Sound Measurement, Techniques of Measurement Tools, Scaling and Important Scaling Technique

Module IV: Problems in Research

Research Ethics: codes and ethics, permissions to research, responsibilities, confidentiality, feedback, participatory research; Research Proposal and literature review: research proposal, review of literature, levels of analysis, using the library and internet, abstracting, word processing, plagiarism

Module V: Actions in Research

English in report writing: words, sentences, paragraph, writing style; The Report: improving quality, sections, drawing conclusions, evaluation checklists, persistence; Common Citation Styles

Basic Readings

1. Kothari, C. R. (2004): **Research Methodology: Methods and Techniques**, New Age International Private Limited Publishers, New Delhi.
2. Guthrie, G. (2010): **Basic Research Methods**, Sage Publications India Private Limited, New Delhi.
3. Monippally, M. M. (2010): **Academic Writing: A Guide for Management Students and Researchers**, Response Books (Sage), New Delhi, Pp. 196-217

Additional Readings

1. Young, P. V. (1996): **Scientific Social Survey and Research**, PHI Learning Private Limited, New Delhi
2. Dooley, D. (2008): **Social Research Methods**, Prentice-Hall of India Private Limited, New Delhi

DSE Group II

DSEG 2.1: Environmental Economics

Course Description

This course introduces the students to the basics of environmental economics to understand the fundamentals of environmental concerns and develop insights into valuation of environment.

Module I: Economy and Environment

Nature and Scope of Environmental Economics- historical development, early economic paradigms, post- war economics and environmentalism; Environment and Economy interaction; Environment as a public good- National versus global public goods, Market failure, Externalities and the environment; The nexus involving environment, development and poverty.

Module II: The Economics of Pollution and Climate change

The optimal level of pollution, Pollution as externality, alternative definitions of pollution; The market Approach to optimal pollution, Property rights and market bargain theorems, Coase theorem; Taxation, Subsidies and optimal pollution; Pollution permit trading; Climate change – concept, causes, effects and management; Climate change and Agriculture

Module III: Valuation of Environmental damage

Methods and difficulties of environmental valuation, Economic value, Total economic value, Option value, Existence value; Direct and Indirect Valuation of Environmental Goods: The hedonic price approach, Contingent valuation, Travel cost approach; Willingness to pay vs. Willingness to accept.

Module IV: Environmental Pollution and Regulation in India

Causes and effects of water pollution, air pollution, noise pollution, soil pollution, Prevention and control of environmental degradation, Mechanism for environmental regulation in India- Environmental policy and legislations

Module V: Natural Resources and Sustainable Development

Environment and sustainable development, Concept and indicators of sustainable development, Resource scarcity, Renewable and exhaustible resources, Optimal use of renewable resources – fishery and forest, Tragedy of commons, People's Participation in the management of common property resources

Reading List:

1. Bhattacharya, R. N. (2002): Environmental Economics: An Indian Perspectives, OUP, New Delhi
2. Shankar, U. (Ed.) (2001): Environmental Economics, OUP, New Delhi.
3. Dayal, V. and Chopra, K. (2009): Handbook of Environmental Economics in India, OUP, New Delhi
4. Bromley, D.W (Ed)(1995); Handbook of Environmental Economics, Blackwell, London
5. Fisher, A.C(1981); Resource and Environmental Economics, Cambridge University Press
6. Helfand, G and P. Berck (2011); The Economics of the Environment, PHI Learning Private Limited, New Delhi
7. Hemple Lamont, C (1998); Environmental Economics – the Global Challenge First East West Press
8. Hussen, A.M (1999); Principles of Environmental Economics, Routledge, London
9. Kolstad, C.D (1999); Environmental Economics Oxford University Press, New Delhi
10. Pearce, D.W and R.K Turner (1948); Economics of Natural Resources and the Environment, Harvester Wheatsheaf
11. Perman R.M. and J. McGilvary (1996); Natural Resources and Environmental Economics, Longman, London
12. Tietenberg. T (1994); Environmental Economics Policy, Harper Collings, New York
13. The Economics of Climate Change: The Stern Review by Great Britain Treasury, Cambridge University Press

DSEG 2.2: International Economics

Course Description

This course introduces the students to international trade and finance to understand the theories of international trade and develop insights into trade policy and balance of payments. The course also develops insight into international financial system and the trade policy of India.

Module I: Importance of Trade and Trade Theories

Importance of the study of International Economics; Inter-regional and international trade; Need for a separate theory of international trade; Theories of Trade- absolute advantage, comparative advantage and opportunity cost; Heckscher-Ohlin theory of trade — its main features, assumptions and limitations

Module II: Trade and Economic Growth

Concepts of terms of trade and their importance; Doctrine reciprocal demand – Offer curve techniques; Gains from trade— their measurement and distribution; International Trade and Growth: Small and Open country cases; Tariffs and quotas – their impact in partial equilibrium analysis; Free trade and policy of tariffs in relation to economic growth with special reference to India

Module III: Exchange Rate

Concept and Types of Exchange Rate (bilateral vs trade-weighted exchange rate, cross exchange rate, spot, forward, futures), Demand for and Supply of foreign exchange, Exchange Rate Determination: Purchasing-Power Parity Theory, The Monetary Model of Exchange Rates, Asset or Portfolio Model of Exchange Rates. Fixed versus Flexible exchange rate

Module IV: Balance of Trade and Payments

Concepts and components of balance of trade and balance of payments; Equilibrium and disequilibrium in balance of payments; Consequences of disequilibrium in balance of payments; Various measures to correct deficit in BoPs; Foreign trade multiplier- Concept and implications; Present balance of payment position of India – Need for and rationale of trade reforms in India including partial and full convertibility of rupee; recent export and import policies in India

Module V: International Economic Institutions

Functions of IMF, World Bank, WTO and Asian Development Bank — Their achievements and failures; Their Role from the point of view of India; Forms of economic cooperation; Reforms for the emergence of international monetary system and trading blocs at the global level

Reading List:

1. Krugman Paul R. and Obstfeld Maurice. *International Economics*, Pearson Education
2. Salvatore Dominick. *International Economics*, Wile India.
3. Sodersten Bo and Reed J. *International Economics*, McMillan Publisher
4. Carbaugh Robert. *International Economics*, South-Western College Publication.
5. Gandolfo Giancarlo. *International Trade Theory and Policy*, Springer Publication
6. Gandolfo Giancarlo. *International Finance and Open-Economy Macro Economics*, Springer Publication
7. Copeland Laurence. *Exchange Rates and International Finance*, Addison Wesley, Publication.
8. Kanan, P. B. (1994): *The International Economy*, Cambridge University Press, London.
9. Kindleberger, C. P. (1973): *International Economics*, R.D. Irwin, Homewood.

DSEG 2.3: Economics of Agriculture

Course description

This course introduces the students to significance of agriculture in the Indian economy and helps to understand the role agriculture in economic development. It is designed to develop insights into changing agricultural practices in India and assess the significance of agriculture in the era of liberalisation.

Module I

Role of Agriculture in Economic Development, Economic growth – sectoral changes and agriculture, agriculture in rural development, farm and non-farm employment issues, inter-linkages between agriculture and industry; empirical evidence of inter-dependence between agriculture and industry

Module II

Traditional Agriculture: characteristics; Schultz's hypothesis – its criticisms; Mechanization of Indian Agriculture; Case for and against farm mechanization; Green revolution and trends of mechanization in India

Module III

Agricultural price policy for a developing economy – objectives and effectiveness of agricultural price policy, elements of agricultural price policy, features of an ideal agricultural price policy, agricultural price policy in India and public distribution system

Agricultural marketing – need and criteria for assessing efficiency, agricultural marketing system in India, development of a national agricultural marketing platform

Module IV

Risk and uncertainty in agriculture – difference between risk and uncertainty, types of uncertainty in agriculture, measures for mitigating risk and uncertainty in agriculture, new agricultural insurance scheme of India

Rural credit in India, importance and estimates, agencies for rural credit, review of progress of institutional finance in rural India since independence

Module V

Agriculture in Indian Planning, Globalization and Indian agriculture, Case for and against privatization of agriculture, WTO and India's trade in agricultural commodities

Reading List:

1. Ghatak, S and K. Ingerscent (1984), Agricultural and Economic Development, Select Books, New Delhi.
2. Rudra, A (1982), Indian Agricultural Economics: Myths and Realities, Allied Publishers, New Delhi.
3. Sony, R. N. (2006), Leading Issues in Agricultural Economics, Vishal Publishing, Jalandhar.
4. Tyagi, B. P. (1998), Agricultural Economics and Rural Development, J. P. Nath Publishing, Meerut.
5. Sadhu, A N and A Singh (2008), Fundamentals of Agricultural Economics, Himalaya Publishing House, Mumbai.
6. Lekhi, R K and Joginder Singh (2008), Agricultural Economics, Kalyani Publishers, Ludhiana.

SEC II: Data Analysis and Computer Application (Option I)

Course Description:

The purpose of this course is to introduce basic computer skills to students at UG level in non technical subjects. After completion of this course, the students are expected to acquire some basic knowledge about computers and to develop some basic skills in using computers for data storage, compilation, analysis and presentation.

Module I: Introduction to computer and Basic data types

Introduction to computer- Characteristics and Basic Applications of Computer, Components of Computer System, Central Processing Unit (CPU), VDU, Keyboard and Mouse, Other input/output Devices, Memory, concepts of Hardware and Software, Classifications of computers; Representation of data/Information concepts of data processing, Basic data types, Storage of data/Information as files, operating system and The User Interface (windows, Linux), Windows Setting- Control Panels, Accessories (windows)

Module II: Basic Word Processing

Introduction to Word Processing, Opening Word Processing Package, Opening and closing documents, Using a Document/Help Wizard, Text Creation and Manipulation, Formatting the Text, Handling Multiple Documents, Table Manipulation, Printing, saving documents in different formats

Module III: Spreadsheets and Basic Data Analysis

Spread Sheet, Elements of Electronics Spread Sheet, Application/usage of Electronic Spread Sheet, Manipulation of cells, Formulas and functions; Spread sheets for Small accountings- maintaining invoices/budgets, basic practical data analysis works (Maintaining daily and monthly sales reports)

Module IV: Basic Computer Communication and Internet

Basic of Computer networks- LAN and WAN, Internet, Service on Internet; WWW and Web Browsers, Web Browsing software, Surfing the Internet, Chatting on Internet, Email-Basic of electronic mail, Using Emails, Document handling in Email.

Module V: Basic Presentations

Basics- Difference between presentation and document, Using Power Point, Creation of Presentation, Preparation of Slides, Selection of type of Slides, Importing text from word documents, Providing aesthetics- Slide Designs, Slide Manipulation and Slide Show, Presentation of the Slides

Reading List:

1. C.S. French "Data Processing and Information Technology", BPB Publications 1998
2. P.K Sinha, Computer Fundamentals, BPB Publications, 1992
3. Guy Hart-Davis "The ABCs of Microsoft Office 97 Professional edition", BPB Publications, 1998
4. Karl Schwartz, "Microsoft Windows 98 Training Guide", 1998

Course Description

This course intends to explain the ideas on financial system in India. It will help the students to enhance their knowledge on concepts like financial institutions, instruments and markets, their functioning and usage in real world.

Module I: Financial system

The structure of the financial system- Functions of the financial sector-Indicators of financial development; Financial System and Economic Development; financial inclusion: concept and its evolution; policy initiatives on financial inclusion.

Module II: Interest rate policy

Theories of interest rate determination-Level of interest rates-Long period and short period rates- Administered interest rates; Deregulation of interest rates; financial sector reforms in India.

Module III: Money market

Money Market: features; objectives; features of a developed and under developed money market; importance of money market; composition of money market: organized and unorganized; money market institutions and instruments; features and problems of Indian money market.

Module IV: Capital Market

Capital market: composition; Primary and secondary market for securities. Functions of new issue and secondary market; organizations of stock exchanges in India; defects in Indian stock exchange; SEBI; its objectives and functions

Module V: Non-Banking Financial Companies

Non-Banking Financial Companies: Hire purchase Companies-Venture Capital Companies. Insurance Sector: objectives, functions, life insurance and general insurance; IRDA and its role and functions in financial markets.

Basic Reading List

1. M.Y.Khan-Indian Financial System, Tata McGraw Hill, New Delhi.
2. L.M.Bhole: Financial institutions and Market, Tata McGraw hill, New Delhi.
3. Gorden & Natrajan: Financial Market and institutions, Himalaya Publishing house.

SYLLABUS FOR B.A. (HONORS) EDUCATION UNDER CHOICE BASED CREDIT SYSTEM OF UTKAL UNIVERSITY, BHUBANESWAR

CORE - 1

BASICS IN EDUCATION

INTRODUCTION:

The Philosophical foundation is a unique educational charity whose aim is to bring philosophy to schools and the wider community. Through doing philosophy in the classroom the primary concern is to improve the educational practices and provide opportunities for the disadvantaged. Philosophical enquiry develops speaking and listening skills vital for literacy and emotional development, helps children who find it difficult to access other classes, and encourages critical and creative thinking essential in the 21st Century. And it will prepare students to apply knowledge, sensibility, skills and dispositions of philosophical inquiry, analysis, and interpretation to educational practices.

Course Objectives

- after completion of the paper, students shall be able to:
- explain the concept of education and its relationship with philosophy
- list areas of philosophy and narrate their educational implications.
- describe the contribution of Philosophy to the field of education.
- appreciate the contribution of various Indian Schools of Philosophy to the field of education.
- evaluate the impact of Western Philosophies on Indian Education.
- narrate the contribution of the Great Indian Thinkers.

Unit – 1 Bases of Education

- Meaning, Nature and purpose of Education
- Aims of Education: Education for individual development and education for social efficiency
- Functions of education

Unit – 2 Philosophical foundations of education

- Concept of Philosophy

- Inter dependence of philosophy and education
- Branches of philosophy and their educational implications –
Metaphysics, Epistemology and Axiology.

Unit – 3 Reflections of Indian schools of Philosophy on education

- Common characteristics of Indian Philosophy
- Sankhya and Vedanta as Philosophical systems
- Educational implications of Sankhya and Vedanta.

Unit – 4 Western Schools of Philosophy and their educational implication.

- Idealism
- Naturalism
- Pragmatism

Unit – 5 Doctrines of Great Educators of East and West and their influence on the practices of school education with special reference to Aims and ideals of Education, Curriculum, method of teaching and the role of teacher.

- Gandhi
- Sri Aurobindo
- Rousseau
- Dewey

REFERENCES

- Agarwal, J.c. (2010), *Teacher and Education in a Developing society*, Delhi; Vikash Publishing house.
- Arulsarmy, S (2011), *Philosophical and sociological perspectives on Education*, New Delhi; Neelkamal Publications Pvt. Ltd.
- Bhatia K.K., (2011), *Philosophical and sociological foundations of Education*, New Delhi; Kalyani Publishers.
- Bigge, Morris, L. *Educational Philosophies for Teachers*. Columbus, USA: Charies
- Boston, USA: Allyn & Bacon.
- Brubacher, John. S. *Modern Philosophies of Education*. New York, USA: McGraw
- Butler J. Donald, *Four Philosophies and their practices in Education and Religion*.

- Chauhe, S.P. & Chaube, A (2009), *Foundation of education* , New Delhi; Vikash, Publishing house Pvt. Ltd.
- Dash, B.N. (2011) *Foundation of Education*, New Delhi; Kalyani Publishers.
- E. Merrill Publishing Co.
- Gutek, Gerald L. (2009). *New Perspectives on Philosophy and Education*. New
- Hill Book Company Inc.
- Janeja, V.R. (2012) *Educational Thought and Practice*, New Delhi, Sterling Publishers, Private Limited.
- Jersey, USA: Pearson
- Kneller, George F. *Introduction to Philosophy of Education*. New York, USA: John
- Mishra, Bhawna (2004), *Education Evolution Development and Philosophy*, New Delhi; Akanhsa Publishing House.
- Mohanty, Jagannatha (1991), *Foundation of Education*, Cuttack – 2, Takshashila.
- Nayak, B.K *Text Book of Foundation of Education*. Cuttack, Odisha: Kitab Mhal.
- New York, USA: Harper & Row.
- Ozman, Howard A., & Craver, Samuel M., *Philosophical Foundations of Education*.
- Premnath, *Bases of Educations*. Delhi, India: S. Chand and Co.
- Publishers.
- Ross, James S., *Ground Work of Educational Theory*. London, U.K: Oxford
- Rusk, Robert R., *Philosophical Bases of Education*, London, U.K: Oxford University of London Press Ltd.
- Safaya, R.N. & Shaida, B.D. (2010), *Modern Theory and Principles of Education*, New Delhi : Dhanpatrai Publishing Company Pvt. Ltd.
- Saiyadain, K.G. *Education and social order*. Bombay: Asia Publishing House.
- Taneja, V. R. (2000). *Educational Thought and Practice*. New Delhi: Sterling University of London Press Ltd.
- Wiley and Sons, Inc.
- Wingo, G. Max. *Philosophies of Education*. New Delhi: Sterling Publishers.

C1 Practical

Book Review

Each Student is required to review a Book / Journal / Educational Article and Write a report.

CORE – 2

EDUCATION AND SOCIETY

INTRODUCTION

Education is a sub-system of the society. The aims of education are determined by the aims of the society. The relationships between the two concepts i.e., education and society are so strong that it is not possible to separate them because what happens to one affects the other. It is impossible to think purposefully about many contemporary problems and issues of education without thinking about the society. Educational institutions are micro-societies, which reflect the entire society. The education system in any given society prepares the child for future life and instils in him those skills that will enable him to live a useful life and contribute to the development of the society. Education as a social phenomenon does not take place in a vacuum or isolation; it takes place in the society. This paper will deal with the functioning of education vis-a-vis the society. Education as a sub-system of society and how other sub-systems affect education will be discussed. Various agencies which are involved towards promotion of education will be discussed at length. Special emphasis is placed on issues relating to equality of educational opportunity with specific reference to the Scheduled Castes/Tribes and women. Special attention is also given how education plays an important role towards social change, national integration and international understanding in a diverse social context.

Course Objectives

After completion of this paper, students shall be able to:

- justify education as a social process and explain its function.
- describe the aims of education from sociological perspective.
- list various agencies of education and their function.
- justify education as a sub-system of society and how other sub-systems affect education;
- appreciate the importance of education for social change.

Unit – 1 **Education and society**

- **Society : Meaning and characteristics**

- **Types of society : Agricultural, Industrial, rural and urban**

- **Interrelationship between education and society**

- Views of Indian thinkers on Education and Society :

Radhakrishnan and Sri Aurobindo on Education

- Views of Western Thinkers on Education and Society: Dewey and Illich

Unit – 2 Education and culture

- Meaning and concept of culture

- Characteristics and types of culture

- Cultural lag and acculturation

- Cultural dimensions of Education

- Inter relationship between education, custom and value system.

Unit – 3 Education, Social process and Institution

- Education and socialization

- Education and social change

- Education and social mobility

- Role of Education for the development of the marginalised

- Education and Affirmative action

Unit – 4 Education and Globalisation

- Education, Growth and Development

- Globalisation and liberalization

- Educational system in Europe

- Educational system in SAARC countries

- Education in Global context

Unit – 5 Education and state

- Concept of Democracy

- Education in totalitarian and welfare state

- Interrelationship of state and education

- Role of education in Nation building

- State Control of Education and Autonomy in Education.

REFERENCES

- Abraham, M.F. (2008). *Contemporary Sociology*. New Delhi: Oxford University Press.
- Anand, C.L. et.al. (Ed.) (1983). *Teacher and Education in Emerging in Indian Society*. New Delhi: NCERT.
- Dewey, John (1973). *The School and Society*. Chicago: University of

Chicago Press.

- Mathur, S.S. (1966). *A Sociological Approach to Indian Education*. Vinod PustakMandir, Agra.
- Nayak, B.K. *Text Book of Foundation of Education*. Cuttack: Kitab Mahal.
- NCERT (1983). *Teacher and Education in Emerging Indian Society*. New Delhi.
- Ottaway, A.K.C. (1966). *Education and Society*. London: Routledge and Kegan Paul.

C2 Practical

Field Study

Each student is required to visit a school observe the school functioning and prepare a report

CORE – 3

THE LEARNER AND LEARNING PROCESS

INTRODUCTION:

Educational Psychology plays a pivotal role in understanding Children's unique character in teaching learning process. No child is alike from physical, psychological, and social point of view. So a classroom teacher must understand unique characteristics of children and the factors affecting children's learning. This course will enable the learners to understand the Children's innate potentialities and apply educational psychology in teaching learning process.

Course Objectives:

After completion of this paper, students shall be able to:

- establish relationship between education and psychology.
- understand various methods used to study individual behaviour.
- explain the application of educational psychology in teaching learning process.
- understand individual difference from intelligence, creativity, and personality point of view
- explain the concept of learning and factors affecting learning.
- reflect the contribution of various learning theories in teaching learning process.
- Explain different category of people from different Personality type and the type of adjustment.

Unit - 1 **Educational Psychology**

- Relationship between education and psychology

- Meaning, Nature and scope of educational psychology

- Relevance of educational psychology for teacher

- Methods of studying learner behaviour :

Survey, observation case study and experimental

Unit – 2 **Developmental psychology**

• Concept

• Difference between growth and development

- Principles of development
- Areas of development : Physical, social, emotional and intellectual during childhood and adolescence
- Piagetian stages of cognitive development

Unit – 3

Intelligence, creativity and individual difference

- Meaning and nature of intelligence
- Theories: Uni-factor, two-factor, multiple factor, Gardner's theory of Multiple Intelligence.
- Measurement of intelligence : individual and group tests, verbal, non- verbal and performance test.
- Individual difference: concept, nature factors and Role of Education
- Creativity : Meaning, Nature and Stages of creative thinking
Assessing and nurturing creativity.

Unit – 4

Learning and motivation

- Learning : Meaning nature and factor
- Theories of learning with experiment and educational implications: Trial and error with focus on laws of learning classical conditioning, operant conditioning and insightful learning and constructivist approach to learning.
- Motivation: concept, types and technique of motivation.

Unit – 5

Personality and Mental Health

- Personality: Meaning and nature
- Assessment: Subjective, objective and projective techniques.
- Mental Health: Concept, factor affecting mental health and role of teacher.
- Mental Health of teachers
- Adjustment mechanism

REFERNECES

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- Sharma R.N. (2010) Educational Psychology, Delhi, Surjeet Publications.
- Mangal S.K. (2008) Essentials of Educational Psychology, New Delhi, Prentice Hall of India Private Limited.
- Kuppuswamy B (2013) Advanced Educational Psychology, New Delhi,

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- Kulshreshtha S.P. (2013) Educational Psychology, Meerut, R. Lall Book Depot.
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- Chauhan, S.S.(1998). *Advanced Educational Psychology*. Vikash Publishing House, New Delhi.
- Choube, S. P. & Choube. (1996). Educational Psychology and Experiments. Himalay Publishing House New Delhi.
- Mangal S.K. (1997). *Advanced Educational Psychology*. Presentice Hall of India, New Delhi.
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- Maslow, A.H. (1970). Motivation and Personality (2nd edition). New York: Harper & Row.

C3 Practical

Administration of Psychological Test

Each student is to administer a psychological test (Intelligence / creativity / personality test) and interpret the scores and prepare a report.

CORE – 4

PEDAGOGICAL SKILLS

INTRODUCTION

It is important to note that 'education' is not synonymous with 'school'. It has always been the case that a range of activities that are educational in nature can, indeed should, occur outside the school, even from the earliest age given the educative role of the parents. The Delors Commission Report on education for the 21st century proposed 'learning to live together' as one of the four pillars of education. It advocates learning to live together by developing an understanding of other people and an appreciation of interdependence – carrying out joint projects and learning to manage conflicts in a spirit of respect for the values of pluralism, mutual understanding and peace (UNESCO, 1996). The policy context in India and around the globe is moving towards recognition of the educational value of newer form of pedagogy in the 21st Century which will enable the children to develop critical reasoning power, justify their views, independent decision making power, expression of thoughts, and empathy to others' feelings. Recently NCERT (2005) and NCTE (2009) have changed their curriculum framework and accordingly revised their text books and teacher orientation process to empower the prospective teachers to cope up with emerging pedagogies and to promote higher order learning of the learners like, creative expression, authenticity, abstraction of ideas, and multiple thinking, etc. This paper is intended to give insight to the students on importance of pedagogy in education.

Course objectives

After completion of the course, the students shall be able to:

- explain the concept of pedagogy;
- differentiate pedagogy from other allied concepts;
- define different type of task of teaching
- establish relationship between teaching and learning;
- list out different approaches and methods of teaching;

Unit – 1 **Concept of teaching – learning**

- Meaning and definitions of teaching
- Characteristics and importance of teaching
- Meaning and definition of learning.

- Relationship between teaching and learning.

Unit – 2 Task of teaching

- Meaning and definition of teaching task
- Variables involved in a teaching task: Independent Dependent and intervening variable.
- Phases of teaching task : Pre-active, interactive and post – active phase.
- Level of teaching task: Memory Understanding and reflective level.
- Lesson plan design : The Herbartian steps, 5E Model ICON Design Model.

Unit – 3 Theories of teaching

- Meaning and Nature of Theory of teaching
- Types of Teaching Theories.
- Formal : Communication theory,
- Descriptive : Gagne’s hierarchical theory
- Normative: Theories of Mitra and Clarke

Unit – 4 Principles and Maxims of Teaching

- General principles teaching
- Psychological principles of teaching
- Maxims of teaching

Unit – 5 Approaches and Methods of Teaching

Inductive – Deductive, Analytic - synthetic,
Problem Solving and Project
method.

Shift in focus from teaching to learning –

constructivist approach Activity based and child centered

approach – concept and elements.

REFERENCES

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- Chauhan S.S. (1995) Innovation of Teaching Learning Process, Vikas

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C-4 Practical

Preparation of Lesson

Plan

Each student is to required develop five lesson plans in his/her method subject, (which he / she has to opt in 3rd Semester). The plan will be developed following Herbatian approach / 5E Model / Icon Design Model.

CORE - 5

TECHNOLOGY AND INNOVATIONS IN EDUCATION

INTRODUCTION

Educational technology (ET) is the efficient organization of any learning system adapting or adopting methods, processes, and products to serve identified educational goals (NCERT, 2006). This involves systematic identification of the goals of education, recognition of the diversity of learners' needs, the contexts in which learning will take place, and the range of provisions needed for each of these. Our schools should move from a predetermined set of outcomes and skill sets to one that enables students to develop explanatory reasoning and other higher-order skills. Educational technology is a powerful tool towards developing such reasoning and skills. It should enable students to access sources of knowledge, interpret them and create knowledge rather than be passive users. It should enable the teachers to promote flexible models of curriculum transaction. It should encourage to use flexible curriculum content and flexible models of evaluation as well. Present paper will give an exposure to students to understand the meaning, nature and scope of educational technology. They will be sufficiently oriented about nuances of communication and their implications in educational context. They will understand the underlying principles of instructional design. Students will develop the ability to prepare lesson plans based on constructivist approach. They will be oriented about the need and importance distance education in India.

Course Objectives

On completion of this course, the students will be able to:

- understand the meaning, nature and scope of educational technology
- explain with examples various approaches to educational technology
- describe systems approach and its application in educational context
- explain the concepts, principles, modes, process and barriers of communication and their implications in educational context
- explain the instructional design and its underlying principles
- describe different models of teaching and their use in effective classroom teaching

Unit – 1 **Educational Technology**

Meaning, nature and scope

Approaches to Educational Technology : Hardware, software and
system approach

Types of Educational Technology

Importance of Educational Technology for the teacher and the student.

Unit – 2

Communication Process

Meaning and nature

Process, components and

types Barriers of

communication

Study of Classroom Communication through flander's interaction analysis.

Unit – 3

Innovations in Educational Technology

Programmed instruction : Concept Basic principles and

applications Microteaching : Concept assumptions, phases

and applications.

Simulated Teaching : concept, procedure and applications

Personalized system of instruction : Concept, objectives, strategies and
applications

Unit – 4

Teaching Models

Concept attainment

model Advance

organizer model

Synetics model

Inductive model

Memory model

(These teaching models are to be discussed with reference to focus, syntax, social system, support system and application)

Unit – 5 **Classroom instructional Aids**

Projected and non projected

Aids ICT – enabled devices

Organisation of school teaching learning

Materials (TLM) Centre: Objective

Procedure

Planning

Applicatio

n

Types of Materials to be procured for teaching different school subjects.

REFERENCES

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 - Sampath et. al. (1981): *Introduction to Educational Technology*. New Delhi: Sterling Publishers Pvt. Ltd.
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 - Tarachand – *Educational Technology*, New Delhi, Anmol Publication.
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 - Venkataiah, N. (1996): *Educational technology*. New Delhi: APH Publishing Corporation.
 - Walia, J.S. *Essentials of Educational Technology*. Jalandhar: Ahim Paul Pub.

C5 Practical

Classroom Interaction Analysis

Each student is to observe one classroom interaction preferably in a school and prepare an observation matrix and write a report.

CORE - 6

PEDAGOGY OF SCHOOL SUBJECTS

(Each student is required to select any one of the following school subjects) **METHODS OF TEACHING ODIA**

Introduction

Mother-tongue plays a significant role in the education of a child. It has a great importance in the field of education. Therefore, mother tongue must be given an important and prominent place in the school curriculum. Method of teaching Odia will enable us to preserve and enrich our language and culture forever by developing Odia language skills among learners. The learners will also be equipped with the skills to prepare Odia lesson plans by using constructivist approach.

Learning Objectives and Expected Outcomes

On completion of the course the students shall be able to:

- describe the concept of Mother Tongue;
- explain the semantic peculiarity of Odia language
- justify the importance and objectives of teaching Mother Tongue (Odia) at Secondary Stage;
- describe various pedagogical approaches of language teaching.
- prepare subject specific lesson plan for improvement of language skills. plan and construct test to assess language skills and content areas.

Unit –1 Conceptual

Importance of mother tongue in the life and education of the child Aims and objectives of teaching mother tongue at school level.

Place of mother tongue in the school curriculum.

Unit – 2 Methods and approaches

Direct Method

Discussion Method

Discussion cum appreciation

method Inductive and deductive

method

Unit – 3 Techniques of Teaching

Teaching of prose and

poetry Teaching of

Grammar Teaching of

composition

Unit – 4 Teaching Learning Materials for teaching Odia

Teaching learning materials : Purpose, Types and

Use Language Text Book : Importance, Purpose

Language Laboratory characteristics application

Unit – 5 Development of Lesson Plan

Preparation of Lesson Plan : Herbartian approach

5E Model

Icon Design Model

REFERENCES:

Daswani, C. J. *Language Education in Multilingual India*. New/Delhi
(UNESCO)

http://en.wikipedia.org/wiki/Language_education

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Bureau NCERT (2005). National Curriculum Framework,
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Palmer, H.P. *Principles of Language Teaching*. George G. Harrep
and Co. Ltd.

Ryburn, W.M. (1926). *Suggestions for the Teaching of
Mother Tongue*. OUP.

METHOD OF TEACHING ENGLISH

INTRODUCTION

Language is always regarded as the means of communication. Among all the foreign languages English is worldwide accepted as the international language. It has been the window on the world through which we peep into the world to grasp international information on trade, education, health, politics etc. In this connection we need to strengthen our efficiency in English language to present ourselves in the market of education as a skilled person. Basically, in teaching and learning, English language deals with different modes of transaction, language skills. It enables a teacher to follow variety of methods of teaching of prose & poetry, grammar; and enables to prepare the lesson plan and scheme of lessons. As a student of education, one needs to learn role and anatomy of English language, methods of teaching and developing language skills, phonetics etc which are reflected in the course contents of this paper.

Learning Objectives and Expected Outcomes

On completion of course the students shall be able to:

- State the place of English language in India
- describe English as a second language in the multi lingual syllabus India
- List out different techniques of teaching
- Discuss different type of teaching learning materials in teaching English
- Prepare lesson plan in English

Unit – 1 Teaching / Learning English as a second language

- Importance of learning English as a second language
- Aims and objectives of teaching English
- Place of English in school curriculum

Unit – 2 Methods and approaches

- Translation and Direct methods
- Structural approach to teaching English
- Communicative approach to learning English

Unit – 3 Techniques of teaching

- Teaching prose and poetry
- Teaching grammar

- Teaching composition

Unit – 4 Teaching learning materials for teaching English

- Teaching aids : purpose types and use
- The English test book and work book
- The language laboratory
- Application of ICT in teaching English

Unit – 5 Developing a lesson plan for teaching English

- Herbartian approach
- 5 E Model
- ICON Design Model

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METHODS OF TEACHING MATHEMATICS

INTRODUCTION

Mathematics is closely linked not only with the daily life of the human society but also with scientific and technological world. Therefore, teaching of mathematics has formed, since the advent of education in human history, one of the three 'R's of learning. To be effective in teaching and creating a constructive learning situation, the teacher should not only have the content knowledge of mathematics, but also the pedagogical knowledge and its values in daily life of the human being. The pedagogical knowledge of mathematics will help the learner to effectively transact the mathematical concept and apply the effective strategy to assess the learner.

Course Objectives

On completion of the course the students shall be able to:

- explain the nature and scope of mathematics
- identify different types of proof in mathematics and their application to solving mathematical problems
- relate the mathematical concepts with other school subjects
- achieve the mastery over the methods, strategy and approaches for transacting the contents of mathematics
- develop mathematics achievement test and acquire of the scoring procedure
- analyze learners learning difficulties and develop remedial strategies to meet needs of slow learners and to develop enrichment materials for the advanced learners

Unit – 1 Importance and values of teaching mathematics

- Aims and objectives of teaching mathematics
- Relationship of mathematics with other school subjects.

Unit – 2 Mathematics curriculum and its organization at school stage.

- Principles of curriculum construction in Mathematics
- Principles of Arranging / organizing curriculum
- Pedagogical analysis of content in School Mathematics

Unit – 3 Methods of teaching mathematics

- Analytic and synthetic methods

- Inductive and deductive methods
- Project method

Unit – 4 Teaching learning Materials in Mathematics

- Teaching aids in mathematics : Purpose, types and use.
- Mathematics text book and workbook.
- Application of ICT in teaching mathematics.

Unit – 5 Developing lesson plan for teaching mathematics.

- Herbartian approach
- 5 E Model
- ICON Design Model.

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METHOD OF TEACHING HISTORY

INTRODUCTION

History occupies an important place in the school curriculum. Through History students will aware about the past events and developments. History creates linkage between present and past. Through the subject our students will respect our culture, traditions and heritage. History shows path to future.

COURSE OBJECTIVES:

On completion of the course, students shall be able to:

- explain the meaning and scope of History
- relate History with other school subjects
- explain the different approaches to organization of contents in History
- achieve mastery over different methods and approached for curriculum transaction
- List out the different types of teaching learning materials in history and explain their importance.
- Prepare Lesson plan in History

Unit – 1 History: Meaning, nature, scope, and importance

- Aims and objectives of teaching History at school level.
- Relationship of History with other school subject.

Unit – 2 The History curriculum

- Approaches to organization of contents in history curriculum: chronological, concentric, topical, regressive.
- Selection of content of History : Local, national and global perspectives.
- The History curriculum at school level in Odisha.

Unit – 3 Methods of Teaching History

- Lecture, story telling, narration-cum-discussion, dramatization, source method.
- Development of sense of time and space.

Unit – 4 Teaching learning material (TLM) in history

- Purpose, types and use
- Time line.

- ICT-enabled teaching aids in History.

Unit – 5

Preparation of Lesson Plan in History

- Herbartian Approach
- 5E Model
- ICON design model

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METHOD OF TEACHING SCIENCE

Introduction

The paper is meant for the students joining Masters Level with B.S background. The paper intends to develop an insight among the students regarding science as a distinct

discipline with its characteristics and method of inquiry. The MA (Education) students pursuing science would focus both a s physical and biological science and acquaint themselves with different methods and models of teaching. The methods, models and materials would be discussed with reference to the content of course prescribed for H.S.C examination in science. The students, on completion of course, are expected to develop scientific thinking, adapt methods and materials to the needs of students and conduct assignments in line with constructivist perspective.

Learning Objectives and Expected Outcomes

On completion of the course the students shall be able to

- gain insight on the meaning nature, scope and objective of science education.
- appreciate science as a dynamic body of knowledge
- appreciate the fact that every child possesses curiosity about his natural surroundings
- identify and relate everyday experiences with learning science
- appreciate various approaches of teaching learning of science
- employ various techniques for learning science
- use different activities like demonstration ,laboratory experiences, observation, exploration for learning of science
- facilitate development of scientific attitudes in learner
- Construct appropriate assessment tools for evaluating science learning

Unit – 1 Conceptual

- Meaning, nature and scope of General Science
- Aims and objectives of teaching science at school level.
- Correlation of science with other school subjects.
- Importance of science in the school curriculum

- Unit – 2 Methods and approaches**
- Observation method
 - Demonstration-cum-Discussion method
 - Project method
 - Heuristic method
 - Laboratory method
- Unit – 3 Science curriculum**
- Principles of curriculum construction in science
 - Organisation of curriculum in science
 - Pedagogical analysis of contents in science
- Unit – 4 Teaching learning materials (TLM) for teaching science**
- Purpose, type and use
 - Application of ICT in teaching science
 - The science laboratory : Purpose, Importance and utility
- Unit – 5 Development of Lesson plan for teaching Science**
- Herbartian Approach
 - 5 E Model
 - ICON Design model

REFERENCES

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METHOD OF TEACHING GEOGRAPHY

INTRODUCTION

Geography as a subject play a vital role in the school Curriculum for many people, Geography means knowing where places are and something of their characteristics is important for reading or the multiplication of tables for arithmetic, but Geography involves far more. Geography is the study of places on earth and their relationship with each other. Often the study of Geography begins with one's home community and expands as person gains greater experience. Thus Geography provides a conceptual link for children between home, school and the world beyond. Geographers study how people enteract with the environment and with each other from place to place and they classify the earth into regions. It helps us to be better citizen.

Course Objectives:

On completion of the course ,students shall be able to:

- explain the meaning and scope of Geography.
- relate Geography with other school subjects
- explain the different approaches of curriculum transaction in Geography.
- list out the different type of Teaching Learning Material (TLM) in Geography
- explain the principles of curriculum organization in Geography.
- Prepare lesson plan in teaching Geography.

Unit – 1 Conceptual

- Meaning, nature and scope of Geography
- Aims and objectives of teaching Geography at the school level.
- Correlation of Geography with other school subjects.
- Place of Geography in the school curriculum.

Unit – 2 Methods and approaches

- Direct observation and indirect observation
- Discussion method / Demonstration-cum-discussion method
- Project method
- Regional method
- Heuristic method

Unit – 3 Geography curriculum

- Principles of curriculum construction in Geography
- Organisation of curriculum in Geography
- Pedagogical Analysis of contents in Geography

Unit – 4 Teaching Learning Materials (TLM) for teaching

- Teaching Learning Materials : Purpose, type, & use
- Application of ICT in Teaching Geography
- Importance of Geography Room: Purpose, importance, utility
- Geography Text Book: Importance characteristics purpose and application.

Unit – 5 Development of Lesson Plan for teaching Geography

- Herbartian approach
- 5 E Model
- ICON Design Model

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- Verma, O.P. & Vedanayagam E.G. Geography Teaching New Delhi, India : Sterling Publisher Pvt. Ltd.
- Verma, O.P. Methods of teaching Geography New Delhi, India, Sterling Publishers Pvt. Ltd.

C-6 Practical

School

Internship

Each student will deliver 5 (five) lesson in a school in his / her method subject opted in the 3rd Semester following Herbartian approach / 5E Model / Icon Design Model.

CORE – 7

STATISTICS IN EDUCATION

INTRODUCTION

The fundamental principles and techniques of statistics provide a firm foundation to all those who are pursuing courses in education, psychology and sociology. The role of statistics is essential for collection, analysis, grouping and interpreting the quantitative data. Research and innovations are very essential in the field of education for enrichment, progress and development of the knowledge society. A lot of surveys and research works are carried out in the field of education. Statistical methods help the researchers in carrying out these researches successfully. Therefore, the basic knowledge of statistical method is very vital for conducting any survey, research and project work. Students at undergraduate level must have to develop the basic knowledge of statistical methods used in education.

Course Objectives

After completion of this course students shall be able to:

- Describe the importance of statistics in field of education
- Convey the essential characteristics of a set of data by representing in tabular and graphical forms.
- Compute relevant measures of average and measures of variation
- Spell out the characteristics of normal probability of distribution
- Examine relationship between and among different types of variables of a research study

Unit – 1 **Concept of Statistics**

- Meaning, Definition and characteristics of statistics
- Kinds of statistics
- Types of Data
- Scales of Measurement
- Frequency Distribution

Unit – 2 **Graphical Representation of Data**

- Histogram
- Frequency Polygon
- Pie-Diagram

- Cumulative frequency graph
- Cumulative percentage curve / Ogive

Unit – 3

Measures of Central Tendency and Dispersion:

- Mean
- Median
- Mode
- Range
- Average Deviation
- Quartile Deviation
- Standard Deviation

Unit – 4

Measures of Correlation

- Concept of Correlation
- Linear and Non-linear correlation
- Rank difference method of correlation
- Product moment correlational method

Unit – 5

Inferential Statistics

- Normal Probability curve – Divergence from Normality
- Chi-square test
- t-test

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C-7 Practical

Statistical Analysis of Achievement Scores

Each student is required to collect the achievement scores of the students of a class at least 02(two) schools and make statistical analysis of the collected data and a report.

CORE – 8

CURRICULUM DEVELOPMENT & EDUCATIONAL GUIDANCE

INTRODUCTION

The organization of schooling and further education has long been associated with the idea of a curriculum. But what actually is curriculum, and how might it be conceptualized? We explore theory and practice of curriculum design and its relation to informal education. Curriculum theory and practice to some must sound like a dull but required course activity. Curriculum theory at its best is a challenging and exciting intellectual puzzle. It is a vibrant field full of contradictions, challenges, uncertainties and directions. Yet it is a critical field, the outcome of which does matter. When we teach, whether from preschool to high school; from children to adult, whether educating or training, what we do must make a difference. We cannot waste our audiences time with training that doesn't help, with educating that doesn't educate, or teaching that which may be irrelevant or even wrong. If a surgeon makes a mistake, his patient dies. If teachers, educators, professors, trainers make a mistake, we do not readily see the consequences, and indeed may never see the consequences. Ask yourself: Have you hurt anyone lately by giving misinformation? Did you really make a difference in your teaching, say yesterday? How do you know? Does the curriculum that you help design and deliver really do the job it is supposed to? This course deals with the theory and practice of curriculum design. Participants will want to ask "How do I do curriculum design?" "What are the theoretic underpinnings which inform the practical problems of making curriculum?" For this course, however, the underlying theoretical foundations which inform how and what one does will bias our discussions into particular directions. Students need Guidance in different ways and in various forms to solve their problem. Educational guidance is helpful for all categories of learner There are different services available to provide guidance to students . The present paper emphasizes the study of various concepts of guidance and counseling and its importance in teaching learning process.

Course Objectives:

On completion of this course, the students shall be able to:

- define and explain the concept of curriculum.
- list different types of curriculum with examples.
- suggest bases of curriculum such as, philosophical,

psychological and sociological.

- describe different considerations for curriculum planning;
- elucidate different process of curriculum development;
- explain the role of teacher in curriculum development.
- identify major issues and trends in curriculum;
- Explain National curricular Framework (2005)
- Explain different type of Guidance & Counselling
- List out different type of counseling services and the role of teacher in organizing those services

Unit – 1 Curriculum

- Meaning and importance
- Types of Curriculum: subject centered, learner centered, experience centered curriculum, Core curriculum, Local specific curriculum.
- Components of curriculum: Objectives, Content, Learning experience & Evaluation

Unit – 2 Bases of curriculum

- Philosophical, Sociological & Psychological bases of curriculum, Principles of curriculum construction:
 - Principles of Activity centredness, Community centeredness
 - Integration, Relevance, Balance, Flexibility, Variety & Plurality, Forward looking, contextuality, ICT – enabled

Unit – 3 National Curricular Framework (NCF) 2005

- Guiding Principles
- Learning & knowledge
- Curricular areas, School Stages & Assessment

Unit – 4 Guidance and counseling

- Guidance: Meaning, Nature and scope
- Types of guidance : Educational, Vocational, & Personal
- Counseling : Meaning, nature & Scope
- Different types of counseling
- Techniques of counseling

Unit – 5 Organisation of Guidance services in school

- Placement service
- Occupational information service

- Pupil inventory service
- Follow up service
- Role of teacher in organizing guidance services in school

References

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C-8 Practical

Text Book

Review

Each student will review a school text book and write a detailed report.

CORE - 9

EDUCATIONAL ASSESSMENT & EVALUATION

INTRODUCTION

Assessment is considered to be one of the most crucial aspects of any teaching learning process, as it helps the teacher to record the growth of their students, planning for instructional strategy and most importantly helps to assess their own growth over the years. An effective method of assessment in the classroom helps to create conducive learning environment and a teacher must have to know different techniques of assessment which may improve students' learning. The key issues that involve in assessment are how to assess, when to assess, and what will be its implication on students learning. The paper outlines the above mentioned questions and different issues that involves in assessment.

Course Objectives

After completion of the course ,students shall be able to:

- describe the role of assessment in education.
- differentiate measurement, assessment and evaluation.
- establish the relationship among measurement, assessment and evaluation.
- explain different forms of assessment that aid student learning.
- use wide range of assessment tools and techniques and construct these appropriately.
- classify educational objectives in terms of specific behavioral form
- prepare a good achievement test on any school subject
- explain the characteristics of good measuring instruments.
- list out different type of assessment techniques

Unit – 1 **Assessment & Evaluation in Education**

- Understanding the meaning of Test, Measurement Evaluation and Assessment
- Scales of Measurement
- Types of measurement, Norm Referenced and Criterion Referenced
- Procedure of Evaluation: Placement, Formative, Diagnostic and Summative

- Concept of continuous and comprehensive evaluation (CCE).
- Unit – 2 Instructional Objectives**
- Taxonomy of Educational objectives with special reference to cognitive domain
 - Methods of stating instructional objectives: General instructional objectives and specific learning outcomes.
 - Relationship of Evaluation procedure with objectives.
 - Construction of objective based and objective type test items: Essay type, Objective type: principles of construction, Advantages and limitations.

Unit – 3 Techniques of Assessment

- Observation
- Interview
- Rating scale
- Checklist
- Project
- Concept Mapping

(Above techniques are to be discussed with reference to purpose, type, procedure of administration and application)

Unit – 4 Test construction

- Teacher made test vs. standardization
- General Principles of Test construction and standardization : Planning, Preparing, Tryingout & Evaluating.

Unit – 5 Characteristics of a Good Test

- Reliability - Concept and method
- Validity - Concept, type and methods of validation
- Objectivity - Concept, type and factors
- Usability - Concept and factors

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C-9 Practical

Construction of an achievement test

Each student will construct 50 objective based objective type test items along with a blue print

CORE – 10

INTRODUCTION TO EDUCATIONAL RESEARCH

INTRODUCTION

Research is a creative work undertaken systematically to increase the stock of knowledge, including knowledge of humanity, culture and society, and the use of this stock of knowledge to devise new applications. It is used to establish or confirm facts, reaffirm the results of previous work, solve new or existing problems, support theorems, or develop new theories. A research project may also be an expansion on past work in the field. The primary purposes of research are documentation, discovery, interpretation, or the research and development of methods and systems for the advancement of human knowledge. Approaches to research depend on epistemologies, which vary considerably both within and between humanities and sciences. In the present paper, students will be given an orientation about the nature, purpose, scope of research in education. A brief overview of different types of research in education will be given to the students. Students will be exposed to different methodology of research in education. Students can use appropriate tools and techniques for the collection of data and understand concept of sampling.

Course Objectives

On completion of this course the students shall be able to:

- Describe the nature, purpose, scope of research in education
- Identify types of research in education
- Explain the characteristic of qualitative, quantitative and mixed research
- Select and explain an appropriate method for a research study
- Select appropriate tools and techniques for the collection of data
- Describe the procedure of preparation of Research Report

Unit – 1 Introduction to Research

- Methods of Acquiring knowledge
- The Nature of science
- Meaning and characteristics of research
- Basic, Applied and action research
- The nature of educational research

Unit – 2 Types of studies in Educational Research

- Descriptive Research
- Experimental Research
- Qualitative Research
- Philosophical and Historical studies

Unit – 3 Research Design

- Identification of problem and formulation of Research question
- Hypothesis : Meaning and types
- Sampling : Concept and purpose
- Tools of data collection : Questionnaire, Rating scale, Attitude scale and checklist
- Techniques of data collection : Interview and observation

Unit – 4 Data Analysis and Interpretation

- Analysis of Quantitative Data (Descriptive statistical Measure)
- Analysis of Quantitative Data (inferential statistics based on parametric tests)
- Analysis of Quantitative Data (inferential statistics based on non-parametric tests)
- Analysis of Qualitative Data

Unit – 5 Research reports and application

- Writing proposal / synopsis
- Method of literature survey / Review
- Research Reports various components or structure
- Scheme of chapterization and Referencing

REFERENCES

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C-10 Practical

Preparation of Project

proposal

Each student will prepare a project proposal.

CORE – 11

HISTORY OF EDUCATION IN INDIA

INTRODUCTION

In heritage of Indian education, you need to know the key words, *Heritage* and *Education*. The Indian heritage witnesses the most fabulous contributions in the field of education. It is believed that in the ancient days, education was imparted orally by the sages and the scholars and the information was passed on from one generation to the other. The Gurukuls were the traditional Hindu residential schools of learning which were typically in the teacher's house or a monastery. At the Gurukuls, the teacher imparted knowledge on various aspects of the religion, the scriptures, the philosophy, the literature, the warfare, the statecraft, the medicine astrology and the history. As the students of Education, you all need to learn the system of education starting from the ancient India till the today's globalised knowledge society through the hierarchy of time. The paper will develop a sense of appreciation and pride about the Indian Cultural and Educational heritage.

Course objectives

On completion of this course ,students shall be able to:

- narrate the concept of education in the context of Indian heritage.
- describe education in ancient India, particularly, Vedic Education, panishadic Education, and the Buddhist Education.
- critically examine the education system in Medieval India
- elaborate the role of teacher, school and community in preservation of Indian heritage and achievement of national goals.
- Evaluate the education system during British period with special emphasison the commissions and committees.
- Elaborate the status of education during post-independence period with special emphasis on the commissions and committees.

Unit – 1 **Education in Ancient India**

- Education during Vedic & Upanishadic period
- Education during Buddhist period
- Ancient seats of learning: Nalanda, Taxila, & Varanasi
- Achievements of Ancient India in different fields of knowledge

and enlightenment.

Unit – 2 Education in Medieval India

- Islamic Education in India: Aims, structure, curriculum, methods and educational institutions.
- Hindu Education: Aims, structure, curriculum, methods and educational institution.
- Impact of the interaction between the two systems of education.
- Evaluation of state patronage for education during the period.

Unit – 3 Education during early British period (up to 1885)

- Educational endeavours during the early British period (up to 1835)
- Adam's Report
- Macalay's Minute and Bentinck's Resolution. 1835
- Wood's Despatch 1854
- Hunter Commission Report 1882

Unit – 4 Education during later British period (1885-1947)

- National Education Movement
- Curzon's Education Policy
- Calcutta University (Sadler) Commission report 1917
- Basic Education 1937

Unit – 5 Education in Independent India

- Report of the University Education Commission 1948
- Report of the Secondary Education Commission 1952.
- Report of the Indian Education Commission 1966
(Reports of the commissions to be studied with reference to Aims, structure & Curriculum)
- NPE 1986 and the Revised NPE 1992.
 - Essence & the Role of Education
 - National System of Education
 - Reorganisation of Education at different stages.
- Report of NKC with regard to school & higher education

REFERENCES:

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C-11 Practical

Case Study

Each student will make a case study of an educational institution and prepare report.

CORE – 12

COMPARATIVE EDUCATION

INTRODUCTION

This paper is an introduction to a systematic study of comparative education, the analytical survey of foreign educational systems. Comparative education is relatively a young sub field in the very old discipline of pedagogy. Educational reforms are so intimately connected with politics, with problems of race, nationality, language and religious and social ideals that it becomes rather imperative to have a glimpse over the evolution of educational development of nations. This course is an attempt to combine the two purposes : an academic insight and a general introduction into comparative education as a study of contemporary solutions to various countries. It is widely recognized that this intending students of education should have some knowledge of foreign educational systems and their comparative merits. This paper also aims at the analytical study of education in all countries with a view to perfecting national systems with modification and changes, which the circumstances and local conditions would demand.

Course objectives

On completion of this course ,students shall be able to:

- Explain the scope of comparative education
- List out the factors of comparative education
- Compare the structure,curriculum and evaluation system of India with that of China, Japan,U.K and U.S.A

Unit – 1 **Definition and scope of Comparative Education**

- First pioneers of comparative education.
- Other subsequent comparative studies
- Approaches: statistical, psychological and historical
- National traditions and the definition of a nation.

Unit – 2 **Theory and Methods of comparative Education**

- Purpose of comparative education
- Area studies : Description and interpretation
- Comparative studies : Juxtaposition and comparison

Unit – 3 **Factors**

- The Racial factor
- The Linguistic factor
- Geographic and economic factor
- Religious factor

Unit – 4 Systems of Education

(Characteristic, structure, curriculum and evaluation system)

- U.K.
- U.S.A.

Unit – 5 Systems of Education

(Characteristic, Structure, Curriculum & Evaluation system)

- China
- Japan

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Core-12 Practical

Term Paper

Each student is required to prepare a term paper on any topic of comparative education.

DISCIPLINE SPECIFIC ELECTIVE (DSE) – 1 ICT IN

EDUCATION

INTRODUCTION

Information and Communication Technology (ICT) now hold great potential for increasing the access to information as well as a means of promoting learning. ICT has tremendous potentiality in transforming classrooms into more engaging, collaborative and productive learning environments in which instructions can be customized to students' specific needs, interests and learning styles. It is also redefining the way educators teach as well as the way the students learn. The present paper is based on above assumptions. The paper will orient the learners about the need and importance of ICT in education. It will describe about the importance of open source software in education particularly, in developing country like, India. Students will be given an exposure about the various approaches and stages towards the use of ICT in education. Students are expected to develop reasonably good ICT skills in terms of use of various computer software and ICT tools.

Course Objectives

On completion of this course, the students shall be able to:

- explain the concept, nature and scope of ICT in education
- differentiate Web. 1.0 and Web 2.0
- describe the importance of open source software in education
- list and explain various approaches in adoption and use of ICT in education.
- list and explain various stages of ICT usages in general and pedagogical usages in particular in education.
- describe the needed teacher competencies for ICT usage in the classroom.
- ☐ demonstrate the use of various computer software such as Word-processing , Spreadsheets, and Presentation.

Unit – 1

Information & Communication Technology : Meaning and importance

- The ICT infrastructure : computers, telecommunication network, networking.
- Introduction to internet, the World Wide Web, e-mail, and social media.

- ICT potential for improving access, quality and inclusion in education

Unit – 2

E- learning : meaning and importance

E – learning methods and media :

Virtual learning environment

Virtual universities

Massive Open Online Course(MOOCs)

Webinars

Special internet forum / discussion

groups e-tutorials

Unit – 3

ICT Resources

- Open Educational Resources (OERs) purpose and importance
- e-Libraries, e-books, e-journals, Infflibnet
- Important website for education : NCERT, UGC, NCTE, MHRD, DHE, UNESCO, UNICEF, UIS (UNESCO Institute of Statistics) etc.
- Other learning resources: Encyclopedia, dictionaries, multimedia etc.

Unit – 4 ICT in class room

- Purpose and importance of ICT in class room
- ICT enabled curriculum : enhancing ICT use in the existing curriculum
- Full integration of ICT into curriculum
- Designing / Developing ICT integrated smart classrooms: hardware and software requirements, utilization procedures
- Developing multimedia and ICT based lessons.

Unit – 5

ICT for school improvement

- ICT for competency standards and professional development of teachers
- ICT for school administration
- ICT for student support services : admission libraries, guidance, maintenance of student records etc.
- ICT enabled assessment
- ICT for open and distance learning
- ICT for life long learning

REFERENCES

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DSE-1 Practical

Internet Search for Study Material

Each student is required to search internet, collect study materials related to any educational topic and write a report.

DISCIPLINE SPECIFIC ELECTIVE (DSE) – 2

SPECIAL EDUCATION

INTRODUCTION

Nature and nurture have a substantial role to play in growth and development of human beings. Nature and nurture apart, human organism is susceptible to damage through disease and injury. Disease, accident, genetic causes or any other reason, which inflicts the persons, causing loss or want of abilities, may not be equal in all cases. Accordingly the degree of abilities or lack of abilities varies. Deviations from average of physical and mental ability of human beings beyond limits resulting in substantial and appreciable difficulties in performing a function or in social adjustment process be perceived as disability. Some of the practitioners understand rehabilitation as a graded acquential individualized approach in which charity has given way to right so far as the empowerment of persons with disability is concerned. Education is the means to empower them. It has become a fundamental right of every child. The evolution of education of persons with disability has a history with the starting point in the 10th century in Europe and America. It has been realized that education of the persons with disability is very crucial for the development and independent living as far as possible. Education of the persons with disability has evolved as an essential responsibility of the government not only because of constitutional provisions but also with the UN mandates.

Course Objectives

On completion of this course, students shall be able to

- know about the concept, nature, objectives, types and historical perspective of special education
- explain the innovations and issues of special education
- elaborate the policies and programmes of special education
- able to identify different type of special category children
- understand various educational interventions meant for special children
- explain the role of resource teacher and special teacher

- Unit – 1** **Conceptual**
- Exceptional children : Concept and types
 - Inter relationship between impairment, disability and handicap.
 - Historical development of special education in India.
 - Issues and innovations in Education of Exceptional children: Mainstreaming, Labeling and De-institutionalisation.
- Unit – 2** **Policies and programmes in the Education of special children**
- Indian Education Commission (1964-66)
 - National Policy on Education (1986)
 - Report of Rama Murty Committee (1991)
 - Programme of Action (1992)
 - UN Conventions in Human Rights (1994)
- Unit – 3** **Education of the gifted and creative children**
- Concept
 - Characteristics
 - Identification
 - Educational provisions
 - Role of Teacher
- Unit – 4** **Education of the Educable Mentally Retarded**
- Concept
 - Characteristics
 - Methods of identification
 - Educational Provision
 - Role of Teacher
- Unit – 5** **Education of Children with Learning Disability**
- Concept
 - Characteristics
 - Methods of identification
 - Role of Special / Resource Teacher

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DSE-2 Practical

Case study of Special

Child

Each student is required to conduct a case study of a special child and write a report.

CORE – 13

EDUCATIONAL PLANNING, ADMINISTRATION AND MANAGEMENT

INTRODUCTION

Management is a universal phenomenon. Knowledge of management is indispensable for successful accomplishment of goals of an organization. Knowledge of management is required to ensure efficiency and better output of an organization and its functioning. As we know education plays a significant role in the socioeconomic development of the country, proper management of educational institutions requires managerial skills among all the people entrusted with the responsibilities of education. The paper deals with various concepts, principles and functions of educational management. It emphasizes on educational planning, finance and school management and focuses on trends in educational management. The paper will develop an interest towards the educational management.

Course Objectives

On completion of the course the students shall be able to:

- explain the concept, nature and scope of educational management
- describe the functions of educational management and administration
- list down various types of educational administration
- elaborate the principles of educational management
- elaborate the steps in planning
- explain different types of administration
- elaborate functions of state level educational bodies
- describe the sources of financing in education

Unit – 1 Educational Planning

- Meaning, Nature, Objective and scope
- Approaches: Social Demand, Cost benefit analysis and Manpower requirement
- Steps in Educational Planning : Diagnosis of Educational Development, Plan formulation, Plan implementation,

Monitoring and Evaluation.

- School Development Plan : Concept and Process

Unit – 2 Educational Administration

- Concept, Objectives and scope of educational administration
- Types : Totalitarian and Democratic
- Basic Functions of Administration : Planning, Organizing, Directing and Controlling.

Unit – 3 Educational administration in the state

- Administration of Education in Odisha: Structure and Functions.
- Functions of state level educational bodies: SCERT, BSE & OPEPA

Unit – 4 Educational Management

- Meaning, Nature and Scope
- Types: Centralized vs Decentralised Authoritarian vs Democratic
- Functions of Educational Management

Unit – 5 Economics of Education

- Costs in Education: The current cost and capital cost of education
 - The Direct and Indirect cost of education.
 - The private cost, social cost and unit cost of education.
- Educational Expenditure as investment
- Financing of Education :
 - Agencies of financing Education
 - Financing of education by parents
 - Financing of education by Employers.

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C-13 Practical

Visit to Administrative Unit

A visit to educational administrative unit such as DHE, SCERT, RDE, CHSE, University OPEPA interaction with administrator(s) and preparation of a report.

CORE – 14

CONTEMPORARY CONCERNS IN INDIAN EDUCATION

INTRODUCTION:

To remain current, to widen understanding levels holistically, and to thoroughly prepare learner for the world in which they will ultimately live and work, they must continually examine current practices in search of better solutions and needed change. The intent of this course is to familiarize learner to historical roots of Universalisation of Elementary education and initiative so far taken by Govt. to materialize this reality. Further, paper generally discusses the effort of Govt. to extend the provision of free and compulsory education at secondary level and developing a sound approach to dealing with the rapid pace of reform and change from the teacher's perspective. Emphasis is placed on examining over various emerging issues, problems and strategies of current trends relating to Peace education, Human Rights education value education, environmental education, Life skills education

Course Objectives

On completion of the course the students shall be able to:

- explain the concept of universalization of elementary education
- describe universalization of elementary education and secondary education implementation strategies
- describe present position of secondary education
- Explain the challenges of secondary education
- explain present scenario of higher education and agencies for improvement
- explain the concept of value education, environmental education and Life skills education

Unit – 1

Elementary Education

- Universalisation of elementary education.
- Right of Children to Free and Compulsory Education (RCFCE) Act 2009.
- Quality concerns in Elementary education.
- Sarva Sikshya Abhiyan (SSA) & District Primary Education Project (DPEP)

Unit – 2 Secondary Education

- Present position of secondary education in India
- Challenges and problems of secondary education.
- Vocationalisation of secondary education
- Rashtriya Madhyamik Sikshya Abhiyan (RMSA)

Unit – 3 Higher Education

- Present position of Higher Education in India
- Challenges in higher education : expansion, quality & inclusiveness.
- RUSA

Unit – 4 Social Commitments in Education

- Gender issues in Indian education
- Equalisation of educational opportunity
- Constitutional provisions for education
- Education for national integration and international understanding.

Unit – 5 Emerging concerns

- Environmental Education
- Value education, Peace Education and Human Rights Education
- Adolescent Education
- Life skills ducation

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C-14 Practical

Educational Programme Review

Each student is required to collect the perception of students / teachers / community members about the relevance and implementation issues in respect of an educational initiative / programme and prepare a report.

DISCIPLINE SPECIFIC ELECTIVE (DSE) – 3

DISTANCE EDUCATION

INTRODUCTION:

Distance education was an educational mode supplementary, Complementary and alternative to conventional/traditional system of education depending on the situation it was practiced. Today it has evolved into an independent system of education, hanks to the growth of communication Technologies and cognitive sciences which are flexible enough to use the technologies for pedagogic purposes. It is an educational innovation to meet the ever increasing and diversified educational needs and demands of the society which are sequal to changing social, economic and other conditions on one hand and technological developments on the other. Distance education is innovative in the sense that it sets up its own norms, approaches and methodology which are different from the face-to-face system of education. It can be non-conformist and non-traditional in nature. It makes adequate provision to impart instruction to learners at a distance by incorporating a variety of means for didactic interaction between its students and the teaches and / or the institution. This paper is an attempt to provide the students of education honours some of the fundamental concepts under the purview of distance education.

Course Objectives

On completion of this course, students shall be able to

- explain the importance of Distance education in the present context
- describe the historical perspective of distance education
- elaborate the curricular process of Distance education
- understand various modes of student support services
- develop clear idea about different type of Distance education institutions

Unit – 1 Concept of Distance Education

- Aims and objectives of Distance Education
- Purposes and functions served by distance education.
- Theories of Distance Education
- Distance education in India : Historical perspective

Unit – 2 Curricular process in Distance Education

- Preparing and supplying study material

- ICT support for distance learning
- Personal contact programme in distance learning
- Assignments and projects in distance learning

Unit – 3 Development of distance learning material /self –

instructional material (SIM)

- Planning for self instructional material: Importance objectives and learning outcomes
- Preparation of the material
- Context, language and formal editing of self – instructional material
- Self –assessment for self – instructional material

Unit – 4 Distance learners

- Profit of distance learners
- Needs of distance learner
- Problems of distance learner
- Steps for facilitating distance learner
- Student support services

Unit – 5 Open and distance learning institutions:

- Open Universities and open schools : Meaning and Nature
- IGNOU and NIOS
- Other forms of distance education – correspondence courses, Radio TV education
- Virtual universities and Massive Open online courses.

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DSE-3 Practical

Preparation of Self instructional materials (SIM)

Each student is required to prepare a self instructional material (SIM) on any topic.

OR

Case study of Distance education study centre

Each student is required to conduct case study of distance education study centre (IGNOU, NIOS, SOU, etc.) and write a report.

Distribution of Marks

Record - 20 marks

Viva voce - 05 marks

Total = 25 marks

DSE – 4 PROJECT

Each student is required to prepare a project on educational problem / issue and submit a report. The project shall be evaluated by an external and internal examination.

GENERIC ELECTIVE (G.E.) – 1

VISION OF EDUCATION IN INDIA:

ISSUES AND CONCERNS

INTRODUCTION

Education is essentially a normative endeavour, hence is intentional. It intends, rather deliberately, to socialize children into a value frame or normative structure. That is why history reveals that every education system, at different historical periods, had been guided by certain value concerns. In contemporary times, the education system in India derives its values from the Constitution of India. While socializing children education has to negotiate within the frame of Constitutional values. Indian Constitution envisioned a humane society based on freedom, equality and justice, and this led to evolving many institutions to realize the vision. In this regard, education has been considered as an agency of social transformation and classroom as the shaper of the envisioned destiny. Since teachers ought to play crucial role in realizing the vision, they are to be informed the Constitutional vision so as to develop normative perspectives regarding education and thereby emerging concerns and issues. This normative perspective a teacher holds in turn guides his/her actions and acquires a meaning to action.

Education being an operational area, every citizen perceives several issues related to it through personal experience. The student-teachers need to understand the main issues that touch their functioning as also situate themselves in context. Such an understanding on at least a few issues and concerns will equip student teachers to be ready for dealing with other issues and concerns in the field. This is very relevant as it may not be possible to bring under scrutiny all issues and concerns.

Since, concerns and issues cannot and should not be 'informed' like 'ready to cook facts', the course is designed in such a fashion that prospective teachers would be encouraged to come to terms with concerns and issues that would emerge out of their reasoned engagement with contemporary educational reality in the light of professed humanistic values,

Course Objectives

On completion of the course the students shall be able to:

- explain normative vision of Indian Society

- explain the view points of Indian thinkers on Education
- elaborate the contemporary issues like universalisation of school education, RTE Act -2009 and Rastriya Madhyamika sikshya Abhiyan
- identify importance of common school system

Unit – 1 Normative vision of Indian Education

- Normative orientation of Indian Education: A historical enquiry.
- Constitutional provisions on education that reflect national ideas : Democracy, Equity, Liberty, Secularism and social justice
- India as an evolving nation state : Vision, nature and salient feature – Democratic and secular polity, federal structure : Implications for educational system .
- Aims and purposes of education drawn from the normative vision.

Unit – 2 Vision of Indian Education : Four Indian thinkers

- An overview of salient features of the “Philosophy and Practice” of education advocated by these thinkers.
 - Rabindranath Tagore : Liberationist pedagogy
 - M.K. Gandhi : Basic Education
 - Jiddu Krishnamurty : Education for Individual and social Transformation
 - Sir Aurobindo : integral Education

Unit – 3 Concern for Equality in Education: Concerns and Issues

- Universalisation of school education
 - (i) Issues of (a) Universal enrollment
 - (b) Universal Retention
 - (c) Universal success
 - (ii) Issues of quality and equity

Unit – 4 Concern for Equality in Education

- Equality of Educational opportunity
- Prevailing nature and forms of inequality including Dominant and Minor groups and the related issues.
- Inequality in schooling : Public-private schools, Rural-urban schools, single teachers schools and many other forms of inequalities in school systems and the process leading to

disparity.

- Idea of common school system

Unit – 5

Education and Development – an interface

- Education for National Development : Education Commission (1964-66)
- Emerging trends in the interface between:
 - Political process and education
 - Economic Development and Education
 - Social cultural – changes in Education

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GE-1 Practical

Term paper

Each student is required to prepare a term paper on the educational ideas of any Indian Thinkers or on any contemporary issues on Education.

GENERIC ELECTIVE (G.E.) - 2

ASSESSMENT AND EVALUATION TECHNIQUES

INTRODUCTION

Assessment is considered to be one of the most crucial aspects of any teaching learning process, as it helps the teacher to record the growth of their students, planning for instructional strategy and most importantly helps to assess their own growth over the years. An effective method of assessment in the classroom helps to create conducive learning environment and a teacher must have to know different techniques of assessment which may improve students' learning. The key issues that involve in assessment are how to assess, when to assess, and what will be its implication on students learning. The paper outlines the above mentioned questions and different issues that involves in assessment.

Course Objectives

After completion of the course the students shall be able to:

- describe the role of assessment in education.
- differentiate measurement, assessment and evaluation.
- establish the relationship among measurement, assessment and evaluation.
- explain different forms of assessment that aid student learning.
- use wide range of assessment tools and techniques and construct these appropriately.
- classify educational objectives in terms of specific behavioral form
- prepare a good achievement test on any school subject

Unit – 1 The Measurement, Evaluation and Assessment Process

- Educational Testing and Assessment : Context, Issues and Trends.
- The Role of Measurement, Evaluation and Assessment in Teaching.
- Instructional Goals and objectives : Foundation for Assessment.
- Types of Assessment: Placement, Formative, Diagnostic and Summative.

Unit – 2 Classroom tests and Assessment

- Planning classroom tests and assessment
- Constructing objective test items: simple forms and multiple choice forms.
- Constructing Essay type questions: Form and uses; suggestions for scoring essay questions.

Unit – 3 Alternative Techniques of Assessment

- Observational Technique: Observation schedule, Anecdotal Records, Rating scales, Checklists
- Self – reporting Techniques: Interview, portfolio, questionnaire and inventories.
- Peer – appraisal: “Guess who” technique, sociometric technique.

Unit – 4 Processing and Reporting in Assessment

- Processing qualitative evaluation data: Content Analysis
- Considerations for reporting the performance
- Scheme of reporting: criterion – reformed and non reformed interpretation.
- Combining mark or grades over different subjects and reporting results of assessment to different users.

Unit – 5 Contemporary Trends in Assessment

- Marks vs Grading system
- Credit system
- Concept of Continuous and Comprehensive Evaluation (CCE)
- ☐ Computers in student evaluation

REFERENCES

- Aggrawal, J.C. (1997). Essentials of Examination System, Evaluation, Tests and Measurement. New Delhi: Vikas Publishing House Pvt Ltd.
- Banks, S.R. (2005). Classroom Assessment: Issues and Practices. Boston: Allyn & Bacon.
- Blooms, B.S.(1956). Taxonomy of Educational Objectives. New York: Longman Green and Company

- Cooper, D. (2007). Talk About Assessment, Strategy and Tools to Improve Learning. Toronto: Thomson Nelson
- Earl, L.M. (2006). Assessment as Learning: Using Classroom Assessment to Maximize Student Learning. Thousand Oaks, California: Corwin Press
- Gronlund, N.E. (2003). Assessment of student Achievement. Boston: Allyn & Bacon.
- Kaplan, R.M. & Saccuzzo. D.P. (2000). Psychological Testing, Principles, Applications & Issues. California: Wordsworth.
- Linn, R.L. & Gronlund, N.E. (2000). Measurement and Assessment in Teaching London: Merrill Prentice Hall.

GE-2 Practical

Achievement Test Construction

Each student is required to construct 50 objective based objective type test items along with a blue print.

GENERIC ELECTIVE (G.E.) - 3

CONTEMPORARY PEDAGOGY

INTRODUCTION

It is important to note that 'education' is not synonymous with 'school'. It has always been the case that a range of activities that are educational in nature can, indeed should, occur outside the school, even from the earliest age given the educative role of the parents. The Delors Commission Report on education for the 21st century proposed 'learning to live together' as one of the four pillars of education. It advocates learning to live together by developing an understanding of other people and an appreciation of interdependence – carrying out joint projects and learning to manage conflicts in a spirit of respect for the values of pluralism, mutual understanding and peace (UNESCO, 1996). The policy context in India and around the globe is moving towards recognition of the educational value of newer forms of pedagogy in the 21st Century which will enable the children to develop critical reasoning power, justify their views, independent decision making power, expression of thoughts, and empathy to others' feelings. Recently NCERT (2005) and NCTE (2009) have changed their curriculum framework and accordingly revised their text books and teacher orientation process to empower the prospective teachers to cope up with emerging pedagogies and to promote higher order learning of the learners like, creative expression, authenticity, abstraction of ideas, and multiple thinking, etc. This paper is intended to give insight to the students on importance of pedagogy in education.

Course objectives

After completion of the course, the students shall be able to:

- explain the concept of pedagogy;
- differentiate pedagogy from other allied concepts;

Unit – 1 Meaning process and Aims of Education

- Concept of Teaching and learning
- Nature and characteristics of teaching
- Meaning and characteristics of learning

Unit – 2 The task of teaching

- Meaning and definition of teaching task
- Variables involved in teaching task
- Phases of teaching : Pre-active, interactive and post – active

- Levels of teaching : Memory, understanding and reflective

Lesson plan design : Herbartian steps, ICON Model and 5E Model

Unit – 3 Principles and maxims of teaching

- General principles of teaching
- Psychological principles of teaching
- Maxims of teaching

Unit – 4 Approaches and methods of teaching

- Inductive –Deductive
- Analytic and synthetic
- Problems solving and project method
- Shift in focus from teaching to learning – The constructivist approach.
- Activity based and child centered approach to teaching .

Unit – 5 Technology in teaching

- ICT tools and techniques facilitating teaching : www, internet applications in teaching and learning.
- Teaching Learning Material (TLM) : purpose, types and use
- Role of mass media in teaching learning.

GE-3 Practical

Preparation of Lesson

Plan

Each student is required to develop 05(Five) lesson plans on any school subject (Odia, English, History, Geography, Math, General Science) based on Herbartian approach / 5E Model / Icon design Model.

REFERENCES

- Aggarawal, J.C. (1995) Essential of Educational Technology, Vikas Publishing House New Delhi.
- Chauhan S.S. (1995) Innovation of Teaching Learning Process, Vikas Publishing House, New Delhi.
- Kochar, S.K. (2011) Methods and Techniques of Teaching, Sterling Publisher Pvt. Ltd., New Delhi.

- Mangal S.K. and Mangal, UMA (2010), Essentials of Educational Technology, New Delhi, Asok Ghosh PHI Learning Pvt. Ltd.
- Mangal, S.K. (1988) Fundamentals of Educational Technology, Educational Publishers Ludhiana.
- Nageswara Rao, S., Sreedhar, P & Bhaskar Rao (2007) Methods and Techniques of teaching, Sonali Publications, New Delhi
- Oliver, R.A. (1963) effective teaching, J.M. Dent & Sons, Toronto
- Pathak, R.P. & Chaudhary J (2012) Educational Technology, Pearson, New Delhi.
- Rayment, T (1946) Modern Education - - It's Aims and Methods, Longmans, Green Co. London.
- Ryburn, W.M. (1955) Principles of Teaching, Geoffrey Cembidge, OUP
- Sampath, K, Pannir Salvam. A., & Santhanam, S. (1981) introduction to Educational Technology, sterling publishers, New Delhi.
- Sharma, R.A. (1986) Technology of Teaching, International Publishing House, Meerut.

GENERIC ELECTIVE (G.E.) – 4

EARLY CHILDHOOD CARE AND EDUCATION

INTRODUCTION

This paper will help the students to develop a sensitivity towards the needs and rights of children and will provide an understanding of their development. Students will also acquire skills that will help them to interact with children. Besides orienting the students towards a vocation in childcare, this course will orient the students towards organizing services for children. These services are crèches / day care centres and pre- schools for children upto six years of age. Students will enlighten themselves regarding how the pre-school education prepares the child for schooling which lies ahead. Pre-schools in our country are called by various names: anganwadi, balwadi, nursery school, kindergarden and play center.

Course Objectives

On completion of this course, students shall be able to:

- understand the importance of early childhood stage as the formative stage of growth and development
- explain the basic principles of curriculum formulation and their respective growth
- list out the activities for the different type of developmental needs of early child
- elaborate the learning materials needed for their appropriate developmental stage.

Unit – 1 Introduction to childcare and development

- Basic concepts in child development : Scope, growth and development, stages of development, areas of development, significance of study of child development.
- Principles of growth and development.

Unit – 2 Curriculum for ECCE

- Basic principles of the curricular framework
- Areas: cognitive development, language

development, social and emotional development, exploring, the environment, habit formation.

Unit – 3 Activities for physical development, movement and mobility.

- Activities for cognitive development
- Activities for language development
- Activities for social and emotional development
- Activities for exploring the environment
- Creative and aesthetic activities.

Unit – 4 Learning materials for ECCE

- Principles of selection of materials
- Type of materials
- Specific materials for different activities
- Preparation of teacher made materials
- Concept of toy bank

Unit – 5 Statutory framework for ECCE

- Constitutional framework
- National ECCE Policy, 2013
- Rights of the children

REFERENCES:

- Aggarawal J.C. and Gupta S. (2013) Early Childhood care and Education New Delhi: Shipra Publications
- Kaul Veneta (2009) Early child hood Education Programme, New Delhi, NCERT
- Soni Romila, Kapoor Rajendra & Vashishitha Krushna Kanta (2008) Early childhood Education an Introduction, New Delhi, NCERT
- NCF Curriculum Framework-2005

GE-4 Practical Observation of ECCE Centre

Each student is required to observe an ECCE centre and prepare a report.

**SYLLABUS FOR B.A. (HONORS) ENGLISH
UNDER CHOICE BASED CREDIT SYSTEM OF
UTKAL UNIVERSITY, BHUBANESWAR**

CBCS UG SYLLABUS Sem 1

Core 1

British Poetry and Drama: 14th to 17th Centuries

The paper seeks to introduce the students to British poetry and drama from the 14th to the 17th centuries. It offers the students an exploration of certain seminal texts that set the course of British poetry and plays.

British Poetry and Drama: 14th to 17th Centuries

Unit 1

A historical overview:

The period is remarkable in many ways: 14th century poetry evokes an unmistakable sense of “modern” and the spirit of Renaissance is marked in the Elizabethan Drama. The Reformation brings about sweeping changes in religion and politics. A period of expansion of horizons: intellectual and geographical.

Unit 2

Chaucer: *The Wife of Bath’s Tale* or *Sir Gawain and the Green Knight* (Part 1, lines 1-490)

Unit 3

Thomas Campion: “Follow Thy Fair Sun, Unhappy Shadow”, Sir Philip Sidney: “Leave , O Love, which reachest but to dust”, Edmund Waller: “Go, lovely Rose”, Ben Jonson: “Song to Celia”, William

Shakespeare: Sonnets: “Shall I compare thee to a summer’s day?”, “When to the seasons of sweet silent thought”,

“Let me not to the marriage of true minds.”

Unit 4

William Shakespeare: *Macbeth* or *Twelfth*

Night. Unit 5

Marlowe: *The Jew of Malta* or Thomas Dekker: *The Shoemaker’s Holiday*.

Suggested Readings:

Weller series: *Macbeth&Twelfth Night*

Chaudhury & Goswami: *A History of English Literature: Traversing Centuries.*

Orient Blackswan

Harold Bloom: *Shakespeare: The Invention of the Human*

Sanders, Andrews: *The Short Oxford History of English Literature.* Oxford: OUP

CBCS UG SYLLABUS Sem 1

Core 2

British Poetry and Drama: 17th and 18th Century

The objective of this paper is to acquaint students with the Jacobean and the 18th century British poetry and drama, the first a period of the acid satire and the comedy of humours; and the second a period of supreme satiric poetry and the comedy of manners.

Unit 1

A historical overview

17th C: Period of the English Revolution (1640–60); the Jacobean period; metaphysical poetry; cavalier poetry; comedy of humours; masques and beast fables

18th C: Puritanism; Restoration; Neoclassicism; Heroic poetry; Restoration comedy; Comedy of manners

Unit 2

John Milton: *Lycidas* Or *L'Allegro* and *Il Penseroso*:

John Donne: *A Nocturnall upon S. Lucie's Day, Love's Deity*; and Andrew Marvel: *To His Coy Mistress*; *The Garden*; *A Dialogue between the Soul and the Body*

Unit 3

Ben Jonson: *Volpone* or *The Alchemist*:

Unit 4

Pope: *Ode on Solitude*, *Summer*, *Sound and Sense*, *The Dying Christian to his*

Soul; and Robert Burns: *A Red Red Rose*, *A Fond Kiss*, *A Winter Night*, *My*

Heart's in the Highlands **Unit 5**

Dryden : *All for Love* Or Congreve: *The Old Bachelor*

Suggested readings:

1. *A History of English Literature: Traversing the Centuries* - Chowdhury & Goswami, Orient Blackswan
2. *Lycidas* - John Milton (Eds. Paul & Thomas), Orient Blackswan
3. *The Norton Anthology of English Literature, Vol. B: The Sixteenth Century & The Early Seventeenth Century*
4. *The Norton Anthology of English Literature: The Restoration and the Eighteenth Century*

Core 3

British Literature: 18th Century

The objective of the paper is to acquaint the students with two remarkable forms of literature: Essay and novel. The period is also known for its shift of emphasis from reason to emotion.

Unit -1 A historical overview:

Restoration, Glorious Revolution, Neo-classicism, Enlightenment.

Unit-2 Joseph Addison : On Giving Advice

Reflections in Westminster Abbey

Defence and Happiness of Married

Life

Richard Steele: Recollections

On Long-Winded People

Unit-3 Daniel Defoe: *Robinson Crusoe*

Unit-4 Oliver Goldsmith: A City Night-Piece

On National

Prejudices Man in

Black

Samuel Johnson: Expectations of Pleasure frustrated

Domestic Greatness Unattainable

Mischiefs of Good Company

The Decay of Friendship

Unit-5 Thomas Gray: Elegy written in a country churchyard

Suggested Readings:

1. *A History of English Literature: Traversing the Centuries* - Chowdhury & Goswami, Orient Blackswan
2. *The Norton Anthology of English Literature: The Restoration and the Eighteenth Century*

CBCS UG SYLLABUS Sem 2

Core 4

Indian Writing in English

Though a late developer, Indian writing in English has been the fastest growing branch of Indian literature. It has delivered a rich and vibrant body of writing spanning all genres. As a 'twice born' form of writing, it partakes of both the native and alien perspectives and has an inherent inclination to be postcolonial. This paper attempts to introduce the students to the field of Indian writing in English through some representative works.

Unit – 1

A historical overview of Indian writing in English the key points of which are East India Company's arrival in India, Macaulay's 1835 Minutes of Education, India's first war of independence and the establishment of colleges to promote Western education. The focus in the literary setting will include Dean Mohammed's travel writing, said to be the first work of Indian English writing, Toru Dutt and Henry Derezio in poetry and Bankim Chandra Chatterjee and Lal Behari Day in prose fiction.

Unit 2

Crystallization: R.K. Narayan, *The Bachelor of Arts* or Mulk Raj Anand, *Untouchable*

Unit 3

Flowering: R. Parthasarathy (ed) *Ten Twentieth Century Indian Poets*. The following poets and their poems are to be studied. Nissim Ezekiel, "Good Bye Party for Miss Puspa T.S", "Poet, Lover, Bird Watcher", Arun Kolatkar, "The Boat Ride", "Jejuri", Kamala Das, "My Grandmother's House", "A Hot Noon in Malabar", Jayanta Mahapatra, "Indian Summer", "Grass", A. K. Ramanujan, "Looking for a Cousin on a Swing", "Small Scale Reflections on a Great House"

Unit 4

Performing: Mahesh Dattani, *The Final Solution* Or Manjula Padmanabhan, *The Harvest*

Unit 5

Maturation: Amitav Ghosh, *Shadow Lines* Or Kiran Desai, *The Inheritance of Loss*

Suggested Readings:

1. Arvind Krishna Mehrotra, *An illustrated History of Indian Literature in English*. Hyderabad: Orient BlackSwan, 2003.
2. R. Parthasarathy, *Ten Twentieth-Century Indian Poets*. Delhi: Oxford University Press, 1975.
3. Vinay Dharwadkar, "The Historical Formation of Indian-English Literature" in Sheldon Pollock (ed.) *Literary Cultures in History*. New Delhi: Oxford University Press, 2003.

CBCS UG SYLLABUS Sem 3

Core 5

British Romantic Literature

The paper aims at acquainting the students with the Romantic period and some of its representative writers. At the same time one of the chief objectives of the paper is to give the students with a broad idea of the social as well as historical contexts that shaped this unique upheaval.

UNIT I: A Historical Overview:

The period otherwise known as The Romantic Revival may also be called as The Age of Revolution as it owes its origin to the Epoch making French Revolution of 1789. The emphasis on individual liberty and unbridled desire free from the shackles of classicism made this period unique, intriguing and controversial.

UNIT-II

Robert Burns: "To a Muse" and "The Cotter's Saturday Night"

William Blake: "The Holy Thursday" and "London"

UNIT-III

William Wordsworth: "Tintern Abbey" and "Ode on Intimations of

Immortality" Samuel Taylor Coleridge: "Kubla Khan" and "Road to Xanadu"

UNIT-IV

John Keats "Ode on a Grecian Urn" and "Ode on Melancholy"

P.B. Shelley: "Ode to the West Wind" and "To a Skylark"

UNIT-V:

William Wordsworth: Preface to *Lyrical Ballads* (2nd Edition)

OR

P.B. Shelley: "A Defence of Poetry"

Suggested Reading:

The Routledge History of Literature in English

History of English Literature: Traversing the Centuries – Chowdhury & Goswami

Romantic Imagination by C. M. Bowra

Pelican Guide to English Literature. Vol.5. Edited by Boris Ford

CBCS UG SYLLABUS Sem 3

Core 6

19th Century British Literature

The paper seeks to expose students to the literature produced in Britain in the 19th century. The focus is mainly on prose (fictional and non-fictional) and criticism. The 19th century embraces three distinct periods of the Regency, Victorian and late Victorian.

Unit 1

A Historical Overview

The 19th century British literature though mainly famous for the Romantic Movement, was also a witness to major socio-political developments like industrialization, technological advancements and large scale mobilization of people from the rural to the urban centers. Much of these prosaic activities/developments needed the medium of prose for its articulation. Politically known as the Victorian period 19th century also witnessed what is known as the culture and society debate.

Unit 2 : Essays

Charles Lamb: "Old China"

William Hazlitt: "On Going Journey"

Leigh Hunt: "A Few Thoughts on sleep"

R L Stevenson: "Walking Tours"

Unit 3: Novels

Mary Shelly: *Frankenstein* OR R.L .Stevenson: *Dr. Jekyll and Mr. Hyde*

Unit 4: Novel

Jane Austen: *Pride and Prejudice* OR Elizabeth Gaskell: *Mary Barton*

Unit 5 : Criticism

Mathew Arnold: *Culture and Anarchy* (Chapter 1)

OR

William Hazlitt: "Lectures Chiefly on the Dramatic Literature of the Age of Elizabeth" from *Lectures on English Poets*

Suggested Reading:

- Chapter 4, 5 from a *Short Introduction to English Literature* by Jonathan Bate
- *The English Novel* by Terry Eagleton
- *The Cultural Critics* by Leslie Johnson

CBCS UG SYLLABUS Sem 3

Core 7

American Literature

This paper seeks to give the students a sense of how the great American themes of self-reliance, individualism, sin and redemption and multiculturalism were shaped through its rich and varied Literature.

Unit – I : Genesis and evolution, and the defining myths of American Literature—city on a hill, the frontier spirit, the American Dream, manifest destiny, e pluribus unum

Unit – II: Harriet Jacobs *Incidents in the Life of a Slave Girl* OR “Economy” , “Where I lived, and What I Lived for”, “Reading” and “Pond in Winter” from H D Thoreau’s *Walden*

Unit – III: *The Pioneers* – James Fennimore Cooper OR *Billy Budd*—Herman Melville

Unit – IV: (Any four poets to be studied)

- Walt Whitman: “when I heard the learn’d astronomer” and “A noiseless patient spider”
- Emily Dickinson: “Success is counted sweetest” and “‘Faith’ is fine invention”
- Robert Frost: “The road not taken” and “Fire and Ice”
- Wallace Stevens: “Thirteen ways of looking at a blackbird” and “Disillusionment of ten o’ clock”
- Adrienne Rich: “For the record” and “A valediction forbidding mourning”
- Susan Howe: “From the midnight” and “That this”
- Rita Dove: “Teach us to number our days” and “Exit”

Unit – V *Desire under the Elms*– Eugene O’Neill OR *The Dutchman*—Amiri Baraka

Suggested Reading

- Lewisohn, Ludwig. *The Story of American Literature*. The Modern Library, N. Y.
- Horton, Rod & Herbert W.. Edwards. *Backgrounds of American Literary Thought* . 3rd edition.
- Stewart, Randall(ed). *Living Masterpieces Of American Literature* . Brown University
- Norton Anthology of American Literature. 8th edition.

Core 8

British Literature: Early 20th Century

British Literature: Early 20th Century

This paper aims to familiarize the students with the new literature of Britain in the early decades of the 20th century. The course will mainly focus on the modernist canon, founded on Ezra Pound's idea of 'make it new', but will cover war poetry, social poetry of the 1930s and literary criticism.

Unit 1 (A historical overview): Highlights will include developments in society and economy, leading to a crisis in western society known as the First World War and the resultant change in the ways of knowing and perceiving. Such triggers for the modern consciousness as Marx's concept of class struggle, Freud's theory of the unconscious, Bergson's *duree*, Nietzsche's will to power and Einstein's theory of relativity are to be discussed.

Unit 2 T.S. Eliot "The Love Song of J. Alfred Prufrock"

W.B. Yeats	"Sailing to Byzantium"
Ezra Pound	"In a Station of the Metro"
T.E. Hulme	"Autumn"
Hilda Doolittle	"The Mysteries Remain"

Unit 3 War Poetry : Wilfred Owen "Dulce Et

Decorumest" Siegfried Sassoon "Suicide in the

Trenches"

Social Poetry: W.H Auden "The Unknown Citizen"

Stephen Spender "An Elementary Classroom in a

Slum" Louis MacNeice "Prayer before

Birth"

Unit 4 Virginia Woolf: *Mrs. Dalloway* OR

James Joyce: Stories from *Dubliners* ("The Sisters", "Evelyn", "An Encounter", "Clay", "Two Gallants")

Unit 5 Literary Criticism: Henry James, "The Art of Fiction" or T.S. Eliot, "Tradition and Individual Talent"

Suggested Readings:

1. *Pelican Guide to English Literature: The Modern Age*(ed.) Boris Ford
2. Jonathan Bate, *English Literature: A Very short Introduction*, Oxford Paperback
3. Peter Faulkner, *Modernism*. London: Methuen
4. Peter Childs, *Modernism, New Accents*. Routledge

CBCS UG SYLLABUS Sem 4

Core 9

European Classical Literature

The objective of this paper is to introduce the students to European Classical literature, commonly considered to have begun in the 8th century BC in ancient Greece and continued until the decline of the Roman Empire in the 5th century AD. The paper seeks to acquaint the students with the origins of the European canon.

Unit-1 A historical overview:

Classical Antiquity: ancient Greece, the rise and decline of the Roman Empire

Geographical space: cultural history of the Greco-Roman world centered on the Mediterranean Sea

Unit-2 Epic poetry:

Homer *Odyssey* (Book I) **OR**

Virgil *Aeneid* (Book I)

Unit-3 Tragedy:

Sophocles *Oedipus the King* **OR**

Aeschylus *Prometheus Bound*

Unit-4 Comedy:

Aristophanes *Frogs* **OR** Plautus *Asinaria*

Unit-5 Criticism:

Plato *Republic*, (Book 10) **OR**

Aristotle *Poetics*, Chapter 6,7,8 **OR**

Horace *Ars Poetica* or *Essay on Poetic Theory***OR**

Longinus *On the Sublime*, Chapter 7, 39

Suggested Readings:

Auerbach, Erich. *Mimesis: The Representation of Reality in Western Literature*. USA: Princeton University Press. 2013.

Beye, Charles Rowan. *Ancient Greek Literature and Society*. Ithaca, New York: Cornell University Press. 1987

*All the texts are available for access on Project Gutenberg <https://www.gutenberg.org/>

CBCS UG SYLLABUS Sem 4

Core 10

Women's writing

The course aims to acquaint the students with the complex and multifaceted literature by women of the world, reflecting the diversity of women's experiences and their varied cultural moorings. It embraces different forms of literature: poetry, fiction, short fiction, and critical writings. In certain respects, it interlocks concerns of women's literary history, women's studies and feminist criticism.

Unit 1: In Defence of A Literature of Their Own

Mary Wollstonecraft: "Introduction" from "A Vindication of the Rights of Women"

OR

Sarala Devi: "Narira Dabi" (The Claim of the Woman) Trans. S.Mohanty, Chapters 13 & 17 from the collective novel *Basanti* (The first two in *Lost Tradition: Early Women's Writing from Orissa* and the third in *Indian Literature No.*)

Unit 2: Desiring Self: Fiction by Women from the Centre

Charlotte Bronte: *Jane Eyre* OR Emily Bronte: *Wuthering Heights*

Jean Rhys: *Wide Sargasso Sea* OR Dorris Lessing: *The Grass is Singing*

Unit 3: Desiring and Dissenting Self: Fiction by Women from the Periphery

Krupabai Sathianadhan: *Saguna or Kamala*

OR

Prativa Ray: *Yajnaseni*

Unit 4: Tongues of Flame: Poetry by Women from Across the World

***Any Four Poets to be read**

Kamala Das "An Introduction" & "The

Sunshine Cat" Shanta Acharya

"Homecoming", "Shringara"

Eunice de Souza "Women in Dutch Painting" & "Remember

Medusa?" Tishani Doshi "Ode to the Walking Woman"

& "What the Body Knows"

Maya Angelou "Phenomenal Woman" & "I Know Why the Caged

Bird Sings" Sylvia Plath "Mirror" & "Barren Woman"

Margaret Atwood "This is a Photograph of me" & "The

Landlady" **Unit 5: Discoursing at Par: Literary Criticism**

by Women Virginia Woolf: "Chapter 1" from *A Room of*

One's Own

OR

Simone de Beauvoir: "Introduction" from *The Second Sex*

Web Resources:

- Virginia Woolf, *A Room of One's Own*
<https://victorianpersistence.files.wordpress.com/2013/03/a-room-of-ones-own-virginia-woolf-1929.pdf>
- Mary Wollstonecraft, *A Vindication of the Rights of Women*:
Introduction <http://pinkmonkey.com/dl/library1/vindicat.pdf>
- Maya Angelou's Poems
http://www.poemhunter.com/i/ebooks/pdf/maya_angelou_2012_6.pdf
- Sylvia Plath's Collected Poems
https://monoskop.org/images/2/27/Plath_Sylvia_The_Collected_Poems_1981.pdf
- Margaret Atwood's Poems
<http://www.poemhunter.com/margaret-atwood/poems/>
- Eunice de Souza, "Remember Medusa?" & "Women in Dutch Painting"
<http://www.poetrynook.com/poem/remember-medusa> ,
<http://www.gallerie.net/issue14/poetry1.html>
- Tishani Doshi's Poems

http://www.poemhunter.com/i/ebooks/pdf/tishani_doshi_2012_6.pdf

- Simone de Beauvoir *The Second Sex*
<http://burawoy.berkeley.edu/Reader.102/Beauvoir.I.pdf>

Suggested Reading:

- Toril Moi, *Sexual Textual Criticism*
- Elaine Showalter, *A Literature of Their Own*
- Sandra Gilbert and Susan Gubar, *The Mad Woman in the Attic*
- Gill Plain and Susan Sellers, *A History of Feminist Literary Criticism*. Cambridge University Press. 2007. Essays to be read: Helen Carr, "A History of Women's Writing" and Mary Eagleton, "Literary Representations of Women"
https://mthoyibi.files.wordpress.com/2011/09/05-history-of-feminist-literary-criticism_gill-plain-and-sus.pdf

CBCS UG SYLLABUS Sem 5

Core 11

Modern European Drama

The aim of this paper is to introduce the students to the best of experimental and innovative dramatic literature of modern Europe.

Unit 1: Politics, social change and the stage; text and performance; European Drama: Realism and Beyond; Tragedy and Heroism in Modern European Drama; The Theatre of the Absurd

Unit 2: Henrik Ibsen: *Ghosts* OR August Strindberg: *Miss Julie*

Unit 3: Luigi Pirandello: *Six Characters in Search of an Author* OR Heiner Müller: *Hamletmachine*

Unit 4: Eugene Ionesco: *Chairs* OR Jean Genet: *The Maids*

Unit 5: Samuel Beckett: *Waiting for Godot* OR Bertolt Brecht: *The Good Woman of Szechuan*

Web Resources

- *Hamletmachine*: <http://theater.augent.be/file/13>
- Pirandello: <http://www.eldritchpress.org/lp/six.htm>
- Ionesco: <http://www.kkworld.com/kitablar/ejen-ionesko-kergedan-eng.pdf>
- Genet: <http://web.mit.edu/jscheib/Public/phf/themaids.pdf>
- Ibsen: <http://www.gutenberg.org/files/8121/8121-h/8121-h.htm>
- Strindberg: <https://archive.org/details/missjulieotherpl00striiala>

Suggested Reading:

1. Constantin Stanislavski, *An Actor Prepares*, Chap. 8, 'Faith and the Sense of Truth', tr. Elizabeth Reynolds Hapgood (Harmondsworth: Penguin, 1967) sections 1,2, 7,8,9, pp. 121-5, 137-46.
2. Bertolt Brecht, 'The Street Scene', 'Theatre for Pleasure or Theatre for Instruction', and 'Dramatic Theatre vs Epic Theatre', in *Brecht on Theatre: The Development of an Aesthetic*, ed. And tr. John Willet (London: Methuen, 1992) pp.68-76, 121-8.
3. George Steiner, 'On Modern Tragedy', in *The Death of Tragedy* (London: Faber, 1995) pp. 303- 24.
4. Raymond Williams, "Tragedy and Revolution" in *Modern Tragedy*, Rvsd Ed (London: Verso, 1979) pp. 61-84.
5. Jean Genet, Reflections on Theatre (London:Faber & Faber) Chapter 2: "The Strange World Urb..." pp. 63-74.

CBCS UG SYLLABUS Sem 5

Core 12

Indian Classical Literature

This paper aims at creating awareness among the students of the rich and diverse literary culture of ancient India.

Unit 1: Vedic Literature

1. *Samjnana Sukta* Rig Veda X.19
2. *Sivasankalpa Sukta* Yajur Veda XXX.I.6
3. *Purusha Sukta* Yajur Veda XV.XXXI. 1-16

References: The New Vedic Selection Vol 1, Telang and Chaubey, Bharatiya Vidya Prakashan, New Delhi

Unit 2: Selections from Epic Lit.

Vyasa 'The Dicing' and 'The Sequel to Dicing,' 'The Book of the Assembly Hall', 'The Temptation of Karna', Book V 'The Book of Effort', in *The Mahabharata*: tr. And ed. J.A.B. van Buitenen (Chicago: Brill, 1975) pp. 106-69 OR 'Ayodhya Kanda' (Book II), 1st Canto—The Ramayana of Valmiki. Gita Press Edition.

Unit 3: Sanskrit Drama

Kalidasa, *Abhijnanasakuntalam*, Act IV, tr. M.R Kale, Motilal Banarasi Dass, New Delhi OR Bhavabhuti's *Rama's Last Act (Uttararamacharita)* tr. Sheldon Pollock (New York: Clay Sanskrit Library, 2007)

Unit 4: Sanskrit Drama

Mrcchakatika by Sudraka, Act I, tr. M.M. Ramachandra Kale (New Delhi: Motilal Banarasi Dass, 1962)

Unit 5: Aesthetics and Maxims

- Bharata's *Natyasastra*, Chapter VI on Rasa theory References- English Translation by M.M. Ghosh, Asiatic Society, Kolkata, 1950
- *Sahitya Darpana* of Vishvanatha Kaviraja Chaps-I & II References- English Translation by P.V. Kane, Motilal Banarsi Dass, N Delhi
- Nitisataka of Bhartrhari 20 verses from the beginning References- The Satakatraya edited by D.D. Kosambi, Published in Anandashrama Series, 127, Poona, 1945. Also English Translation published from Ramakrishna Mission, Kolkata

Suggested Reading:

- Kalidasa. Critical Edition, Sahitya Akademi
- B.B Choubey, New Vedic Selection, Vol 1, Bharatiya Vidya Prakashan, New Delhi
- H.H.Wilson (Tr.)- *Rig Veda*
- Bharata, *Natyashastra*, tr. Manomohan Ghosh, vol.I, 2 nd edn (Calcutta: Granthalaya, 1967) chap. 6: 'Sentiments', pp. 100–18.
- J.A.B.Van Buitenen, 'Dharma and Moksa', in Roy W. Perrett, ed., *Indian Philosophy*, vol. V, *Theory of Value: A Collection of Readings* (New York: Garland, 2000) pp.33–40.
- Vinay Dharwadkar, 'Orientalism and the Study of Indian Literature', in *Orientalism and the Postcolonial Predicament: Perspectives on South Asia*, ed. Carol A. Breckenridge and Peter van der Veer (New Delhi: OUP, 1994) pp. 158–95
- *Universals of Poetics* by Haldhar Panda

CBCS UG SYLLABUS Sem 6

Core 13

Postcolonial Literature

This paper seeks to introduce the students to postcolonial literature—a body of literature that responds to the discourses of European colonialism and empire in Asia, Africa, Middle East, the Pacific and elsewhere. By focusing on representative texts situated in a variety of locations, the paper aims to provide the students with the opportunity to think through and understand the layered response – compliance, resistance, mimicry and subversion - that colonial power has provoked from the nations in their search for a literature of their own.

Unit 1: Concept

- Definition and characteristics: Resistant descriptions, appropriation of the colonizer's language, reworking colonial art forms & etc.
- Scope and Concerns: Reclaiming spaces and places, asserting cultural integrity, revising history

Prescribed Reading:

Achebe, Chinua "An image of Africa: Racism in Joseph Conrad's *Heart of Darkness*," *Research in*

Unit 2: Indian

Raja Rao: *Kanthapura* OR R K Narayan: *The English Teacher*

Unit 3: Caribbean and African

V S Naipaul: *The Mimic Men* OR Chinua Achebe: *No Longer at Ease*

Unit 4: South African

Nadine Gordimer: *July's People* OR J M Coetzee: *Life & Times of Michael K*

Unit 5: Criticism

Chinua Achebe: "English and the African Writer" and
Ngugi wa Thiong'o: "The Quest for Relevance" from *Decolonising the Mind: The Politics of Language in African Literature*

Web Resources

- Achebe, Chinua "An image of Africa: Racism in Joseph Conrad's Heart of Darkness," *Research in African Literatures, Vol. 9, No.1, Special Issue on Literary Criticism. (Spring, 1978), pp. 1-15.* <http://english.gradstudies.yorku.ca/files/2013/06/achebe-chinua.pdf>
- Achebe, Chinua: "English and the African Writer" <https://mrvenglish.wikispaces.com/file/view/English+and+the+African+Writer.pdf>
- Thiong'o, Ngugi Wa. "The Quest for Relevance" from *Decolonising the Mind: The Politics of Language in African Literature* [https://www.humanities.uci.edu/critical/pdf/Wellek Readings Ngugi Quest for Relevance. pdf](https://www.humanities.uci.edu/critical/pdf/Wellek%20Readings%20Ngugi%20Quest%20for%20Relevance.pdf)
- Ashcroft, Bill, Gareth Griffiths, Helen Tiffin. *Post-Colonial Studies: The Key Concepts*. New York: Routledge. 2007.

Suggested Reading:

- Ashcroft, Bill, Gareth Griffiths, Helen Tiffin. "Introduction", *The Empire Writes Back: Theory and Practice in Post-Colonial Literature*. London, New York: Routledge, 2nd edition, 2002.
- Bhabha, Homi K. *The Location of Culture*. Noida: Atlantic Books. 2012.
- Gandhi, Leela. *Postcolonial Theory: An Introduction*. OUP. 1998.
- Said, Edward. *Orientalism*. India: Penguin. 2001.
- Spivak, Gayatri Chakraborty. *Can the Subaltern Speak?*. UK: Macmillan.1998 <http://planetarities.web.unc.edu/files/2015/01/spivak-subaltern-speak.pdf>

Core 14

Popular Literature

This paper seeks to introduce the students to genres such as romance, detective fiction, campus fiction, fantasy/mythology, which have a “mass” appeal, and can help us gain a better understanding of the popular roots of literature.

Unit 1: Introduction to the concept

- What is popular literature?
- Debate between popular and high cultures ('high brow' v/s 'low brow')
- What is Genre fiction?
- Debate between genre fiction and literary

fiction

Essays for discussion:

- Lev Grossman: “Literary Revolution in the Supermarket Aisle: Genre Fiction is Disruptive Technology”
<http://entertainment.time.com/2012/05/23/genre-fiction-is-disruptive-technology/>
- Arthur Krystal: “Easy Writers: Guilty pleasures without guilt”
<http://www.newyorker.com/magazine/2012/05/28/easy-writers>
- Joshua Rothman: “A Better Way to Think About the Genre Debate”
<http://www.newyorker.com/books/joshua-rothman/better-way-think-genre-debate>

Stephen Marche: How Genre Fiction Became More Important than Literary Fiction”

<http://www.esquire.com/entertainment/books/a33599/genre-fiction-vs-literary-fiction/> Midterm:

Unit 2: Detective Fiction

Sherlock Holmes: *The Hound of the Baskervilles* OR Agatha Christie: *Murder on the Orient Express*

Unit 3: Romance

Shobha De: *Socialite Evenings* OR Nicholas Sparks: *The Notebook*

Unit 4: Campus Fiction

Chetan Bhagat: *Five Point Someone* OR David Lodge: *Small World: An Academic Romance*

Unit 5: Rewriting Mythology

Amish Tripathi: *The Immortals of Meluha* OR Anuja Chandramouli: *Arjuna: Saga of a Pandava Warrior-Prince*

Suggested Reading

- Leslie Fiedler, *What was Literature? Class, Culture and Mass Society*
- Leo Lowenthal, *Literature, Popular Culture and Society*
- *Popular Fiction: Essays in Literature and History* by Peter Humm, Paul Stigant, Peter Widdowson

CBCS UG SYLLABUS SEM 5

Discipline Specific Course

1. Literary Theory

Objective

The development of theory in the last half-century or more is a fact of critical importance in the academic study of literature. Far from being seen as a parasite on the text, theory has been seen as a discourse that provides the conceptual framework for literature. This paper aims to give the students a firm grounding in a major methodological aspect of literary studies known as theory.

Starred texts are to be taught. Questions with alternatives are also to be set from these

texts. Unit 1: Overview

- Crisis in literary criticism and the search for a method
- Rise of theory
- What does it mean to theorise?

Unit 2: New Criticism and Formalism: with an emphasis on the main critical concepts of NC such as paradox, irony, tension, intentional and affective fallacy, heresy of paraphrase and of Formalism such as ostranenie, literariness, foregrounding, dominant and deviant

- *Cleanth Brooks, "The Language of Paradox" Or W.K. Wimsatt Jr. and Monroe Beardsley, "The Intentional Fallacy"
- *Viktor Shklovsky, "Art as Device" Or Roman Jakobson, "Linguistics and Poetics"

Unit 3: Structuralism and Poststructuralism: with an emphasis on the main critical concepts of Structuralism such as binary opposition, synchrony and diachrony, syntagm and paradigm and of Poststructuralism such as collapse of the binary, difference, mise-en-abym, erasure

- *Gerard Genette, "Introduction" to *Narrative Discourse*
(https://archive.org/stream/NarrativeDiscourseAnEssayInMethod/NarrativeDiscourse-AnEssayInMethod_djvu.txt) Or Roland Barthes, "Face of Garbo" and "French Fries" (from *Mythologies*)
- Jacques Derrida, "On the Idea of the Supplement" (from *Of Grammatology*) Or Michel Foucault, "What is an Author?"
(<http://artsites.ucsc.edu/faculty/Gustafson/FILM%20162.W10/readings/foucault.author.pdf>) (Either of the two essays can be taught depending on availability)

Unit 4: Marxism and New Historicism: with an emphasis on main critical concepts of Marxism such as base, superstructure, ideology, commodification, determination and of New Historicism such as power, resistance, high-low dialectic

- *Louis Althusser, "Letters on Art" (from *Lenin and Philosophy and Other Essays*) Or Georg Lukacs, "On Reification" (from *History and Class Consciousness*)
- Raymond Williams, "In Memory of Lucien Goldmann" Or Stephen Greenblatt, "Learning to Curse" (Either of the two essays can be taught depending on availability)

Unit 5: Eco-criticism and Eco-feminism: with an emphasis on main critical concepts of Ecology as environment, balance, food chain and of Eco-feminism as body and its colonisation, patriarchy, woman as a creative principle in harmony with nature

- *Rachel Carson, "A Fable for Tomorrow" and "The Obligation to Endure" (from *Silent Spring* ([http://library.uniteddiversity.coop/More Books and Reports/Silent Spring-Rachel Carson-1962.pdf](http://library.uniteddiversity.coop/More_Books_and_Reports/Silent_Spring-Rachel_Carson-1962.pdf)))
- *Mack-Canty, Colleen, "Third-Wave Feminism and the Need to Reweave the Nature/Culture Duality." *NWSA Journal* 16, no. 3 (2004): 154-179 (from [JSTOR Arts & Sciences VI](#))

Suggested Reading:

Terry Eagleton, *Literary Theory: An Introduction for Foreign Students*

David Robey and Anne Jefferson, *Modern Literary*

Theory Jonathan Culler, *Literary Theory: A Very Short*

Introduction Richard Barry, *Beginning Theory*

Tony Bennett, *Formalism and Marxism*

Terence Hawkes, *Structuralism and Semiotics*

Christopher Norris, *Deconstruction: Theory and*

Practice Veaser H. Aram (ed), *The New Historicism*

Reader

Greg Gerrard, *Eco-Criticism*

Discipline Specific Course

2: Reading World Literature

This paper proposes to introduce the students to the study of world literature through a representative selection of texts from around the world. The idea is to read beyond the classic European canon by including defining literary texts from other major regions/countries—except the United States of America—written in languages other than English, but made available to the readers in English translation.

Unit 1: Concept

- The idea of world literature: Scope and definition
- Uses of reading world literature

Unit 2: European

Albert Camus *The Outsider*

OR

Fyodor Dostoevsky *Notes from Underground*

Unit 3: Caribbean and African

V S Naipaul *In a Free State*

OR

Chimamanda Ngozi Adichie *Purple Hibiscus*

Unit 4: Canadian Short Fiction

Margaret Atwood *Stone Mattress & Pretend Blood*

OR

Alice Munro *The Bear Came Over the Mountain & Face*

Unit 5: Latin American Poetry

Pablo Neruda "Death Alone", "Furies and Suffering", "There's no Forgetting", "Memory"

OR

Octavio Paz "from San Ildefonso Nocturne", "Between Going and Staying the Day
Wavers", "Humayun's Tomb", "Motion"

Web Resources:

- The Complete Stories by Franz Kafka
http://www.vanderbilt.edu/olli/class-materials/Franz_Kafka.pdf
- What is world Literature? (Introduction) David Damrosch
<http://press.princeton.edu/chapters/i7545.html>
- Tagore's comparative world literature
https://www.academia.edu/4630860/Rabindranath_Tagores_Comparative_World

Literature

- Dostoevsky's *Notes from Underground* <http://www.gutenberg.org/files/600/600-h/600-h.htm>
- Margaret Atwood's *Stone Mattress* <http://www.newyorker.com/magazine/2011/12/19/stone-mattress>
- Margaret Atwood's *Pretend Blood* <http://www.independent.co.uk/arts-entertainment/books/features/first-lives-club-pretend-blood-a-short-story-by-margaret-atwood-1779529.html>
- Alice Munro's short Stories <http://www.newyorker.com/magazine/2013/10/21/the-bear-came-over-the-mountain-2>, <http://www.newyorker.com/magazine/2008/09/08/face>
- Poems of Octavio Paz http://www.poetrysoup.com/famous/poems/best/octavio_paz

Suggested Reading:

- *Weltliteratur*: John Wolfgang von Goethe in *Essays on Art and Literature* Goethe : The Collected Works Vol.3
- Rabindranath Tagore "World Literature": *Selected Writings On Literature and Language*: Rabindranath Tagore Ed. Sisir Kumar Das and Sukanta Chaudhuri Damrosch
- Goethe's "World Literature Paradigm and Contemporary Cultural Globalization" by John Pizer "Something Will Happen to You Who Read": Adrienne Rich, Eavan Boland' by Victor Luftig .JSTOR iv. *Comparative Literature* University of Oregon.
- David Damrosch, *What is World Literature?* Princeton University Press
- "WLT and the Essay" *World Literature Today* Vol. 74, No. 3, 2000. JSTOR Irish University Review, Vol.23 Spring 1, Spring-Summer.

CBCS UG SYLLABUS SEM 6

Discipline Specific Course

3: Research Methodology

Research methodology is a discipline specific course pitched at a higher level than the generic academic preparatory courses. Research is at the core of every university course starting from the UG to the PhD level. This course is designed to develop the fundamentals of research from creating a questioning mechanism in the students' minds leading up to writing research papers and dissertations. Students learn the methodological issues imperative for conducting research and for research documentation. The course also aims to train students in the essentials of academic and research writing skills.

Unit 1 Research and the Initial Issues

- Research as systematic investigation
- Searching for and locating research questions; Finding the general background about research problem/question: review of existing literature and applicable

theories

- Refining the research problem/question; formulating its rationale and objectives
- Writing a research synopsis

Unit 2 Literature review

- Selecting review areas based on the research objectives
- Primary, secondary and tertiary sources, and related theory/s (sources: library, databases, online sources, previous research, archives, media, social/psychological/political/educational contexts, and such others)
- Gathering, reading and analysing literature and related theory
- Writing the review with implications for the research question selected

Unit 3 Hypotheses and formulation of research design

- Formulating hypotheses based on research objectives
- Formulation of research design: qualitative, quantitative, combinatory; steps in research design Theory application
- Data collection tools: surveys, questionnaires, interviews, observation checklists, review checklists, comparison tools, text analysis tools
- Data analysis and interpretation

Unit 4 Results and documentation

- Preparing tables, charts, and graphs to present data; Collating the findings
- Testing hypotheses; Generalisation of results
- Writing a dissertation; MLA/APA citation: in-text and works cited pages
- Plagiarism and related problems

Unit 5 Practical (for Internal Assessment)

Students will write i. literature review of 1000 words on a research question and ii. a book review of 500 words.

Texts prescribed

- i. K Samantray, *Academic and Research Writing*. Orient Blackswan (2015)
- ii. Kothari & Garg, *Research Methodology*. New Age Publishers
- iii. Deepak Chawla & Neena Sondhi. *Research methodology: Concepts & Cases*. Vikas Publishing

Generic Elective

Academic Writing and Composition

This is a generic academic preparatory course designed to develop the students' writing skills from basic to academic and research purposes. The aim of this course is to prepare students to succeed in complex academic tasks in writing along with an improvement in vocabulary and syntax.

Unit 1 Instruments of writing I

- Vocabulary development: synonyms and antonyms; words used as different parts of speech; vocabulary typical to 'science' and 'commerce'
- Collocation; effective use of vocabulary in context

Unit 2 Instruments of writing II

- Syntax: word order; subject-predicate; subject-verb agreement; simple, complex, compound, compound-complex sentences; structure and uses of active and passive sentences
- Common errors in Indian writing

Unit 3 Academic writing I

- What is academic writing?
- The formal academic writing process: the 'what' and the 'how' of writing; use of cohesive and transitional devices in short and extended pieces of writing

Unit 4 Academic writing II

- Paragraph writing: topic sentence, appropriate paragraph development ; expository, descriptive, narrative and argumentative paragraphs
- Extended pieces of writing: process development using comparison-contrast, cause and effect, argumentation, and persuasion

Unit 5 Project writing: (writing projects)

- What's a Project: reading-based, field work-based project : how to pick a topic for the project; background reading
- Structure of a Project: Title, aim of the project (a short statement), other objectives if any, significance of the Project : why is the project being undertaken, sources/books to be consulted for the study, method: Is it quantitative (field work) or qualitative (text-related), analysis/interpretation, findings, conclusion

Texts prescribed

1. K Samantray, *Academic and Research Writing: A Course for Undergraduates*, Orient

- BlackSwan
2. Leo Jones (1998) *Cambridge Advanced English: Student's Book* New Delhi: CUP
 3. Stanley Fish (2011) *How to Write a Sentence*

CBCS UG SYLLABUS SEM 2-GE 2

Generic Elective

Modern Indian Literature

The paper aims at introducing students to the richness and diversity of modern Indian literature written in many languages and translated into English.

Unit-I Historical Overview

Background, definition of the subject and historical perspectives will be covered.

Unit-II The Modern Indian Novel

Fakir Mohan Senapati: *Six Acres and a Third* Or U. R. Ananthamurthy: *Sanskara*

Unit-III The Modern Indian Short Story

Selected stories by Fakir Mohan Senapati: "Rebati", Rabindra Nath Tagore: "Post Master" Premchand: "The Shroud", Ishmat Chughtai: "Lihaaf"

Unit-IV Modern Indian Life Writing

Excerpts from M.K. Gandhi's *Story of My Experiments with Truth* (First two chapters), Amrita Pritam's *The Revenue Stamp* (first two chapters), *Autobiography* by Rajendra Prasad (chapter six & seven)

Unit-V The Modern Indian Essay

- A. K. Ramanujan "Is there an Indian Way of Thinking? An Informal Essay" *Collected Essays*, OUP, 2013
- "Decolonising the Indian Mind" by Namwar Singh. Tr. Harish Trivedi *Indian Literature*, Vol. 35, No. 5 (151) (Sept.-Oct., 1992), pp. 145-156
- G. N. Devy's introduction to *After Amnesia*, pp. 1-5, *The G. N. Devy Reader*, Orient BlackSwan, 2009.

Suggested Readings:

1. Sisir Kumar Das, *History of Indian Literature 1910–1956, Triumph and Tragedy*, Sahitya Akademi, New Delhi, 2000
2. Amit Chaudhuri, *The Vintage Book of Modern Indian Literature*, 2004
3. M.K. Naik, *A History of Indian English Literature*, Sahitya Akademi, 2004

Generic Elective

Language, Literature and Culture

This is a broad-based course that aims to encourage students to be knowledgeable and inquiring into the nature of language, nature of literature and the role of culture in both. The course introduces students to how language is special for humans, and how literature and culture make human beings caring. There is a strong emphasis here on encouraging students to develop intercultural understanding, open-mindedness, and the attitudes necessary for them to respect and evaluate a range of points of view.

Unit 1 Language

- Nature of language
- Functions of language : transactional, informative, interactional

(use these terms under each category above: Instrumental language, Regulatory Language, Interactional Language, Personal Language, imaginative Language, Heuristic Language, Informative Language)

Unit 2 Language and Literature 1

- Literature and its language
- Literary terms, Figures of speech used in literature: simile, metaphor, metonymy, irony, paradox, synecdoche, oxymoron

Unit 3 Language and Literature 2

- Language used in poetry, fiction and non-fiction
- Text analysis

Unit 4 Language and culture 1

- Culture, its implications and interpretations
- Transmission of culture through language: Culture and society

Unit 5 Language and Culture 2

- Intercultural and cross-cultural communications
- Analysis and applications

Suggested Reading

- Kalyani Samantray, *Pragmatics* (E-Pathsala)
- Bibhudendra Narayan Patnaik & Kalyani Samantray, *Cross-Cultural and Intercultural Communications* ((E-Pathsala)
- Brown, G & Yule, G. *Discourse Analysis*. CUP
- **Scaglia, B (ed.)** *Language, Understood: Examining the Linguistics of Discourse*

Analysis and Studies. Webster's Digital Service.

- **Culture and language**
- <http://www2.lib.nifs-k.ac.jp/HPBU/annals/an46/46-11.pdf>
- <http://barthimeous.blogspot.in/2011/03/relationship-between-culture-and.html>
- *Companion to Literary Forms* by Padmaja Ashok, Orient BlackSwan. 2015
- *Literature and Language* (ed.) Loveleen Mohan, Randep Rana, Jaibir S. Hooda. Orient BlackSwan.

CBCS UG SYLLABUS SEM 4-GE 4

Generic Elective

Language and Linguistics

Unit 1: Language and Human Language

- Nature and features of Human language ; language and human communication; differences from other forms of communications
- Artificial intelligence and human language

Unit 2 :Linguistics and Language 1

- What is linguistics; development in the history of linguistic studies; contribution of linguistics to other areas of human inquiry
- Linguistics for jobs

Unit 3 :Linguistics and Language 2

- Phonetics and accuracy in pronunciation
- Fluency and contextual speaking

Unit 4 :Linguistics and Language 3

- Morphology and Nature of words
- Word formation processes

Unit 5: Linguistics and Language 4

- Nature of sentences and connected texts; syntax and discourse
- Language and meaning: semantics

Recommended reading

- i. *A Course in Linguistics*. Tarni Prasad. PHI
- ii. *Linguistics: A very short introduction*. P H

Mathews.OUP

Skill Enhancement Compulsory Course

2. SEC 1 (English Communication)
3. SEC 2
 - A. Soft Skills OR
 - B. Translation and Principles of Translation

SEC 1: Skill Enhancement Compulsory Course

for Arts Semester 1

Paper: 1 Marks: 100 Credits: 04

The purpose of this course is twofold: to train students in communication skills and to help develop in them a facility for communicative English.

Since language is which binds society together and serves as a crucial medium of interaction as well as interchange of ideas and thoughts, it is important that students develop a capacity for clear and effective communication, spoken and written, at a relatively young age. The need has become even more urgent in an era of globalization and the increasing social and cultural diversity that comes with it.

English, being a global language par excellence, it is important that any course in communication is tied to an English proficiency programme. The present course will seek to create academic and social English competencies in speaking, listening, arguing, enunciation, reading, writing and interpreting, grammar and usage, vocabulary, syntax, and rhetorical patterns.

Students, at the end of the course, should be able to unlock the communicator in them by using English appropriately and with confidence for further studies or in professional spheres where English is the indispensable tool of communication.

Unit-1:

[20]

Introduction

1. What is communication?
2. Types of communication
 - Horizontal
 - Vertical
 - Interpersonal
 - Grapevine

3. Uses of Communication

Prescribed Reading: Chapter 1 *Applying Communication Theory for Professional Life: A Practical Introduction* by Dainton and Zellely

http://tsime.uz.ac.zw/claroline/backends/download.php?url=L0ludHJvX3RvX2NvbW11bmljYXRpb25fVGhlb3J5L_nBkZg%3D%3D&cidReset=true&cidReq=MBA563

Unit-2: Language of Communication [20]

1. Verbal: spoken and written

2. Non-verbal

- Proxemics
- Kinesics
- Haptics
- Chronemics
- Paralinguistics

3. Barriers to communication

4. Communicative English

Unit-3: Reading Comprehension [20]

- Locate and remember the most important points in the reading
- Interpret and evaluate events, ideas, and information
- Read “between the lines” to understand underlying meanings
- Connect information to what they already know

Unit-4: Writing [20]

- Expanding an Idea
- Note Making
- Information Transfer
- Writing a Memo
- Writing Formal Email
- Writing a Business Letter
- Letters to the Editor
- CV & Resume Writing
- Covering Letter
- Report Writing
- News Story
- Interviewing for news papers

(The above-mentioned writing activities are covered in the prescribed textbook *Vistas and Visions*)

Unit 5: Language functions in listening and conversation [20]

- Discussion on a given topic in pairs
- Speaking on a given topic individually
- Group Discussion
- Interview
- Dialogue

(Practice to be given using the set pieces from the prescribed textbook *Vistas and Visions*)

Grammar and Usage

1. Phrasal Verbs
2. Collocation
3. Using Modals
4. Use of Prepositions
5. Common Errors in English Usage

(The above-mentioned grammar items are covered in the textbook *Vistas and Visions*)

Grammar questions must be set in contexts; not as isolated sentences as used for practice in the prescribed textbook.

Book Prescribed:

Vistas and Visions: An Anthology of Prose and Poetry. (Ed.) Kalyani Samantray, Himansu S. Mohapatra, Jatindra K. Nayak, Gopa Ranjan Mishra, Arun Kumar Mohanty. OBS

Texts to be

studied Prose

- Decoding Newspapers
- Pleasures of Ignorance
- Playing the English Gentleman
- Lifestyle English
- A Cup of Tea

Poetry

- Last Sonnet
- Sonnet 46 (Shakespeare)
- Pigeons
- Miracles

All grammar and writing activities in the textbook *Vistas and Visions*

Recommended Reading:

Fluency in English – Part II, OUP, 2006

Business English, Pearson, 2008

Communicative English. E. Suresh Kumar and P. Sreehari

Break Free: Unlock the Powerful Communicator in You. Rajesh, V. Rupa, 2015

Soft Skills Shalini Verma, 2009.

Language, Literature and Creativity, Orient BlackSwan, 2013

Skill Enhancement Compulsory Course for Science

Semester 1

Paper: 1 Marks: 100 Credits: 04

The purpose of this course is twofold: to train students in communication skills and to help develop in them a facility for communicative English.

Since language it is which binds society together and serves as a crucial medium of interaction as well as interchange of ideas and thoughts, it is important that students develop a capacity for clear and effective communication, spoken and written, at a relatively young age. The need has become even more urgent in an era of globalization and the increasing social and cultural diversity that comes with it.

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Students, at the end of the course, should be able to unlock the communicator in them by using English appropriately and with confidence for further studies or in professional spheres where English is the indispensable tool of communication.

Unit 1

[20]

Introduction

1. What is communication?
2. Types of communication
 - Horizontal
 - Vertical
 - Interpersonal
 - Grapevine
3. Uses of Communication

Prescribed Reading: Chapter 1 *Applying Communication Theory for Professional Life: A Practical Introduction* by Dainton and Zellely

<http://tsime.uz.ac.zw/claroline/backends/download.php?url=L0ludHJvX3RvX2NvbW11bmljYXR>

Unit-2

[20]

Language of Communication

1. Verbal: spoken and written
2. Non-verbal
 - Proxemics
 - Kinesics
 - Haptics
 - Chronemics
 - Paralinguistics
3. Barriers to communication
4. Communicative English

Unit-3

[20]

Reading Comprehension

- Locate and remember the most important points in the reading
- Interpret and evaluate events, ideas, and information
- Read “between the lines” to understand underlying meanings
- Connect information to what they already know

Unit 4

[20]

Writing

- Expanding an Idea
- Note Making
- Information Transfer
- Writing a Memo
- Writing Formal Email
- Writing a Business Letter
- Letters to the Editor
- CV & Resume Writing
- Covering Letter
- Report Writing
- News Story
- Interviewing for news papers

(The above-mentioned writing activities are covered in the prescribed textbook *Vistas and Visions*)

Unit 5: Language functions in listening and conversation

[20]

1. Discussion on a given topic in pairs
2. Speaking on a given topic individually

3. Group Discussion
4. Interview
5. Dialogue

(Practice to be given using the set pieces from the prescribed textbook *Vistas and Visions*)

Grammar and Usage

1. Phrasal Verbs
2. Collocation
3. Using Modals
4. Use of Prepositions
5. Common Errors in English Usage

(The above-mentioned grammar items are covered in the textbook *Vistas and Visions*)

Book Prescribed:

Vistas and Visions: An Anthology of Prose and Poetry. (Ed.) Kalyani Samantray, Himansu S. Mohapatra, Jatindra K. Nayak, Gopa Ranjan Mishra, Arun Kumar Mohanty. OBS

Texts to be

studied Prose

- The Gold Frame
- Lifestyle English
- Need for Excellence
- Ecology and Community
- My Lost Dollar

Poetry

- The Darkling Thrush
- The Felling of the Banyan Tree
- Another Woman
- Meeting Poets

All grammar and writing activities in the textbook *Vistas and Visions*

Recommended Reading:

Fluency in English – Part II, OUP, 2006

Business English, Pearson, 2008

Communicative English. E. Suresh Kumar and P. Sreehari

Break Free: Unlock the Powerful Communicator in You. Rajesh, V. Rupa, 2015

Soft Skills Shalini Verma, 2009.

Language, Literature and Creativity, Orient BlackSwan, 2013

Language through Literature. (forthcoming) ed. Gauri Mishra, Dr. Ranajan Kaul, Dr. Brati Biswas

SEC 1

Skill Enhancement Compulsory Course for

Commerce Semester 1

Paper: 1 Marks: 100 Credits: 04

The purpose of this course is twofold: to train students in communication skills and to help develop in them a facility for communicative English.

Since language is which binds society together and serves as a crucial medium of interaction as well as interchange of ideas and thoughts, it is important that students develop a capacity for clear and effective communication, spoken and written, at a relatively young age. The need has become even more urgent in an era of globalization and the increasing social and cultural diversity that comes with it.

English, being a global language par excellence, it is important that any course in communication is tied to an English proficiency programme. The present course will seek to create academic and social English competencies in speaking, listening, arguing, enunciation, reading, writing and interpreting, grammar and usage, vocabulary, syntax, and rhetorical patterns.

Students, at the end of the course, should be able to unlock the communicator in them by using English appropriately and with confidence for further studies or in professional spheres where English is the indispensable tool of communication.

Unit 1

[20]

Introduction

1. What is communication?
2. Types of communication
 - Horizontal
 - Vertical
 - Interpersonal
 - Grapevine
3. Uses of Communication

Prescribed Reading: Chapter 1 *Applying Communication Theory for Professional Life: A Practical Introduction*

by Dainton and Zelle

<http://tsime.uz.ac.zw/claroline/backends/download.php?url=L0ludHJvX3RvX2NvbW11bmljYXRpb25fv>

Unit 2 [20]

Language of Communication

1. Verbal: spoken and written
2. Non-verbal
 - Proxemics
 - Kinesics
 - Haptics
 - Chronemics
 - Paralinguistics
3. Barriers to communication
4. Communicative English

Unit--3

[20]

Reading Comprehension

- Locate and remember the most important points in the reading
- Interpret and evaluate events, ideas, and information
- Read “between the lines” to understand underlying meanings
- Connect information to what they already know

Unit 4

[20]

Writing

- Expanding an Idea
- Note Making
- Information Transfer
- Writing a Memo
- Writing Formal Email
- Writing a Business Letter
- Letters to the Editor
- CV & Resume Writing
- Covering Letter
- Report Writing
- News Story
- Interviewing for news papers

(The above-mentioned writing activities are covered in the prescribed textbook *Vistas and Visions*)

Unit 5: Language functions in listening and conversation

[20]

1. Discussion on a given topic in pairs

2. Speaking on a given topic individually
3. Group Discussion
4. Interview
5. Dialogue

(Practice to be given using set pieces from the prescribed textbook *Vistas and Visions*)

Grammar and Usage

1. Phrasal Verbs
2. Collocation
3. Using Modals
4. Use of Prepositions
5. Common Errors in English Usage

(The above-mentioned grammar items are covered in the textbook *Vistas and Visions*)

Grammar questions must be set in contexts; not as isolated sentences as used for practice in the prescribed textbook.

Book Prescribed:

Vistas and Visions: An Anthology of Prose and Poetry. (Ed.) Kalyani Samantray, Himansu S. Mohapatra, Jatindra K. Nayak, Gopa Ranjan Mishra, Arun Kumar Mohanty. OBS

Texts to be

studied Prose

The Last Leaf

- Need for Excellence
- How Wealth Accumulates and Men Decay
- Values in Life
- Lifestyle English

Poetry

- Hidden Flame
- One Day I wrote Her Name
- The Darkling Thrush
- Meeting Poets

All grammar and writing activities in the textbook *Vistas and Visions*

Recommended Reading:

Fluency in English – Part II, OUP, 2006

Business English, Pearson, 2008

Communicative English. E. Suresh Kumar and P. Sreehari

Break Free: Unlock the Powerful Communicator in You. Rajesh, V. Rupa, 2015

Soft Skills Shalini Verma, 2009.

Language, Literature and Creativity, Orient BlackSwan, 2013

Language through Literature. (forthcoming) ed. Gauri Mishra, Dr. Ranajan Kaul, Dr. Brati Biswas

Skill Enhancement Course Credits: 4

Marks: 100

1. Soft Skills

Soft skills are 'people skills' that include communication skills, work ethic, positive attitude, emotional intelligence and other personal attributes crucial for success in business or career. Soft skills can be learnt and practiced for personal fulfillment and progress in career. This course provides the soft skills required mainly for professional achievements, and in the process, many of the personal requirements of an individual can be compiled with.

Unit 1

Soft skills and why they are important

What are soft skills?

Soft skills in communication; soft skills and intercultural communication

Unit 2

Soft skills in preparing for a career 1

Competency in verbal and written communication skills: active listening, interactive speaking, reading different types of texts, writing for formal and business contexts

Unit 3

Soft skills in preparing for a career 2

1. Using the Microsoft Office: word, excel, powerpoint; working online and offline; telephone and face-to-face etiquette in professional communication
2. Cross-Cultural etiquette: cultural awareness, cultural sensitivity, cultural flexibility, cross-cultural communication

Unit 4

Soft skills in getting jobs

CV Writing, writing job applications; GD Skills and interview taking skills; getting another job

Unit 5

Soft skills on the job

Emotional Intelligence; time and stress management; team work and net-working; presentation skills;

making meeting work: preparing, executing, following up; negotiation skills and crisis management

Prescribed Reading:

- i. Kalyani Samantray, Soft Skills for your Career, OUP
- ii. Himansu S. Mohapatra, Model of the Middle (Pieces to read: “ Our Literature Their Literature”, “ Life style English”, “Writing it Right”, “ The Vinglish way to English”)

Suggested Reading:

- i. Jayashri Mohanraj, Skill Sutras
- ii. Marian K Woodab, How to Communicate under Pressure

CBCS UG SYLLABUS SEM 4-SEC 2

Skill Enhancement Course Credits: 2

Marks: 50

2. Translation and Principles of Translation

This paper seeks to make students aware of a fundamental process of human communication which involves movement between languages. Known by the familiar term of translation, this process of transfer of meaning and values across language borders is as inevitable as it is problematic and challenging. The paper would acquaint students with the ‘what’, ‘why’ and ‘how’ of translation, approaches and problems of translation, and it would also sensitize them to the various ways of reading a translation.

Unit 1

What is Translation? Carrying across of meaning from source language to target language

Why Translation? Translation as a bridge, self –other interaction

Unit 2

Approaches to translation

- Domestication: Readability in the target language
- Foreignisation: Faithfulness to the source language text

Unit 3

How to Translate:

- sense translation based on difference (metaphrase), word-to-word translation based on

equivalence (paraphrase), regulated transformation (imitation)

- adaptation

Unit 4

Problems of translation

- Cultural gap
- Untranslatability
- Translation as appropriation of indigenous languages by English

Unit 5

How to read a translation:

Cultural difference and how to locate it, presence of the foreign in terms of cultural contexts and language

Text to be studied: *Rebati*, in *Bride Price and Other Stories* by Fakir Mohan Senapati, Rupa Publications.

Suggested Reading:

Translation Studies by Susan Basnett

“Found in Translation” Hamid Dabashi http://opinionator.blogs.nytimes.com/2013/07/28/found-in-translation/?_r=0

“Cultural Translation” by Harish Trivedi, “Translation and Globalization” by Paul St-Pierre from *Translation: Reflection, Refraction, Transformation*. Ed. Paul St-Pierre, Prafulla C Kar

**SYLLABUS FOR B.A. (HONORS) HISTORY UNDER
CHOICE BASED CREDIT SYSTEM OF UTKAL UNIVERSITY,
BHUBANESWAR**

Semester I

C.C.I: HISTORY OF INDIA- I

Unit-I: Reconstructing Ancient Indian History

- [1] Early Indian notions of History
- [2] Sources of Historical Writings
- [3] Historical Geography (Identification of Ancient historic sites and their importance)

Unit-II: Pre-historic hunter-gatherers

- [1] Paleolithic culture- Upper, Middle and Lower; Tool making habit
- [2] Mesolithic culture-New developments in technology and economy; rock art.

Unit-III: The advent of food production

Neolithic and Chalcolithic cultures:

- [1] Regional and chronological distribution
- [2] Settlements and Food Production

Unit-IV: The Harappan civilization

- [1] Origins; settlement patterns and town planning
- [2] Agrarian base; craft productions and trade
- [3] Social and political organization; religious beliefs and practices
- [4] Causes of Decline

Unit-V: Cultures in transition

- [1] Origin of the Aryans
- [2] Early Vedic Age- Society, Polity, Religion and Philosophy
- [3] Later Vedic Age- Social Stratification (Varna and Gender), Polity, Religion, Literature and Philosophy

Reading List:

- R.S. Sharma, India's Ancient Past, New Delhi, OUP, 2007
R. S. Sharma, Material Culture and Social Formations in Ancient India, 1983.
R.S. Sharma, Looking for the Aryas, Delhi, Orient
Longman Publishers,1995
D. P. Agrawal, The Archaeology of India, 1985
Bridget & F. Raymond Allchin, The Rise of Civilization in India and Pakistan, 1983.
A. L. Basham, The Wonder that Was India, 1971.
D. K. Chakrabarti, The Archaeology of Ancient Indian Cities, 1997,
Paperback.
D. K. Chakrabarti, The Oxford Companion to Indian Archaeology, New Delhi, 2006.
H. C. Raychaudhuri, Political History of Ancient India, Rev. ed. With Commentary by
B. N. Mukherjee, 1996
K. A. N. Sastri, ed., History of South India, OUP, 1966.
Upinder Singh, A History of Ancient and Early Medieval India, 2008.
Romila Thapar, Early India from the Beginnings to 1300, London,
2002.
Irfan Habib, A People's History-Vol.1, PreHistory, 2001,
----Vol.-2, Indus Civilization: Including Other Copper Age Cultures and

the History of Language Change till 155 B.C., 2002
 Uma Chakravarti, The Social Dimensions of Early Buddhism. 1997.
 Rajan Gurukul, Social Formations of Early South India, 2010.
 R. Champakalakshmi, Trade, Ideology and urbanization: South India 300 BC- AD 1300, 1996.
 Gregory L. Possehl, A Indus Civilization: The Contemporary Perspectives, New Delhi, Vistaar publications, 2002.

C.C.II: SOCIAL FORMATIONS AND CULTURAL PATTERNS OF THE ANCIENT WORLD

Unit-I: Evolution of humankind; Paleolithic and Mesolithic-cultures.

Unit-II: Neolithic Culture: Food production; beginnings of agriculture and animal husbandry

Unit-III: Bronze Age Civilizations: with reference to *any one* of the following: i) Egypt (Old

Kingdom); ii) Mesopotamia (Sumeria & Babylonia); iii) China (Shang); iv) Eastern Mediterranean (Minoan); economy, social stratification, state structure, religion.

Unit-IV: Nomadic groups in Central and West Asia; Advent of iron and its implications

Unit-V: Ancient Greece:

Agrarian economy, urbanization, trade and politics in Ancient Greece: Athens and Sparta; Greek Culture.

Reading List:

Burns and Ralph. World Civilizations.
 Cambridge History of Africa, Vol. I.
 I. Gordon Childe, What Happened in History.
 G. Clark, World Prehistory: A New Perspective.
 B. Fagan, People of the Earth.
 Amar Farooqui, Early Social Formations.
 M. I. Finley, The Ancient Economy.
 Jacquetta Hawkes, First Civilizations.
 G. Roux, Ancient Iraq.
 Bai Shaoyi, An Outline History of China.
 H. W. F. Saggs, The Greatness that was Babylon.
 B. Trigger, Ancient Egypt: A Social History.
 UNESCO Series: History of Mankind, Vols. I - III./ or New ed.
 History of Humanity.
 R. J. Wenke, Patterns in Prehistory.
 G. E. M. Ste Croix, Class Struggles in the Ancient Greek World.
 J. D. Bernal, Science in History, Vol. I.
 V. Gordon Childe, Social Evolution.
 Glyn Daniel, First Civilizations.
 A. Hauser, A Social History of Art, Vol. I.

A.E.C.C-I: Environmental Science

(to be prepared by University)

GE-I: For non-History students, Minor-1

Semester II

C.C.III: HISTORY OF INDIA-II

Unit-I: Economy and Society (circa 300 BCE to circa CE 300):

- [1] Expansion of agrarian economy
- [2] Urban growth; craft production: trade and trade routes
- [3] Social stratification: class, Varna, jati, untouchability; gender; marriage and property relations

Unit-II: Changing political formations (circa 300 BCE to circa CE 300):

- [1] The Mauryan Empire: Chandragupta Maurya and Asoka-Conquest and Administration;
- [2] Post-Mauryan Polities with special reference to the Kushanas and the Satavahanas- Kaniska I and Gautamiputra Satakarni

Unit-III: Towards early medieval India [circa CE fourth century to CE 750]:

- [1] Gupta Age: Agrarian expansion, land grants, graded Land rights and peasantry
- [2] The problem of urban decline: patterns of trade, currency, and urban Settlements.
- [3] Varna, proliferation of *jatis*: changing norms of marriage and property.
- [4] The nature of polities: the Gupta empire and its contemporaries: post- Gupta polities – Pallavas, Chalukyas

Unit-IV: Religion, philosophy and society (circa 300 BCE- CE 750):

- (1) Consolidation of the brahmanical tradition: dharma, *Varnashram*, *Purusharthas*, *Samskaras*.
- (2) Theistic cults (from circa second century BC): Mahayana; the Puranic tradition.
- (3) The beginnings of Tantricism

Unit-V: Cultural developments (circa 300 BCE- CE 750):

- [1] A brief survey of Sanskrit, Pali, Prakrit and Tamil literature. Scientific and technical treatises
- [2] Art and architecture; Mauryan, post-Mauryan, Gupta, post-Gupta

Reading List:

- B. D. Chattopadhyaya, *The Making of Early Medieval India*, 1994.
- D. P. Chattopadhyaya, *History of Science and Technology in Ancient India*, 1986.
- D. D. Kosambi, *An Introduction to the Study of Indian History*, 1975.
- S. K. Maity, *Economic Life in Northern India in the Gupta Period*, 1970.
- B. P. Sahu (ed), *Land System and Rural Society in Early India*, 1997.
- K. A. N. Sastri, *A History of South India*.
- R. S. Sharma, *Indian Feudalism*, 1980.
- R.S.Sharma, *Urban Decay in India, c.300-1000*, Delhi, Munshiram Manohar Lal, 1987
- Romila Thapar, *Asoka and the Decline of the Mauryas*, 1997.

Susan Huntington, *The Art of Ancient India: Buddhist, Hindu, and Jain*, New York, 1985.
N. N. Bhattacharya, *Ancient Indian Rituals and Their Social Contents*, 2nd ed., 1996.
J. C. Harle, *The Art and Architecture of the Indian Subcontinent*, 1987.
P. L. Gupta, *Coins*, 4th ed., 1996.
Kesavan Veluthat, *The Early Medieval in South India*, New Delhi, 2009
H. P. Ray *Winds of Change*, 1994.
Romila Thapar, *Early India: From the Origins to 1300*, 2002.

C.C. IV: SOCIAL FORMATIONS AND CULTURAL PATTERNS OF THE MIEVEAL WORLD

Unit-I: Roman Republic: Polity and Empire in ancient Rome: Agrarian economy, urbanization, trade.

Unit-II: Religion and culture in ancient Rome; Crises of the Roman Empire- Rise and fall

of Julius Caesar

Unit-III: Economic developments in Europe from 7th to 14th centuries:

[1] Organization of production, towns and trade,

[2] Technological developments.

[3] Feudalism- Origin, growth and decline

Unit-IV: Religion and culture in medieval Europe: Medieval Church, Monastic Communities, and Papacy

Unit-V: Societies in Central Islamic Lands:

[1] The tribal background, *ummah*, Caliphate state; rise of Sultanates

[2] Religious developments: the origins of shariah, Sufism

[3] Urbanization and trade

Reading List:

Perry Anderson, *Passages from Antiquity to Feudalism*.

Marc Bloch, *Feudal Society*, 2 Vols.

Cambridge History of Islam, 2 Vols.

Georges Duby, *The Early Growth of the European Economy*.

Fontana, *Economic History of Europe*, Vol. I (relevant chapters).

P. K. Hitti, *History of the Arabs*.

P. Garnsey and Saller, *The Roman Empire*.

SUGGESTED READINGS

S. Ameer Ali, *The Spirit of Islam*.

J. Barrowclough, *The Medieval Papacy*.

Encyclopedia of Islam, 1st ed., 4 vols.

M. G. S. Hodgson, *The Venture of Islam*.

GE-II- (For non-History Students, Minor-2)

Semester III

C.C.V: HISTORY OF INDIA-III (c. 750 -1206)

Unit –I: Studying Early Medieval India:

[1] Historical geography

[2] Sources: texts, epigraphic and numismatic Data,

[3] Indian feudalism

[4] Rise of the Rajputs and the nature of the state

Unit-II: Political Structures:

[1] Evolution of political structures: Rashtrakutas, Palas, Pratiharas, and Cholas

[2] Legitimization of kingship; *Brahmanas* and temples; royal genealogies and rituals

[3] Arab conquest of Sindh: causes and impact

[4] Causes and consequences of early Turkish invasions: Mahmud of Ghazni; Shahab-ud-Din of Ghur

Unit-III: Agrarian Structure and Social Change:

[1] Agricultural expansion; crops

[2] Landlords and peasants

[3] Proliferation of castes; status of Untouchables

[4] Tribes as peasants and their place in the Varna Order

Unit-IV: Trade and Commerce:

[1] Inter-regional trade

[2] Maritime trade and forms of exchange [3] Process of urbanization

[4] Merchant guilds of South India

Unit-V: Religious and Cultural Developments:

[1] Bhakti, Tantrism, Puranic traditions; Condition of Buddhism and Jainism

[2] Islamic intellectual traditions: Al-Biruni; Al-Hujwiri

[3] Regional languages and literature

[4] Art and architecture: Evolution of regional styles: Kalingan and Dravidian style of Temple Architecture.

Reading List:

R.S. Sharma, Indian Feudalism (circa 300 - 1200). B.D. Chattopadhyaya, The Making of Early Medieval India. R.S. Sharma and K.M. Shrivastava, eds, Comprehensive History of India, Vol. IV (A & B).

Mohammad Habib and K.A. Nizami, eds, Comprehensive History of India, Vol. V, The Delhi Sultanate Hermann Kulke, ed., The State in India (AD 1000 - AD 1700).

Dissanayake, W. and K. M. Gokul Singh, Indian Popular Cinema, Trentham Book, London, 2004 John Storey, Cultural Theory and Popular Culture, London, 2001 Oberoi, Patricia, Freedom and Destiny: Gender, Family and Popular Culture in India, Delhi, 2009 Christopher Princy, Camera Indica: The Social Life of Indian Photographs, Chicago, 1998

Pankaj Rag, Dhuno ke Yatri, Rajkamal, New Delhi, 2006 (Hindi) Ramanujan, A.K. Folktales from India A Selection of Oral Tales from Twenty-two Languages (Only Introduction). Ramaswamy, V. 'Women and the 'Domestic' in Tamil Folk Songs' in Kumkum Sangari and Uma Chakravarti, eds., From Myths to Markets: Essays on Gender, Shimla, 1999

Singh, Lata (ed.), Theatre in Colonial India: Playhouse of Power, New Delhi, 2009

N. Karashima, South Indian History and Society (Studies from Inscriptions, AD 850 - 1800

Derryl N. Maclean, Religion and Society in Arab Sindh. Irfan Habib, Medieval India: The Study of a Civilization. Richard Davis Lives of Indian Images.

Romila Thapar, Somanatha: The Many Voices of a History. John S. Deyell, Living

Without Silver: The Monetary History of Early Medieval North India.
 Vijaya Ramaswamy, Walking Naked: Women, Society, and Spirituality in South India.
 Burton Stein, Peasant State and Society in Medieval South India.
 R. Champakalakshmi, Trade, Ideology and Urbanization: South India, 300 BC to 1300 AD.
 Al. Beruni's India, NBT edition. Ali Hujwiri, Kashful Mahjoob, tr. R. Nicholson.
 S C Mishra, Rise of Muslim Communities in Gujarat. J. Schwartzberg, Historical Atlas of South Asia.

C.C.VI: RISE OF THE MODERN WEST – I

Unit-I: Transition from feudalism to capitalism:

1. The problems of Transition: Economic Expansion, Industrial production, trade and commerce
2. Urban Development, Town life

Unit-II: Early colonial expansion:

1. Motives, voyages and explorations
2. The conquests of the Americas: Beginning of the era of colonization
3. Mining and plantation, The African slaves

Unit-III: Renaissance:

1. Its social roots, city-states of Italy
2. Spread of humanism in Europe
3. The Art of Renaissance- Architecture, Sculpture, Painting and Literature

Unit-IV: The Reformation

1. Origins, course and results
2. Spread of Reformation movements.
3. Emergence of European State system: Spain, France, England, Russia

Unit-V: Economic developments of the sixteenth century:

1. Shift of economic balance from the Mediterranean to the Atlantic.
2. Commercial Revolution- Causes and Nature
3. Growth of Industries and its impact

Reading List:

B. H. Slicher von Bath, The Agrarian History of Western Europe. AD.500 - 1850.
 Charles A. Nauert, Humanism and the Culture of the Renaissance (1996).
 D. H. Pennington, Seventeenth Century Europe.
 F. Rice, The Foundations of Early Modern Europe
 G. R. Elton, Reformation Europe, 1517 - 1559.
 Harry Miskimin, The Economy of Later Renaissance Europe: 1460 - 1600.
 J. Lynch, Spain under the Hapsburgs.
 James B. Collins, The State in Early Modern France, New Approaches to European History.
 L. W. Owie, Seventeenth Century Europe.
 M. P. Gilmore, The World of Humanism. 1453 - 1517.
 M. S. Anderson, Europe in the Eighteenth Century.
 Perry Anderson, The Lineages of the Absolutist State.
 Peter Kriedte, Peasants, Landlords and Merchant Capitalists. Peter Mathias, First Industrial Revolution.
 Stuart Andrews, Eighteenth Century Europe.
 The Cambridge Economic History of Europe. Vol. I - VI.
 The New Cambridge Modern History of Europe, Vols. I - VII.

C.C. VII: HISTORY OF INDIA IV (c.1206 - 1526)

Unit-I: Interpreting the Sources of Delhi Sultanate:

Survey of Sources: (a) Persian *Tarikh* Tradition, (b) Vernacular Histories; (c) Epigraphy

Unit-II: Sultanate Political Structures:

1. Consolidation of the Sultanate of Delhi: Balban, the Khaljis and the Tughluqs.
2. Theories of kingship: The ruling elites, Sufis, Ulema and the imperial monuments

Unit-III: Emergence of Regional Identities

1. Bahamanis, Vijayanagar, Gujarat and Odisha.
2. Regional Art, Architecture and Literature.

Unit-IV: Society and Economy:

1. Iqta and the Revenue-free Grants.
2. Agricultural production, Technology.
3. Market Regulations, Growth of Urban Centers.
4. Trade and Commerce, Indian Ocean (Maritime) Trade.

Unit-V: Religion, Society and Culture:

1. Sufi silsilas: Chishtis and Suhrawardis; doctrines and practices, Social roles
2. Bhakti movement and monotheistic traditions: Kabir, Nanak and Sri Chaitanya.
3. Social Impact of the Bhakti tradition: Rise of Liberal Thought, Ideology of Equality and Gender Relations

Reading List:

- K.A. Nizami, Religion and Politics in the Thirteenth Century.
S.A.A. Rizvi, A History of Sufism in India, Vol. I.
Satish Chandra, Medieval India, vol.I, Har Anand Publications, New Delhi.
Tapan Raychaudhuri and Irfan Habib, eds, Cambridge Economic History of India, Vol. I.
W.H. McLeod, Karine Schomer, et al, Eds, The Sants.
Burton Stein, New Cambridge History of India: Vijayanagara.
Pushpa Prasad, Sanskrit Inscriptions of the Delhi Sultanate.
Richard M. Eaton, ed., India's Islamic Traditions.
Sheldon Pollock, Languages of the Gods in the World of Men.
Vijaya Ramaswamy, Walking Naked: Women, Society, and Spirituality in South India.
K.C. Panigrahi, History of Orissa, Cuttack, Kitab Mahal, 2008

SEC.I: Understanding Heritage

This course will enable students to understand the different facets of heritage and their significance. It highlights the legal and institutional frameworks for heritage protection in India as also the challenges facing it. The implications of the rapidly changing interface between heritage and history will also be examined. The course will be strongly project-based and will require visits to sites and monuments. At least two Projects will be based on visits to Museums/Heritage Sites.

Unit-I: Defining Heritage

- [1] Meaning of 'antiquity'
- [2] Archaeological sites
- [3] Tangible heritage
- [4] Intangible heritage and art treasures

Unit-II: Evolution of Heritage -Legislation and the Institutional Framework:

[1] Conventions and Acts— national and international Heritage

[2] Heritage related government departments

[3] Museums, Regulatory Bodies

[4] Conservation Initiatives

Unit-III: Challenges facing Tangible and Intangible Heritage

[1] Development of Heritage Sites

[2] Antiquity smuggling.

[3] Conflicts (to be examined through specific case studies)

Unit-IV: Heritage and Travel:

[1] Viewing Heritage Sites

[2] The relationship between cultural heritage, landscape and travel, and recent trends

[3] Management of heritage sites

Unit-V: World Heritage Monuments:

[1] Tajmahal

[2] Red Fort

[3] Golden temple at Amritsar

[4] Sun temple at Konark

Reading List

David Lowenthal, *Possessed By The Past: The Heritage Crusade and The Spoils of History*, Cambridge, 2010

Layton, R. P. Stone and J. Thomas. *Destruction and Conservation of Cultural Property*. London: Rutledge, 2001

Lahiri, N. *Marshaling the Past - Ancient India and its Modern Histories*. Ranikhet: Permanent Black. 2012, Chapters 4 and 5.

S.S. Biswas, *Protecting the Cultural Heritage (National Legislations and International Conventions)*. New Delhi: INTACH, 1999.

Acts, Charters and Conventions are available on the UNESCO and ASI websites (www.unesco.org; www.asi.nic.in)

Agrawal, O.P., *Essentials of Conservation and Museology*, Delhi, 2006_ Chainani, S. 2007. *Heritage and Environment*. Mumbai: Urban Design Research Institute, 2007

GE-III- (For non-History Students, Minor-1)

Semester IV

C.C.VIII: RISE OF THE MODERN WEST – II

Unit- I: 17th century European crisis: economic, social and political dimensions

Unit-II: The English Revolution and European politics in the 18th century:

(1) Major issues-political and intellectual Currents

(2) Parliamentary monarchy

(3) Patterns of Absolutism in Europe

Unit-III: Rise of modern science

(1) Development of Science from Renaissance to the 17th century

(2) Impact of Modern science on European society

Unit-IV: Mercantilism, European economics and Preludes to the Industrial Revolution

(1) Origin and spread of Mercantilism

(2) Impact of Mercantilism on European economy

(3) Agricultural and Scientific Background to the Industrial Revolution

Unit-V: The American Revolution, 1776

- (1) Political currents
- (2) Socio-Economic Issues
- (3) Significance of the American Revolution

Reading List:

- T.S. Aston and C.H.E. Philpin (eds.), *The Brenner Debate*.
 H. Butterfield, *The Origins of Modern Science*.
 Carlo M. Cipolla, *Fontana Economic History of Europe, Vols. II and III*.
 Carlo M. Cipolla, *Before the Industrial Revolution, European Society and Economy, 1000 -1700*. 3rd ed. (1993)
 . D.C. Coleman (ed.), *Revisions in Mercantilism*.
 Ralph Davis, *The Rise of the Atlantic Economics*.
 Maurice Dobb, *Studies in the Development of Capitalism*.
 J.R. Hale, *Renaissance Europe*.
 R. Hall, *From Galileo to Newton*.
 Christopher Hill, *A Century of Revolutions*.
 Rodney Hilton, *Transition from Feudalism to Capitalism*.
 Stephen J. Lee, *Aspects of European History, 1494 - 1789*.
 G. Parker, *Europe in Crisis, 1598 - 1648*.
 G. Parker and L.M. Smith, *General Crisis of the Seventeenth Century*.
 J.H. Parry, *The Age of Reconnaissance*.
 Meenaxi Phukan, *Rise of the Modern West: Social and Economic History of Early Modern Europe*.
 V. Poliensky, *War and Society in Europe. 1618 -48*.
 Theodore K. Rabb, *The Struggle for Stability in Early Modern Europe*.
 V. Scammell, *The First Imperial Age: European Overseas Expansion, 1400-1715*.
 Jan de Vries, *Economy of Europe in an Age of Crisis 1600- 1750*.
 B. V. Rao, *World History, New Delhi: Sterling Publishers*
 M. S. Anderson, *Europe in the Eighteenth Century*.
 Perry Anderson, *The Lineages of the Absolutist State*
 Stuart Andrews, *Eighteenth Century Europe*.
 B. H. Slicher von Bath, *The Agrarian History of Western Europe. AD. 500 - 1850*.
 The Cambridge Economic History of Europe. Vol. I - VI.
 James B. Collins, *The State in Early Modern France, New Approaches to European History*.
 G. R. Elton, *Reformation Europe, 1517-1559*.
 M. P. Gilmore, *The World of Humanism. 1453 -1517*.
 Peter Kriedte, *Peasants, Landlords and Merchant Capitalists*.
 J. Lynch, *Spain under the Hapsburgs*.
 Peter Mathias, *First Industrial revolution*.
 Harry Miskimin, *The Economy of Later Renaissance Europe: 1460 - 1600*.
 Charles A. Nauert, *Humanism and the Culture of the Renaissance (1996)*.

The New Cambridge Modern History of Europe, Vols. I - VII.

L. W. Owie, Seventeenth Century Europe.

D. H. Pennington, Seventeenth Century Europe.

F. Rice, The Foundations of Early Modern Europe

C.C. IX: HISTORY OF INDIA V (c. 1526 - 1750)

Unit-I: Sources and Historiography:

- (1) Persian literary culture, translations; (2) Vernacular literary Traditions; (3) Memoirs and Travelogues

Unit-II: Establishment of Mughal rule:

- (1) India on the eve of advent of the Mughals
- (2) Fire arms, military technology and warfare
- (3) Sher Shah: Administrative and Revenue reforms

Unit-III: Consolidation of Mughal rule:

- (1) Incorporation of Rajputs and other indigenous groups in Mughal Nobility
- (2) Evolution of administrative institutions: *zabti*, *mansab*, *jagir*, *madad-i-maash*
- (3) Beginning of the crisis: Agrarian and Jagir crises; Revolts
- (4) Emergence of the Marathas; Shivaji; expansion under the Peshwas

Unit-IV: Society and Economy:

- (1) Land rights and revenue system: Zamindars and peasants
- (2) Trade routes and patterns of internal commerce; overseas trade
- (3) Urban Centres, Craft and Technology

Unit-V: Cultural ideals:

- (1) Religious tolerance and *sulh-i-kul*; Sufi mystical and intellectual interventions
- (2) Mughal Art and Architecture
- (3) Mughal and Rajput Paintings: Themes and Perspectives

Reading List:

M. Athar Ali, The Mughal Nobility under Aurangzeb.

Muzaffar Alam and Sanjay Subramanian, eds, The Mughal State, 1526 - 1750.

J.F. Richards, The Mughal Empire.

Satish Chandra, Essays on Medieval Indian History.-----, Medieval India, vol.2, Har Anand Publications, New Delhi

Irfan Habib, Agrarian System of Mughal India, 1526-1707. S.A.A. Rizvi, Muslim Revivalist Movements in Northern India.

S. Arsatnam, Maritime India in the Seventeenth Century. Satish Chandra, Parties and Politics at the Mughal Court.

Andre Wink, Land and Sovereignty in India. Harbans Mukhia, The Mughals of India.

Iqbal Husain, Ruhela Cheiftancies in 18th Century India.

C.C. X: HISTORICAL THEORIES & METHODS

Unit-I: Meaning and Scope of History

1. Definition, Nature and Scope of History.
2. Object and Value of History.
3. History, Science and Morality.

Unit-II: Traditions of Historical Writing

1. Ancient Greek Traditions – Herodotus, Thucydides
2. Ancient Roman Traditions - Polybius, Tacitus
3. Medieval Understanding: Western – St. Augustine, Arabic – Ibn Khaldun.

Unit-III: History as Interdisciplinary Practice

1. History and Archaeology, History and Anthropology.
2. History and Psychology, History and Literature.
3. History and Political Science

Unit-IV: Modern Theories

1. Scientific History: Ranke, Croce, Comte
2. Karl Marx, RG Collingwood, Toynbee
3. Total History: Marc Bloch, Lucien Febver, Fernand Braudel

Unit-V: Historical Methods

1. Sources of History: Written, Oral. Visual & Archaeological.
2. Historical facts.
3. Historical Causation.
4. Historical Objectivity

Reading List:

Arthur Marwick, *New Nature of History: Knowledge Evidence, Language* (Chapter V: The Historian at work: Forget 'facts' Foreground Sources), Lyceum Books Incorporated, 2001.

-----, *The Nature of History* (Chapter IV: History, Science and Social Science), London: Macmillan, 1989.

B. Sheik Ali, *History: Its Theory and Method*, Macmillan, Reprinted, 1996.

E. H. Carr, *What is History?*, Penguin Books, Reprinted, 1983.

E. Sreedharan, *A Text Book of Historiography*, Orient Longman, Reprinted, 2004.

Irfan Habib, *Interpreting Indian History*, Northeastern Hill University Publications, Shillong, 1988.

Marc Bloch, *The Historian's Craft*, Vintage Book, New York, 1953. (Introduction and Chapter-I: History Men and Time)

Maurice Aymard and Harbans Mukhia (eds), *French Studies in History*, Vols- I & II, Orient Longman, 1989.

Romila Thapar, *Past and Prejudice*, NBT, New Delhi, 1975.

S. K. Bajaj, *History: It's Philosophy, Theory & Methodology*, Patiala, 1987.

SEC.II: Understanding Popular Culture

The paper examines some popular cultures expressed in different mediums like visual, oral and cultural. In the process of their evolution, these cultures eclectically draw from traditions, articulate anxieties, and even give rise to new traditions. The paper endeavours to equip students with understanding such phenomena historically, with special reference to India. It is imperative that the Students use electronic devices to view, record, and document the subject matter.

Unit-I: Introduction of Popular Culture

[1] Meaning and Definition of popular culture

[2] Understanding it historically

Unit-II: Visual expressions:

[1] Folk art,

[2] Calendar art

[3] Photography

Unit-III: Performance:

[1] Theatres

[2] Music

[3] Folk tales/songs/Suang, Yatra and Nautanki: Identifying themes, functionality

Unit-IV: The audio-visual: cinema and television:

[1] Indian cinema: Mapping the influence of the national struggle for independence (1930s and 40s)

[2] Idealized nationalism (1950s), disillusionment and the anti-establishment mood (1970s and 80s)

[3] Documentary films, Expressions of popular culture in television; the impact of the Internet and audio-visual media

Unit-V: Fairs, Festivals and Rituals:

[1] Disentangling mythological stories

[2] Patronage

[3] Regional variations

[4] Impact on Society

Reading List:

Dissanayake, W. and K. M. Gokul Singh, Indian Popular Cinema, Trentham Book, London, 2004

John Storey, Cultural Theory and Popular Culture, London, 2001.

Oberoi, Patricia, Freedom and Destiny: Gender, Family and Popular Culture in India, Delhi, 2009

Christopher Princy, Camera Indica: The Social Life of Indian Photographs, Chicago, 1998

Pankaj Rag, Dhuno ke Yatri, Rajkamal, New Delhi, 2006(Hindi)

Ramanujan, A.K. Folktales from India A Selection of Oral Tales from Twenty-two Languages (Only Introduction).

Ramaswamy, V. 'Women and the 'Domestic' in Tamil Folk Songs' in

KumkumSangari and Uma Chakravarti, eds., From Myths to Markets: Essays on Gender, Shimla, 1999
Singh, Lata (ed.), Theatre in Colonial India: Playhouse of Power, New Delhi, 2009

G.E. IV:(For non-History students, Minor-2)

Semester V

C.C.XI: History of Modern Europe- I (c. 1780-1939)

Unit-I: The French Revolution:

- [1] Crisis of Ancient Regime
- [2] Intellectual currents.
- [3] Social classes and emerging gender relations.

Unit-II: Revolution and its European repercussions:

- [1] Phases of the French Revolution 1789 - 99.
- [2] Art and Culture of French Revolution.
- [3] Napoleonic consolidation - reform and empire.

Unit-III: Restoration and Revolution: c. 1815 - 1848:

- [1] Forces of conservatism & restoration of old hierarchies.
- [2] Social, Political and intellectual currents.
- [3] Revolutionary and Radical movements, 1830 - 1848.

Unit-IV: Capitalist Industrialization and Socio-Economic Transformation (Late 18th century to AD 1914)

- [1] Process of capitalist development in industry and agriculture: case Studies of Britain, France, the German States and Russia.
- [2] Evolution and Differentiation of social classes: Bourgeoisie, Proletariat, land owning classes and peasantry.
- [3] Changing trends in demography and urban patterns.
- [4] Family, gender and process of industrialization.

Unit-V: Varieties of Nationalism and the Remaking of States in the 19th and 20th Centuries.

- [1] Intellectual currents, popular movements and the formation of National identities in Germany, Italy
- [2] Specificities of economic development, political and administrative Reorganization - Italy, Germany

Reading List:

C.M. Cipolla: Fontana Economic History of Europe, Volume III: The Industrial Revolution.

Norman Davies, Europe.

J. Evans: The Foundations of a Modern State in 19th Century Europe.

T.S. Hamerow: Restoration, Revolution and Reaction: Economics and Politics in

Germany [1815 - 1871]. E.J. Hobsbawm: The Age of Revolution.

Lynn Hunt: Politics, Culture and Class in the French Revolution.

James Joll, Europe Since 1870. George Lefebvre, Coming of the French Revolution.

George Lichtheim : A Short History of Socialism. Alec Nove: An Economic History of the

USSR.

Andrew Porter, European Imperialism, 18760-1914 (1994). Anthony Wood, History of Europe, 1815 û 1960 (1983).

Stuart Woolf: History of Italy, 1700-1860. G. Barrowclough, An Introduction to Contemporary History.

Fernand Braudel, History and the Social Science in M. Aymard and H. Mukhia Ed. French Studies in History, Vol. I (1989).

Maurice Dobb: Soviet Economic Development Since 1917. M. Perrot and G. Duby [eds.]: A History of Women in the West, Volumes 4 and 5.

H.J. Hanham; Nineteenth Century Constitution, 1815 - 1914. E.J. Hobsbawm, Nations and Nationalism.

Charles and Barbara Jelavich: Establishment of the Balkan National States, 1840 û 1920. James Joll, Origins of the First World War (1989).

Jaon B. Landes: Women and the Public Sphere in the Age of the French Revolution. Colin Lucas: The French Revolution and the Making of Modern Political Culture, Volume Nicholas Mansergh: The Irish Question, 1840 û 1921.

K.O. Morgan: Oxford Illustrated History of Britain, Volume 3 [1789 -1983].

R.P. Morgan: German Social Democracy and the First International.

N.V. Riasanovsky: A History of Russia.

J.M. Robert, Europe 1880 û 1985. J.J. Roth (ed.), World War I : A Turning Point in Modern History.

Albert Soboul: History of the French Revolution (in two volumes).

Lawrence Stone, History and the Social Sciences in the Twentieth Century The Past and the Present (1981).

Dorothy Thompson: Chartists: Popular Politics in the Industrial Revolution.

E.P. Thompson: Making of the English Working Class.

Michel Vovelle, fall of the French Monarchy (1984).

H. Seton Watson: The Russian Empire.

Raymond Williams: Culture and Society.

C.C.XII: HISTORY OF INDIA VII (c. 1750 - 1857)

Unit-I: India in the mid 18th Century; Society, Economy, Polity

Unit-II: Expansion and Consolidation of colonial Power:

[1] Foreign trade and early forms of exactions from Bengal.

[2] Dynamics of expansion, with special reference to Bengal, Mysore, Awadh, Punjab

Unit-III: Colonial State and Ideology:

[1] Arms of the colonial state: army, police, law

[2] Ideologies of the Raj and racial attitudes

[3] Education: indigenous and modern

Unit-IV: Economy and Society:

[1] Land revenue systems- Permanent, Ryotwari and Mahalwari

[2] Commercialization of Agriculture- Consequences

[3] Drain of Wealth-causes and consequences

[4] Growth of modern industry

Unit-V: Popular Resistance: Causes and Consequences

[1] Santhal uprising (1856-57), Indigo rebellion (1860)

[2] Pabna agrarian Leagues (1873), Deccan riots (1875)

[3] Movement of 1857-causes and consequences

Reading List:

- C. A. Bayly, Indian Society and the Making of the British Empire, New Cambridge History of India.
- Bipan Chandra, Rise and Growth of Economic Nationalism in India.
- Suhash Chakravarty, The Raj Syndrome: A Study in Imperial Perceptions, 1989.
- J.S. Grewal, The Sikhs of the Punjab, New Cambridge History of India Ranajit Guha, ed., A Subaltern Studies Reader.
- Dharma Kumar and Tapan Raychaudhuri, eds., The Cambridge Economic History of India, Vol. II.
- P.J. Marshall, Bengal: The British Bridgehead, New Cambridge History of India.
- R.C. Majumdar, ed., History and Culture of Indian People, Vols. IX and X. British Paramountcy and Indian Renaissance.
- David Arnold and Ramchandra Guha, eds, Nature, Culture and Imperialism.
- Amiya Bagchi, Private Investment in India.
- Bipan Chandra, K.N. Panikkar, Mridula Mukherjee, Sucheta Mahajan and Aditya Mukherjee, India's Struggles for Independence.
- A.R. Desai, Peasant Struggles in India.
- R.P. Dutt, India today.
- M.J. Fisher, ed., Politics of Annexation (Oxford in India Readings).
- Ranjit Guha, Elementary Aspects of Peasant Insurgency in Colonial India (1983).
- P.C. Joshi, Rebellion 1857: A Symposium.
- J.Krishnamurti, Women in Colonial India.
- Dadabhai Naroji, Poverty and Un-British Rule in India.
- Rajat K. Ray, ed., Entrepreneurship and Industry in India, 1800-1947, Oxford In India Readings.
- Eric Stokes, English Utilitarians and India Thomas
- R. Metcalf, The Ideologies of the Raj

D.S.E-I: HISTORY OF THE UNITED STATES OF AMERICA (c.1776-1945)

Unit-I: The Background:

- [1] The land and indigenous people: settlement and colonization by Europeans
- [2] Early colonial society and politics; indentured labour-White and Black

Unit-II: Making of the Republic:

- [1] Revolution, Sources of conflict: Revolutionary groups, Ideology:
- [2] The American War of Independence- Causes and consequences
- [3] Processes and Features of Constitution making

Unit-III: Evolution of American Democracy:

- [1] Federalists: Jeffersonianism: Jacksonianism, Rise of political parties-1840-1960; Judiciary-role of the Supreme Court
- [2] Limits of democracy: Blacks and women.

Unit-IV: Early Capitalism:

- [1] Beginnings of Industrialization.
- [2] Immigrants and changing composition of Labour; Early Labour Movements.

Unit-V: The Agrarian South and Civil War:

- [1] Plantation economy.
- [2] Slave Society and Culture: Slave resistance.
- [3] Rise of Republicanism, Emancipation and Lincoln

Reading List:

- Bernard Bailyn, The Great Republic.
Bernard Bailyn, The Ideological Origins of the American Revolution.
Charles Beard, An Economic Interpretation of the American Constitution.
Peter Carroll and David Noble, Free and Un-free: A New History of the United States.
David B. Davis, The Problem of Slavery in the Age of Revolution.
U. Faulkner, American Economic History.
Eric Foner, America's Black Past.
John Hope Franklin, From Slavery to Freedom.
Gerald N. Grobb and George A. Billias, Interpretations of American History: Patterns and Perspectives, 2 Vols.
David M. Potter, The Impending Crisis.
J. G. Randall and David Donald, The Civil War and Reconstruction.
Kenneth Stampp, The Peculiar Institution, Slavery in the Antebellum South.
Federick Jackson Turner, The Frontier in American History.
Lee Benson, The Concept of Jackson Democracy.
Ray A. Billington, Westward Expansion.
Paul Boyer, Harvard Sitkoff, Nancy Woloch, The Enduring Vision: A History of the American People, Vols. Land 2.
Thomas Cochran, The Inner Revolution.
A. O. Craven, The Growth of Southern Nationalism, 1848 - 1861.
Carl N. Degler, At Odds: Women and Family in America from the Revolution to the Present.
Lewis L. Gould (ed.), The Progressive Era.
John D. Hicks, The Federal Union: A History of USA Since 1865.
R.P. Kaushik, Significant Themes in American History.
Irving Kristol, Gordon Wood and others, America's Continuing Revolution.
Richard W. Leopold, The Growth of American Foreign Policy.
Perry Miller, From Colony to Province.

Gary Nash (ed.), Retracing the Past.

Henry Pelling, American Labor.

Edward Pessen, Jacksonian Panorama.

Charles Sellers, Henry May and Neil McMillen, A Synopsis of American History; 2 Vols.

Donald Shiham, The Making of American History: The Emergence of the Nation, Vols. II & I.

Dwijendra Tripathi and S.C. Tiwari, Themes and Perspectives in American History.

DSE.II: History and Culture of Odisha

Unit-I: Socio-political life of Early and Medieval Odisha:

[1] Kalinga War (261 B.C.) and its significance

[2] Mahameghavahan Kharavela: His time and achievements

[3] The Bhauma Karas and The Somavamsis

[4] The Gangas and The Suryavamsis

Unit-II: Religion, Art and Literature of Early and Medieval Odisha:

[1] Buddhism, Jainism and Sanatana Dharma in Odisha.

[2] Development of Art and Architecture: Buddhist Art, Temples and Jain
Sculptures

[3] Evolution and Growth of Odia Language

[4] Development of Odia Literature-Sarala Mohabharata

[5] Panchasakhas, Sri Chaitanya and Bhakti Movement in Odisha

Unit-III: Political and Economic structure in Medieval Odisha:

[1] Mughal Administration

[2] Maratha Administration

[3] Impact on Odisha's Socio-Economic Condition

Unit-IV: Colonialism in Odisha:

[1] The Early British Administration: Its Socio-economic impact

[2] The Odia Identity Movement

[3] Freedom Struggle in Odisha

Unit-V: Socio-cultural Changes in Modern Odisha:

[1] Development of Modern Education

[2] Social Reform Movements in Odisha

Reading List:

- A. Easchman et al (eds) The Cult of Jagannath and Regional Tradition of Orissa, Manohar, New Delhi, 1978.
- A. K. Mishra, Intellectual Tradition of Orissa: 2006.
- A. K. Mishra, The Raj, Nationalists and Reforms, 2007.
- A.K. Mishra, Indian Culture, Science and Technology (with special emphasis on Odisha), 2011.
- B.K. Mallik; Paradigms of Dissent and Protest: Social Movements in Eastern India (1400-1700 AD Manohar, New Delhi, 2004.
- J. Dora, Sakta Monuments of Orissa, A Study of Art, Architecture and Iconography, New Delhi, 2010.
- K.C. Mishra, The Cult Jagannath.
- M.N. Das (ed) Sidelights on History and Culture of Orissa, Vidyapuri
- A.C. Pradhan, A Study of History of Orissa, Bhubaneswar, Panchsheel
- K.C. Panigrahi, History of Orissa, Cuttack, Kitab Mahal, First edition, 1981
- Chittaranjan Das, A Glimpse into Oriya Literature, Orissa Sahitya Akademi, Bhubaneswar, 1962
- K.B. Tripathi, The Evolution of Oriya Language and Script, Utkal University, Bhubaneswar
- K.C. Panigrahi, Sarala Dasa, Sahitya Akademi, New Delhi, 1975 Khageswar
- Mahapatra, (ed), Charyagitika

Semester VI

C.C. XIII: HISTORY OF INDIA VIII (c. 1857 - 1950)

Unit-I: Cultural changes and Social and Religious Reform

Movements:

- [1] The advent of printing and its implications
- [2] Reform and Revival: Brahma Samaj, Arya Samaj, Aligarh Movement
- [3] Emancipation of Women, Sanskritization and Anti-Caste Movements

Unit-II: Nationalism: Trends up to 1919:

- [1] Political ideology and organizations, formation of INC
- [2] Moderates and Extremists.
 - [3] Swadeshi Movement
 - [4] Revolutionary Movements

Unit-III: Gandhian nationalism after 1919: Ideas and Movements:

- [1] Mahatma Gandhi: Perspectives and Methods

[2] Non- Cooperation, Civil Disobedience, Quit India, and INA

[3] Princely India: States' Peoples' Movement

[4] Nationalism and Social Groups: Peasants, Tribals, Dalits and Women

Unit-IV: Communalism and Partition:

[1] Ideologies and practices, Hindu Mahasabha, Muslim League

[2] Partition and Independence

Unit-V: Emergence of a New State:

[1] Making of the Constitution

[2] Integration of Princely States

[3] Land Reforms and beginnings of Planning

Reading List:

Judith Brown, Gandhi's rise to Power, 1915-22.

Paul Brass, The Politics of India Since Independence, OUP, 1990.

Bipan Chandra, Nationalism and Colonialism in Modern India, 1979.

Bipan Chandra, Rise and Growth of Economic Nationalism in India.

Mohandas K. Gandhi, An Autobiography or The Story of My Experiments with Truth.

Ranjit Guha, ed., A Subaltern Studies Reader.

Peter Hardy, Muslims of British India.

Mushirul Hasan, ed., India's Partition, Oxford in India Readings.

D.A. Low, ed., Congress and the Raj.

John R. McLane, Indian Nationalism and the Early Congress.

Jawaharlal Nehru, An Autobiography.

Gyanendra Pandey, The Construction of Communalism in colonial north India.

Sumit Sarkar, Modern India, 1885-1947. Anil

Seal, Emergence of Indian Nationalism.

Ram Lakhan Shukla (ed.), Adhunik Bharat ka Itihas.

Eleanor Zelliot, From Untouchable to Dalit: Essays on the Ambedkar Movement.

Judith Brown, Gandhi: (et al) A Prisoner of Hope.

Bipan Chandra, Communalism in Modern India, 2nd ed., 1987. Bipan

Chandra, K.N. Panikkar, Mridula Mukherjee, Sucheta Mahajan and

Aditya Mukherjee, India's, Struggles for Independence.

A.R. Desai, Social Background of Indian Nationalism.

A.R. Desai, Peasant Struggles in India.

Francine Frankel, India's Political Economy, 1947-77. Ranajit

Guha, and G.C. Spivak, eds. Select Subaltern Studies.

Charles Heimsath, Indian Nationalism and Hindu Social Reform.

F. Hutchins, Illusion of Permanence.

F. Hutchins, Spontaneous Revolution.

V.C. Joshi (ed.), Rammohan Roy and the process of Modernization in India.

J.Krishnamurti, Women in Colonial India

C.C. XIV: HISTORY OF MODERN EUROPE II (c. 1780 -1939)

Unit-I: Liberal Democracy, Working Class Movements and Socialism in the 19th and 20th Centuries:

[1] The struggle for parliamentary democracy and civil liberties in Britain.

[2] Forms of protest during early capitalism: food riots in France and England: Luddites and Chartism.

[3] Early Socialist Thought; Marxian Socialism

Unit-II: The Crisis of Feudalism in Russia and Experiments in Socialism:

[1] Emancipation of serfs.

[2] Revolutions of 1905; the Bolshevik Revolution of 1917.

[3] Programmes of Socialist Construction.

Unit-III: Imperialism, War and Crisis: c. 1880-1939:

[1] Theories and mechanisms of imperialism; Growth of Militarism; Power blocks and alliances: expansion of European empires –First World War(1914 – 1918)

[2] The post 1919 World Order: economic crises, the Great Depression and Recovery.

[3] Fascism and Nazism.

[4] Origins of the Second World War.

Unit-IV: Cultural Transformation since circa 1850:

[1] Changing contexts: [i] Notions of Culture [ii] Creation of a New public sphere and mass media

[2] Creation of new cultural forms: from Romanticism to Abstract Art.

[3] Culture and the making of ideologies: Constructions of Race, Class and Gender, ideologies of Empire.

Unit-V: Intellectual Developments since circa 1850:

Major intellectual trends:

[1] Mass education and extension of literacy.

[2] Institutionalization of disciplines: History, Sociology and Anthropology.

[3] Darwin and Freud.

Reading List:

Gerald Brennan: The Spanish Labyrinth: An Account of the Social and Political Background of the Civil War

C.M. Cipolla: Fontana Economic History of Europe, Volume II the Present (1981). I : The Industrial Revolution.

Norman Davies, Europe.

J. Evans: The Foundations of a Modern State in 19th Century Europe.

T.S. Hamerow: Restoration, Revolution and Reaction: Economics and Politics in Germany [1815 - 1871].

E.J. Hobsbawm : The Age of Revolution. Lynn Hunt: Politics, Culture and Class in the French Revolution.

James Joll, Europe Since 1870. David Landes: Prometheus Unbound. George Lefebvre, Coming of the French Revolution.

George Lichtheim: A Short History of Socialism. Peter Mathias, First Industrial Revolution.

Alec Nove: An Economic History of the USSR. Andrew Porter, European Imperialism, 18760 -1914 (1994).

Anthony Wood, History of Europe, 1815 û 1960 (1983). Stuart Woolf: History of Italy, 1700 û 1860.

G. Barrowclough, An Introduction to Contemporary History.

Fernand Braudel, History and the Social Science in M. Aymard and H. Mukhia eds. French Studies in History, Vol. I (1989).

Maurice Dobb: Soviet Economic Development Since 1917.

M. Perrot and G. Duby [eds.]: A History of Women in the West, Volumes 4 and 5.

H.J. Hanham; Nineteenth Century Constitution, 1815 û 1914.
 E.J. Hobsbawm, Nations and Nationalism.
 Charles and Barbara Jelavich: Establishment of the Balkan National States, 1840 û 1920.
 James Joll, Origins of the First World war (1989).
 Jaon B. Landes: Women and the Public Sphere in the Age of the French Revolution.
 David lowenthal, The Past is a Foreign Country.
 Colin Licas: The French Revolution and the Making of Modern Political Culture, Volume 2.
 Nicholas Mansergh: The Irish Question, 1840 - 1921.K.O. Morgan: Oxford Illustrated History of Britain, Volume 3 [1789 - 1983].
 R.P. Morgan: German Social Democracy and the First International.N.V. Riasanovsky: A History of Russia.
 J.M. Robert, Europe 1880 - 1985.
 J.J. Roth (ed.), World War I: A Turning Point in Modern History.Albert Soboul: History of the French Revolution (in two volumes).

D.S.E. III: HISTORY OF THE UNITED STATES OF AMERICA-II (c.1776- 1945)

Unit-I: Reconstructions: Political changes and Economic transformation:

- [1] Conservative and Radical phases.
- [2] The New South: Participants and Reactions, Carpetbaggers; Scalawags, Blacks, Ku Klux Klan.
- [3] Growth of Capitalism
- [4] Depression.

Unit-II: Resistance and Reform:

- [1] Agrarian crises and populism
- [2] Urban corruption and progressivism
- [3] Labour movements and Unionization.
- [4] New Deal.

Unit-III: U.S. Imperialism:

- [1] Spanish-American War
- [2] Expansion in the Far East and Latin America
- [3] World War I and Fourteen Points
- [4] Americans in World War II: Bombing of Hiroshima and Nagasaki

Unit-IV: Afro-American Movements:

Black Movements: Booker T. Washington, W.E.B. Dubois; NAACP and Marcus Garvey.

Unit-V: Socio-Cultural, Religious and Intellectual Movements:

- [1] Abolitionists, Women's rights movement and Suffrage
- [2] Religious movements: Early Revivalism; Puritans, Quakers, Mormons; Temperance
- [3] Mass culture (circa 1900 - 1945)
- [4] Major literary trends (circa 1900 – 1945)

Reading List:

Bernard Bailyn, The Great Republic.
 Bernard Bailyn, The Ideological Origins of the American Revolution.
 Charles Beard, An Economic Interpretation of the American Constitution.
 Dee Brown, Bury My Heart at Wounded Knee, An Indian History of

the American West.

Peter Carroll and David Noble, *Free and Unfree: A New History of the United States*.

David B. Davis, *The Problem of Slavery in the Age of Revolution*.
32

U. Faulkner, *American Economic History*.

Robert Fogel, *Railroads and American Economic Growth*.

Eric Foner, *America's Black Past*.

John Hope Franklin, *From Slavery to Freedom*.

Gerald N. Grobb and George A. Billias, *Interpretations of American History: Patterns and Perspectives, 2 Vols*.

Richard Hofstadter, *The Age of Reform, From Bryan to FDR* Linda Kerber, *Women's America: Refocusing the Past*.

David M. Potter, *The Impending Crisis*.

W. Pratt, *A History of the United States Foreign Policy*.

James Randail, *The Civil War and Reconstruction*.

J. G. Randall and David Donald, *The Civil War and Reconstruction*.

Kenneth Stampp, *The Peculiar Institution, Slavery in the Antebellum South*.

Federick Jackson Turner, *The Frontier in American History*.

Robert Wiebe, *The Search for Order*.

Lee Benson, *The Concept of Jackson Democracy*.

Ray A. Billington, *Westward Expansion*.

Paul Boyer, Harvard Sitkoff, Nancy Woloch, *The Enduring Vision: A History of the American People, Vols. Land 2*.

Thomas Cochran, *The Inner Revolution*.

A. O. Craven, *The Growth of Southern Nationalism, 1848 - 1861*.

Lance E. Davis (ed.), *American Economic Growth*.

Carl N. Degler, *At Odds: Women and Family in America from the Revolution to the Present*.

Fogel and Engerman? *Time on the Cross-*.

Lewis L. Gould (ed.), *The Progressive Era*.

John D. Hicks, *The Federal Union: A History of USA Since 1865*.

R.P. Kaushik, *Significant Themes in American History*.

David M. Kennedy, Thomas Bailey and Mel Piehl, *The Brief American Pageant*.

Irving Kristol, Gordon Wood and others, *America's Continuing Revolution*.

Richard W. Leopold, *The Growth of American Foreign Policy*.

Perry Miller, *From Colony to Province*.

Gary Nash (ed.), *Retracing the Past*.

Henry Pelling, *American Labor*.

Edward Pessen, *Jacksonian Panorama*.

Charles Sellers, Henry May and Neil McMillen, *A Synopsis of American History; 2 Vols*.

Donald Shiham, *The Making of American History: The Emergence of the Nation, Vols. II & I*.

Dwijendra Tripathi and S.C. Tiwari, *Themes and Perspectives in American History*.

James Weinstein, *The Corporate Ideal in the Liberal state*.

GENERIC ELECTIVE (GE) PAPERS (For non-History students)

(1) HISTORY AND CULTURE OF ODISHA

Unit-I: Socio-political life of Early and Medieval Odisha:

- [1] Kalinga War (261 B.C.) and its significance
- [2] Mahameghavahan Kharavela: His times and achievements
- [3] The Bhauma Karas and The Somavamsis
- [4] The Gangas and The Suryavamsis

Unit-II: Religion, Art and Literature of Early and Medieval Odisha:

- [1] Budhism, Janisim and Sanatana Dharma in Odisha.
- [2] Development of Art and Architecture: Buddhist Art, Temples and Jaina Sculptures
- [3] Evolution and Growth of Odia Language and Literature: Sarala Mohabharata
- [4] Panchasakhas, Sri Chaitanya and Bhakti Movement in Odisha

Unit-III: Political and Economic structure in Medieval Odisha:

- [1] Mughal Administration
- [2] Maratha Administration
- [3] Impact on Odisha's Socio-Economic Condition

Unit-IV: Colonialism in Odisha:

- [1] The Early British Administration: Its Socio-economic impact
- [2] The Odia Identity Movement
- [3] Freedom Struggle in Odisha

Unit-V: Socio-cultural Changes in Modern Odisha:

- [1] Development of Modern Education
- [2] Social Reform Movements in Odisha
- [3] Modern Odia Literature: Radhanath Roy, Phakir Mohan Senapati and Gangadhar Meher

Reading List:

- A. Easchman et al (eds) The Cult of Jagannath and Regional Tradition of Orissa, Manohar, New Delhi, 1978.
- A. K. Mishra, Intellectual Tradition of Orissa, Bhubaneswar, 2006.
- , The Raj, Nationalists and Reforms, Bhubaneswar, 2007.
-, Indian Culture, Science and Technology (with special emphasis on Odisha), 2011.
- B.C. Ray, Orissa under the Mughals
- , Orissa under the Marahatas
- , Foundation of British Orissa
- B.K. Mallik, Medieval Orissa: Literature, Society, Economy, Bhubaneswar, 1996
- , Paradigms of Dissent and Protest: Social Movements in Eastern India (1400-1700 AD Manahar, New Delhi, 2004.

J. Dora, Sakta Monuments of Orissa, A Study of Art, Architecture and Iconography, New Delhi, 2010.

K.C. Mishra, The Cult Jagannath.

M.N. Das (ed) Sidelights on History and Culture of Orissa, Vidyapuri

M. A. Haq, Muslim Administration in Orissa

A.C. Pradhan, A Study of History of Orissa, Bhubaneswar, Panchsheel

K.C. Panigrahi, History of Orissa, Cuttack, Kitab Mahal, First edition, 1981

Chittaranjan Das, A Glimpse into Oriya Literature, Orissa Sahitya Akademi, Bhubaneswar, 1962

K.B. Tripathi, The Evolution of Oriya Language and Script, Utkal University, Bhubaneswar

K.C. Panigrahi, Sarala Dasa, Sahitya Akademi, New Delhi, 1975 Khageswar Mahapatra, (ed), Charyagitika

(2) FREEDOM MOVEMENT IN INDIA

Unit-I: Growth of National Consciousness in 19th century:

[1] Socio-Economic impact of British Rule

[2] Role of Press and Journalism

[3] Formation of Political associations prior to 1885

Unit-II: Nationalism: Trends up to 1919:

[1] Formation of Indian National Congress: Its ideology and Performance

[2] Moderates and Extremists

[3] Swadeshi Movement and its impact

Unit-III: Gandhian nationalism after 1919: Ideas and Movements:

[1] Mahatma Gandhi: Perspectives and Methods

[2] Non- Cooperation, Civil Disobedience, Quit India Movements

[3] Indian National Army (INA) and Subash Chandra Bose

Unit-IV: Communalism and Partition:

[1] Ideologies and practices: Hindu Mahasabha, Muslim League

[2] Partition and Independence

Unit-V: Emergence of a New Nation:

[1] Making of the Constitution

[2] Integration of Princely States

[3] Land Reforms and beginnings of Planning

Reading List:

Judith Brown, Gandhi's rise to Power, 1915-22.

Paul Brass, The Politics of India Since Independence, OUP, 1990.

Bipan Chandra, Nationalism and Colonialism in Modern India, 1979.

Bipan Chandra, Rise and Growth of Economic Nationalism in India.

Mohandas K. Gandhi, An Autobiography or The Story of My Experiments with Truth.

Ranjit Guha, ed., A Subaltern Studies Reader.

Peter Hardy, Muslims of British India.

Mushirul Hasan, ed., India's Partition, Oxford in India Readings.

D.A. Low, ed., Congress and the Raj.

John R. McLane, Indian Nationalism and the Early Congress.

Jawaharlal Nehru, An Autobiography.

Gyanendra Pandey, The Construction of Communalism in colonial north India.

Sumit Sarkar, Modern India, 1885-1947. Anil

Seal, Emergence of Indian Nationalism.
 Ram Lakhan Shukla (ed.), Adhunik Bharat ka Itihas.
 Eleanor Zelliot, From Untouchable to Dalit: Essays on the Ambedkar Movement.
 Judith Brown, Gandhi: (et al) A Prisoner of Hope.
 Bipan Chandra, Communalism in Modern India, 2nd ed., 1987. Bipan Chandra, K.N. Panikkar, Mridula Mukherjee, Sucheta Mahajan and Aditya Mukherjee, India's, Struggles for Independence.
 A.R. Desai, Social Background of Indian Nationalism.
 A.R. Desai, Peasant Struggles in India.
 Francine Frankel, India's Political Economy, 1947-77. Ranajit Guha, and G.C. Spivak, eds. Select Subaltern Studies.
 Charles Heimsath, Indian Nationalism and Hindu Social Reform.
 F. Hutchins, Illusion of Permanence.
 F. Hutchins, Spontaneous Revolution.
 V.C. Joshi (ed.), Rammohan Roy and the process of Modernization in India.
 J.Krishnamurti, Women in Colonial India

(3) MAKING OF CONTEMPORARY INDIA

Unit-I: Towards Independence and Emergence of the New State :

Government of India Act 1935; Working of the GOI Act; Negotiations for Independence

and Popular Movements; Partition: Riots and Rehabilitation

Unit-II: Making of the Republic -The Constituent Assembly:

Drafting of the Constitution, Integration of Princely States

Unit-III: Indian Democracy at Work c1950- 1970s:

Language, Region, Caste and Religion; Electoral Politics and the Changing Party System;

Regional Experiences, India and the World (Non Aligned Movement)

Unit-IV: Economy c 1950-1970s:

The Land Question, Planning and Economy, Industry and Labour

Unit-V: Society and Culture c 1950-1970s:

The Women's Question: Movements and Legislation

Cultural Trends: Education, Institutions and Ideas, Science, Literature, Media, Arts

Reading List:

Granville Austin, Indian Constitution: Cornerstone of a Nation, New Edition, OUP, 2011

Francine Frankel, India's Political Economy, 1947-2004, New Delhi: Oxford University Press, 2006.

Paul Brass, The Politics of India Since Independence, Cambridge: Cambridge University Press, 1994.

Ram Chandra Guha, India after Gandhi: The History of the World's Largest Democracy, New Delhi: Picador, 2007

Bipan Chandra, et al (ed) India after Independence, New Delhi: Penguin Books, 1999

Appadurai, Domestic Roots of India's Foreign Policy 1947-1972. New Delhi: Oxford University Press, 1979.

Rajni Kothari, Politics in India, New Delhi: Orient Longman,1970.
Joya Chatterji, The Spoils of Partition: Bengal and India, 1947-67,
Cambridge: Cambridge University Press, 2007.
Sunil Khilnani, The Idea of India, Penguin Books, New Delhi, 2004

(4) ISSUES IN THE CONTEMPORARY WORLD

Unit-I: Colonialism and Nationalism: Social Transformation after the Second World War; United Nations and UNESCO; NAM, Cold War: the character of Communist States

Unit-II: Perspectives on Development and

Underdevelopment: Globalization and Liberalization--Impact

Unit-III:Social Movements in the North and the South:

Feminist & Human Rights issues

Unit-IV:Ecological Movements: Recent Issues and Developments

Unit-V: Modernity and Cultural Transformation: Emerging trends in Culture, Media and

Consumption

Reading List:

E.J. Hobsbawm, The Age of Extremes, 1914 – 1991, New York: Vintage, 1996

Carter V. Findley and John Rothay, Twentieth-Century World,Boston: Houghton-Mifflin, 5th ed.,2003.

Norman Lowe, Mastering Modern World History, London: Palgrave Macmillan, 1997

Mark Mazower, The Balkans: A Short History [especially chap.

4], New York: Modern Library, 2000: paperback, 2002

Basil Davidson, Modern Africa: A Social and Political History, 3d edn. London / New Jersey: Addison – Wesley, 1995

I, Rigoberta Menchu, An India Woman in Guatemala [Memoir of

1992 Nobel Peace Prize Winner, London: Verso.1987 {Hindi translation available}

Jonathan Spence, The Gate of Heavenly Peace: The Chinese and Their Revolution, 1895 – 1980, Penguin, 1982

SYLLABUS FOR B.A. (HONORS) ODIA UNDER CHOICE
BASED CREDIT SYSTEM OF UTKAL
UNIVERSITY, BHUBANESWAR

ଓଡ଼ିଆ ଭାଷା ଶିକ୍ଷା ଉନ୍ନତୀକରଣ କର୍ମସୂଚୀ

Ability Enhancement Compulsory Course (AECC)

ଓଡ଼ିଆ ଭାଷା ଶିକ୍ଷା ଉନ୍ନତୀକରଣ କର୍ମସୂଚୀ-୧

MIL Communications-Odia

ଓଡ଼ିଆ ଭାଷା ଶିକ୍ଷା ଉନ୍ନତୀକରଣ କର୍ମସୂଚୀ-୧, ଓଡ଼ିଆ ଭାଷା ଶିକ୍ଷା ଉନ୍ନତୀକରଣ କର୍ମସୂଚୀ-୧, ଓଡ଼ିଆ ଭାଷା ଶିକ୍ଷା ଉନ୍ନତୀକରଣ କର୍ମସୂଚୀ-୧

ଓଡ଼ିଆ ଭାଷା ଶିକ୍ଷା ଉନ୍ନତୀକରଣ କର୍ମସୂଚୀ-୧

ଓଡ଼ିଆ ଭାଷା ଶିକ୍ଷା ଉନ୍ନତୀକରଣ କର୍ମସୂଚୀ-୧, ଓଡ଼ିଆ ଭାଷା ଶିକ୍ଷା ଉନ୍ନତୀକରଣ କର୍ମସୂଚୀ-୧, ଓଡ଼ିଆ ଭାଷା ଶିକ୍ଷା ଉନ୍ନତୀକରଣ କର୍ମସୂଚୀ-୧

(Credits-2, total classes-20, one period-1 hours, course-II, Full Marks-50)

* ଓଡ଼ିଆ ଭାଷା ଶିକ୍ଷା ଉନ୍ନତୀକରଣ କର୍ମସୂଚୀ-୧:

Gjò _ûVýLiWÿûUò _i! | @ûiÚûbòðK (CBCS / iòàòìòGip) _ûVý _âYûkú @^êiûùe _âÊêZ ùjûAQòö aòbò^Û Éeùe @ûagýK @^êiûùe iciûcdòK _eòìÚòZòKê ù^A búaaò^òcd | _ûeÆeòK ù~ûMûù~ûM iÚû^ Kò_eò IWÿò@û bûhûùe ijRùe, iekùe | @û^!ùe ùjûA_ûeòà- G \òM _âZò G[òùe xû^ \ò@û~ûAQòö IWÿò@û bûhû | iûjòZýe i\ýZc _âûùdûMòK mû^e aòKûg ^òcòð +3 Éeúd aò\ýû[ðúuê Gòj _ûVýKâce LiWÿûUò iûjû~ý Keòàö ùi[ò_ûAñ _âPkòZ aòKûg ^òcòð +3 Éeúd aò\ýû[ðúuê Gjò _ûVýKâce LiWÿûUò iûjû~ý Keòàö ùi[ò_ûAñ _âPkòZ bûhûe ùa÷dûKeYòK, ayúajûeòK | _âûùdûMòK \òM _âZò G[òùe xû^ \ò@û~ûAQòö G[òùe iòû~ûM _âKòâdûee @^êaò]ò, ù~ûMûù~ûMe Z[ý | Zðß _âZò MéeêZß \ò@û~ûAQòö Gjû aò\ýû[òðu búaaò^òcdûcòK \IZú aeìòùe ijû~ý Keòàö ùicûù^ gêj | _eòz^Û búauè ù~ùKøYìò _âKûe mû^e ìP^û Z[ý | iòjû«Kê ùcûLòK | fòLòZ Éeùe ijRùe _âKûg Keò_ûeòà Gaõ ùicû^u cûZébûhûe aòKûg NUò_ûeòàö

G[òùe _ûVý-1 / _ûVý-2 / _ûVý-3 / _ûVý-4 / _ûVý-5 / _ûVý-6 / _ûVý-7 Gjò_eò iûZùMûUò Z[ý, ìP^û | @û«aòð\ýûcìkK iòû~ûM _ûV ejòQòö aò\ýû[ðú ùicû^u eêPò | cêq _i! @^êiûùe ù~ ùKøYìò \êAUòKê aûQò ù^A_ûeòàö _â[c Zòù^ûUòeê ùMûUòG _â[c _~ðýûde (1c ùicòÁûe) | ùgh PûùeûUòeê ùMûUòG \ßòZúd _~ðýûd (2d ùicòÁûe) _ûAñ

aúQòùäö

cífýûu^ aòbûR^ _jZò :

- (K) _ûVe _âùZýK GKKeê (dê^òUþ) ùMûUòG ùMûUòG Keò ùcûU 4Uò
 \úNđ_âgÛ _Wÿòäö 600eê 700 g± cæùe 2Uòe C?e ù\âûKê ùjaö
 (2"12=24)
- (L) _ûVe _âùZýK GKKeê 4Uò iöìò¯ _âgÛ _Wÿòäö 2Uòe C?e 200eê 300 g±
 cæùe ù\âûKê ùja (2"8=16)
- (M) _ûVe _âùZýK GKKeê 2Uò ùfLûG 8Uò @Zò iöìò¯ _âgÛ @ûiòäö aò\ýû[đú
 ùMûUòG aûKýùe 5Uòe C?e ù\ùäö (2"5=10)
 ùcûU ^'e / cífýûu - 50ö

iaòùgh _ûVý

ù~ûMûù~ûMcikK cûZébûhû-IWÿò@û (AECC)

ù~ùKøYìò 2Uò _ûV aûQ

Elective-Any Two

_â[c _~đýûd / 1st SEMESTER

ûVý-1 / Course-3: aòmû ^ Kkû I bûhû-iûjòZý

1c GKK : aòmû_ ^e _eòbûhû, _eòie, _âKû~đý

2d GKK : aòmû_ ^e KkûcôK Cùÿgý

3d GKK : aòmû_ ^e _âKûe I _âÉêZò

4[đ GKK : ùfûK iö_Kđ-aòmû_ ^ I aòmû_ ^e bûhû

5c GKK : aòmû_ ^ Kkû I iûjòZý

iöaû\, bûhû I iûjòZý

_ûVý-2 / Course-5

1. íû\e _eòbûhû I _eòie

2. íû\e _âKûe I C_ù~ûMòZû

3. MYcûæc]cđú iöaû\ _âÉêZò

4. eì_KûcôK `òPe É,eP^û, iµû\Kúd

5. iöaû\ I iûjòZý, íû\e bûhû

gévkuùK÷!òâK Azû]ú^ _ûV-IWÿò@û

(ù~ùKøYiò 4Uò aûQòaûKê ùja)

DISCIPLINE SPECIFIC (CENTRIC) ELECTIVE-ODIA (ANY FOUR)

- * ahđûjđ ~đýûd - 5c I 6Â (Semester-V, VI)
- * ahđûj ~đýûd-5c (Semester-V) _â[c I \βòZúd _Zâ100+100=200 ^'e
- * ahđûj ~đýûd-6Â (Semester-VI) ZÉZúd _Zâ
20 ^'e @û«ü _eúlû / 80 ^'e cêLý _eúlû) 100 ^'e
- * PZê[đ _Zâ - _âKì _âÉÊZò (hÂ ~đýûd / Semester-VI
(75 ^'e _âKì ùfLû + 25 ^'e iûlûZKûe) 100 ^'e
ùcûU 400 ^'e
- * ùcûU @ûiÚûcìfýûu (Total Credits) 6 " 4 = 24
- * cìfýûu I _âgÛ_Zâ aòbûR^ ^òdc : _â[c Zòù^ûUò _Zâ _âùZýK 100 ^'e
aògòÁö 80 ^'e cêLý _eúlû I 20 ^'e @û«ü _eúlûö @û«ü _eúlûe 20 ^'e
_âgÛ @Zò iöìò`cìkK ùjaû CPòZpö G cêLý _eúlû 80 ^'e Gjûe aòbûR^
^òdc ùjCQò-
- (K) _âùZýK _Zâe _âùZýK (5Uò~ûK) GKKeê ùMûUòG ùfLûGñ ùcûU 5Uò
_âgÛ _Wòàö aò\ýû[đúuê _i! @^êiûùe 600 eê 700 g±ùe 3Uò _âgÛe
C☑e ù\àûKê ùjaö ùcûU cìfýûu- 3 " 12=36ö
- (L) _âùZýK _Zâe _âùZýK (5Uò~ûK) GKKeê iöìò` ùaû]mû^cìkK 5Uò _âgÛ
_Wòàö Zòù^ûUòe C☑e 400 g± cæùe ù\àûKê ùjaö cìfýûu aòbûR^
3"8=24ö
- (M) _âùZýK _Zâe 5Uò~ûK GKKeê ùcûU 15ùMûUò _âgÛ @ûiòàö 10Uò
_âgÛe iöìò` C☑e 50Uò g± @[aû 2Uò aûKý cæùe ù\àûKê ùjaö 10 "2=20ö
- * bìcòKû (_òdû`f) : Gjò _ûVýKâcUò aò\ýû[đúcû^uê IWÿògûe iûöÄÉZòK,
iûcûRòK I eûR^úZòK AZòjûie aòa☑đ^ aòhdùe mû^ @ûjeY _ûAñ
iêù~ûM ù\àö IWÿò@û iûjòZýùe icûR I iöÄÉZòe _âZò`k^, iûjòZýZ☑β,
iRđ^gúkZû, bûhòK gévkû, iûjòZýe aòaò]Zû, iûjòZý g±ùKûh, fòL^ ùKøgk,
ùKûhMâ^Úû\ò iµû\^û I _âPkòZ bûhûe ayûKeY, Kûö_êUeòK ùKøgk
aò\ýû gòIY AZýû\ò \òMKê æû^ \ò@û~ûA G _ûVýKâcUò _âÉÊZ
ùjûAQöö
Gjò _ûVýKâcùe ùcûU 13ùMûUò _ûV @Qòö aò\ýû[đú ^òÿòđÁ gévkûe
aò\ýû bûaùe ù~ùKøYiò PûùeûUò _ûVKê aûQò_ùeòùàö G[ôcæê
ùMûUòG _ûVKê @û]ûe Keò Zû' ijòZ @^ý aò\ýûKê iöù~ûM Keò hÂ

_~đýûd (ùicòÁe-6) _eúlû ùakKê _âKì Kû~đýUòG ùfLò 50 _éÂû cxùe
_âÉÊZ Keòau ùjuaö _âKìUò 4[đ _Zâ bûaùe aòuaPòZ ùjaö
aòugh \âÁáy : _â[c \éAUò _Zâ 1eê 8 iõLýK _ûVeê aQû~òao Zézúd _Zâ 9eê
iõLýK _ûVeê aQû~òao

iaòùgh _ûVýKâc

ùcûU 13 ùMûUò _ûV: 4Uò aûQòua

_Zâ iõLýû- 4

_âùZýK _Zâ- 100^'e (20 ^'e @û«ü _eúlû + 80^'e @«òc cêLý _eúlû)

@ûiÚû - cìfýûu = 6"4 = 24

_âùZýK _Zâ _ûAñ 40Uò _òeòdWp, _âZò _òeòdWp - 1N?û

ahđûiđ _~đýûd- 5/6 (ùicòÁe)

_ûVý-1: IWÿògûe iûđĂézòK AZòjûi | IWÿò@û iûjòZý (@ûiÚûcìfýûu 4+2=6)

1c GKK: IWÿògûe iõlò̄ AZòjûi | IWâ RûZòe HZòjý Gaõ ùa÷gòÁýö

2d GKK: IWÿògûe iõĂézò (iõùl_ùe Kkû, aûYòRý, ice, gâúRM^Ûû[iõĂézò)ö

3d GKK: IWÿògûe aòbò^Û lcđe aòKûg | Zûle iûjòZòýK _âZò`k^ (iûeûõg
mû^bò?òK)ö

4[đ GKK: ùaøj iõĂézò | P~đýû_ \, IWÿògûe iûcûRòK | iûđĂézòK AZòjûiùe
i~đýaõg | IWÿò@û iûjòZýö

5c GKK: IWÿò@û iûjòZýùe Mûşòau\ú Pò«û]ûeûö

_ûVý-2: iûjòZý Z?ß | iûjòZý _eòbûhû

1c GKK: eúzò, iòjû« ùeûcû?òK Pò«û]ûeû, aòNU^aû\ (_âûPý-_û½ûZý
aòPûeùe)

2d GKK: iRđ^gúkZû (_âûPý-_û½ûZý \éÁòbwúùe)

3d GKK: \kòZ iûjòZý | Zêk^ûcòK iûjòZý(_eòbûhû | C_ù~ûMòZû)

4[đ GKK: @ûbûi Mì, @Yê _ZâòKû, PòZâKì, c^Éû?ßòK C_^ýûi, cêq]ûeùe
^ûUK, _âûùdûMòK icûùfûP^ûö

5c GKK: @bò]û^ _âÉÊZòKkû | @şd^/iûjòZý g±ùKûh MV^ aò]òö

_ûVý-3: K[ûiûjòZý @şd^

1c GKK: @ia%õđ(\kòZ C_^ýûi)- aòbìZò _...^ûdK

2d GKK: céZêý egàò (ùà÷mû^òK C_^ýûi)-ùMûKêkû^! cjû_ûZâ
 3d GKK: \lòYûa[đ (_âûùdûMòK C_^ýûi)- gû«^ê Kêcûe @ûPû~đý
 4[đ GKK: ceûke céZêý (_â[c 3Uò Mì)- iêue!â cjû«ò
 5c GKK: lê\âMì @xd^ (Mì gzû±úe)- iõKk^ ù\áu _âi^Û _...^ûdK, iõMc
 _aæòùKg^, aâjà_êe
 _ûVý Mì: cgûYòe `êf- iyò\û^! eûCZeûd
 Wòcòeò`êf- @Lòk ùcûj^ _...^ûdK
 cêLû- Ké¾ _âiû\ cògâ
 e^ôûKe- eaò _...^ûdK

_ûVý-4: ^ûUK I GKûuòKû @xd^ DSE III

1c GKK: @bò~û^ - KûkúPeY _...^ûdK
 2d GKK: aû^_âiÚ- aòRd cògâ
 3d GKK: aòZKđòZ @_eûjÛ- cù^ûeõR^ \ûi
 4[đ GKK: @[P PûYKý- e^ôKûe PA^ò
 5c GKK: GKûuòZû:
 _ûV: @kò_êeùe ^òùKûfûi- ùMû_ûk ùQûUeûd
 _âùag _âiÚû^ - aògßRòZp \ûi
 eûÉû ^ûjó- ^úkû\âò bìhY jeòP!^

_ûVý-5: IWÿò@û Kûaý-KaòZû @xd^ DSE I

1c GKK: M\û_ađ- iûekû \ûi
 2d GKK: ù_âciê]û^ò]ô (1c I 14g Qû!)- Cù_!â b-
 3d GKK: _gê_lúe Kûaý (_â[c Zòù^ûUò Mû[ûKaòZû)- eû]ûùcûj^ MWÿ^ûdK
 4[đ GKK: _âûPú^ cæKûkú^ KaòZû- _âûPú iûjòZý _âZòÂû^, KUK
 _ûVý KaòZû: bâce PòUûC- \ú^aşê eûRjeòP!^
 c^ùaû] PCZògû- bqPeY \ûi
 aûecûiú ùKûAfò- gue \ûi
 PKû^d^ ùj- cû]aú \ûiú
 5c GKK: @û]ê^òK KaòZû- KaòZû Pd^/iµû\^û- C}k aògßaò\ýûkd
 _ûVý KaòZû: K[êKòe bûa^û- eû]û^û[eûd
 a!úúe iûõæ @^êPò«û- ùMû_aşê \ûg
 ~ûZâû iwúZ- ùa÷KêY× ^û[_...^ûdK
 _âbûZ @aKûg- ^!Kòùgûe ak

icê\â I cêñ- ùiøbûMý Kêcûe cògâ

_ûVý-6/M\ý iûjòZý @xd^

1c GKK: cû\kû_û-ò- ~ûZò ùKgeú I @^wbúc ù\â- _âûPú^ M\ý _\ýû\gð-
IWÿògû iûjòZý GKûùWcú

2d GKK: IWÿò@û ecýeP^û
_ûVý _âiw: aUê@û- ùMûaò! Zâò_ûVúd
Az«ò\û_òùK- ùa÷¾a PeY iûcf
bêf- bêaù^gße ùaùjeû

3d GKK: Rúa^iáZò(1-20 _éÂû) ^ûeûdY aúeae iûc«, Mâ^Úc!òe

4[ð GKK: ù\ùgù\ùg (_â[c 3Uò _ûV)- aûeòÁe ùMûaò! \ûi

5c GKK: iRð^gúk _âa§- _âa§ Pd^, C}k aògßaò\ýûkd

_ûVý _âiw: @^« ù_âc- aògß^û[Ke
aògß bûZéZß- e^ôûKe _Zò
icûRaû\ú cû^aòKZû- eû]û^û[e[
Êû]ú^Zûe ^iZ^ cìfýùau]- ùMûùfûK aòjûeú]k

_ûVý- 7: IWÿò@û bûhû I aýûajûeòK aýûKeY

1c GKK: IWÿò@û bûhûe ùcøkòK ùa÷gòÁý I HZòjûiòK aòa[ð^

2d GKK: IWÿò@û]ß^ò I a%oðcûkû

3d GKK: IWÿò@û g± aòba (@û[òkòK I ù\gR)

4[ð GKK: IWÿò@û g± MV^aò]ô (eì_òcZ[ß/Êeaý-^ iõù~ûM aò]ô/_âZýd
iõù~ûM)

5c GKK: I^ò@û eìXòe MV^ I _âùdûM

_ûVý-8: iûjòZý fòL^ Kkû DSE II

1c GKK: _âa§ fòL^ Kkû

2d GKK: KaòZû fòL^ Kkû

3d GKK: ^ûUK eP^û I c[C_iÚû_ ^ Kkû

4[ð GKK: lê\âMì eP^û Kkû

5c GKK: ù~ùKøYiò KaòZûe _âùdûMòK @ûùfûP^û

(_ûV\û^ icdùe gòIKcûù^ ù~ùKøYiò 3Uò KaòZû ^cê^û eìù_ C_iÚû_ ^ Keò
ùfLK I ùfLûe ^ûc ^ù\A aò\ýû[ðú ^òùR ZûjûKê Kò_eò aêSò _âùdûMòK
\òMeê aýûLýû KeêQ«ò ZûjûKê ^òeì_Y Keòuaö _âùdûMòK icûùfûP^û

_jZòKê G ùlZâùe @^êieY Keû~òäö)

_ûVý-9: IWÿò@û bûhûe Kõ_êýUeòK áyájûe

1c GKK: Kõ_êUee _eòbûhû I C_ù~ûMòZû

2d GKK: ì`Up ùlßdûee I jûWðùlßdûe Kõ_êUe- _âKû~ðý

3d GKK: IWÿò@û bûhûe Kõ_êýUeúKeY- IWÿò@û `ãUip, Kò-ùâûWð,
Kõ_êýUeòK g± _âKâòdû, a^û^ I áyûKeY ~ûõPK _âKòâdû

4[ð GKK: IWÿò@ûèe AõUeù^U áyájûee àòàò] \òM

5c GKK : IWÿò@û iûcûRòK ùlßâpiûAUipip

_ûVý-10 / Course-10 : IWÿò@û ùfûKiûjòZý DSC-III

1c GKK : ùfûKaò\ýû I ùfûKiûjòZý (iõmû, Êei_, _eòie)

2d GKK : IWÿò@û ùfûKMúz

3d GKK : IWÿò@û ùfûKKûjûYú I R^gîZò

4[ð GKK : IWÿò@û ùfûK ^ûUK

5c GKK : _âaû\, _âaP^, ^ñû\ò@û, eêXÿò, ùfûKûPûeúd (gKê^ àògßûi)

_ûVý-11 / Course-11 : IWÿò@û iûjòZýe AZòjûi

1c GKK : IWÿò@û iûjòZýee AZòjûi (AZòjûi I iûjòZýe AZòjûi, IWÿò@û iûjòZýe
AZòjûi eP^û]ûeû, ~êM aòbûMúKeY)

2d GKK : IWÿò@û @^êaû\ iûjòZýe AZòjûi

3d GKK : IWÿò@û _âa§ iûjòZýe AZòjûi

4[ð GKK : IWÿò@û _\ý iûjòZýe AZòjûi

5c GKK : IWÿò@û K[ûiûjòZý I ^ûUý iûjòZýe AZòjûi

_ûVý-12 / Course-12 : gûÈúd IWÿò@û bûhûe @û`òìòK _âudûM

1c GKK : bûhû-eûRbûhû, _âgûi^òK bûhû Gaõ IWÿò@û bûhûe eûRbûhû
bûaùe _âPkòZ ùjaùe AZòjûi, gûÈúd bûhû bûaùe IWÿò@û bûhûe
ùa÷gòÁýö

2d GKK : ^[úKeY _âKòâdûö

3d GKK : ieKûeú _Zâ, @û`òìòK áyqòMZ _Zâ, aûYòRòýK _Zâ, ùNûhYû _Zâö

4[ð GKK : @]ôìP^û, aòm^-ò, mû_^ I mû_^úd, aòaeYú fòL^, _âgûi^òK
g±ùKûhe bìcòKûö

5c GKK : PòVû, LiWÿû, \fòfp _âÉêZúKeY, ùa÷VKú _âÉûa I @^êùcû\^

_âKòâdûö

ijûdk Mâ^ÚîPú

1. _âúPú^ ù_ú[ô gèi iö_ú\^ú _jZò | @^êaú\ ùKøgk-...^ûdk, @ûgêùZûh, bêaù^gße
2. fò_òe KµêUe gòlû - _eòWû eùcg P!â, aò\ýú_êeú, KUK
3. ùcøkòK KµêUe gòlû - cògâ ù\aKû«, ù`âŠip _aägđip, KUK
4. IWÿò@û _âa§ iûjòZýe AZòjûi - Ke aûCeúa§ê, ù`âŠip _aäögđip, KUK
5. K[û iûjòZýe Kkû | KûeòMeú - \ûi KòùgûeúPeY, AÁ%ođ ùcWò@û, bêaù^gße
6. IWÿògûe iûöÄézòK AZòjûi - cògâ _âuaû] Kêcûe, aò\ýú_êeú
7. IWÿò@û iûjòZýe @û\ò_ađ - cjû«ò iêùe!â
8. IWÿò@û iûjòZýe AZòjûi - _...^ûdk _VûYò, ^ûf!û
9. IWÿò@û iûjòZýùKûh - aògßûk aögú]e, jòcûöggê _âKûg^, KUK
10. Rúa^ú iûjòZý ùK @æd^ - IWÿògû eûRý _ûVý _êÉK _âYd^ | _âKûg^ iõiÚû, bêaù^gße
11. _âûùdûMòK IWÿò@û bûhû - IWÿògû eûRý _ûVý _êÉK _âYd^ | _âKûg^ iõiÚû, bêaù^gße
12. IWÿò@û iûjòZýe iûcûRòK iûöÄézòK AZòjûi - \ûi PòZeöR^, IWÿògû eûRý _ûVý _êÉK _âYd^ | _âKûg^ iõiÚû, bêaù^gße
13. aòcgđ aòMâj - Zòâ_ûVú iù«ûh, ù`âŠip _aäögđi, KUK
14. iûjòZýe îPú_Zâ - _...^ûdk aòbìZò, ^ûf!û, KUK
15. IWÿò@û a%ođcûkû - UòKûdZ, ùK÷kûi P!â, _êeú
16. iûjòZýe Wûk_Zâ - iûcf ùa÷¾a PeY
17. iûjòZýe eì_ùeL - jeòP!^ ^úkû\òâ bìhY
18. _âPkòZ IWÿò@û bûhûe aýûKeY - cjû_ûZâ aòRd _âiû\, aò\ýú_êeú
19. iöù~ûM @^êaò]ô - Zòâ_ûVú iù«ûh, ^ûf!û, KUK

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 C}k aògßaò\ýûkd

_i! | @ûiÚûbòZòK _ûVýLiWÿû : iÛûZK (IWÿò@û i'û^) 2015-16

_â]û^ _ûVýûögg- Core Course

ùcûU _Zâ iöLýû-14

_âùZýK _Zâ - 100 cìfýûu aògòÁ (20 ^'e cjûaò\ýûkd Éeúd @û«ü _~đýûd _eúlû +k 80 aògßaò\ýûkd Éeúd cû^K @«òc _eúlû)

- i¹û[^] : RùY iÛûZK - i¹û[^]e (@[^]ið) aò\ýû[ðú - ùcûUþ 1400 [^]ee _eúlû ù\ùäö
- (K) @Zò Kcpùe (ùcûUþ) 50Uò Kû~ðý [^]òNððU (_òeòdWþ)ùe ùMûUòG
_Zâe _ûV\û[^] ùgh ùjaö ùMûUòG Kû~ðý [^]òNððU aû _òeòdWþ-60
cò[^]òUþ aû 1 NðUû)
- (L) _âùZýK _Zâ 5ùMûUò dê[^]òUþ / GKK / C_ûðgùe aòbq ùjûAQòö
- (M) _âùZýK _Zâ 6 @ûiÛûbòZòK Kû~ðý [^]òNðð (4+2 ùKâWòUþ) _ûAùäö
ùMûUòG @ûiÛûbòZòK Kû~ðý [^]òNððUe cjZß ùjCQò- 10 _òeòdWþ ijòZ
icû[^]ö
ùcûU 14 ùMûUò i¹û[^] _Zâe @ûiÛûcífýûu (ùKâWòUþ) ùjCQò - 14 " 6
(4+2)= 84ö G[ôcxeê 14 " 4 = 56 ZûZßòK _ûV (Theory) Gað 14 " 2 = 28
ÊKúd ùgâYú ùaû]K _ûV (Tutorial) ijòZ RWòZö
- (N) _eúlû _~ðýûdKâc (Semester) | _âÉûaòZ _ûV ù~ûR[^]û :
- (O) aò\ýû[ðú^{cû^}u Êû]ú[^] cêq ùc]ûaéZò _eúlû _ûAñ ùicû[^]u _i| |
ùaû]mû[^]cikK \úNð iðlò⁻, @Zò iðlò⁻ _eúlû [^]òcù« C_iÛû[^]û Keû~òäö
- (P) [^]e / cìkýûu aòbûR[^] _jZò :
1. _âùZýK _â]û[^] _ûVýûðg aû _âùZýK _Zâ - 100 [^]e aògòÁ
 2. cjûaò\ýûkdÉeúd @û«ü _eúlû - 20 [^]e
aògßaò\ýûkdÉeúd cêLý @û«ü _eúlû - 80 [^]e
 3. aògßaò\ýûkdÉeúd cêLý _eúlûùe [^]òcÛcùZ _âgÛ _Wÿòä:
- (K) _âùZýK _Zâe _âùZýK GKKeê 5Uò \úNð _âgÛ _Wÿòäö aò\ýû[ðú 3Uò
_âgÛe Cûe 600 eê 700Uò g± cæùe ù\ùäö (3"12=36 [^]e)
- (L) _âùZýK _Zâe _âùZýK GKKeê 5Uò iðlò⁻ _âgÛ _Wÿòäö aò\ýû[ðú 3Uò
_âgÛe CZe 300 g± cæùe ù\ùäö (3"8=24)
- (M) ùcûU 5ùMûUò iðlò⁻ _âgÛ _âùZýK GKKeê @û]ûe Keò _Wÿòäö 3Uò
_âgÛe CZe aò\ýû[ðú 50 g± cæùe ù\ùäö (3"5=15)
- (N) 8Uò @Zò iðlò⁻ _âgÛ _Wÿòäö aò\ýû[ðú 5Uòe CZe ùMûUòG g±ùe @[aû
ùMûUòG aûKýùe ù\ùäö (5"1=5)

_ûV bìcòKû (_òâd'k)

iÛûZK ùgâYúùe IWÿò@û bûhû | iûjòZý í'súd _ûV\û[^] [^]òcù« Gjò
_ûVýKâce LiWÿûUò _âÉêZ ùjûAQòö Gjûe _âÉêZò ùlZâùe aògßaò\ýûkd
@ûùdûMu _âùùdûRòZ " _i| | @ûiÛûbòZòK [^]iZ[^] _ûVýaò[^]ýûi _jZò"Kê
MâjY Keû~ûûAQòö Gjò _ûVýLiWÿûUò i\ýZc bûhû iûjòZý í'súd mû[^]

aýaiÚû I Pk«ú icdùe C_ù~ûMòZûKê Pûjó _âÉÊZ ùjûAQòö \êAgj ahðe
 IWÿò@û bûhûe Cù^àh, àòKûg]ûeû ijòZ Gjûe iûõ_âZòK iUòZò,
 aýûKeYbòZòK I bûhûZûZßòK ùa÷gòÁý iõ_Kðùe àò\ýû[ðúcû^ue iaòùgh
]ûeYû Gjò _ûVýKâceê còkò_ûeêQòö G[ôijòZ IWÿò@û bûhûe fòLòZ
 IWÿò@û iûjòZýe _âûd 1200 ahðe iûjòZòýK àòKûg]ûeû àòhdùe
 àò\ýû[ðúcû^ue]ûeYû ^ò½òZ iKûeûcòK ùjûA_ûeòa G[ô_âZò xû^
 \ò@û~ûAQòö IWÿò@û iûjòZýe aýûajûeòK _âùdûR^ I cjZß _âZò xû^
 G[òùe \ò@û~ûAQòö IWÿò@û iûjòZýe àòàò] iûjòZòýK _âûei_, àòbò^Ü
 icde iûjòZý-]ûeû I àògòÁ iûjòZý-ùfLKu cìk_ûV ijòZ àò\ýû[ðúuê
 ù~ûWÿòù\âuùe _ûVýLiWÿûUò i`k ùjCQòö IWÿò@û bûhû I iûjòZýKê
 iaðbûeZúd bûhû iûjòZý ijòZ ù~ûWÿò ù\âuKê I @û«RðûZúd iûjòZý
 àò\ýû @^êKìk Keò àòPûe KeòâuKê Gjò LiWÿûUò àò\ýû[ðúu C_ù~ûMú
 ùjûA_ûeêQòö LiWÿûUòKê ùcûU 14ùMûUò _Zâùe I _âùZýK _ZâKê 5Uò
 ùfLûGñ GKK aû C_ûõgùe àòbq Keû~ûAQòö
 àòùgh \âÁáy : +3 i¹û^ (@^ið) ùgâYú ^òcòZ _âÉÊZ Gjò _ûVýKâce 14ùMûUò
 _ûV / _Zâeê ùgh \êAUòKê KûUò\ò@û~ûA iû]ûeY +3 Azû]ú^ (B.A
 Programme) ùgâYú _ûAñ _â]û^ _ûVýûõg eìù__âPk^ Keû~òàö @^êei_
 bûaùe Cbùd SEC / DSE icû^ bûaùe @^ý i¹û^ I Azû]ú^ (B.A. Honours /
 Pass) àò\ýû[ðú _â\Z _ûVýKâc @^êiùe @û«ügevku àò\ýZû bûaùe
 aûQò_ûeòàö

iaòùgh _ûVýKâc (Detail Syllabus)

â[c~ðýûd (Semester-1)

cìk_ûV : **IWÿò@û iûjòZýe AZòjûi**

_â]û^ _ûVýûõg-1 (Core Course-1): **IWÿò@û iûjòZýe AZòjûi** (i`ceê ùhûWÿg
 gZû±ú_~ðý«)

1c GKK / dê^òUþ-1 : _âûKþ-iûekû iûjòZý (P~ðýûMúz, ^û[iûjòZý)

2d GKK / dê^òUþ-2 : iûekû iûjòZý (iûekû \ûiu eP^ûi,ûe I ùiiaêe iûjòZòýK,
 iûcûRòK I iûõÄézòK ùa÷gòÁý)

3/ GKK / dê^òUþ-3 : _õPiLû iûjòZýe _éÂbìcò I ùfLK (akeûc RM^Üû[)

4[ð GKK / dê^òUþ-4 : _õPiLû iûjòZýe ùa÷gòÁý

5c GKK / dê^òUþ-5 : _õPiLû iûjòZýe iûcûRòK I iûõÄézòK @ûùa\^

_â]û^ _ûVýûõg-2 (Core Course-2: **ç~êMúd IWÿò@û iûjòZýe AZòjûi**

- 1c GKK / dê^òUþ-1 : cœ~êMúd / IWÿò@û iûjòZýe _éÂbìcò I aòKûg]ûeû
- 2d GKK / dê^òUþ-2 : cœ~êMúd / IWÿò@û iûjòZý (@ûLýûdòKû Kûáy, _êeûYgòâZ, ùa÷¾a Kûáy)
- 3d GKK / dê^òUþ-3 : cœ~êMúd Kûáyê @ûwòK ùa÷PòZâý (@ûkuêeòKZû, iûwúZòKZû, eúZòùa÷PòZâý)
- 4[ð GKK / dê^òUþ-4 : cœ~êMúd Kûáyê @ûcòK ùa÷PòZâý (eiùPZ^û, aòhdaÉê aò^ýûi, PeòZâPòZâY)
- 5c GKK / dê^òUþ-5 : cœ~êMúd MúZòKûáy _eõ_eû (Põ_ì, PC_\ú, PCZògû)

\βòZúd _~đýûd (Semester-II)

_â]û^ _ûVýûõg-3 (Core Course-3): @û]ê^òK IWÿò@û iûjòZý

ZéZúd _Zâ

- 1c GKK / dê^òUþ-1 : @û]ê^òK IWÿò@û iûjòZýe _éÂbìcò I ^aRûMeYe bìcòKû
- 2d GKK / dê^òUþ-2 : _âûKþ @û]ê^òK Kûke IWÿò@û Kûáy KaòZû I K[ûiûjòZý
- 3d GKK / dê^òUþ-3 : IWÿò@û iûjòZýùe izýaû\ú]ûeû
- 4[ð GKK / dê^òUþ-4 : IWÿò@û iûjòZýùe iaêR]ûeû
- 5c GKK / dê^òUþ-5 : IWÿò@û _âMZòaû\ú I aûÉaaû\ú iûjòZý]ûeû

_â]û^ _ûVýûõg-4 (Core Course-4): Êû]ú^Zûe IWÿò@û ijòZý

PZê[ð _Zâ

- 1c GKK / dê^òUþ-1 : Êû]ú^Zû _eaZđú IWÿò@û KaòZû
- 2d GKK / dê^òUþ-2 : Êû]ú^Zû _eaZđú IWÿò@û C_^ýûi I Mì
- 3d GKK / dê^òUþ-3 : Êû]ú^Zû _eaZđú IWÿò@û ^ûUK I GKûuòKû
- 4[ð GKK / dê^òUþ-4 : Êû]ú^Zû _eaZđú IWÿò@û M\ý iûjòZý (_âa§ I icûùfûP^û)
- 5c GKK / dê^òUþ-5 : Êû]ú^Zû _eaZđú IWÿò@û iûjòZýùe _Zâ_ZòâKû
- _ûVýûõg 1 eê _ûVýûõg 4 ^òcù« ijûdK Mâ^ÚiìPú :
1. IWÿò@û iûjòZýe @û\ò_ađ I CZe cœ_ađ : cjû«ò iêùe!â, KUK ÁêùWõUip ùÁûe
 2. @û]ê^òK IWÿò@û iûjòZýe AZòjûi : iûc«eûd ^Uae, aûYúba^, bêaù^gße
 3. IWÿò@û iûjòZýe iõlò _eòPd : @ûPû~đý aé!ûa^, Mâ^Úc!òe, KUK

4. IWÿò@û iûjòZýe AZòjûi : cû^iòðj cûdû]e, Mâ^Úc|òe, KUK
5. IWÿò@û iûjòZýe AZòjûi : Ke aûCeúaŝê, ù`âŠip _aäògđip, KUK
6. @û]ê^òK IWÿò@û iûjòZýe aòKûg]ûeû : Zòâ_ûVú iù«ûh Kêcûe, iê|eMWÿ
7. IWÿò@û iûjòZýe AZòjûi : _...^ûdK _VûYò, ^ûk|û, KUK
8. IWÿò@û iûjòZýe AZòjûi : _ûXú ùaYê]e, _âûPú iûjòZý _âZòÂû^, KUK
9. @û]ê^òK Kûaý Ròmûiû, PòZâKÌ : \ûi \ûge[ô, @Mâ\iz, KUK
10. KaòZûe cû^PòZâ : cjû«ò Rû^Kú afäb, ù`âŠip _aäògđip, KUK
11. IWÿò@û iûjòZýe KâcaòKûg : cjû«ò iêue|â, @Mâ\iz, KUK
12. @^êaû\ iûjòZýe ZZß I _âùdûM : _â]û^ cû^ûeõR^, IWÿògû aêKp ùÁûe, KUK
13. iûjòZý iûPú_Zâ : _...^ûdK aòbìZò, ^ûf|û, KUK
14. CZe @û]ê^òKZû ZZß I _âùdûM : iõ. gZ_[ú ù\áú _âiû\, @Mâ\iz, KUK
15. @û]ê^òKaû\ I CZe @û]ê^òKaû\ : e[_â\ú_ Kêcûe, izý^ûeûdY aêKpùÁûe, KUK
16. IWÿò@û Kûaý ùKøgk : @ûPû~đý iê\gđ^, aâjà_êe
17. K[ûiûjòZýe K[^òKû : IZû aò¾ê_òâdû, _âûPú iûjòZý _âZòÂû^, KUK
18. iûekû cjûbûeZ iéÁòe bìcò_ađ : iûjê C\d^û[, Pò^àd _âKûg^, KUK
19. iaêReê iûõ_âZòK : gZ_[ú ^òZýû^|, Mâ^Úc|òe, KUK
20. IWÿò@û iûjòZýe _âMZòaû\ú]ûeû : gZ_[ú aòRd Kêcûe, IWÿògû aêKp ùÁûe, KUK
21. IWÿò@û C_^ýûi : ùaùjeû Ké¾PeY, RM^Ûû[e[, KUK
22. @ûùfûP^û cûkû : cògâ KûjÛëPeY, ù`âŠip _aäògđip, KUK
23. IWÿò@û iûjòZýe AZòjûi : @û\ý _âdûi - cjû«ò _âi^Û Kêcûe, KUK

ZéZúd _~đýûd (Semester-III)

_â]û^ _ûVýûõg-5 (Core Course-5): **IWÿò@û bûhûe HZòjûiòK aòKûgKâc_õPc_Zâ**

1c GKK / dê^òUp-1 : IWÿò@û bûhûe C_òZò I KâcaòKûg

2d GKK / dê^òUp-2 : IWÿò@û fò_òe HZòjûiòK aòZđ^ I fIY

3d GKK / dê^òUp-3 : IWÿò@û gòkûùfLe bûhû

4[đ GKK / dê^òUp-4 : P~đýû_ \ I iûekû iûjòZýe bûhû

5c GKK / dê^òUp-5 : IWÿò@û bûhû ijòZ @^ý bûhûe iµKđ (\âûaòWÿ, @ÁòK, ~ûa^òK, AõeûRú)

_â]û^ _ûVýûõg-6 (Core Course-6): IWÿò@û bûhûe ùcøkòK Êei_ I fLY

hÂ _Zâ

1c GKK / dê^òUp-1 : gûÈúd bûhû, IWÿò@û bûhûe gûÈúd fLY, IWÿò@û bûhûe ùcøkòK I ùa÷gòÁý

2d GKK / dê^òUp-2 : IWÿògûe J_bûhòKú bûhûùlZâ I IWÿò@û @ûõPkòK bûhû-C_bûhû-ùâûfö

3d GKK / dê^òUp-3 : IWÿò@û cû^K bûhû I K[ôZ bûhû

4[õ GKK / dê^òUp-4 : IWÿò@û M\ý bûhûe àòâZõ^

5c GKK / dê^ò~p-5 : IWÿò@û g± àòba I Gjûe @[õ ^ò¿Zò cìkK ùa÷gòÁý (@bò]ûcìkK, fLYûcìkK, aý~^ûcìkK)

_â]û^ _ûVýûõg-7 (Core Course-7): IWÿò@û bûhûe _âùdûM I aýûajûeòK aýûKeY

1c GKK / dê^òUp-1 : IWÿò@û iûcûRòK I iûõÄézòK]ûeûùe iêbûhY I @_bûhY

2d GKK / dê^òUp-2 : IWÿò@û iûcûRòK - ùfûKûPûecìkK g± I Zû'e _âùdûM

3d GKK / dê^òUp-3 : @gêj a^û^ I bîfþ fòL^e KûeY I Zû'e gêj ^òeûKeY

4[GKK / dê^òUp-4 : IWÿò@û @leZZß I a%õ òbûR^

5c GKK / dê^òUp-5 : IWÿò@û aûKýe MXÿY, _âKûe I _âùdûMPûZêeú, aòeûcPòjÛe aýajûe, cê\âY ZîUò iõùgû]^ _jZò, aòmû ^e bûhû, ùNûhYû Kkû (@ûueòõ@ûUõ) I bûhòK C_ûd

PZê[õ _~õýûd (Semester-IV)

_â]û^ _ûVýûõg-8 (Core Course-8): (ùfûK]ûeû/IWÿò@û bûhûe ùcøLòK _eõ_eû)

1c GKK / dê^òUp-1: ùfûK iõÄézò I ùfûKiûjòZý (iõmû, Êei_, _âKûeùb\)

2d GKK / dê^òUp-2 : IWÿò@û ùfûKMúz, Gjûe _âKûeùb\ I ùa÷gòÁý

3d GKK / dê^òUp-3 : IWÿò@û ùfûKKûjûYú I R^gîZò

4[õ GKK / dê^òUp-4 : IWÿò@û ùfûùKûqò, _âKûeùb\, iûcûRòK-iûõÄézòK @ûùà\^

5c GKK / dê^òUp-5 : ùfûK^ûUK

bòZò _ûVýûõg-1 (Core Course-9): **IWÿò@û iûjòZýe Êeì_, ZZß I iûjòZòýK g±**
 1c GKK / dê^òUþ-1 : KaòZû, C_ ^ýûi, @ûcôRúa^ú
 2d GKK / dê^òUþ-2 : @û]ê^òKZû, C_ ^òùagaû\, eiaû\
 3d GKK / dê^òUþ-3 : _âùdûMòK icúlû, ùg÷kúZûZßòK icúlû
 4[đ GKK / dê^òUþ-4 : Zêk^ûcôK iûjòZýe _eòbûhû I C_ ù~ûMòZû
 5c GKK / dê^òUþ-5 : @^êaû\ZZß I @^êaû\e _âKûeùb\

cìk / _â]û^ _ûVýûõg-10 (Core Course-10): **IWÿò@û iûjòZýe iaòùgh @xd^**
ùfLKúd _ûV

1c GKK / dê^òUþ-1 : RM^Ûû[\ûi, C_ |â b-
 2d GKK / dê^òUþ-2 : búcùbûA, iyò\û^!
 3d GKK / dê^òUþ-3 : MùlòK gû«^ê Kêcûe @ûPû~đý, J_ ^ýûiòK ùMû_ú^û[
 cjû«ò
 4[đ GKK / dê^òUþ-4 : ^ûUýKûe RMù^àúj^ fûf I eùcg _âiû\ _ûYòMâújú
 5c GKK / dê^òUþ-5 : _âûaşòK PòZeõR^ \ûi I icûùfûPK ^Uae iûc«eùd

_?c _~đýûd (Semester-V)

cìk / _â]û^ _ûVýûõg-11 (Core Course-11): **IWÿò@û iûjòZýe iaòùgh @xd^**
Kûaý KaòZû _ûV

1c GKK / dê^òUþ-1 : cjûbûeZ-M\û_ađ (iûekû \ûi)
 2d GKK / dê^òUþ-2 : Kòùgûûe P|âû^^ Põ_ì (K-N @^ê_âûi)- Kaòi~đý akù\ a
 e[
 3d GKK / dê^òUþ-3 : PòfòKû-eû]û^û[
 4[đ GKK / dê^òUþ-4 : _âûPú^ cæKûkú^ IWÿò@û KaòZû, _âûPú iûjòZý
 _âZòÂû^, KUK
 * gâúeûc ùKûAfò-akeûc \ûi
 * cjûaûjê - a^cûkò
 * @û\ý cûMđgúe - @PêýZû^! \ûi
 * c^ùaû] PCZògû - bqPeY
 5c GKK / dê^òUþ-5 : @û]ê^òK IWÿò@û KaòZû - iõ_û\^û iÛûZùKûZe gòlû
 _eòh\, C}k aògßaò\ýûkd, iê]û _âKûg^ú, KUK
 * @céZcd- Mwû]e ùcùje
 * ^cÄûe - cûdû]e cû^iòđj
 * Mûşûeúe @ûgúaðû\ - Kûkò! úPeY _ûYòMâújú

* IWÿògû - iúZûKû« cjû_ûZâ

* bd - ecûKû« e[

cik / _â]û^ _ûVýûõg-12 (Core Course-12): **IWÿò@û iûjòZýe @xd^ - K[ûiûjòZý / ^ûUýiûjòZý**

1c GKK / dê^òUþ-1 : @ûKûge Aiûeû (C_ ^ýûi)- cù^ûR \ûi

2d GKK / dê^òUþ-2 : @cûaûiýûe P!â (C_ ^ýûi) - ùMûaò! iû

3d GKK / dê^òUþ-3 : lê\âMì

_ûVýMì : * eûšò_ê@ @^«û -`Kúeùcûj^

* ^úkcûÁâûYú-ùMû\ûaeúg cjû_ûZâ

* gâúKé¾u ùgh jûi - iêùe!â cjû«ò

* ùcûl - _âZòbû eûd

4[đ GKK / dê^òUþ-4 : cwk @cwk aòkß cwk (^ûUK) - aòRd Kêcûe gZ_[ú, @Mâ\iZ, KUK

@[aû

* iaûùgh ùfûK (^ûUK) - ^eûdY iûjê

5c GKK / dê^òUþ-5 : GKûuòKû _ûV

_ûVý_âiw : * @ûaòÃûe - _âûYaşê Ke

* Q\àùagú - aògßRòZþ \ûi

* cKÿcû - ùMû_ûk ùQûUeûd

hÂ _~đýûd (Semester-VI)

_â]û^ _ûVýûõg-13 (Core Course-13): **IWÿò@û iûjòZý @xd^ -M\ý iûjòZý**

1c GKK / dê^òUþ-1 : ùcû icde IWÿògû-WKÖe Ké¾P!â _ûYòMâûjú (30 _éÂûe _ûVýûõg _V^úd)

2d GKK / dê^òUþ-2 : \êA \òM«e @ûKûg (bâcY KûjûYú)-Kê-aòjûeú \ûg _â[c 4Uò @xûd / 1c bûM

3d GKK / dê^òUþ-3 : Kûaý í'û\ (icûùfûP^û-1/2d @xûd) - \ûge[ô \ûi

4[đ GKK / dê^òUþ-4 : e[i_ K (1c, 2d @xûd)-P!âùgLe e[

5c GKK / dê^òUþ-5 : _âaş : @û]ê^òK IWÿò@û _âaş, iê]û _âKûg^ú,

_ûVý_âiw : cjûùiaûZ - aògß^û[Ke

* ^òR \ûdòZß - cûdû]e cû^iòđj

* _âkd iõùKZ - geZ Kêcûe cjû«ò

cik / _â]û^ _ûVýûõg-14 (Core Course-14): **IWyò@û bûhûe aýûajûeòK**

_âùdûM

1c GKK / dê^òUp-1 : aýûajûeòK fòL^Kkû - _eòbûhû, Êeì_, ùa÷PòZâý

2d GKK / dê^òUp-2 : Kû~đýûkd fòL^ @^êaò]ô (^[ô _âÉêZò I fòL^ / Uò®Yú fòL^ / _âÉûa fòL^ I @^êùcû\^ / PòVû _âÉêZò I fòL^ / @]ôìP^û, aòm`ò I ùNûhYû fòL^)

3d GKK / dê^òUp-3 : iûjòZý I cê\òâZ MYcûæc (iûjòZý I iû'û\òKZû / iûjòZý I iõ_û\Kúd fòL^ PûZêeú / É, aû `òPe eP^û / cê\òâZ MYcûæce bûhû)

4[đ GKK / dê^òUp-4 : _êÉK eP^û ùKøgk

5c GKK / dê^òUp-5 : iõ_û\^û Kkû (_Zâ/_ZòâKû)

_â]û^ _ûVýûõg-5eê _ûVýûõg 14 ^òcù« ijûdK Mâ^ÚìPú:

1. IWyò@û bûhûe C_òZò I KâcaòKûg : cjû«ò aõgú]e, ù`âŠip _aäògđip, KUK
2. IWyò@û bûhûe Cù^àh I aòKûg : iûjê aûiêù\, ù`âŠip _aäògđip, KUK
3. IWyò@û bûhûZZß I fò_òe aòKûg : Zòâ_ûVú Kê-aòjûeú, eûRý_ûVý _êÉK _âYd^ I _âKûg^ iõiÚû, bêaù^gße
4. aézò G ùcû ù_ûùh KêUé' : cjû«ò _õPû^^, bêaù^gße
5. iûekû cjûbûeZe bûhûZûZßòK @^êgúk^ : cjû_ûZâ]ù^gße, ù`âŠip _aäògđi, KUK
6. IWyò@û bûhû aòba : cjû_ûZâ aòRd _âiû\, aò\ýû_êeú, KUK
7. aýûajûeòK IWyò@û bûhû I _âùdûMûcôK aýûKeY : Zòâ_ûVú iù«ûh, ^ûk'û, KUK
8. aýûajûeòK IWyò@û aýûKeY : cògâ je_âiû\, _âûPú iûjòZý _âZòÂû^, KUK
9. IWyò@û ùfûKiûjòZý I ùfûK iõÄéZò : _â]û^ Ké¾P'â, aò\ýû_êeú, KUK
10. IWyò@û ùfûKiûjòZý icúlû : cjû_ûZâ gýûciê'e, aò\ýû_êeú, KUK
11. a%õ _eòPd : UòKûdZeûd ùK÷kûi P'â, iêfb _âKûg^ú, _êeú
12. ùfûK^ûUK : \ûi ùjc« Kêcûe, Mâ^Úc'òe, KUK
13. IWyò@û @ûiuc I aõMkûe ùfûK^ûUý : iûjê ^ûeûdY, iZý^ûeûdY aêKp ùÁûe, KUK
14. IWyò@û ùfûKiõÄéZò I ùfûKiûjòZý : cògâ cùj'â Kêcûe, Mâ^Úc'òe, KUK
15. IWyò@û fò_ò I bûhû : cjû_ûZâ LùMgße, Mâ^Úc'òe, KUK
16. _âùdûMòK bûhû aòmû_ ^e \òMaò\òM : _...^ûdK ùK.aò., IWyò@û

- _ûVý_êÉK_âYd^ I _âKûg^ iõiÚû, bêaù^gße
17. aòPòZâ KaòZß : Zòâ_ûVú iù«ûh, ^ûk!û, KUK
 18. _âùdûMòK IWÿò@û bûhû : cògâ @Rd, KújûYú, KUK
 19. g±MV^ ùKûh : Zòâ_ûVú _â`êfä, bêaù^gße
 20. @û]ê^òK K[û iùjòZý : _...^ûdK aòbìZò, Mâ^Úc!òe, KUK
 21. IWÿò@û _âa§ iùjòZý : Ke aùCeòa§ê, cjúaúe _âKûg^, bêaù^gße
 22. _âùdûMòK IWÿò@û bûhû : eûRý _ûVý_êÉK_âYd^ I _âKûg^ iõiÚû, bêaù^gße
 23. _âPkòZ IWÿò@û bûhûe aýûKeY : cjû_ûZâ aòRd _âiû\, aò\ýû_êeú, KUK
 24. IWÿò@û iùjòZý ùKûh : aògßûk aõgú]e, jòcûõgê _âKûg^, KUK
 25. IWÿò@û iùjòZýe iúcûRòK I iùõÄéZòK AZòjûi : \ûi PòZeõR^, eûRý _ûVý_êÉK_âYd^ I _âKûg^ iõiÚû, bêaù^gße
 26. IWÿò@û bûhûZûZßòK _âa§ I icûùfûP^û : cògâ je_âiû\, @Mâ\ìZ, KUK
 27. IWÿò@û ùføKòK _\ (1c/2d bûM) : _âjeûR ùMû_ûk P!â, KUK ùUâWòõ Kõ_û^ú
 28. C]k MâûcýMúZ I Kkû : cjû_ûZâ PKâ]e, IWÿògû iùjòZý GKûùWcú
 29. iùjòZýe eì_ùeL : jeòP!^ ^úkû\òâ bìhY

**@û«üicÁòcìkK Azû]ú^ _ûV - IWÿò@û
GENERIC ELECTIVES (GE)- COURSE**

ìP^û

- * _ZâiõLýû - 4/8 ùMûUò _ûV \ò@û~òâ - 4ùMûUò _ûV 4Uò _Zâ_ûAñ aùQòaûKê ùjaö
- * _âùZýK _Zâ - 100 ^'e aògòÁ / ùcûU - 400
- * _âùZýK _Zâùe 5ùMûUò GKK ejòaö
- * _âùZýK _Zâe @ûiÚûcìfýûu (Credits) 6 / ùcûU cìfýûu 6 " 4 = 24
- * ahđûjđ _~đýûd 1, 2, 3, 4 (ùicòÁûe 1-2-3-4) _âùZýK _~đýûd aù ùicòÁûeùe ùMûUòG ùMûUòG _ûV_Zâ ejòaö ~[û-
 - * aùhđûjđ _~đýûd-1 (Sem-I) _â[c_Zâ / _ûV-1
 - * aùhđûjđ _~đýûd-2 (Sem-II)\ßòZúd _Zâ / _ûV-2
 - * aùhđûjđ _~đýûd-3 (Sem-III) _â[c_Zâ / _ûV-3
 - * aùhđûjđ _~đýûd-4 (Sem-IV) _â[c_Zâ / _ûV-4
- _âùZýK _Zâ_ûAñ ahđKê @ZòKcpùe 50Uò ùgâYú _ûV\û^ ùja Gaõ 10 ùMûUò ÊKúdùaû]^ cìkK ùgâYú gòlû\û^ (UêýùUêeû@ûfp Kâûip) ùjaö

^'e aòbûR^ aò]ô

(K) ùcûU ^'e - 100

(L) @û«ü_eúlû - 20 / cêLý_eúlû - 80

(M) cêLý_eúlûe_âùZýK GKKeê ùMûUòG ùfLûGñ_i!cìkK ùaû]mû^ cû_K
5Uò \úNđ_âgÛ_Wÿòäö 5Uò \úNđ_âgÛeê 3Uòe CZe 600 g± cæùe
ù\âûKê ùjaö 3`12=36

(N) _âùZýK GKKeê ùMûUòG ùfLûGñ f²mû^cìkK iöìò`_âgÛ_Wòäö ùcûU
5ùMûUò_âgÛeê 3ùMûUò_âgÛe CZe 400 g± cæùe ù\âûKê ùjaö
3`8=24

(O) _ûðùPûUò GKKeê ùcûU 8Uò @Zò iöìò`cìkK_âgÛ_Wÿòäö 5Uòe CZe
ùMûUòG aûKýùe ù\âûKê ùjaö
1`5=5

iaòùgh_ûVýKâc

â[c~đýûd (Semester-1) (ùMûUòG aûQ)

_ûV-2 / _Zâ-1 (Core Course-2) : **iRđ^ûgúk Kkû**

1c GKK : iRđ^gúkZûe iöìò`_ I fIY

2d GKK : iRđ^gúkZûe @û]ûe

3d GKK : ^ûUK iöìò`_ eP^û / M_-C_^ýûiKê ^ûUý eì_û«e

4[đ GKK : fòL^ Kkû I bûa iö_âiûeY_ìZò

5c GKK : Mì eP^û ùKøgk

@[aû

_ûV-4 / _Zâ-2 (Core Course-4) : **iûjòZý @xd^**

1c GKK : _âa§ Pd^ (iö. C}k aògßaò\ýûkd)

_ûVý : * @^« ù_âc - aògß^û[Ke

* iûekû iûjòZý - aöğú]e cjû«ò

* cêñ iZý[cđû KjêQò - P!âùgLe e[

2d GKK : KaòZû Pd^ (iö. C}k aògßaò\ýûkd)

_ûVý : * KõPêKòe bûa^û - eû]û^û[eûd

* Zòù^ûUò iù^U - cûdû]e cû^iòöj

* icê\â I cêñ - ùiøbûMý Kêcûe cògâ

3d GKK : @aùaû]_eúlY - (ùMûUòG_ \ý_eòùz\ 200 g± cæùe @]aû lê\â
KaòZûUòG_Wÿòäö Zjòeê 5Uò_âgÛ @aùaû]_eúlYcìkK CZe_ûAñ

@ûMZ ùjaö)
 4[đ GKK : _âaP^ / ìqò @ûgòâZ iRđ^ûcôK fòL^ (ùMûUòG _âaP^ / XM / ìqò
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SYLLABUS FOR B.A. (HONORS) PHILOSOPHY UNDER CHOICE BASED
 CREDIT SYSTEM OF UTKAL UNIVERSITY, BHUBANESWAR

GENERAL PHILOSOPHY

- Unit-I** : Definition, Nature and Function of Philosophy, Philosophy in relation to other modes of thinking like science and Religion
- Unit – II** : Problems of Being : Monism and Pluralism
 Realism: (a) Naive Realism (b) Representative Realism (Locke), Idealism
 : Meaning, Esse est Percipi (Berkeley)
- Unit – III** : Problems of Knowledge: What is Knowledge? Sources of Knowledge
 : Empiricism, Rationalism
- Unit –IV** : Problems of Ethics : (1) Theories of Goodness : The Good and the Evil (2) Theories of Conduct : Egoism and Altruism
- Unit-V** : Problems of Metaphysics:
 (1) Substance and Universal
 (2) Mind and Body

Basic Study Materials:

1. John Hospers - An Introduction to Philosophical Analysis

2. G. T. W. Patrick - Introduction to Philosophy
3. G. W. Cunningham - Problems of Philosophy
4. B. Russell - Problems of Philosophy
5. D. W. Hamlyn - Metaphysics
6. Richard Taylor - Metaphysics

FIRST YEAR U. G. CORE COURSE

Semester – I

Paper – II: Logic & Scientific Method

Full Marks: 20 + 80 = 100

Credit Points: 04

- Unit-I** : Definition of Logic, Deductive & Inductive Arguments, Validity & Soundness of Arguments, Laws of Thought
- Unit – II** : Classification of Propositions (from Quality & quantity stand point) Distribution of terms, Square of Oppositions, Existential Import of Propositions, Interpretation of Categorical Propositions
- Unit-III** : Inference – Immediate Inference (Conversion & Observation) Mediate Inference (Syllogism) : Figure & Moods, Testing Validity of Arguments by syllogistic Rules
- Unit-IV** : Inductive Reasoning & Scientific Enquiry
- (a) Laws of Causation – Meaning & Definition cause and condition, Qualitative & Quantitative Marks of Causation
- (b) Mills Experimental Methods
- Unit-V** : Science & Probability : (a) Scientific Explanation and Unscientific explanation (b) Hypothesis & Confirmation

Recommended Books:

1. Copi, Cohen & MacMahan – Introduction to Logic (14th Edition)
2. Cohen & Nagel – Introduction to Logic & Scientific Method
3. Alex Rosenberg – Philosophy of Science : A Cont. Introduction
4. W. Kneale – Probability & Introduction
5. John Hospers – Philosophical Analysis

SYSTEMS OF INDIAN PHILOSOPHY (I)

Full Mark: 20 + 80 = 100

Credit Points: 04

- Unit-I** : Salient Features of Indian Philosophy, Astika & Nastika systems,
Basic concepts like Rta, Rna, Purusartha, Law of Karma
- Unit – II** : Carvakas – Epistemology and Metaphysics (Lokayatamata)
- Unit-III** : Jainism – Syadvada, Anekantavada Jaina ethics (concept of Triratna)
- Unit-IV** : Buddhism – Four Noble Truths, Doctrine of Momentariness,
Dependant Origination, No Soul Theory, Nirvana
- Unit-V** : Samkhya Dualistic System : Purusa, Prakriti, Theory of Causation,
Theory of Evolution

Books Recommended:

1. G. C. Nayak (ODIA) - Bharatiya Darshana
2. B. B. Choudhury (ODIA) - Bharatiya Darshanara Ruparekha (Trans.) of M. Hiriyana's Outline of Indian Philosophy
3. Dutta & Chatterjee – An Introduction to Indian Philosophy
4. C. D. Sharma – A Critical Survey of Indian Philosophy
5. R. K. Puligandla – Fundamentals of Indian Philosophy
6. S. Radhakrishnan – Indian Philosophy, Vol. I / II
7. J. N. Sinha – Indian Philosophy

Semester-II / Paper-IV / Phil. Core

SYMBOLIC LOGIC

Full Mark: 20 + 80 = 100

Credit Points: 04

Books Prescribed: Basson & O' Corner: Introduction to Symbolic Logic

Unit-I	Chapter-I	Introduction
	Chapter-II	The Calculus of Propositions
Unit – II	Chapter-III	Calculus of Propositions (Sec 1 to 60)
Unit-III	Chapter – III	Calculation of Propositions (Sec 7 to 9)
Unit-IV	Chapter-V	The Elements of Predicate Calculus (Section 1 to 9)
Unit-V	Appendix	(Sec-1 to Sec-4)

2nd Year U. G. Philosophy (Core)

Semester-III / Paper-VI / Ethics

Full Mark: 20 + 80 = 100

Credit Points: 04

Unit-I	: Definition, Nature & Scope of Ethics. Ethics in relation to Politics, Sociology and Religion
Unit – II	: Distinction between moral and non-moral action Moral Judgement and factual judgement, subject or Moral judgement
Unit-III	: Utilitarianism, Hedonism
Unit-IV	: Rigorism, Perfectionism
Unit-V	: Theories of punishment; Retributive, Reformative and Preventive theory

Books for Reference:

1. J. N. Sinha – A Manual of Ethics
2. W. Frankena – Ethics

Semester – II Paper

– VII / Phil. (Core)

HISTORY OF GREEK PHILOSOPHY

F. M.: 20 + 80 = 100

Credits: 04

- Unit-I** : Nature of Greek Philosophy: What is Philosophy? Origin, development and salient features of early Greek Thought
- Unit – II** : Pre-Socratic Thought : The Being of Thales, Becoming of Heraclitus and Atomism of Democritus
- Unit-III** : Socrates : Problem before Socrates, Dialectical method, epistemology of Socrates and ethics
- Unit-IV** : Plato : Theory of Idea, Theory of Knowledge and Theory of Soul
- Unit-V** : Aristotle : A Critique of Plato, Theory of Form and Matter, Theory of Causation

Suggested Readings:

- (1) W. T. Stace - Greek Philosophy
- (2) Burnet - Greek Philosophy
- (3) Y. Masih - A Critical History of Philosophy
- (4) F. Thilly - A History of Philosophy
- (5) B. Russell - A History of Western Philosophy
- (6) B. A. G. Fuller - A History of Greek Philosophy

Semester – III

Paper – V / Phil. (Core)

SYSTEMS OF INDIAN PHILOSOPHY (II)

F. M.: 20 + 80 = 100

Credits: 04

- Unit-I** : Yoga system of Patanjali: Citta Vriti Nirodha and Astanga Yoga
- Unit – II** : Nyaya: Pramanas
Vaisesika: Categories (Padarthas)
- Unit-III** : Upanisadic view of Atman and Brahman Vidya & Avidya, Para Vidya & Apra Vidya
- Unit-IV** : Sankara's View on Maya, Jiva, Isvara & Brahman and Liberation (Jivanmukti & Videhamukti)
- Unit-V** : Ramanuja – Refutation of Sankara's view of Maya, Concept of Brahman, Jiva and Liberation

Books Recommended:

- (1) G. C. Nayak (ODIA) - Bharatiya Darshana
- (2) B. B. Choudhury (ODIA) (Trans.) - Bharatiya Darshanara Ruparekha
- (3) Dutta & Chatterjee – An Introduction to Indian Philosophy
- (4) J. N. Sinha – Indian Philosophy
- (5) R. K. Puligandla – Fundamentals of Indian Philosophy
- (6) S. Radhakrishnan – Indian Philosophy (Vol. I & II)
- (7) J. N. Sinha – Indian Philosophy

Semester – IV

U. G. Arts Core (Philosophy)

Paper - VII

CONTEMPORARY INDIAN PHILOSOPHY

F. M.: 20 + 80 = 100

Credits: 04

- Unit-I** : R. N. Tagore : God and Reality, Nature of Religion Man and his destiny
- Unit – II** : Swami Vivekananda : Concept of Man and his Destiny, Practical Vedanta, Universal Religion
- Unit-III** : Sri Aurovindo: Nature of World, Maya, Theory of Evolution, Satchidananda, Integral Yoga
- Unit-IV** : M. K. Gandhi: Truth, God, Non-violence, Satyagraha and Sarvodaya
- Unit-V** : S. Radhakrishnan : Concept of Man, Reality, Intellect & Institution Religion

Basic Study Materials:

- (1) B. K. Lal – Contemporary Indian Philosophy
- (2) T. M. P. Mahadevan & V. Saroja – Contemporary Indian Philosophy
- (3) H. Sahoo (ed.) – Contemporary Indian Philosophy

Semester – IV

Paper – IX

(HISTORY OF MODERN EUROPEAN PHILOSOPHY)

F. M. : 20 + 80 = 100

Credits : 04

- Unit-I** : Bacon – Theory of Idola, Inductive Method
Descartes – Universal Doubt, Cogito-ergo-sum, Existence of God,
Interactionism
- Unit – II** : Spinoza – Substance, Attribute and Modes Psycho-physical parallelism
Leibnitz – Theory of Monads, pre-established Harmony
- Unit-III** : Locke : Refutation of Innate Ideas, Sources of Knowledge
Berkeley : Subjective Idealism, Esse-est-Percipi
- Unit-IV** : Hume – Impression & Ideas, Scepticism, Theory of Causality
- Unit-V** : Kant – Reconciliation between Empiricism and Rationalism, Possibility
of Synthetic Apriority Judgement Space & Time

Books Prescribed

1. Y. Masih – History of Western Philosophy
2. H. Ray & G. Das – (O) Paschatya Darshanara Itihasa
3. Fran Thilly – A History of Philosophy
4. Ira Sengupta – A History of Western Philosophy
5. B. Russell – History of Western Philosophy
6. Barlingay & Kulkarni – A critical survey of Western Philosophy

Semester – IV

(Philosophy Core)

Paper – X

(PHILOSOPHY OF LANGUAGE)

F. M.: 20 + 80 = 100

Credits: 04

- Textual Study** : John Hospers – An Introduction to Philosophical Analysis
- Unit-I** : Word – Meaning : Meaning of the word “Meaning” Ambiguity and vagueness
- Unit – II** : Definitions : Denotative, Connotative, & Ostensive Defining and Accompanying characteristics stipulate & Reparative Definition, Persuasive definition
- Unit-III** : Sentence – Meaning : Proposition and sentence word-meaning and sentence – meaning, criteria of sentence – meaning/
- Unit –IV** : Analytic – synthetic, a priori – a posteriori, distinction, logical possibility and impossibility.
- Unit – V** : Concept ; Nature and source
Truth : Correspondence, Coherence and Truth as it “Works”

B.A. (Hons)

Semester – V / Paper – XI

F.M. 20+80

=100

3rd Year

Study of Western Classic

Credits -04

[Meditations of Rene Descartes]

Unit-I

Meditation – I

Sceptical Doubts

Meditation – II

Cogito ergo sum, Sum res cogitans The wax
Argument

Unit – II

Meditation – III

Clear and distinct perceptions Theory of Ideas,
Existence of God

Unit-III

Meditation – IV

God is no Deceiver, Will, Intellect and
Possibility of Error

Unit – IV

Meditation – V

Essence of Material Things, Existence of God

Unit – V

Meditation – VI

Mind-body Dualism, Primary & Secondary
Quality

Book Recommended

1. Rene Descartes - Meditations on First Philosophy
2. Rae Langton - A study guide to Descartes Meditations
3. Amelie Rorty - Essays on Descartes Meditations

ISA UPANISADS WITH SANKARA’S COMMENTARY

Unit-I	What are Upanisads, place of Upanisads in Indian Philosophy and Culture – Isa Upanisad
Unit – II	Mantra 1 to 44
Unit-III	Mantra 5 to 9
Unit – IV	Mantra 10 to 14
Unit – V	Mantra 15 to 18

Basic Study Materials:

1. The Isa Upanisad with Sankara’s Commentary
2. S. Radhakrishnan - The Principal Upanisad
3. Satyavadi Mishra - Central Philosophy of the Upanisads

SOCIAL & POLITICAL PHILOSOPHY

Unit-I	Sociality, Social Science & Social Laws Philosophy of Social Science – Relation between Individual society (Mechanical, Organic and Idealistic view)
Unit – II	Political Ideals – Justice, Liberty, Equality, Equality Political Doctrines – Humanism, Secularism Feminism, Philosophy Ecology
Unit-III	Democratic Ideals: Democratic Government, Conditions for successful functioning of Democracy.
Unit – IV	Political Ideologies (a) Anarchism (b) Marxism (C) Sarvodaya
Unit – V	Social progress: Human Rights: Origin and development, Declaration of Human Rights : Theory and Practice

Basic for Suggested Readings:

1. O.P. Gauba – An Introduction to Political Philosophy
2. J. Sinha – Outlines of Political Philosophy
3. D.D. Raphael – Problems of Political Philosophy
4. Krishna Ray & Chhanda Gupta – Essays in Social & Political Philosophy
5. M.K. Gandhi – Hind Swaraj

APPLIED ETHICS

- Unit – I** What is Applied Ethics : Nature & Scope of applied ethics – Ethical Theories – Deontology, Utilitarianism, Relativism and Subjectivism
- Unit – II** **Taking Life : Animals** – Animals Rights, Reverence for life, killing of animals
- Unit – III** **Taking Life : Humans** – Euthanasia : Types Abortion
- Unit – IV** Environmental Ethics : Relation between man and nature, Anthropocentrism, Non-Anthropocentrism
Western Tradition – Responsibility for Future Generation, Deep Ecology
- Unit – V** Professional Ethics : (a) Business ethics – Rights and obligations, justice & honesty in ethics.
(b) Bio-medical Ethics – Hippocratic Oath, Rights and obligations of Health – care Professionals, Doctor- Patient-Relationship

Books Recommended

1. Peter Singer – Practical Ethics
2. J. Jagadev – Biomedical Ethics
3. Tom Regan – Animal Rights
4. J.P. Thirou – Ethics : Theory & Practice

Discipline Specific Elective (DSE)

Semester – V

(Credits 4/F.M. 100)

Paper – I

THE PHILOSOPHY OF BHAGBAD GITA

- Unit – I** The Bhagabad Gita: Concept of Yoga, Concept of life and death.
- Unit – II** Karma & Karmaphala in the Bhagabad Gita, classification of Karma :
Karma, Akarma, Vikarma
- Unit- III** Concepts like Jnana & Vijnana, Ksara and Aksara, Uttama Purusa in Bhagabad Gita.
- Unit – IV** Chapter XVIII (Verse 1 to 36) with Sankara’s commentary

Basic Study Materials:

1. S.Radhakrishnan (Trans. & Ed) - The Bhagabad Gita
2. S.C. Panigrahi - Concept of Yoga in the Gita
3. A.G.K. Warrior (Trans.) - Srimad Bhagabad Gita Bhasya of Sri Sankaracharya
4. K.M. Munshi & R.R. Diwakar - Bhagabad Gita & Modern Life
5. P.N. Srinivasachari - The Ethical Philosophy of the Gita

Paper – II Philosophy

of Religion (DSE-II)

- Basic Text** John Hick – Philosophy of Religion
- Unit – I** Introduction to Philosophy of Religion Judaism – Christian Concept of God (Chapter – 1)
- Unit – II** Grounds for belief in existence of God (Chapter – 2)
- Unit – III** Grounds for belief against existence of God (Chapter – 3)
- Unit – IV** The Problem of Evil (Chapter – 4)
- Unit- V** Conflicting Truth Claims of different Religions (Chapter – 9)
Religious Pluralism

Books for Reference

1. Y. Masih- Introduction to Religious Philosophy
2. Arvind Sharma – Philosophy of Religion

Paper – III

Philosophy of Mind (DSE-3)

- Unit – I Nature and Scope of Philosophy of Mind, Mind and Soul, Nature of Mental Phenomena Consciousness – Theories of Mental Phenomena
- Unit – II The Third Person Account: Merits and Limitations. The First Person Account, Theory of intentionality.
- Unit – III Some theories of Mind – Dualism, Materialism, Identity Theory, Double Aspect Theory.
- Unit – IV The Concept of a person and the problem of personal Identity.
- Unit – V Some theories of Mind – Interactionism, Parallelism, Epiphenomenalism, The Problem of Free will.

Basic Study Materials

1. J.A. Shaffer – Philosophy of Mind
2. S. Shoemaker – Self knowledge & self- identity
3. S. Hampshire – Philosophy of Mind
4. T.E. Wilkerson – Minds brains and people

SEMESTER – VI

PAPER - I

Project Compulsory

(Dissertation 60 + Viva 40 Marks)

The student has to prepare a project of his own selecting a topic from Philosophical perspective in consultation with a teacher. He / She has to prepare a dissertation of 60 marks which will be evaluated by an external examiner and he / she will face a viva-voice test (40 marks) by an external examiner along with his / her supervisor of the concerned project.

Paper – II

Gandhian Studies

- Unit – I Political Thought of Gandhi** : Gandhi's concept of Politics – goals and methods of action; concept and claim of spiritualizing politics, Satyagraha
- Unit – II Economic Thought of Gandhi** : Gandhi's ideas and efforts in the field of economics; Gandhi's critique of industrialization – evils and consequences; philosophy of work & employment, need and greed
- Unit – III Gandhi's Social Thought and Social Work:** Philosophy of Sarvodaya, concept of Gram Swaraj, Varnashrama Versus Caste system untouchability.
- Unit- IV Gandhi on Education:** Meaning and aims of education Basic education (Nai Talim), Duties of Students, Parents and Teachers in education and their interrelationship.
- Unit – V Gandhi's idea of Peace:** Meaning of peace and violence; peace and Disarmament; Non-violent way to world peace. Combating terrorism through non-violence; Gandhian Approach to conflict Resolution – Shanti Sena

Basic Study Materials :

1. Mahatma Gandhi - Autobiography
2. Mahatama Gandhi - Hind- Swaraj
3. Mahatama Gandhi - Towards Non-violent Socialism
4. Mahatma Gandhi - Towards New Education
5. S. Radhakrishnan (ed.) - Mahatma Gandhi: Essays & Reflect
6. R.K. Prabhu & U.R. Rao- The mind of Mahatma Gandhi
7. Sarat Mahanty (ODIA) - Gandhi Manisha

Semester – VI DSE**Study of Major Religions of the World****Paper –III**

- unit– I** Sanatan Dharma: Basic features of Sanatan Dharma, The
Conception of Man (amritasya Putra), His Pursuits: Dharma , Artha,
Kama &
Moksa
- Unit – II** Buddhism: Basic features of Buddhism, Four noble truths, Eight-fold
Path, Nirvana
- Unit – III** Jainism: Three Gems, Five Vows, Liberation
- Unit – IV** Christianity: Basic features, God, World ,Salvation
- Unit – V** Islam: Basic features, Man ,God & Human Destiny

Suggested Readings:

- 1.Y. Masih - A Comparative Study of Religions
2. Lloyd Ridgeon - Major World Religions
3. K. N.Tiwary - Comparative Religion

Four Sem.

Paper – I

Credits: 04

Ethics: Theory & Practice

- Unit – I **Definition, Nature & Scope of Ethics**, Distinction between moral & non-moral action, stages of development of voluntary Action.
- Unit – II Distinction between factual and moral judgment, objects of moral judgment.
- Unit – III **Moral Standards** : Hedonism, Mill’s Utilitarianism, Kant’s Rigorism & Perfectionism
- Unit – IV **Environmental Ethics**: Relation between Man & Nature, Anthropocentrism and Non - Anthropocentrism
- Unit- V Concept of Bio-centric, Egalitarianism, Deep Ecology – Man’s Responsibility for the future generation

Recommended Study Materials :

1. William Franken – Ethics
2. J.N. Sinha – A Manual of Ethics
3. Peter Singer – Practical Ethics

SKILL ENHANCEMENT COURSE

Paper – I

F.M 50

Critical Thinking

- Unit – I Introduction to Critical Thinking : Standards of Critical thinking, benefits and limitations
- Unit – II Arguments & Recognising arguments : Definition & Contents of argument premises, hidden premises, conclusions intermediate conclusions

Book Recommended :

1. Hurley, Patrick. J. – A concise Introduction to Logic (2015) 12th Ed.
2. Madhuchhanda Sen - An Introduction to Critical Thinking (2010)

SKILL ENHANCEMENT COURSE

Paper – II

F.M 50

Applied Reasoning

- Unit – I Fallacies: Introduction, fallacies of Relevance, fallacies of Presumption, Fallacies of Ambiguity, Illicit Transference, fallacies in Ordinary language
- Unit – II Types of Reasoning: Analogical, Legal and Moral
- Unit – III Science & Superstition: Distinction, Evidentiary Support, Objectivity Integrity

Book Recommended :

1. H. Patrick, J. – A Concise Introduction to Logic (2015) 12th Edition
2. M. Sen - An Introduction to Critical Thinking (2010)

SYLLABUS FOR B.A. (HONORS) POLITICAL SCIENCE
UNDER CHOICE BASED CREDIT SYSTEM OF UTKAL
UNIVERSITY, BHUBANESWAR

1.1

Paper I- Understanding Political Theory

Course Objective: This course is divided into two sections. Section A introduces the studentsto the idea of political theory, its history and approaches, and an assessment of its critical and contemporary trends. Section B is designed to reconcile political theory and practice through reflections on the ideas and practices related to democracy.

I: Introducing Political Theory (30 Lectures)

1. What is Politics: Theorizing the 'Political'
2. Traditions of Political Theory: Liberal, Marxist, Anarchist and Conservative
3. Approaches to Political Theory: Normative, Historical and Empirical
Critical and Contemporary Perspectives in Political Theory: Feminist and Postmodern

II: Political Theory and Practice (30 Lectures)

The Grammar of Democracy

1. Democracy: The history of an idea
2. Procedural Democracy and its critique
3. Deliberative Democracy

4. Participation and Representation

Essential Readings

I: Introducing Political Theory

Bhargava, R. (2008) 'What is Political Theory', in Bhargava, R and Acharya, A. (eds.) *Political Theory: An Introduction*. New Delhi: Pearson Longman, pp. 2-16.

Bellamy, R. (1993) 'Introduction: The Demise and Rise of Political Theory', in Bellamy, R. (ed.) *Theories and Concepts of Politics*. New York: Manchester University Press, pp. 1-14.

Glaser, D. (1995) 'Normative Theory', in Marsh, D. and Stoker, G. (eds.) *Theory and Methods in Political Science*. London: Macmillan, pp. 21-40.

Sanders, D. (1995) 'Behavioral Analysis', in Marsh, D. and Stoker, G. (eds.) *Theory and Methods in Political Science*. London: Macmillan, pp. 58-75.

Chapman, J. (1995) 'The Feminist Perspective', in Marsh, D. and Stoker, G. (eds.) *Theory and Methods in Political Science*. London: Macmillan, pp. 94-114.

Bhargava, R, 'Why Do We Need Political Theory', in Bhargava, R. and Acharya, A. (eds.) *Political Theory: An Introduction*. New Delhi: Pearson Longman, pp. 17-36.

Bannett, J. (2004) 'Postmodern Approach to Political Theory', in Kukathas, Ch. and Gaus, G. F. (eds.) *Handbook of Political Theory*. New Delhi: Sage, pp. 46-54.

Vincent, A. (2004) *The Nature of Political Theory*. New York: Oxford University Press, 2004, pp. 19-80.

II: The Grammar of Democracy

Srinivasan, J. (2008) 'Democracy', in Bhargava, R. and Acharya, A. (eds.) *Political Theory: An Introduction*. New Delhi: Pearson Longman, pp. 106-128.

Owen, D. (2003) 'Democracy', in Bellamy, R. and Mason, A. (eds.) *Political Concepts*. Manchester and New York: Manchester University Press, pp. 105-117.

Christiano, Th. (2008) 'Democracy', in Mckinnon, C. (ed.) *Issues in Political Theory*, New York: Oxford University Press, pp. 80-96.

Arblaster, A. (1994) *Democracy*. (2nd Edition). Buckingham: Open University Press.

Roy, A. 'Citizenship', in Bhargava, R. and Acharya, A. (eds.) *Political Theory: An Introduction*. New Delhi: Pearson Longman, pp. 130-146.

Brighouse, H. (2008) 'Citizenship', in Mckinnon, C. (ed.) *Issues in Political Theory*, New York: Oxford University Press, pp. 241-258.

1.2 Paper II- Constitutional Government and Democracy in India

Course objective: This course acquaints students with the constitutional design of state structures and institutions, and their actual working over time. The Indian Constitution accommodates conflicting impulses (of liberty and justice, territorial decentralization and a strong union, for instance) within itself. The course traces the embodiment of some of these conflicts in constitutional provisions, and shows how these have played out in political practice. It further encourages a study of state institutions in their mutual interaction, and in interaction with the larger extra-constitutional environment.

I. The Constituent Assembly and the Constitution (16 lectures)

- a. Philosophy of the Constitution, the Preamble, and Features of the Constitution (2 weeks or 8 lectures)
- b. Fundamental Rights and Directive Principles (2 weeks or 8 lectures)

II. Organs of Government (20 lectures)

- a. The Legislature: Parliament (1.5 weeks or 6 lectures)
- b. The Executive: President and Prime Minister (2 weeks or 8 lectures)
- c. The Judiciary: Supreme Court (1.5 weeks or 6 lectures)

III. Federalism and Decentralization (12 lectures)

- a. Federalism: Division of Powers, Emergency Provisions, Fifth and Sixth Schedules (2 weeks or 8 lectures)
- b. Panchayati Raj and Municipalities (1 week or 4 lectures)

READING LIST

I. The Constituent Assembly and the Constitution

a. Philosophy of the Constitution, the Preamble, and Features of the Constitution

Essential Readings:

G. Austin, (2010) 'The Constituent Assembly: Microcosm in Action', in *The Indian Constitution: Cornerstone of a Nation*, New Delhi: Oxford University Press, 15th print, pp.1-25.

R. Bhargava, (2008) 'Introduction: Outline of a Political Theory of the Indian Constitution', in R. Bhargava (ed.) *Politics and Ethics of the Indian Constitution*, New Delhi: Oxford University Press, pp. 1-40.

Additional Reading:

D. Basu, (2012) *Introduction to the Constitution of India*, New Delhi: Lexis Nexis.

S. Chaube, (2009) *The Making and Working of the Indian Constitution*, Delhi: National Book Trust.

b. Fundamental Rights and Directive Principles

Essential Readings:

G. Austin, (2000) 'The Social Revolution and the First Amendment', in *Working a Democratic Constitution*, New Delhi: Oxford University Press, pp. 69-98.

A. Sibal, (2010) 'From Niti to Nyaya,' *Seminar*, Issue 615, pp 28-34.

Additional Reading:

The Constitution of India: Bare Act with Short Notes, (2011) New Delhi: Universal, pp. 4-16.

II. Organs of Government

a. The Legislature: Parliament

Essential Readings:

B. Shankar and V. Rodrigues, (2011) 'The Changing Conception of Representation: Issues, Concerns and Institutions', in *The Indian Parliament: A Democracy at Work*, New Delhi: Oxford University Press, pp. 105-173.

V. Hewitt and S. Rai, (2010) 'Parliament', in P. Mehta and N. Jayal (eds.) *The Oxford Companion to Politics in India*, New Delhi: Oxford University Press, pp. 28-42.

b. The Executive: President and Prime Minister

Essential Readings:

J. Manor, (2005) 'The Presidency', in D. Kapur and P. Mehta P. (eds.) *Public Institutions in India*, New Delhi: Oxford University Press, pp.105-127.

J. Manor, (1994) 'The Prime Minister and the President', in B. Dua and J. Manor (eds.) *Nehruto the Nineties: The Changing Office of the Prime Minister in India*, Vancouver: University of British Columbia Press, pp. 20-47.

H. Khare, (2003) 'Prime Minister and the Parliament: Redefining Accountability in the Age of Coalition Government', in A. Mehra and G. Kueck (eds.) *The Indian Parliament: A Comparative Perspective*, New Delhi: Konark, pp. 350-368.

c. The Judiciary: Supreme Court

Essential Readings:

U. Baxi, (2010) 'The Judiciary as a Resource for Indian Democracy', *Seminar*, Issue 615, pp. 61-67.

R. Ramachandran, (2006) 'The Supreme Court and the Basic Structure Doctrine' in B. Kirpal et.al (eds.) *Supreme but not Infallible: Essays in Honour of the Supreme Court of India*, New Delhi: Oxford University Press, pp. 107-133.

Additional Reading:

L. Rudolph and S. Rudolph, (2008) 'Judicial Review Versus Parliamentary Sovereignty', in *Explaining Indian Institutions: A Fifty Year Perspective, 1956-2006: Volume 2: The Realm of Institutions: State Formation and Institutional Change*. New Delhi: Oxford University Press, pp. 183-210.

III. Federalism and Decentralization

a. Federalism: Division of Powers, Emergency Provisions, Fifth and Sixth Schedules

Essential Readings:

M. Singh, and R. Saxena (eds.), (2011) 'Towards Greater Federalization,' in *Indian Politics: Constitutional Foundations and Institutional Functioning*, Delhi: PHI Learning Private Ltd., pp.166-195.

V. Marwah, (1995) 'Use and Abuse of Emergency Powers: The Indian Experience', in B. Arora and D. Verney (eds.) *Multiple Identities in a Single State: Indian Federalism in a Comparative Perspective*, Delhi: Konark, pp. 136-159.

B. Sharma, (2010) 'The 1990s: Great Expectations'; 'The 2000s: Disillusionment Unfathomable', in *Unbroken History of Broken Promises: Indian State and Tribal People*, Delhi: Freedom Press and Sahyog Pustak Kuteer, pp. 64-91.

The Constitution of India: Bare Act with Short Notes, (2011) New Delhi: Universal, pp 192-213.

Additional Readings:

R. Dhavan and R. Saxena, (2006) 'The Republic of India', in K. Roy, C. Saunders and J. Kincaid (eds.) *A Global Dialogue on Federalism*, Volume 3, Montreal: Queen's University Press, pp. 166-197.

R. Manchanda, (2009) *The No Nonsense Guide to Minority Rights in South Asia*, Delhi: Sage Publications, pp. 105-109.

b. Panchayati Raj and Municipalities

Essential Readings:

P. deSouza, (2002) 'Decentralization and Local Government: The Second Wind of Democracy in India', in Z. Hasan, E. Sridharan and R. Sudarshan (eds.) *India's Living Constitution: Ideas, Practices and Controversies*, New Delhi: Permanent Black, pp. 370-404.

M. John, (2007) 'Women in Power? Gender, Caste and Politics of Local Urban Governance', in *Economic and Political Weekly*, Vol. 42(39), pp. 3986-3993.

Raghunandan, J. R (2012) *Decentralization and local governments: The Indian Experience*, Orient Black Swan, New Delhi

Baviskar, B.S and George Mathew (eds) 2009 *Inclusion and Exclusion in local governance: Field Studies from rural India*, New Delhi, Sage

2.1 Paper III – Political Theory-Concepts and Debates

Course Objective: This course is divided into two sections. Section A helps the student familiarize with the basic normative concepts of political theory. Each concept is related to a crucial political issue that requires analysis with the aid of our conceptual understanding. This exercise is designed to encourage critical and reflective analysis and interpretation of social practices through the relevant conceptual toolkit. Section B introduces the students to the important debates in the subject. These debates prompt

us to consider that there is no settled way of understanding concepts and that in the light of new insights and challenges, besides newer ways of perceiving and interpreting the world around us, we inaugurate new modes of political debates.

Section A: Core Concepts

I. Importance of Freedom (10 Lectures)

a) Negative Freedom: Liberty

b) Positive Freedom: Freedom as Emancipation and Development

Important Issue: Freedom of belief, expression and dissent

II. Significance of Equality (12 lectures)

a) Formal Equality: Equality of opportunity

b) Political equality

c) Egalitarianism: Background inequalities and differential treatment

Important Issue: Affirmative action

III. Indispensability of Justice (12 Lectures)

a) Procedural Justice

b) Distributive Justice

c) Global Justice

Important Issue: Capital punishment

IV. The Universality of Rights (13 Lectures)

a) Natural Rights

b) Moral and Legal Rights

c) Three Generations of Rights

d) Rights and Obligations

Important Issue: Rights of the girl child

Section B: Major Debates (13 Lectures)

I. Why should we obey the state? Issues of political obligation and civil disobedience.

II. Are human rights universal? Issue of cultural relativism.

III. How do we accommodate diversity in plural society? Issues of multiculturalism and toleration.

Essential Readings Section

A: Core Concepts

I. Importance of Freedom

Riley, Jonathan. (2008) 'Liberty' in McKinnon, Catriona (ed.) *Issues in Political Theory*, New York: Oxford University Press, pp. 103-119.

Knowles, Dudley. (2001) *Political Philosophy*. London: Routledge, pp. 69- 132.

Swift, Adam. (2001) *Political Philosophy: A Beginners Guide for Student's and Politicians*. Cambridge: Polity Press, pp. 51-88.

Carter, Ian. (2003) 'Liberty', in Bellamy, Richard and Mason, Andrew (eds.). *Political Concepts*. Manchester: Manchester University Press, pp. 4-15.

Sethi, Aarti. (2008) 'Freedom of Speech and the Question of Censorship', in Bhargava, Rajeev and Acharya, Ashok. (eds.) *Political Theory: An Introduction*. New Delhi: Pearson Longman, pp. 308-319.

II. Significance of Equality

Swift, Adam. (2001) *Political Philosophy: A Beginners Guide for Student's and Politicians*. Cambridge: Polity Press, pp. 91-132.

Casal, Paula & William, Andrew. (2008) 'Equality', in McKinnon, Catriona. (ed.) *Issues in Political Theory*. New York: Oxford University Press, pp. 149- 165.

Acharya, Ashok. (2008) 'Affirmative Action', in Bhargava, Rajeev and Acharya, Ashok. (eds.) *Political Theory: An Introduction*. New Delhi: Pearson Longman, pp. 298-307.

III. Indispensability of Justice

Menon, Krishna. (2008) 'Justice', in Bhargava, Rajeev and Acharya, Ashok. (eds.) *Political Theory: An Introduction*. New Delhi: Pearson Longman, pp. 74-86.

Wolf, Jonathan. (2008) 'Social Justice', in McKinnon, Catriona. (ed.) *Issues in Political Theory*. New York: Oxford University Press, pp. 172-187.

Swift, Adam. (2001) *Political Philosophy: A Beginners Guide for Student's and Politicians*.

Cambridge: Polity Press, pp. 9-48.

Knowles, Dudley. (2001) *Political Philosophy*. London: Routledge, pp. 177-238.

McKinnon, Catriona. (ed.) (2008) *Issues in Political Theory*. New York: Oxford University Press, pp. 289-305.

Bedau, Hugo Adam. (2003) 'Capital Punishment', in LaFollette, Hugh (ed.). *The Oxford Handbook of Practical Ethics*. New York: Oxford University Press, pp. 705-733.

IV. The Universality of Rights

Seglow, Jonathan. (2003) 'Multiculturalism' in Bellamy, Richard and Mason, Andrew (eds.). *Political Concepts*. Manchester: Manchester University Press, pp. 156-168.

Tulkdar, P.S. (2008) 'Rights' in Bhargava, Rajeev and Acharya, Ashok. (eds.) *Political Theory: An Introduction*. New Delhi: Pearson Longman, pp. 88-104.

McKinnon, Catriona. (2003) 'Rights', in Bellamy, Richard and Mason, Andrew. (eds.) *Political Concepts*. Manchester: Manchester University Press, pp. 16-27.

Menlowe, M.A. (1993) 'Political Obligations', in Bellamy Richard.(ed.) *Theories and Concepts of Politics*. New York: Manchester University Press, pp. 174-194.

Amoah, Jewel. (2007) 'The World on Her Shoulders: The Rights of the Girl-Child in the Context of Culture & Identity', in *Essex Human Rights Review*, 4(2), pp. 1-23.

Working Group on the Girl Child (2007), *A Girl's Right to Live: Female Foeticide and Girl Infanticide*, available on [http://www.crin.org/docs/Girl's infanticide CSW 2007.txt](http://www.crin.org/docs/Girl's%20infanticide%20CSW%202007.txt)

Section B: Major Debates

Hyums, Keith. (2008) 'Political Authority and Obligation', in Mckinnon, Catriona. (ed.) *Issues in Political Theory*, New York: Oxford University Press, pp. 9-26

Martin, Rex. (2003) 'Political Obligation', in Bellamy, Richard and Mason, Andrew. (eds.) *Political Concepts*, Manchester: Manchester University Press, pp. 41-51.

Campbell, Tom. (2008) 'Human Rights' in Mckinnon, Catriona. (ed.) *Issues in Political Theory*. New York: Oxford University Press, pp. 194-210.

Mookherjee, Monica, 'Multiculturalism', in Mckinnon, Catriona. (ed.) *Issues in*

Political Theory. New York: Oxford University Press, pp. 218- 234.

Seglow, Jonathan, 'Multiculturalism', in Bellamy, Richard and Mason, Andrew. (eds.) *Political Concepts*, Manchester: Manchester University Press, pp. 156-168.

2.2 Paper IV- Political Process in India

Course objective: Actual politics in India diverges quite significantly from constitutional legal rules. An understanding of the political process thus calls for a different mode of analysis - that offered by political sociology. This course maps the working of 'modern' institutions, premised on the existence of an individuated society, in a context marked by communitarian solidarities, and their mutual transformation thereby. It also familiarizes students with the working of the Indian state, paying attention to the contradictory dynamics of modern state power.

I. Political Parties and the Party System (1.5 weeks or 6 lectures)

Trends in the Party System; From the Congress System to Multi-Party Coalitions

II. Determinants of Voting Behaviour (2 weeks or 8 lectures)

Caste, Class, Gender and Religion

III. Regional Aspirations (2 weeks or 8 lectures)

The Politics of Secession and Accommodation

IV. Religion and Politics (2 weeks or 8 lectures)

Debates on Secularism; Minority and Majority Communalism

V. Caste and Politics (1.5 weeks or 6 lectures)

Caste in Politics and the Politicization of Caste

VI. Affirmative Action Policies (1.5 weeks or 6 lectures)

Women, Caste and Class

VII. The Changing Nature of the Indian State (1.5 weeks or 6 lectures)

Developmental, Welfare and Coercive Dimensions

READING LIST

I. Political Parties and the Party System: Trends in the Party System; From the Congress System to Multi-Party Coalitions

Essential Readings:

R. Kothari, (2002) 'The Congress System', in Z. Hasan (ed.) *Parties and Party Politics in India*, New Delhi: Oxford University Press, pp 39-55.

E. Sridharan, (2012) 'Introduction: Theorizing Democratic Consolidation, Parties and Coalitions', in *Coalition Politics and Democratic Consolidation in Asia*, New Delhi: Oxford University Press.

Additional Reading:

Y. Yadav and S. Palshikar, (2006) 'Party System and Electoral Politics in the Indian States, 1952-2002: From Hegemony to Convergence', in P. deSouza and E. Sridharan (eds.) *India's Political Parties*, New Delhi: Sage Publications, pp. 73-115.

II. Determinants of Voting Behaviour: Caste, Class, Gender and Religion

Essential Readings:

Y. Yadav, (2000) 'Understanding the Second Democratic Upsurge', in F. Frankel, Z. Hasan, and R. Bhargava (eds.) *Transforming India: Social and Political Dynamics in Democracy*, New Delhi: Oxford University Press, pp. 120-145.

C. Jaffrelot, (2008) 'Why Should We Vote? The Indian Middle Class and the Functioning of World's Largest Democracy', in *Religion, Caste and Politics in India*, Delhi: Primus, pp. 604-619.

R. Deshpande, (2004) 'How Gendered was Women's Participation in Elections 2004?', *Economic and Political Weekly*, Vol. 39, No. 51, pp. 5431-5436.

S. Kumar, (2009) 'Religious Practices Among Indian Hindus,' *Japanese Journal of Political Science*, Vol. 10, No. 3, pp. 313-332.

III. Regional Aspirations: The Politics of Secession and Accommodation

Essential Readings:

M. Chadda, (2010) 'Integration through Internal Reorganisation', in S. Baruah (ed.) *Ethnonationalism in India: A Reader*, New Delhi: Oxford University Press, pp. 379-402.

P. Brass, (1999) 'Crisis of National Unity: Punjab, the Northeast and Kashmir', in *The Politics of India Since Independence*, New Delhi: Cambridge University Press and Foundation Books, pp. 192-227.

IV. Religion and Politics: Debates on Secularism: Minority and Majority Communalism

Essential Readings:

T. Pantham, (2004) 'Understanding Indian Secularism: Learning from its Recent Critics', in R. Vora and S. Palshikar (eds.) *Indian Democracy: Meanings and Practices*, New Delhi: Sage, pp. 235-256.

N. Menon and A. Nigam, (2007) 'Politics of Hindutva and the Minorities', in *Power and Contestation: India since 1989*, London: Fernwood Publishing, Halifax and Zed Books, pp. 36-60.

Additional Reading:

N. Chandhoke, (2010) 'Secularism', in P. Mehta and N. Jayal (eds.) *The Oxford Companion to Politics in India*, New Delhi: Oxford University Press, pp. 333-346.

V. Caste and Politics: Caste in Politics and the Politicization of Caste

Essential Readings:

R. Kothari, (1970) 'Introduction', in *Caste in Indian Politics*, Delhi: Orient Longman, pp.3-25. M. Weiner, (2001) 'The Struggle for Equality: Caste in Indian Politics', in Atul Kohli (ed.) *The Success of India's Democracy*, New Delhi: Cambridge University Press, pp. 193-225.

G. Omvedt, (2002) 'Ambedkar and After: The Dalit Movement in India', in G. Shah (ed.) *Social Movements and the State*, New Delhi: Sage Publications, pp. 293-309.

VI. Affirmative Action Policies: Women, Caste and Class

Essential Readings:

M. Galanter, (2002) 'The Long Half-Life of Reservations', in Z. Hasan, E. Sridharan and R. Sudarshan (eds.) *India's Living Constitution: Ideas, Practices, Controversies*, New Delhi: Permanent Black, pp. 306-318.

C. Jaffrelot, (2005) 'The Politics of the OBCs', in *Seminar*, Issue 549, pp. 41-45.

M. John, (2011) 'The Politics of Quotas and the Women's Reservation Bill in India', in M. Tsujimura and J. Steele (eds.) *Gender Equality in Asia*, Japan: Tohoku University Press, pp. 169-195.

VII. Changing Nature of the Indian State: Developmental, Welfare and Coercive Dimensions

Essential Readings:

S. Palshikar, (2008) 'The Indian State: Constitution and Beyond', in R. Bhargava (ed.) *Politics and Ethics of the Indian Constitution*, New Delhi: Oxford University Press, pp. 143-163.

R. Deshpande, (2005) 'State and Democracy in India: Strategies of Accommodation and Manipulation', Occasional Paper, Series III, No. 4, Special Assistance Programme, Department of Politics and Public Administration, University of Pune.

M. Mohanty, (1989) 'Duality of the State Process in India: A Hypothesis', *Bhartiya Samajik Chintan*, Vol. XII (1-2)

Additional Readings:

T. Byres, (1994) 'Introduction: Development Planning and the Interventionist State Versus Liberalization and the Neo-Liberal State: India, 1989-1996', in T. Byres (ed.) *The State, Development Planning and Liberalization in India*, New Delhi: Oxford University Press, 1994, pp.1-35.

A. Verma, (2007) 'Police Agencies and Coercive Power', in S. Ganguly, L. Diamond and M. Plattner (eds.) *The State of India's Democracy*, Baltimore: John Hopkins University Press, pp. 130-139.

3.1 Paper V- Introduction to Comparative Government and Politics

Course objective: This is a foundational course in comparative politics. The purpose is to familiarize students with the basic concepts and approaches to the study of comparative politics. More specifically the course will focus on examining politics in a historical framework while engaging with various themes of comparative analysis in developed and developing countries.

I. Understanding Comparative Politics (8 lectures)

- a. Nature and scope
- b. Going beyond Eurocentrism

II. Historical context of modern government (16 lectures)

- a. Capitalism: meaning and development: globalization
- b. Socialism: meaning, growth and development
- c. Colonialism and decolonization: meaning, context, forms of colonialism; anti-colonialism struggles and process of decolonization

III. Themes for comparative analysis (24 lectures)

A comparative study of constitutional developments and political economy in the following countries: Britain, Brazil, Nigeria and China.

I. Understanding Comparative Politics

Essential Readings:

J. Kopstein, and M. Lichbach, (eds), (2005) *Comparative Politics: Interests, Identities, and Institutions in a Changing Global Order*. Cambridge: Cambridge University Press, pp.1-5; 16-36; 253-290.

M. Mohanty, (1975) 'Comparative Political Theory and Third World Sensitivity', in *Teaching Politics*, Nos. 1 and 2, pp. 22-38

Additional Readings:

A. Roy, (2001) 'Comparative Method and Strategies of Comparison', in *Punjab Journal of Politics*. Vol. xxv (2), pp. 1-15.

J. Blondel, (1996) 'Then and Now: Comparative Politics', in *Political Studies*. Vol. 47 (1), pp. 152-160.

N. Chandhoke, (1996) 'Limits of Comparative Political Analysis', in *Economic and Political Weekly*, Vol. 31 (4), January 27, pp. PE 2-PE2-PE8

II Historical context of modern government a. Capitalism

Essential Readings:

R. Suresh, (2010) *Economy & Society -Evolution of Capitalism*, New Delhi, Sage Publications, pp. 151-188; 235-268.

G. Ritzer, (2002) 'Globalization and Related Process I: Imperialism, Colonialism, Development, Westernization, Easternization', in *Globalization: A Basic Text*. London: Wiley-Blackwell, pp. 63-84.

Additional Readings:

M. Dobb, (1950) 'Capitalism', in *Studies in the Development of Capitalism*. London: Routledge and Kegan Paul Ltd, pp. 1-32.

E. Wood, (2002) 'The Agrarian origin of Capitalism', in *Origin of Capitalism: A Long View*. London: Verso, pp. 91-95; 166-181.

A. Hoogvelt, (2002) 'History of Capitalism Expansion', in *Globalization and Third WorldPolitics*. London: Palgrave, pp. 14-28.

b. Socialism

Essential Readings:

A. Brown, (2009) 'The Idea of Communism', in *Rise and Fall of Communism*, Harpercollins (e-book), pp. 1-25; 587-601.

J. McCormick, (2007) 'Communist and Post-Communist States', in *Comparative Politics inTransition*, United Kingdom: Wadsworth, pp. 195-209

Additional Readings:

R. Meek, (1957) 'The Definition of Socialism: A Comment', *The Economic Journal*. 67 (265), pp. 135-139.

c. Colonialism, decolonization& postcolonial society

Essential Readings:

P. Duara, (2004) 'Introduction: The Decolonization of Asia and Africa in the Twentieth Century', in P. Duara, (ed), *Decolonization: Perspective From Now and Then*. London: Routledge, pp. 1-18.

J. Chiryankandath, (2008) 'Colonialism and Post-Colonial Development', in P. Burnell, et. al, *Politics in the Developing World*. New Delhi: Oxford University Press, pp. 31-52.

Additional Reading:

M. Mohanty, (1999) 'Colonialism and Discourse in India and China', Available at http://www.ignca.nic.in/ks_40033.html http, Accessed: 24.03.2011.

III. Themes for Comparative Analysis

Essential Reading:

L. Barrington et. al (2010) *Comparative Politics - Structures & Choices*, Boston, Wadsworth, pp. 212-13; 71-76; 84-89.

M. Grant, (2009) 'United Kingdom Parliamentary System' in *The UK Parliament*. Edinburgh: Edinburgh University Press, pp. 24-43

J. McCormick, (2007) *Comparative Politics in Transition*, UK: Wadsworth, pp. 260-270 (China)

M. Kesselman, J. Krieger and William (2010), *Introduction to Comparative Politics: Political Challenges and Changing Agendas*, UK: Wadsworth. pp. 47-70 (Britain); 364-388 (Nigeria); 625-648 (China); 415-440 (Brazil).

Additional Reading:

P. Rutland, (2007) 'Britain', in J. Kopstein and M. Lichbach. (eds.) *Comparative Politics: Interest, Identities and Institutions in a Changing Global Order*. Cambridge: Cambridge University Press, pp. 39-79.

3.2 PERSPECTIVES ON PUBLIC ADMINISTRATION

Objective: The course provides an introduction to the discipline of public administration. This paper encompasses public administration in its historical context with an emphasis on the various classical and contemporary administrative theories. The course also explores some of the recent trends, including feminism and ecological conservation and how the call for greater democratization is restructuring public administration. The course will also attempt to provide the students a comprehensive understanding on contemporary administrative developments.

I. PUBLIC ADMINISTRATION AS A DISCIPLINE [15 lectures]

- Meaning, Dimensions and Significance of the Discipline
- Public and Private Administration
- Evolution of Public Administration

II. THEORETICAL PERSPECTIVES [25 lectures]

CLASSICAL THEORIES

- Scientific management (F.W.Taylor)
- Administrative Management (Gullick, Urwick and Fayol)
- Ideal-type bureaucracy (Max Weber)

NEO-CLASSICAL THEORIES

- Human relations theory (Elton Mayo)
- Rational decision-making (Herbert Simon)

CONTEMPORARY THEORIES

- Ecological approach (Fred Riggs)
- Innovation and Entrepreneurship (Peter Drucker)

III. PUBLIC POLICY [10 lectures]

- Concept, relevance and approaches
- Formulation, implementation and evaluation

IV. MAJOR APPROACHES IN PUBLIC ADMINISTRATION [20 lectures]

- New Public Administration
- New Public Management
- New Public Service Approach
- Good Governance
- Feminist Perspectives

READINGS

I. Public Administration as a Discipline

Meaning, Dimensions and Significance of the Discipline.

Nicholas Henry, *Public Administration and Public Affairs*, Prentice Hall, 1999

D. Rosenbloom, R. Kravchuk. and R. Clerkin, (2009) *Public Administration: Understanding Management, Politics and Law in Public Sector*, 7th edition, New Delhi: McGraw Hill, pp. 1-40

W. Wilson, (2004) 'The Study of Administration', in B. Chakrabarty and M. Bhattacharya (eds), *Administrative Change and Innovation: a Reader*, New Delhi: Oxford University Press, pp. 85-101

b. Public and Private Administration.

M. Bhattacharya, (2008) *New Horizons of Public Administration*, 5th Revised Edition. New Delhi: Jawahar Publishers, pp. 37-44.

G. Alhson, (1997) 'Public and Private Management', in Shafritz, J. and Hyde, A. (eds.) *Classic of Public Administration*, 4th Edition. Forth Worth: Hartcourt Brace, TX, pp. 510-529.

Evolution of Public Administration

N. Henry, *Public Administration and Public Affairs*, 12th edition. New Jersey: Pearson, 2013

M. Bhattacharya, *Restructuring Public Administration: A New Look*, New Delhi: Jawahar Publishers, 2012

P. Dunleavy and C. Hood, "From Old Public Administration to New Public Management", *Public Money and Management*, Vol. XIV No-3, 1994

M. Bhattacharya, *New Horizons of Public Administration*, New Delhi: Jawahar

Publishers, 2011

Basu, Rumki, *Public Administration : Concepts and Theories* Sterling Publishers, New Delhi 2014

II. Theoretical Perspectives Scientific Management

D. Gvishiani, *Organisation and Management*, Moscow: Progress Publishers, 1972

F. Taylor, 'Scientific Management', in J. Shafritz, and A. Hyde, (eds.) *Classics of Public Administration*, 5th Edition. Belmont: Wadsworth, 2004

P. Mouzelis, 'The Ideal Type of Bureaucracy' in B. Chakrabarty, And M. Bhattacharya, (eds), *Public Administration: A Reader*, New Delhi: Oxford University Press, 2003

Administrative Management

H. Ravindra Prasad, Y. Pardhasaradhi, V. S. Prasad and P. Satyrnarayana, [eds.], *Administrative Thinkers*, Sterling Publishers, 2010

I. J. Ferreira, A. W. Erasmus and D. Groenewald , *Administrative Management*, Juta Academics, 2010

Ideal Type-Bureaucracy

R. Weber, 'Bureaucracy', in C. Mills, and H. Gerth, *From Max Weber: Essays in Sociology*. Oxford: Oxford University Press, 1946

Warren. G. Bennis, *Beyond Bureaucracy*, Mc Graw Hill, 1973

Human Relations Theory

D. Gvishiani, *Organisation and Management*, Moscow: Progress Publishers, 1972

B. Miner, 'Elton Mayo and Hawthorne', in *Organisational Behaviour 3: Historical Origins and the Future*. New York: M.E. Sharpe, 2006

Rational-Decision Making

S. Maheshwari, *Administrative Thinkers*, New Delhi: Macmillan, 2009

Fredrickson and Smith, 'Decision Theory', in *The Public Administration Theory Primer*. Cambridge: Westview Press, 2003

Ecological approach

R. Arora, 'Riggs' Administrative Ecology' in B. Chakrabarty and M. Bhattacharya (eds), *Public Administration: A reader*, New Delhi, Oxford University Press, 2003

A. Singh, *Public Administration: Roots and Wings*. New Delhi: Galgotia Publishing Company, 2002

F. Riggs, *Administration in Developing Countries: The Theory of Prismatic Society*. Boston: Houghton Mifflin, 1964

Innovation and Entrepreneurship

Peter Drucker, *Innovation and Entrepreneurship*, Harper Collins, 1999

Peter F. Drucker , *The Practice of Management*, Harper Collins, 2006

III. Public Policy

Concept, Relevance and Approaches

T. Dye, (1984) *Understanding Public Policy*, 5th Edition. U.S.A: Prentice Hall, pp. 1- 44
The Oxford Handbook of Public Policy ,OUP,2006

Xun Wu, M.Ramesh, Michael Howlett and Scott Fritzen ,*The Public Policy Primer: ManagingThe Policy Process*, Rutledge, 2010

Mary Jo Hatch and Ann .L. Cunliffe *Organisation Theory : Modern, Symbolicand Postmodern Perspectives*, Oxford University Press,2006

Michael Howlett, *Designing Public Policies : Principles And Instruments*, Rutledge, 2011
The Oxford Handbook Of Public Policy, Oxford University Press, 2006

Formulation, implementation and evaluation

Prabir Kumar De, *Public Policy and Systems*, Pearson Education, 2012

R.V. Vaidyanatha Ayyar, *Public Policy Making In India*, Pearson,2009

Surendra Munshi and Biju Paul Abraham [Eds.] *Good Governance, Democratic Societies AndGlobalisation*, Sage Publishers, 2004

IV. Major Approaches in Public Administration a. Development administration

M. Bhattacharya, 'Chapter 2 and 4', in *Social Theory, Development Administration andDevelopment Ethics*, New Delhi: Jawahar Publishers, 2006

F. Riggs,*The Ecology of Public Administration, Part 3*, New Delhi: Asia Publishing House, 1961

c. New Public Administration

Essential Reading:

M. Bhattacharya, *Public Administration: Issues and Perspectives*, New Delhi: Jawahar Publishers, 2012

H. Frederickson, 'Toward a New Public Administration', in J. Shafritz, & A. Hyde, (eds.) *Classics of Public Administration*, 5th Edition, Belmont: Wadsworth, 2004

d.New Public Management

U. Medury, *Public administration in the Globalization Era*, New Delhi: Orient Black Swan, 2010

A. Gray, and B. Jenkins, 'From Public Administration to Public Management' in E. Otenyo and N. Lind, (eds.) *Comparative Public Administration: The Essential Readings*: Oxford University Press, 1997

C. Hood, 'A Public Management for All Seasons', in J. Shafritz, & A. Hyde, (eds.) *Classics ofPublic Administration*, 5th Edition, Belmont: Wadsworth, 2004

d. New Public Service Approach

R.B.Denhart & J.V.Denhart [Arizona State University] “ The New Public Service: Serving Rather Than Steering”, in Public Administration Review ,Volume 60, No-6,November-December 2000

e. Good Governance

A. Leftwich, ‘Governance in the State and the Politics of Development’, in *Development and Change*. Vol. 25,1994

M. Bhattacharya, ‘Contextualizing Governance and Development’ in B. Chakrabarty and M. Bhattacharya, (eds.) *The Governance Discourse*. New Delhi: Oxford University Press,1998 B. Chakrabarty, *Reinventing Public Administration: The India Experience*. New Delhi: Orient Longman, 2007

U. Medury, *Public administration in the Globalisation Era*, New Delhi: Orient Black Swan, 2010

f. Feminist Perspective

Camila Stivers, *Gender Images In Public Administration*, California : Sage Publishers,2002 Radha Kumar, *The History of Doing*, New Delhi: Kali For Women, 1998

Sylvia Walby, *Theorising Patriarchy*, Oxford, Basil Blackwell.1997

Amy. S. Wharton, *The Sociology Of Gender*, West Sussex : Blackwell-Wiley Publishers,2012 Nivedita Menon [ed.], *Gender and Politics*, Delhi: Oxford University Press, 1999

Simone De Beauvoir, *The Second Sex*, London: Picador, 1988

Alison Jaggar, *Feminist Politics And Human Nature*, Brighton: Harvester Press,1983

Maxine Molyneux and Shahra Razavi , *Gender, Justice, Development and Rights* ,Oxford: Oxford University Press, 2002

3.3 Paper VII- Perspectives on International Relations and World History

Course Objective: This paper seeks to equip students with the basic intellectual tools for understanding International Relations. It introduces students to some of the most important theoretical approaches for studying international relations. The course begins by historically contextualizing the evolution of the international state system before discussing the agency-structure problem through the levels-of-analysis approach. After having set the parameters of the debate, students are introduced to different theories in International Relations. It provides a fairly comprehensive overview of the major political developments and events starting from the twentieth century. Students are expected to learn about the key milestones in world history and equip them with the tools to understand and analyze the same from different perspectives. A key objective of the course is to make students aware of the implicit Euro - centricism of International Relations by highlighting certain specific perspectives from the Global South.

A. Studying International Relations (15 Lectures)

- i. How do you understand International Relations: Levels of Analysis (3 lectures)
- ii. History and IR: Emergence of the International State System (2 Lectures)
- iii. Pre-Westphalia and Westphalia (5 lectures)
- iv. Post-Westphalia (5 lectures)

D. Theoretical Perspectives (25 Lectures)

- i. Classical Realism & Neo-Realism (6 lectures)
- ii. Liberalism & Neoliberalism (5 lectures)
- iii. Marxist Approaches (5 lectures)
- iv. Feminist Perspectives (4 lectures)
- v. Eurocentricism and Perspectives from the Global South (5 Lectures)

C. An Overview of Twentieth Century IR History (20 Lectures)

- i. World War I: Causes and Consequences (1 Lecture)
- ii. Significance of the Bolshevik Revolution (1 Lecture)
- iii. Rise of Fascism / Nazism (2 Lectures)
- iv. World War II: Causes and Consequences (3 Lectures)
- v. Cold War: Different Phases (4 Lectures)
- vi. Emergence of the Third World (3 Lectures)
- vii. Collapse of the USSR and the End of the Cold War (2 Lectures)
- viii. Post Cold War Developments and Emergence of Other Power Centers of Power (4 Lectures)

Essential Readings:

M. Nicholson, (2002) *International Relations: A Concise Introduction*, New York: Palgrave, pp. 1-4.

R. Jackson and G. Sorensen, (2007) *Introduction to International Relations: Theories and Approaches*, 3rd Edition, Oxford: Oxford University Press, pp. 2-7

S. Joshua. Goldstein and J. Pevehouse, (2007) *International Relations*, New York: Pearson Longman, 2007, pp. 29-35

C. Brown and K. Ainley, (2009) *Understanding International Relations*, Basingstoke: Palgrave, pp. 1-16.

Additional Readings:

K. Mingst and J. Snyder, (2011) *Essential Readings in International Relations*, New York: W.W. Norton and Company, pp. 1-15.

M. Smith and R. Little, (eds) (2000) 'Introduction', in *Perspectives on World Politics*, New York: Routledge, 2000, 1991, pp. 1-17.

J. Baylis and S. Smith (eds), (2008) *The Globalization of World Politics: An Introduction to International Relations*, New York: Oxford University Press, pp. 1- 6.

R. Mansbach and K. Taylor, (2008) *Introduction to Global Politics*, New York: Routledge, pp. 2-32.

Rumki Basu, (ed)(2012) *International Politics: Concepts, Theories and Issues* New Delhi, Sage.

History and IR: Emergence of the International State System:

Essential Readings:

R. Mansbach and K. Taylor, (2012) *Introduction to Global Politics*, New York: Routledge, pp. 33-68.

K. Mingst, (2011) *Essentials of International Relations*, New York: W.W. Norton and Company, pp. 16-63.

P. Viotti and M. Kauppi, (2007) *International Relations and World Politics: Security, Economy, Identity*, Pearson Education, pp. 40-85.

Additional Readings:

J. Baylis, S. Smith and P. Owens, (2008) *The Globalization of World Politics: An Introduction to International Relations*, New York: Oxford University Press, pp. 36- 89.

R. Mansbach and K. Taylor, (2008) *Introduction to Global Politics*, New York: Routledge, pp. 70-135.

J Goldstein and J. Pevehouse, (2007) *International Relations*, New York: Pearson Longman, pp. 50-69.

E. Hobsbawm, (1995) *Age of Extremes: The Short Twentieth Century 1914-1991*, Vikings.

S. Lawson, (2003) *International Relations*, Cambridge: Polity Press, pp. 21-60.

How do you Understand IR (Levels of Analysis):

Essential Readings:

J. Singer, (1961) 'The International System: Theoretical Essays', *World Politics*, Vol. 14(1), pp. 77-92.

B. Buzan, (1995) 'The Level of Analysis Problem in International Relations Reconsidered,' in K. Booth and S. Smith, (eds), *International Relations Theory Today*, Pennsylvania: The Pennsylvania State University Press, pp. 198-216.

Additional Readings:

K. Mingst, (2011) *Essentials of International Relations*, New York: W.W. Norton and Company, pp. 93-178.

J. Goldstein and J. Pevehouse, (2007) *International Relations*, New York: Pearson Longman, pp. 35-49.

K. Waltz, (1959) *Man, The State and War*, Columbia: Columbia University Press.

Theoretical Perspectives:

Classical Realism and Neorealism

Essential Readings:

E. Carr, (1981) *The Twenty Years Crisis, 1919-1939: An Introduction to the Study of International Relations*, London: Macmillan, pp. 63-94.

H. Morgenthau, (2007) 'Six Principles of Political Realism', in R. Art and R. Jervis, *International Politics*, 8th Edition, New York: Pearson Longman, pp. 7-14.

T. Dunne and B. Schmidt, (2008) 'Realism', in J. Baylis and S. Smith (eds), *The Globalization of World Politics: An Introduction to International Relations*, New York: Oxford University Press, pp. 90-107.

K. Waltz, (2007) 'The Anarchic Structure of World Politics', in R. Art and R. Jervis, *International Politics*, 8th Edition, New York: Pearson Longman, pp. 29-49.

Additional Readings:

M. Nicholson, (2002) *International Relations: A Concise Introduction*, New York: Palgrave, pp. 6-7.

H. Bull, (2000) 'The Balance of Power and International Order', in M. Smith and R. Little (eds), *Perspectives on World Politics*, New York: Routledge, pp. 115-124.

Liberalism and Neoliberalism

Essential Readings:

T. Dunne, (2008) 'Liberalism', in J. Baylis and S. Smith (eds.), *The Globalization of World Politics: An Introduction to International Relations*, New York: Oxford University Press, pp. 108-123.

R. Keohane and J. Nye, (2000) 'Transgovernmental Relations and the International Organization', in M. Smith and R. Little (eds.), *Perspectives on World Politics*, New York: Routledge, pp. 229-241.

Additional Readings:

J. Goldstein and J. Pevehouse, (2007) *International Relations*, New York: Pearson Longman, pp. 127-137.

R. Jackson and G. Sorensen, (2007) *Introduction to International Relations: Theories and Approaches*, 3rd Edition, Oxford: Oxford University Press, pp. 97- 128.

Marxist Approaches

Essential Readings:

I. Wallerstein, (2000) 'The Rise and Future Demise of World Capitalist System: Concepts for Comparative Analysis', in Michael Smith and Richard Little (eds), *Perspectives on World Politics*, New York: Routledge, pp. 305-317.

S. Hobden and R. Jones, (2008) 'Marxist Theories of International Relations' in J. Baylis and S. Smith (eds), *The Globalization of World Politics: An Introduction to International Relations*, New York: Oxford University Press, pp. 142-149; 155-158.

J. Goldstein and J. Pevehouse, (2007) *International Relations*, New York: Pearson Longman, pp. 494-496; 500-503.

Additional Readings:

J. Galtung, (2000) 'A Structural Theory of Imperialism', in M. Smith and R. Little, (eds), *Perspectives on World Politics*, New York: Routledge, pp. 292-304.

A. Frank, (1966) 'The Development of Underdevelopment' *Monthly Review*, pp. 17-30.

P. Viotti and M. Kauppi (2007), *International Relations and World Politics: Security, Economy, Identity*, Pearson Education, pp. 40-85.

Modern History Sourcebook: Summary of Wallerstein on World System Theory, Available at <http://www.fordham.edu/halsall/mod/Wallerstein.asp>, Accessed: 19.04.2013

Feminist Perspectives

Essential Readings:

J. Tickner, (2007) 'A Critique of Morgenthau's Principles of Political Realism', in R. Art and R. Jervis, *International Politics*, 8th Edition, New York: Pearson Longman, pp. 15-28.

F. Halliday, (1994) *Rethinking International Relations*, London: Macmillan, pp. 147-166. Additional Readings:

M. Nicholson, *International Relations: A Concise Introduction*, New York: Palgrave, 2002, pp. 120-122.

J. Goldstein and J. Pevehouse, (2007) *International Relations*, New York: Pearson

Longman, pp. 138-148.

S. Smith and P. Owens, (2008) 'Alternative Approaches to International Theory' in J. Baylis and S. Smith (eds), *The Globalization of World Politics: An Introduction to International Relations*, New York: Oxford University Press, pp. 181-184.

IR, Eurocentricism and Perspectives from the Global South on Eurocentricism

Essential Readings:

A. Acharya and B. Buzan, (2007) 'Why Is There No Non- Western IR Theory: Reflections on and From Asia', *International Relations Of The Asia- Pacific*, Vol 7(3), pp. 285-286.

T. Kayaoglu, (2010) 'Westphalian Eurocentrism in I R Theory', in *International Studies Review*, Vol. 12(2), pp. 193-217.

Additional Readings:

O. Weaver and A. Tickner, (2009) 'Introduction: Geocultural Epistemologies', in A. Tickner and O. Waever (eds), *International Relations: Scholarship Around The World*, London: Routledge, pp. 1-31.

R.Kanth (ed), (2009) *The Challenge of Eurocentrism: Global Perspectives, Policy & Prospects*, New York: Palgrave-McMillan.

S. Amin, (2010) *Eurocentrism: Modernity, Religion & Democracy*, New York: Monthly Review Press.

An Overview of Twentieth Century IR History

(a) World War I: Causes and Consequences

Hobsbawm, E. (1995) *Age of Extreme: The Short Twentieth Century, 1914—1991*. London: Abacus, pp. 22-35.

(b) Significance of the Bolshevik Revolution

Hobsbawm, E. (1995) *Age of Extreme: The Short Twentieth Century, 1914—1991*. London: Abacus, pp. 54-78.

(c) Rise of Fascism / Nazism

Hobsbawm, E. (1995) *Age of Extreme: The Short Twentieth Century, 1914—1991*. London: Abacus, pp. 108-141.

Carr, E.H. (2004) *International Relations between the Two World Wars: 1919-1939*. New York: Palgrave, pp. 197-231 and 258-278.

(d) World War II: Causes and Consequences

Taylor, A.J.P. (1961) *The Origins of the Second World War*. Harmondsworth: Penguin,

pp.29-65.

Carruthers, S.L. (2005) 'International History, 1900-1945' in Baylis, J. and Smith, S. (eds.) (2008)

The Globalization of World Politics. An Introduction to International Relations. 4th edn. Oxford: Oxford University Press, pp. 76-84.

(e) Cold War: Different Phases

Calvocoressi, P. (2001) *World Politics: 1945—2000*. Essex: Pearson, pp. 3-91.

Scott, L. (2005) 'International History, 1945-1990' in Baylis, J. and Smith, S. (eds.) (2008) *The Globalization of World Politics. An Introduction to International Relations.* 4th edn. Oxford: Oxford University Press, pp. 93-101.

Hobsbawm, E. (1995) *Age of Extreme: The Short Twentieth Century, 1914—1991*. London: Abacus, pp. 225-226.

(f) Emergence of the Third World

Hobsbawm, E. (1995) *Age of Extreme: The Short Twentieth Century, 1914—1991*. London: Abacus, pp. 207-222.

(g) Collapse of the USSR and the End of the Cold War

Scott, L. (2005) 'International History, 1945-1990' in Baylis, J. and Smith, S. (eds.) (2008) *The Globalization of World Politics. An Introduction to International Relations.* 4th edn. Oxford: Oxford University Press, pp. 93-101.

(h) Post Cold War Developments and Emergence of Other Power Centres of Power: Japan, European Union (EU) and Brazil, Russia, India, China (BRIC)

Brezekski, Z. (2005) *Choice: Global Dominance or Global Leadership*. New York: Basic Books, pp. 85-127.34

Gill, S. (2005) 'Contradictions of US Supremacy' in Panitch, L. and Leys, C. (eds.) *Socialist Register: The Empire Reloaded*. London: Merlin Press. 2004, London, Merlin Press and New York, Monthly Review Press. *Socialist Register*, pp.24-47.

Therborn, G. (2006) 'Poles and Triangles: US Power and Triangles of Americas, Asia and Europe' in Hadiz, V.R. (ed.) *Empire and Neo Liberalism in Asia*. London: Routledge, pp.23-37.

4.1 Paper VIII- Political Processes and Institutions in Comparative Perspective

Course objective: In this course students will be trained in the application of comparative methods to the study of politics. The course is comparative in both what we study and how we study. In the process the course aims to introduce undergraduate students to some of the range of issues, literature, and methods that cover comparative political.

I. Approaches to Studying Comparative Politics (8 lectures)

a. Political Culture
b. New Institutionalism

II. Electoral System (8 lectures)

Definition and procedures: Types of election system (First Past the Post, Proportional Representation, Mixed Representation)

III. Party System (8 lectures)

Historical contexts of emergence of the party system and types of parties

IV. Nation-state (8 lectures)

What is nation–state? Historical evolution in Western Europe and postcolonial contexts
'Nation' and 'State': debates

V. Democratization (8 lectures)

Process of democratization in postcolonial, post- authoritarian and post-communist countries

VI. Federalism (8 lectures) Historical context Federation and Confederation: debates around territorial division of power.

READING LIST

I: Approaches to Studying Comparative Politics

Essential Readings:

M. Pennington, (2009) 'Theory, Institutional and Comparative Politics', in J. Bara and Pennington. (eds.) *Comparative Politics: Explaining Democratic System*. Sage Publications, New Delhi, pp. 13-40.

M. Howard, (2009) 'Culture in Comparative Political Analysis', in M. Lichback and A. Zuckerman, pp. 134- S. (eds.) *Comparative Political: Rationality, Culture, and Structure*. Cambridge: Cambridge University Press.

B. Rosamond, (2005) 'Political Culture', in B. Axford, et al. *Politics*, London: Routledge, pp. 57-81.

Additional Readings:

P. Hall, Taylor and C. Rosemary, (1996) 'Political Science and the Three New Institutionalism', *Political Studies*. XLIV, pp. 936-957.

L. Rakner, and R. Vicky, (2011) 'Institutional Perspectives', in P. Burnell, et .al. (eds.) *Political in the Developing World*. Oxford: Oxford University Press, pp. 53-70.

II: Electoral System

Essential Readings:

A. Heywood, (2002) 'Representation, Electoral and Voting', in *Politics*. New York: Palgrave, pp. 223-245.

A. Evans, (2009) 'Elections Systems', in J. Bara and M. Pennington, (eds.) *Comparative politics*. New Delhi: Sage Publications, pp. 93-119.

Additional Reading:

R. Moser, and S. Ethan, (2004) 'Mixed Electoral Systems and Electoral System Effects: Controlled Comparison and Cross-national Analysis', in *Electoral Studies*. 23, pp. 575-599.

III: Party System

Essential Readings:

A. Cole, (2011) 'Comparative Political Parties: Systems and Organizations', in J. Ishiyama, and M. Breuning, (eds) *21st Century Political Science: A Reference Book*. Los Angeles: Sage Publications, pp. 150-158.

A. Heywood, (2002) 'Parties and Party System', in *Politics*. New York : Palgrave, pp. 247-268.

Additional Readings:

- B. Criddle, (2003) 'Parties and Party System', in R. Axtmann, (ed.) *Understanding Democratic Politics: An Introduction*. London: Sage Publications, pp. 134-142.

IV: Nation-state

Essential Readings:

W. O'Conner, (1994) 'A Nation is a Nation, is a Sate, is a Ethnic Group, is a ...', in J. Hutchinson and A. Smith, (eds.) *Nationalism*. Oxford: Oxford University Press, pp. 36-46.

K. Newton, and J. Deth, (2010) 'The Development of the Modern State ', in *Foundations of Comparative Politics: Democracies of the Modern World*. Cambridge: Cambridge University Press, pp. 13-33.

Additional Reading:

A. Heywood, (2002), 'The State', in *Politics*. New York: Palgrave, pp. 85-102

V. Democratization

Essential Readings:

T. Landman, (2003) 'Transition to Democracy', in *Issues and Methods of Comparative Methods: An Introduction*. London: Routledge, pp. 185-215.

K. Newton, and J. Deth, (2010) 'Democratic Change and Persistence', in *Foundations of Comparative Politics: Democracies of the Modern World*. Cambridge: Cambridge University Press, pp. 53-67.

J. Haynes, (1999) 'State and Society', in *The Democratization*. Oxford: Blackwell, pp. 20-38; 39-63.

Additional Reading:

B. Smith, (2003) 'Democratization in the Third World', in *Understanding Third World Politics: Theories of Political Change and Development*. London: Palgrave Macmillan, pp.250-274.

VI: Federalism

Essential Readings:

M. Burgess, (2006) *Comparative Federalism: Theory and Practice*. London: Routledge, pp. 135-161.

R. Watts, (2008) 'Introduction', in *Comparing Federal Systems*. Montreal and Kingston: McGill Queen's University Press, pp. 1-27

Additional Reading:

R. Saxena, (2011) 'Introduction', in Saxena, R (eds.) *Varieties of Federal Governance: Major Contemporary Models*. New Delhi: Cambridge University Press, pp. xii-x1.

4.2 Paper-IX PUBLIC POLICY AND ADMINISTRATION IN INDIA

Objective: The paper seeks to provide an introduction to the interface between public policy and administration in India. The essence of public policy lies in its effectiveness in translating the governing philosophy into programs and policies and making it a part of the community living. It deals with issues of decentralization, financial management, citizens and administration and social welfare from a non-western perspective.

I. Public Policy [10 lectures]

a. Definition, characteristics and models

b. Public Policy Process in India

II. Decentralization [10 lectures]

- g. Meaning, significance and approaches and types
- h. Local Self Governance: Rural and Urban

III. Budget [12 lectures]

- h. Concept and Significance of Budget
- i. Budget Cycle in India
- j. Various Approaches and Types Of Budgeting

IV. Citizen and Administration Interface [15 lectures]

- a. Public Service Delivery
- b. Redressal of Public Grievances: RTI, Lokpal, Citizens' Charter and E-Governance

V. Social Welfare Administration [20 lectures]

- a. Concept and Approaches of Social Welfare
- b. Social Welfare Policies:
 - Education:** Right To Education,
 - Health:** National Health Mission,
 - Food:** Right To Food Security
 - Employment:** MNREGA

READINGS

Public Policy

T. Dye, (1984) *Understanding Public Policy*, 5th Edition. U.S.A: Prentice Hall

R.B. Denhardt and J.V. Denhardt, (2009) *Public Administration*, New Delhi: Brooks/Cole

J. Anderson, (1975) *Public Policy Making*. New York: Thomas Nelson and sons Ltd.

M. Howlett, M. Ramesh, and A. Perl, (2009), *Studying Public Policy: Policy Cycles and Policy subsystems*, 3rd edition, Oxford: Oxford University Press

T. Dye, (2002) *Understanding Public Policy*, New Delhi: Pearson

Y. Dror, (1989) *Public Policy Making Reexamined*. Oxford: Transaction Publication

Decentralization

Satyajit Singh and Pradeep K. Sharma [eds.] *Decentralisation: Institutions And Politics In Rural India*, OUP, 2007

D. A. Rondinelli and S. Cheema, *Decentralisation and Development*, Beverly Hills: Sage Publishers, 1983

N.G. Jayal, *Democracy and The State: Welfare, Secular and Development in Contemporary India*, Oxford : Oxford University Press, 1999

Bidyut Chakrabarty, *Reinventing Public Administration: The Indian Experience*, Orient Longman, 2007

Noorjahan Bava, *Development Policies and Administration in India*, Delhi: Uppal Publishers, 2001

Gabriel Almond and Sidney Verba, *The Civic Culture*, Boston: Little Brown, 1965 M.P. Lester,

Political Participation- How and Why do People Get Involved in Politics
Chicago: McNally, 1965

III. Budget

Erik-Lane, J. (2005) *Public Administration and Public Management: The Principal Agent Perspective*. New York: Routledge

Henry, N. (1999) *Public Administration and Public Affairs*. New Jersey: Prentice Hall

Caiden, N. (2004) 'Public Budgeting Amidst Uncertainty and Instability', in Shafritz, J.M. & Hyde, A.C. (eds.) *Classics of Public Administration*. Belmont: Wadsworth

IV Citizen And Administration Interface

R. Putnam, *Making Democracy Work*, Princeton University Press, 1993

Jenkins, R. and Goetz, A.M. (1999) 'Accounts and Accountability: Theoretical Implications of the Right to Information Movement in India', in *Third World Quarterly*. June

Sharma, P.K. & Devasher, M. (2007) 'Right to Information in India' in Singh, S. and Sharma, P. (eds.) *Decentralization: Institutions and Politics in Rural India*. New Delhi: Oxford University Press

Vasu Deva, *E-Governance In India: A Reality*, Commonwealth Publishers, 2005

World Development Report, World Bank, Oxford University Press, 1992.

M.J. Moon, *The Evolution of Electronic Government Among Municipalities: Rhetoric or Reality*, American Society For Public Administration, *Public Administration Review*, Vol 62, Issue 4, July – August 2002

Pankaj Sharma, *E-Governance: The New Age Governance*, APH Publishers, 2004

Pippa Norris, *Digital Divide: Civic Engagement, Information Poverty and the Internet*

in Democratic Societies, Cambridge: Cambridge University Press, 2001.

Stephan Goldsmith and William D. Eggers, *Governing By Network: The New Shape of the Public Sector*, Brookings Institution [Washington], 2004

United Nation Development Programme, *Reconceptualising Governance*, New York, 1997
Mukhopadhyay, A. (2005) 'Social Audit', in *Seminar*. No.551.

V. Social Welfare Administration

Jean Drèze and Amartya Sen, *India, Economic Development and Social Opportunity*, Oxford: Oxford University Press, 1995

J.Dreze and Amartya Sen, *Indian Development: Selected Regional Perspectives*, Oxford: Clareland Press, 1997

Reetika Khera- Rural Poverty And Public Distribution System, EPW, Vol-XLVIII, No.45-46, Nov 2013

Pradeep Chaturvedi [ed.], *Women And Food Security: Role Of Panchayats*, Concept Publishers, 1997

National Food Security Mission: nfsm.gov.in/Guidelines/XIIPlan/NFSMXII.pdf

Jugal Kishore, *National Health Programs of India: National Policies and Legislations*, Century Publications, 2005

K. Lee and Mills, *The Economic Of Health In Developing Countries*, Oxford: Oxford University Press, 1983

K. Vijaya Kumar, *Right to Education Act 2009: Its Implementation as to Social Development in India*, Delhi: Akansha Publishers, 2012.

Marma Mukhopadhyay and Madhu Parhar(ed.) *Education in India: Dynamics of Development*, Delhi: Shipra Publications, 2007

Nalini Juneja, *Primary Education for All in the City of Mumbai: The Challenge Set By Local Actors'*, International Institute For Educational Planning, UNESCO: Paris, 2001

Surendra Munshi and Biju Paul Abraham [eds.] *Good Governance, Democratic Societies and Globalisation*, Sage Publishers, 2004

Basu Rumki (2015) *Public Administration in India Mandates, Performance and Future Perspectives*, New Delhi, Sterling Publishers

www.un.org/millenniumgoals
<http://www.cefsindia.org>
www.righttofoodindia.org

4.3 Paper X- Global Politics

Course objective: This course introduces students to the key debates on the meaning and nature of globalization by addressing its political, economic, social, cultural and technological dimensions. In keeping with the most important debates within the globalization discourse, it imparts an understanding of the working of the world economy, its anchors and resistances offered by global social movements while analyzing the changing nature of relationship between the state and trans-national actors and networks. The course also offers insights into key contemporary global issues such as the proliferation of nuclear weapons, ecological issues, international terrorism, and human security before concluding with a debate on the phenomenon of global governance.

I. Globalization: Conceptions and Perspectives (23 lectures)

- a. Understanding Globalization and its Alternative Perspectives (6 lectures)
- b. Political: Debates on Sovereignty and Territoriality (3 lectures)
- c. Global Economy: Its Significance and Anchors of Global Political Economy: IMF,
- d. World Bank, WTO, TNCs (8 lectures)
- e. Cultural and Technological Dimension (3 lectures)
- f. Global Resistances (Global Social Movements and NGOs) (3 lectures)

II. Contemporary Global Issues (20 lectures)

- a. Ecological Issues: Historical Overview of International Environmental Agreements, Climate Change, Global Commons Debate (7 lectures)
- b. Proliferation of Nuclear Weapons (3 lectures)
- c. International Terrorism: Non-State Actors and State Terrorism; Post 9/11 developments (4 lectures)
- d. Migration (3 lectures)
- e. Human Security (3 lectures)

III. Global Shifts: Power and Governance (5 lectures)

READING LIST

I. Globalization – Conceptions and Perspectives Understanding Globalization and its Alternative Perspectives

Essential Readings:

G. Ritzer, (2010) *Globalization: A Basic Text*, Sussex: Wiley-Blackwell, pp. 33-62.
M. Strager, (2009) *Globalization: A Very Short Introduction*, London: Oxford University Press, pp. 1-16.
R. Keohane and J. Nye Jr, (2000) 'Globalization: What's New? What's Not? (And So What?)', in *Foreign Policy*, No 118, pp. 104-119.

Additional Reading:

A. McGrew, (2011) 'Globalization and Global Politics', in J. Baylis, S. Smith and P. Owens (eds.) *Globalization of World Politics: An Introduction to International Relations*, New York: Oxford University Press, pp. 14-31.
A. Heywood, (2011) *Global Politics*, New York: Palgrave-McMillan, pp. 1-24.
W. Ellwood, (2005) *The No-nonsense Guide to Globalization*, Jaipur: NI-Rawat Publications, pp. 12-23.

Political: Debates on Sovereignty and Territoriality

Essential Readings:

A. Heywood, (2011) *Global Politics*, New York: Palgrave-McMillan, pp. 112-134.
R. Keohane, (2000) 'Sovereignty in International Society', in D. Held and A. McGrew (eds.) *The Global Trans-Formations Reader*, Cambridge: Polity Press, pp. 109-123.

Additional Reading:

K. Shimko, (2005) *International Relations: Perspectives and Controversies*, New York: Houghton Mifflin, pp. 195-219.

Global Economy: Its Significance and Anchors of Global Political Economy: IMF, World Bank, WTO, TNCs

Essential Readings:

A. Heywood, (2011) *Global Politics*, New York: Palgrave-McMillan, pp. 454-479.
T. Cohn, (2009) *Global Political Economy: Theory and Practice*, pp. 130-140 (IMF), 208-218 (WTO).
R. Picciotto, (2003) 'A New World Bank for a New Century', in C. Roe Goddard et al., *International Political: State-Market Relations in a Changing Global Order*, Boulder: LynneReinner, pp. 341-351.
A. Narlikar, (2005) *The World Trade Organization: A Very Short Introduction*, New York: Oxford University Press, pp. 22-98.
J. Goldstein, (2006) *International Relations*, New Delhi: Pearson, pp. 392-405 (MNC).
P. Hirst, G. Thompson and S. Bromley, (2009) *Globalization in Question*, Cambridge: Polity Press, pp. 68-100 (MNC).

Additional Readings:

G. Ritzer, (2010) *Globalization: A Basic Text*, Sussex: Wiley-Blackwell, pp. 180-190.
F. Lechner and J. Boli (ed.), (2004) *The Globalization Reader*, London: Blackwell, pp. 236-239 (WTO).
D. Held et al, (1999) *Global Transformations: Politics, Economics and Culture*,

California: Stanford University Press, pp. 242-282 (MNC).

T. Cohn, (2009) *Global Political Economy*, New Delhi: Pearson, pp. 250-323 (MNC).

Cultural and Technological Dimension

Essential Readings:

D. Held and A. McGrew (eds.), (2002) *Global Transformations Reader: Politics, Economics and Culture*, Cambridge: Polity Press, pp. 1-50; 84-91.

M. Steger, (2009) 'Globalization: A Contested Concept', in *Globalization: A Very Short Introduction*, London: Oxford University Press, pp. 1-16.

A. Appadurai, (2000) 'Grassroots Globalization and the Research Imagination', in *Public Culture*, Vol. 12(1), pp. 1-19.

Additional Reading:

J. Beynon and D. Dunkerley, (eds.), (2012) *Globalisation: The Reader*, New Delhi: Rawat Publications, pp. 1-19.

A. Vanaik, (ed.), (2004) *Globalization and South Asia: Multidimensional Perspectives*, New Delhi: Manohar Publications, pp. 171-191, 192-213, 301-317, 335-357.

Global Resistances (Global Social Movements and NGOs)

Essential Readings:

G. Ritzer, (2010) *Globalization: A Basic Text*, Sussex: Wiley-Blackwell, pp. 487-504.

R. O'Brien et al., (2000) *Contesting Global Governance: Multilateral Economic Institutions and Global Social Movements*, Cambridge: Cambridge University Press, pp. 1-23.

J. Fisher, (1998) *Non-Governments: NGOs and Political Development in the Third World*, Connecticut: Kumarian Press, pp. 1- 37 (NGO).

Additional Readings:

G. Laxter and S. Halperin (eds.), (2003) *Global Civil Society and Its Limits*, New York: Palgrave, pp. 1-21.

A. Heywood, (2011) *Global Politics*, New York: Palgrave-McMillan, pp. 150-156 (NGO).

P. Willets, (2011) 'Trans-National Actors and International Organizations in Global Politics', in J. Baylis, S. Smith and P. Owens (eds.) *Globalization of World Politics*, New York: Oxford University Press, pp. 334-342. (NGO)

II. Contemporary Global Issues

Ecological Issues: Historical Overview of International Environmental Agreements, Climate Change, Global Commons Debate

Essential Readings:

J. Volger, (2011) 'Environmental Issues', in J. Baylis, S. Smith and P. Owens (eds.) *Globalization of World Politics*, New York: Oxford University Press, pp. 348-362.

A. Heywood, (2011) *Global Politics*, New York: Palgrave, pp. 383-411.

N. Carter, (2007) *The Politics of Environment: Ideas, Activism, Policy*, Cambridge: Cambridge University Press, pp. 13-81.

Additional Readings:

P. Bidwai, (2011) 'Durban: Road to Nowhere', in *Economic and Political Weekly*,

Vol.46, No. 53, December, pp. 10-12.

K.Shimko, (2005) *International Relations Perspectives and Controversies*, New York: Hughton-Mifflin, pp. 317-339.

Proliferation of Nuclear Weapons

Essential Readings:

D. Howlett, (2011) 'Nuclear Proliferation', in J. Baylis, S. Smith and P. Owens (eds.) *Globalization of World Politics*, New York: Oxford University Press, pp. 384-397.

P. Viotti and M. Kauppi, (2007) *International Relations and World Politics: Security, Economy and Identity*, New Delhi: Pearson, pp. 238-272.

Additional Reading:

A. Heywood, (2011) *Global Politics*, New York: Palgrave, pp. 264-281.

International Terrorism: Non-State Actors and State Terrorism; Post 9/11 developments

Essential Readings:

P. Viotti and M. Kauppi, (2007) *International Relations*, New Delhi: Pearson, pp. 276-307.

A.Heywood, (2011) *Global Politics*, New York: Palgrave, pp. 282-

301. Additional Readings:

J. Kiras, (2011) 'Terrorism and Globalization', in J. Baylis, S. Smith and P. Owens (eds.) *Globalization of World Politics*, New York: Oxford University Press, pp. 366- 380.

A.Vanaik, (2007) *Masks of Empire*, New Delhi: Tulika, pp. 103-128.

Migration

Essential Readings:

G. Ritzer, (2010) *Globalization: A Basic Text*, Sussex: Wiley-Blackwell, pp. 298-322.

S. Castles, (2012) 'Global Migration', in B. Chimni and S. Mallavarapu (eds.) *International Relations: Perspectives For the Global South*, New Delhi: Pearson, pp. 272-285.

Human Security

Essential Readings:

A. Acharya, (2011) 'Human Security', in J. Baylis, S. Smith and P. Owens (eds.) *Globalization of World Politics*, New York: Oxford University Press, pp. 480-493.

S. Tadjbakhsh and A. Chenoy, (2007) *Human Security*, London: Routledge, pp. 13-19; 123-127; 236-243.

Additional Reading:

A. Acharya, (2001) 'Human Security: East versus West', in *International Journal*, Vol. 56, no. 3, pp. 442-460.

III. Global Shifts: Power and Governance

Essential Readings:

J. Rosenau, (1992) 'Governance, Order, and Change in World Politics', in J. Rosenau, and

E. Czempiel (eds.) *Governance without Government: Order and Change in World Politics*, Cambridge: Cambridge University Press, pp. 1-29.

A. Kumar and D. Messner (eds), (2010) *Power Shifts and Global Governance: Challenges from South and North*, London: Anthem Press.

P. Dicken, (2007) *Global Shift: Mapping the Changing Contours of the World Economy*, New York: The Guilford Press.

J. Close, (2001) 'The Global Shift: A quantum leap in human evolution', Available at <http://www.stir-global-shift.com/page22.php>, Accessed: 19.04.2013.

5.1

Paper XI- Classical Political Philosophy

Course objective: This course goes back to Greek antiquity and familiarizes students with the manner in which the political questions were first posed. Machiavelli comes as an interlude inaugurating modern politics followed by Hobbes and Locke. This is a basic foundation course for students.

I. Text and Interpretation (2 weeks)

II. Antiquity Plato (2 weeks)

Philosophy and Politics, Theory of Forms, Justice, Philosopher King/Queen, Communism Presentation theme: Critique of Democracy; Women and Guardianship, Censorship

Aristotle (2 weeks)

Forms, Virtue, Citizenship, Justice, State and Household
Presentation themes: Classification of governments; man as zoon politikon

III. Interlude:

Machiavelli (2 weeks)

Virtu, Religion, Republicanism
Presentation themes: morality and statecraft; vice and virtue

IV. Possessive

Individualism Hobbes (2 weeks)

Human nature, State of Nature, Social Contract, State
Presentation themes: State of nature; social contract; Leviathan; atomistic individuals.

Locke (2 weeks)

Laws of Nature, Natural Rights, Property,
Presentation themes: Natural rights; right to dissent; justification of property

READING LIST

I. Text and Interpretation

Essential Readings:

T. Ball, (2004) 'History and Interpretation' in C. Kukathas and G. Gaus, (eds.) *Handbook of Political Theory*, London: Sage Publications Ltd. pp. 18-30.

B. Constant, (1833) 'The Liberty of the Ancients Compared with that of the Moderns', in D. Boaz, (ed), (1997) *The Libertarian Reader*, New York: The Free Press.

Additional Readings:

J. Coleman, (2000) 'Introduction', in *A History of Political Thought: From Ancient Greece to Early Christianity*, Oxford: Blackwell Publishers, pp. 1-20.

Q. Skinner, (2010) 'Preface', in *The Foundations of Modern Political Thought Volume I*, Cambridge: Cambridge University Press pp. ix-xv.

II.

Antiquity:

Plato

Essential Readings:

A. Skoble and T. Machan, (2007) *Political Philosophy: Essential Selections*. New Delhi: Pearson Education, pp. 9-32.

R. Kraut, (1996) 'Introduction to the study of Plato', in R. Kraut (ed.) *The Cambridge Companion to Plato*. Cambridge: Cambridge University Press, pp. 1-50.

C. Reeve, (2009) 'Plato', in D. Boucher and P. Kelly, (eds) *Political Thinkers: From Socrates to the Present*, Oxford: Oxford University Press, pp. 62-80

Additional Readings:

S. Okin, (1992) 'Philosopher Queens and Private Wives', in S. Okin *Women in Western Political Thought*, Princeton: Princeton University Press, pp. 28-50

R. Kraut, (1996) 'The Defence of Justice in Plato's Republic', in R. Kraut (ed.) *The Cambridge Companion to Plato*. Cambridge: Cambridge University Press, pp. 311-337

T. Saunders, (1996) 'Plato's Later Political Thought', in R. Kraut (ed.) *The Cambridge Companion to Plato*. Cambridge: Cambridge University Press, pp. 464-492.

Aristotle

Essential Readings:

A. Skoble and T. Machan, (2007) *Political Philosophy: Essential Selections*. New Delhi: Pearson Education, pp. 53-64.

T. Burns, (2009) 'Aristotle', in D. Boucher, and P. Kelly, (eds) *Political Thinkers: From*

Socrates to the Present. Oxford: Oxford University Press, pp.81-99.

C. Taylor, (1995) 'Politics', in J. Barnes (ed.), *The Cambridge Companion to Aristotle*. Cambridge: Cambridge University Press, pp. 232-258

Additional Readings:

J. Coleman, (2000) 'Aristotle', in J. Coleman *A History of Political Thought: From Ancient Greece to Early Christianity*, Oxford: Blackwell Publishers, pp.120-186

D. Hutchinson, (1995) 'Ethics', in J. Barnes, (ed.), *The Cambridge Companion to Aristotle* Cambridge: Cambridge University Press, pp. 195-232.

III. Interlude:

Machiavelli

Essential Readings:

A. Skoble and T. Machan, (2007) *Political Philosophy: Essential Selections*. New Delhi: Pearson Education, pp. 124-130

Q. Skinner, (2000) 'The Adviser to Princes', in *Machiavelli: A Very Short Introduction*, Oxford: Oxford University Press, pp. 23-53

J. Femia, (2009) 'Machiavelli', in D. Boucher, and P. Kelly, (eds) *Political Thinkers: From Socrates to the Present*. Oxford: Oxford University Press, pp. 163-184

Additional Reading:

Q. Skinner, (2000) 'The Theorist of Liberty', in *Machiavelli: A Very Short Introduction*. Oxford: Oxford University Press, pp. 54-87.

IV. Possessive

Individualism Hobbes

Essential Readings:

A. Skoble and T. Machan, (2007) *Political Philosophy: Essential Selections*. New Delhi: Pearson Education pp. 131-157.

D. Baumgold, (2009) 'Hobbes', in D. Boucher and P. Kelly (eds) *Political Thinkers: From Socrates to the Present*. Oxford: Oxford University Press, pp. 189-206.

C. Macpherson (1962) *The Political Theory of Possessive Individualism: Hobbes to Locke*. Oxford University Press, Ontario, pp. 17-29.

Additional Readings:

I. Hampsher-Monk, (2001) 'Thomas Hobbes', in *A History of Modern Political Thought: Major Political Thinkers from Hobbes to Marx*, Oxford: Blackwell Publishers, pp. 1-67.

A. Ryan, (1996) 'Hobbes's political philosophy', in T. Sorell, (ed.) *Cambridge Companion to Hobbes*. Cambridge: Cambridge University Press, pp. 208-245.

Locke

Essential Readings:

A. Skoble and T. Machan, (2007) *Political Philosophy: Essential Selections*. New Delhi: Pearson Education, pp. 181-209.

J. Waldron, (2009) 'John Locke', in D. Boucher and P. Kelly, (eds) *Political Thinkers: From Socrates to the Present*. Oxford: Oxford University Press, pp. 207-224

C. Macpherson, (1962) *The Political Theory of Possessive Individualism: Hobbes to Locke*. Oxford University Press, Ontario, pp. 194-214.

Additional Readings:

R. Ashcraft, (1999) 'Locke's Political Philosophy', in V. Chappell (ed.) *The Cambridge Companion to Locke*, Cambridge. Cambridge University Press, pp. 226-251.

I. Hampsher-Monk, (2001) *A History of Modern Political Thought: Major Political Thinkers from Hobbes to Marx*, Oxford: Blackwell Publishers, pp. 69-116

5.2 Paper XII- Indian Political Thought-I

Course objective: This course introduces the specific elements of Indian Political Thoughtspanning over two millennia. The basic focus of study is on individual thinkers whose ideas are however framed by specific themes. The course as a whole is meant to provide a sense of the broad streams of Indian thought while encouraging a specific knowledge of individual thinkers and texts. Selected extracts from some original texts are also given to discuss in class. The list of additional readings is meant for teachers as well as the more interested students.

I. Traditions of Pre-colonial Indian Political Thought (8 lectures)

- a. Brahmanic and Shramanic
- b. Islamic and Syncretic.

II. Ved Vyasa (Shantiparva): Rajadharma (5 lectures)

III. Manu: Social Laws (6 lectures)

IV. Kautilya: Theory of State (7 lectures)

V. Aggannasutta (Digha Nikaya): Theory of kingship (5 lectures)

VI. Barani: Ideal Polity (6 lectures)

VII. Abul Fazal: Monarchy (6 lectures)

VIII. Kabir: Syncretism (5 lectures)

READING LIST

I. Traditions of Pre-modern Indian Political Thought:

Essential Readings:

B. Parekh, (1986) 'Some Reflections on the Hindu Tradition of Political Thought', in T. Pantham, and K. Deutsch (eds.), *Political Thought in Modern India*, New Delhi: Sage Publications, pp. 17- 31.

A. Altekar, (1958) 'The Kingship', in *State and Government in Ancient India*, 3rd edition, Delhi: Motilal Banarsidass, pp. 75-108.

M. Shakir, (1986) 'Dynamics of Muslim Political Thought', in T. Pantham, and K. Deutsch (eds.), *Political Thought in Modern India*, New Delhi: Sage Publications, pp. 142- 160

G. Pandey, (1978) *Sraman Tradition: Its History and Contribution to Indian Culture*, Ahmedabad: L. D. Institute of Indology, pp. 52-73.

S. Saberwal, (2008) 'Medieval Legacy', in *Spirals of Contention*, New Delhi: Routledge, pp.1-31

II. Ved Vyasa (Shantiparva): Rajadharm

Essential Readings:

The Mahabharata (2004), Vol. 7 (Book XI and Book XII, Part II), Chicago and London:University of Chicago Press.

V. Varma, (1974) *Studies in Hindu Political Thought and Its Metaphysical Foundations*, Delhi: Motilal Banarsidass, pp. 211- 230.

B. Chaturvedi, (2006) 'Dharma-The Foundation of Raja-Dharma, Law and Governance', in
The Mahabharata: An Inquiry in the Human Condition, Delhi: Orient Longman, pp. 418- 464.

III. Manu: Social Laws

Essential Readings:

Manu, (2006) 'Rules for Times of Adversity', in P. Olivelle, (ed. & trans.) *Manu's Code of Law: A Critical Edition and Translation of the Manava- Dharamsastra*, New Delhi: OUP, pp. 208-213.

V. Mehta, (1992) 'The Cosmic Vision: Manu', in *Foundations of Indian Political Thought*, Delhi: Manohar, pp. 23- 39.

R. Sharma, (1991) 'Varna in Relation to Law and Politics (c 600 BC-AD 500)', in *Aspects of Political Ideas and Institutions in Ancient India*, Delhi: Motilal Banarsidass, pp. 233-251.

P. Olivelle, (2006) 'Introduction', in *Manu's Code of Law: A Critical Edition and Translation of the Manava –Dharmasastra*, Delhi: Oxford University Press, pp. 3- 50.

IV. Kautilya: Theory of State

Essential Readings:

Kautilya, (1997) 'The Elements of Sovereignty' in R. Kangle (ed. and trns.), *Arthashastra of Kautilya*, New Delhi: Motilal Publishers, pp. 511- 514.

V. Mehta, (1992) 'The Pragmatic Vision: Kautilya and His Successor', in *Foundations of Indian Political Thought*, Delhi: Manohar, pp. 88- 109.

R. Kangle, (1997) *Arthashastra of Kautilya-Part-III: A Study*, Delhi: Motilal Banarsidass, rpt., pp. 116- 142.

Additional Reading:

J. Spellman, (1964) 'Principle of Statecraft', in *Political Theory of Ancient India: A Study of Kingship from the Earliest time to Circa AD 300*, Oxford: Clarendon Press, pp. 132-170.

V. Agganna Sutta (Digha Nikaya): Theory of Kingship

Essential Readings:

S. Collins, (ed), (2001) *Agganna Sutta: An Annotated Translation*, New Delhi: Sahitya Academy, pp. 44-49.

S. Collins, (2001) 'General Introduction', in *Agganna Sutta: The Discussion on What is Primary (An Annotated Translation from Pali)*, Delhi: Sahitya Akademi, pp. 1- 26.

B. Gokhale, (1966) 'The Early Buddhist View of the State', in *The Journal of Asian Studies*, Vol. XXVI, (1), pp. 15- 22.

Additional Reading:

L. Jayasurya, 'Buddhism, Politics and Statecraft', Available at ftp.buddhism.org/Publications/.../Voll1_03_Laksiri%20Jayasuriya.pdf, Accessed: 19.04.2013.

VI. Barani: Ideal Polity

Essential Reading:

I. Habib, (1998) 'Ziya Barani's Vision of the State', in *The Medieval History Journal*, Vol. 2,

(1), pp. 19- 36.

Additional Reading:

M. Alam, (2004) 'Sharia Akhlaq', in *The Languages of Political Islam in India 1200- 1800*, Delhi: Permanent Black, pp. 26- 43

VII. Abul Fazal: Monarchy

Essential Readings:

A. Fazl, (1873) *The Ain-i Akbari* (translated by H. Blochmann), Calcutta: G. H. Rouse, pp. 47-57.

V. Mehta, (1992) 'The Imperial Vision: Barani and Fazal', in *Foundations of Indian Political Thought*, Delhi: Manohar, pp. 134- 156.

Additional Readings:

M. Alam, (2004) 'Sharia in Naserean Akhlaq', in *Languages of Political Islam in India 1200-1800*, Delhi: Permanent Black, pp. 46- 69.

I. Habib, (1998) 'Two Indian Theorist of The State: Barani and Abul Fazal', in *Proceedings of the Indian History Congress*. Patiala, pp. 15- 39.

VIII. Kabir: Syncreticism

Essential Readings:

Kabir. (2002) *The Bijak of Kabir*, (translated by L. Hess and S. Singh), Delhi: Oxford University Press, No. 30, 97, pp. 50- 51 & 69- 70.

V. Mehta, (1992) *Foundation of Indian Political Thought*, Delhi: Manohar, pp. 157- 183.

G. Omvedt, (2008) 'Kabir and Ravidas, Envisioning Begumpura', in *Seeking Begumpura: The Social Vision of Anti Caste Intellectual*, Delhi: Navayana, pp. 91- 107.

Additional Reading:

L. Hess and S. Singh, (2002) 'Introduction', in *The Bijak of Kabir*, New Delhi: Oxford University Press, pp. 3- 35.

6.1 Paper XIII- Modern Political Philosophy

Course objective: Philosophy and politics are closely intertwined. We explore this convergence by identifying four main tendencies here. Students will be exposed to the manner in which the questions of politics have been posed in terms that have implications for larger questions of thought and existence.

I. Modernity and its discourses (8 lectures)

This section will introduce students to the idea of modernity and the discourses around modernity. Two essential readings have been prescribed.

II. Romantics (16 lectures)

a. Jean Jacques Rousseau (8 Lectures)

Presentation themes: General Will; local or direct democracy; self-government; origin of inequality.

b. Mary Wollstonecraft (8 Lectures)

Presentation themes: Women and paternalism; critique of Rousseau's idea of education; legal rights

III. Liberal socialist (8 lectures)

a. John Stuart Mill

Presentation themes: Liberty, suffrage and subjection of women, right of minorities; utility principle.

IV. Radicals (16 lectures)

a. Karl Marx (8 Lectures)

Presentation themes: Alienation; difference with other kinds of materialism; class struggle

b. Alexandra Kollontai (8 Lectures)

Presentation themes: Winged and wingless Eros; proletarian woman; socialization of housework; disagreement with Lenin

Reading List

I. Modernity and its discourses

Essential Readings:

I. Kant. (1784) 'What is Enlightenment?,' available at <http://theliterarylink.com/kant.html>, Accessed: 19.04.2013

S. Hall (1992) 'Introduction', in *Formations of Modernity* UK: Polity Press pages 1-16

II. Romantics

Essential Readings:

B. Nelson, (2008) *Western Political Thought*. New York: Pearson Longman, pp. 221- 255.

M. Keens-Soper, (2003) 'Jean Jacques Rousseau: The Social Contract', in M. Forsyth and M. Keens-Soper, (eds) *A Guide to the Political Classics: Plato to Rousseau*. New York: Oxford University Press, pp. 171-202.

C. Jones, (2002) 'Mary Wollstonecraft's *Vindications* and their Political Tradition' in C. Johnson, (ed.) *The Cambridge Companion to Mary Wollstonecraft*, Cambridge: Cambridge University Press, pp. 42-58.

S. Ferguson, (1999) 'The Radical Ideas of Mary Wollstonecraft', in *Canadian Journal of Political Science* XXXII (3), pp. 427-50, Available at <http://digitalcommons.ryerson.ca/politics>, Accessed: 19.04.2013.

III. Liberal Socialist

Essential Readings:

H. Magid, (1987) 'John Stuart Mill', in L. Strauss and J. Cropsey, (eds), *History of Political Philosophy*, 2nd edition. Chicago: Chicago University Press, pp. 784-801.

P. Kelly, (2003) 'J.S. Mill on Liberty', in D. Boucher, and P. Kelly, (eds.) *Political Thinkers: From Socrates to the Present*. New York: Oxford University Press, pp. 324- 359.

IV. Radicals

Essential Readings:

J. Cropsey, (1987) 'Karl Marx', in L. Strauss and J. Cropsey, (eds) *History of Political Philosophy*, 2nd Edition. Chicago: Chicago University Press, pp. 802-828.

L. Wilde, (2003) 'Early Marx', in D. Boucher and P. Kelly, P. (eds) *Political Thinkers: From Socrates to the Present*. New York: Oxford University Press, pp. 404-435.

V. Bryson, (1992) 'Marxist Feminism in Russia' in *Feminist Political Theory*, London: Palgrave Macmillan, pp. 114-122

C. Sypnowich, (1993) 'Alexandra Kollontai and the Fate of Bolshevik Feminism' *Labour/Le Travail* Vol. 32 (Fall 1992) pp. 287-295

A. Kollontai (1909), *The Social Basis of the Woman Question*, Available at <http://www.marxists.org/archive/kollonta/1909/social-basis.htm>, Accessed: 19.04.2013

Additional Readings:

A. Bloom, (1987) 'Jean-Jacques Rousseau', in Strauss, L. and Cropsey, J. (eds.) *History of Political Philosophy*, 2nd edition. Chicago: Chicago University Press, pp. 559-580.

Selections from *A Vindication of the Rights of Woman*, Available at <http://oregonstate.edu/instruct/phl302/texts/wollstonecraft/woman-a.html#CHAPTER%20II>, Accessed: 19.04.2013.

A. Skoble and T. Machan, (2007) *Political Philosophy: Essential Selections*, New Delhi: Pearson Education, pp. 328-354.

B. Ollman (1991) *Marxism: An Uncommon Introduction*, New Delhi: Sterling Publishers.

G. Blakely and V. Bryson (2005) *Marx and Other Four Letter Words*, London: Pluto

A. Skoble, and T. Machan, (2007) *Political Philosophy: Essential Selections*, New Delhi: Pearson Education, pp. 286-327.

A. Kollontai, (1977) 'Social Democracy and the Women's Question', in *Selected Writings of Alexandra Kollontai*, London: Allison & Busby, pp. 29-74.

A. Kollontai, (1977) 'Make Way for Winged Eros: A Letter to the Youth', in *Selected Writings of Alexandra Kollontai* Allison & Busby, pp. 201-292.

C. Porter, (1980) *Alexandra Kollontai: The Lonely Struggle of the Woman who defied Lenin*, New York: Dutton Children's Books.

6.2 Paper XIV- Indian Political Thought-II

Course objective: Based on the study of individual thinkers, the course introduces a wide span of thinkers and themes that defines the modernity of Indian political thought. The objective is to study general themes that have been produced by thinkers from varied social and temporal contexts. Selected extracts from original texts are also given to discuss in the class. The list of additional readings is meant for teachers as well as the more interested students.

I. Introduction to Modern Indian Political Thought (4 lectures)

II. Rammohan Roy: Rights (4 lectures)

III. Pandita Ramabai: Gender (4 lectures)

IV. Vivekananda: Ideal Society (5 lectures)

V. Gandhi: Swaraj (5 lectures)

VI. Ambedkar: Social Justice (5 lectures)

VII. Tagore: Critique of Nationalism (4 lectures)

VIII. Iqbal: Community (5 lectures)

IX. Savarkar: Hindutva (4 lectures)

X. Nehru: Secularism (4 lectures)

XI. Lohia: Socialism (4 lectures)

Reading List

I. Introduction to Modern Indian Political Thought

Essential Readings:

V. Mehta and T. Pantham (eds.), (2006) '*A Thematic Introduction to Political Ideas in Modern India: Thematic Explorations, History of Science, Philosophy and Culture in Indian civilization*'

Vol. 10, Part: 7, New Delhi: Sage Publications, pp. xxvii-ixi.

D. Dalton, (1982) 'Continuity of Innovation', in *Indian Idea of Freedom: Political Thought of Swami Vivekananda, Aurobindo Ghose, Rabindranath Tagore and Mahatma Gandhi*, Academic Press: Gurgaon, pp. 1-28.

II. Rammohan Roy: Rights

Essential Readings:

R. Roy, (1991) 'The Precepts of Jesus, the Guide to Peace and Happiness', S. Hay, (ed.) *Sources of Indian Tradition, Vol. 2*. Second Edition. New Delhi: Penguin, pp. 24-29.

C. Bayly, (2010) 'Rammohan and the Advent of Constitutional Liberalism in India 1800-1830', in Sh. Kapila (ed.), *An intellectual History for India*, New Delhi: Cambridge University Press, pp. 18- 34.

T. Pantham, (1986) 'The Socio-Religious Thought of Rammohan Roy', in Th. Panthom and K. Deutsch, (eds.) *Political Thought in Modern India*, New Delhi: Sage, pp.32-52.

Additional Reading:

S. Sarkar, (1985) 'Rammohan Roy and the break With the Past', in *A Critique on colonial India*, Calcutta: Papyrus, pp. 1-17.

III. Pandita Ramabai: Gender

Essential Readings:

P. Ramabai, (2000) 'Woman's Place in Religion and Society', in M. Kosambi (ed.), *Pandita Ramabai Through her Own Words: Selected Works*, New Delhi: Oxford

University Press, pp.150-155.

M. Kosambi, (1988) 'Women's Emancipation and Equality: Pandita Ramabai's Contribution to Women's Cause', in *Economic and Political Weekly*, Vol. 23(44), pp. 38-49.

Additional Reading:

U. Chakravarti, (2007) *Pandita Ramabai - A Life and a Time*, New Delhi: Critical Quest, pp. 1-40.

G. Omvedt, (2008) 'Ramabai: Women in the Kingdom of God', in *Seeking Begumpura: The Social Vision of Anti Caste Intellectuals*, New Delhi: Navayana. pp. 205-224.

IV. Vivekananda: Ideal Society

Essential Readings:

S. Vivekananda, (2007) 'The Real and the Apparent Man', S. Bodhasarananda (ed.), *Selections from the Complete Works of Swami Vivekananda*, Kolkata: Advaita Ashrama, pp.126-129.

A. Sen, (2003) 'Swami Vivekananda on History and Society', in *Swami Vivekananda*, Delhi: Oxford University Press, pp. 62- 79.

H. Rustav, (1998) 'Swami Vivekananda and the Ideal Society', in W. Radice (ed.), *Swami Vivekananda and the Modernisation of Hinduism*, Delhi: Oxford University Press, pp. 264-280.

Additional Reading:

Raghuramaraju, (2007) 'Swami and Mahatma, Paradigms: State and Civil Society', in *Debates in Indian Philosophy: Classical, Colonial, and Contemporary*, Delhi: Oxford University Press, pp. 29-65.

V. Gandhi: Swaraj

Essential Readings:

M. Gandhi, (1991) 'Satyagraha: Transforming Unjust Relationships through the Power of the Soul', in S. Hay (ed.), *Sources of Indian Tradition*, Vol. 2. Second Edition, New Delhi: Penguin, pp. 265-270.

A. Parel, (ed.), (2002) 'Introduction', in *Gandhi, freedom and Self Rule*, Delhi: Vistaar Publication.

D. Dalton, (1982) *Indian Idea of Freedom: Political Thought of Swami Vivekananda, Aurobindo Ghose, Mahatma Gandhi and Rabindranath Tagore*, Gurgaon: The Academic Press, pp. 154- 190.

Additional Reading:

R. Terchek, (2002) 'Gandhian Autonomy in Late Modern World', in A. Parel (ed.), *Gandhi, Freedom and Self Rule*. Delhi: Sage.

VI. Ambedkar: Social Justice

Essential Readings:

B. Ambedkar, (1991) 'Constituent Assembly Debates', S. Hay (ed.), *Sources of Indian Tradition, Vol. 2*, Second Edition, New Delhi: Penguin, pp. 342-347.

V. Rodrigues, (2007) 'Good society, Rights, Democracy Socialism', in S. Thorat and Aryama (eds.), *Ambedkar in Retrospect - Essays on Economics, Politics and Society*, Jaipur: IIDS and Rawat Publications.

B. Mungekar, (2007) 'Quest for Democratic Socialism', in S. Thorat, and Aryana (eds.), *Ambedkar in Retrospect - Essays on Economics, Politics and Society*, Jaipur: IIDS and Rawat Publications, pp. 121-142.

Additional Reading:

P. Chatterjee, (2005) 'Ambedkar and the Troubled times of Citizenship', in V. Mehta and Th. Pantham (eds.), *Political ideas in modern India: Thematic Explorations*, New Delhi: Sage, pp. 73-92.

VII. Tagore: Critique of Nationalism

Essential Readings:

R. Tagore, (1994) 'The Nation', S. Das (ed.), *The English Writings of Rabindranath Tagore, Vol. 3*, New Delhi: Sahitya Akademi, pp. 548-551.

R. Chakravarty, (1986) 'Tagore, Politics and Beyond', in Th. Panthams and K. Deutsch (eds.), *Political Thought in Modern India*, New Delhi: Sage, pp. 177-191.

M. Radhakrishnan, and Debasmita, (2003) 'Nationalism is a Great Menace: Tagore and Nationalism' in P. Hogan, Colm and L. Pandit, (eds.) *Rabindranath Tagore: Universality and Tradition*, London: Rosemont Publishing and Printing Corporation, pp. 29-39.

Additional Reading:

A. Nandy, (1994) 'Rabindranath Tagore & Politics of Self', in *Illegitimacy of Nationalism*, Delhi: Oxford University Press, pp. 1-50.

VIII. Iqbal: Community

Essential Readings:

M. Iqbal, (1991) 'Speeches and Statements', in S. Hay (ed.), *Sources of Indian Tradition, Vol.2*, Second Edition, New Delhi: Penguin, pp. 218-222.

A. Engineer, (1980) 'Iqbal's Reconstruction of Religious Thought in Islam', in *Social Scientist*, Vol.8 (8), pp. 52-63.

Madani, (2005) *Composite Nationalism and Islam*, New Delhi: Manohar, pp. 66-91.

Additional Reading:

L. Gordon-Polonskya, (1971) 'Ideology of Muslim Nationalism', in H. Malik (ed.), *Iqbal: Poet-Philosopher of Pakistan*, New York: Columbia University Press, pp. 108- 134.

IX. Savarkar: Hindutva

Essential Readings:

V.Savarkar, 'Hindutva is Different from Hinduism', available at <http://www.savarkar.org/en/hindutva-/essentials-hindutva/hindutva-different-hinduism>, Accessed: 19.04.2013

J. Sharma, (2003) *Hindutva: Exploring the Idea of Hindu Nationalism*, Delhi: Penguin, pp. 124-172.

Additional Reading:

Dh. Keer, (1966) *Veer Savarkar*, Bombay: Popular Prakashan, pp. 223-250.

X. Nehru: Secularism

Essential Readings:

J. Nehru, (1991) 'Selected Works', in S. Hay (ed.), *Sources of Indian Tradition, Vol. 2*, Second Edition, New Delhi: Penguin, pp. 317-319.

R. Pillai, (1986) 'Political thought of Jawaharlal Nehru', in Th. Pantham, and K. Deutsch (eds.), *Political Thought in Modern India*, New Delhi: Sage, pp. 260- 274.

B. Zachariah, (2004) *Nehru*, London: Routledge Historical Biographies, pp. 169-213.

Additional Reading:

P. Chatterjee, (1986) 'The Moment of Arrival: Nehru and the Passive Revolution', in *Nationalist Thought and the Colonial World: A Derivative Discourse?* London: Zed Books, pp.131-166

XI. Lohia: Socialism

Essential Readings:

M. Anees and V. Dixit (eds.), (1984) *Lohia: Many Faceted Personality*, Rammanohar Lohia Smarak Smriti.

S. Sinha, (2010) 'Lohia's Socialism: An underdog's perspective', in *Economic and Political Weekly*, Vol. XLV (40) pp. 51-55.

- A. Kumar, (2010) 'Understanding Lohia's Political Sociology: Intersectionality of Caste, Class, Gender and Language Issue', in *Economic and Political Weekly*, Vol. XLV (40), pp. 64-70.

B) Generic Elective (Interdisciplinary): 4

1.

Feminism: Theory and Practice

Course Objective: The aim of the course is to explain contemporary debates on feminism and the history of feminist struggles. The course begins with a discussion on construction of gender and an understanding of complexity of patriarchy and goes on to analyze theoretical debates within feminism. Part II of the paper covers history of feminism in the west, socialist societies and in anti-colonial struggles. Part III focuses a gendered analysis of Indian society, economy and polity with a view to understanding the structures of gender inequalities. And the last section aims to understand the issues with which contemporary Indian women's movements are engaged with.

I. Approaches to understanding Patriarchy (22 Lectures)

- Feminist theorising of the sex/gender distinction. Biologism versus social constructivism
- Understanding Patriarchy and Feminism
- Liberal, Socialist, Marxist, Radical feminism, New Feminist Schools/Traditions

II. History of Feminism (22 Lectures)

- Origins of Feminism in the West: France, Britain and United States of America
- Feminism in the Socialist Countries: China, Cuba and erstwhile USSR
- Feminist issues and women's participation in anti-colonial and national liberation movements with special focus on India

III. The Indian Experience (16 Lectures)

- Traditional Historiography and Feminist critiques. Social Reforms Movement and position of women in India. History of Women's struggle in India
- Family in contemporary India - patrilineal and matrilineal practices. Gender Relations in the Family, Patterns of Consumption: Intra Household Divisions, entitlements and bargaining, Property Rights
- Understanding Woman's Work and Labour – Sexual Division of Labour, Productive and Reproductive labour, Visible - invisible work – Unpaid (reproductive and

care), Underpaid and Paid work,- Methods of computing women's work , Female headed households

Essential Readings

I. Approaches to understanding Patriarchy

Geetha, V. (2002) *Gender*. Calcutta: Stree.

Geetha, V. (2007) *Patriarchy*. Calcutta: Stree.

Jagger, Alison. (1983) *Feminist Politics and Human Nature*. U.K.: Harvester Press, pp. 25-350.

Supplementary Readings:

Ray, Suranjita. *Understanding Patriarchy*. Available at:

http://www.du.ac.in/fileadmin/DU/Academics/course_material/hrge_06.pdf

Lerner, Gerda. (1986) *The Creation of Patriarchy*. New York: Oxford University Press.

II. History of Feminism

Rowbotham, Shiela. (1993) *Women in Movements*. New York and London: Routledge, Section I, pp. 27-74 and 178-218.

Jayawardene, Kumari. (1986) *Feminism and Nationalism in the Third World*. London: Zed Books, pp. 1-24, 71-108, and Conclusion.

Forbes, Geraldine (1998) *Women in Modern India*. Cambridge: Cambridge University Press, pp. 1-150.

Supplementary Readings:

Eisentein, Zillah. (1979) *Capitalist Patriarchy and the Case for Socialist Feminism*. New York: Monthly Review Press, pp. 271-353.

Funk, Nanette & Mueller, Magda. (1993) *Gender, Politics and Post-Communism*. New York and London: Routledge, Introduction and Chapter 28.

Chaudhuri, Maiyatee. (2003) 'Gender in the Making of the Indian Nation State', in Rege, Sharmila. (ed.) *The Sociology of Gender: The Challenge of Feminist Sociological Knowledge*. New Delhi: Sage.

Banarjee, Sikata. (2007) 'Gender and Nationalism: The Masculinisation of Hinduism and

Female Political Participation', in Ghadially, Rehana. (ed.) *Urban Women in Contemporary India: A Reader*. New Delhi: Sage.

III. Feminist Perspectives on Indian Politics

Roy, Kumkum. (1995) 'Where Women are Worshipped, There Gods Rejoice: The Mirage of the Ancestress of the Hindu Women', in Sarkar, Tanika & Butalia, Urvashi. (eds.) *Women and the Hindu Right*. Delhi: Kali for Women, pp. 10-28.

Chakravarti, Uma. (1988) 'Beyond the Altekarian Paradigm: Towards a New Understanding of Gender Relations in Early Indian History', *Social Scientist*, Volume 16, No. 8.

Banerjee, Nirmala. (1999) 'Analysing Women's work under Patriarchy' in Sangari, Kumkum & Chakravarty, Uma. (eds.) *From Myths to Markets: Essays on Gender*. Delhi: Manohar.

Additional Readings

Gandhi, Nandita & Shah, Nandita. (1991) *The Issues at Stake – Theory and Practice in Contemporary Women's Movement in India*. Delhi: Zubaan, pp. 7-72.

Shinde, Tarabai (1993) 'Stri-Purush Tulna', in Tharu, Susie & Lalita, K. (eds.) *Women Writing in India, 600 BC to the Present. Vol. I*. New York: Feminist Press.

Desai, Neera & Thakkar, Usha. (2001) *Women in Indian Society*. New Delhi: National Book Trust.

2. Gandhi and the Contemporary World

Course objective: Locating Gandhi in a global frame, the course seeks to elaborate Gandhian thought and examine its practical implications. It will introduce students to key instances of Gandhi's continuing influence right up to the contemporary period and enable them to critically evaluate his legacy.

I. Gandhi on Modern Civilization and Ethics of Development (2 weeks)

- a. Conception of Modern Civilisation and Alternative Modernity
- b. Critique of Development: Narmada Bachao Andolan

II. Gandhian Thought: Theory and Action (4 weeks)

- a. Theory of Satyagraha
- b. Satyagraha in Action
 - i. Peasant Satyagraha: Kheda and the Idea of Trusteeship
 - ii. Temple Entry and Critique of Caste
 - iii. Social Harmony: 1947 and Communal Unity

III. Gandhi's Legacy (4 weeks)

- a) Tolerance: Anti - Racism Movements (Anti - Apartheid and Martin Luther King)
- b) The Pacifist Movement
- c) Women's Movements
- d) *Gandhigiri*: Perceptions in Popular Culture

IV. Gandhi and the Idea of Political (2 weeks)

- a) Swaraj
- b) Swadeshi

READINGS

I. Gandhi on Modern Civilization and Ethics of Development

Essential Readings:

B. Parekh, (1997) 'The Critique of Modernity', in *Gandhi: A Brief Insight*, Delhi: Sterling Publishing Company, pp. 63-74.

K. Ishii, (2001) 'The Socio-economic Thoughts of Mahatma Gandhi: As an Origin of Alternative Development', *Review of Social Economy*. Vol. 59 (3), pp. 297-312.

D. Hardiman, (2003) 'Narmada Bachao Andolan', in *Gandhi in his Time and Ours*. Delhi: Oxford University Press, pp. 224- 234.

A Baviskar, (1995) 'The Politics of the Andolan', in *In the Belly of the River: Tribal Conflict Over Development in the Narmada Valley*, Delhi: Oxford University Press, pp.202-228.

R Iyer, (ed) (1993) 'Chapter 4' in *The Essential Writings of Mahatma Gandhi*, New Delhi: Oxford University Press.

R. Ramashray, (1984) 'Liberty Versus Liberation', in *Self and Society: A Study in Gandhian Thought*, New Delhi: Sage Publication.

II. Gandhian Thought: Theory and Action

Essential Readings:

B. Parekh, (1997) 'Satyagrah', in *Gandhi: A Brief Insight*, Delhi: Sterling Publishing Company, pp. 51-63.

D. Dalton, (2000) 'Gandhi's originality', in A. Parel (ed) *Gandhi, Freedom and Self- Rule*, New Delhi: Lexington Books, pp.63-86.

D. Hardiman, (1981) 'The Kheda Satyagraha', in *Peasant Nationalists of Gujarat: Kheda District, 1917-1934*, Delhi: Oxford University Press, pp. 86-113.

J. Brown, (2000) 'Gandhi and Human Rights: In search of True humanity', in A. Parel

(ed) *Gandhi, Freedom and Self-Rule*, New Delhi: Lexington Books, pp. 93- 100.

R. Iyer, (2000) 'Chapter 10 and 11', in *The Moral and Political Thought of Mahatma Gandhi*, New Delhi: Oxford University Press, pp. 251-344

I. Knudegaard, (2010), *Gandhi's Vision for Indian Society: Theory and Action*, Master Thesis in History, University of Oslo, Available at

[https://docs.google.com/viewer?a=v&q=cache:Eqj9br1n3_oJ:https://www.duo.uio.no/bi](https://docs.google.com/viewer?a=v&q=cache:Eqj9br1n3_oJ:https://www.duo.uio.no/bi%20tst)

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ream/handle/123456789/23275/IngridKnudegaardxmasteroppavexixhistorie.pdf?sequence%3D1+gandhi+and+temple+entry&hl=en&gl=in&pid=bl&srcid=ADGEEsiKGssA7q2z1kxiutm3bciHPH_HI3chWKbJIVo9HE4LcWCLmKdKXCirPalzh7Tp47fyobQJHX9GUesefn8YCAQeaQSKMRdrwvYT2Q8c7XV95tQhSGuO9bNCGEdIYGoBjzoVdJc&sig=AHIEtbQ78zwxGvh92AnwmRHiA7t2wWXXJQ](https://docs.google.com/viewer/a=v&q=cache:Eqj9br1n3_oJ:https://www.duo.uio.no/bi%20tst%20ream/handle/123456789/23275/IngridKnudegaardxmasteroppavexixhistorie.pdf?sequence%3D1+gandhi+and+temple+entry&hl=en&gl=in&pid=bl&srcid=ADGEEsiKGssA7q2z1kxiutm3bciHPH_HI3chWKbJIVo9HE4LcWCLmKdKXCirPalzh7Tp47fyobQJHX9GUesefn8YCAQeaQSKMRdrwvYT2Q8c7XV95tQhSGuO9bNCGEdIYGoBjzoVdJc&sig=AHIEtbQ78zwxGvh92AnwmRHiA7t2wWXXJQ), Accessed: 14.04.2013, pp.27-38.

P. Rao, (2009) 'Gandhi, Untouchability and the Postcolonial Predicament: A Note'. *SocialScientist*. Vol. 37 (1/2). Pp. 64-70.

B. Parekh, (1999) 'Discourse on Unsociability', in *Colonialism, Tradition and Reform: An Analysis of Gandhi's Political Discourse*, New Delhi: Sage Publication.

D. Hardiman, (2003) 'Fighting Religious Hatreds', in *Gandhi in His Time and Ours*. Delhi: Oxford University Press.

III. Gandhi's Legacy

Essential Readings:

D. Hardiman, (2003) 'Gandhi's Global Legacy', in *Gandhi in His Time and Ours*. Delhi: Oxford University Press, pp. 238-283.

Manimala, (1984) 'Zameen Kenkar? Jote Onkar: Women's participation in the Bodhgaya struggles', in M. Kishwar and R. Vanita (eds) *In Search of Answers: Indian Women's Voices from Manushi*, London: Zed Press.

M. Shah, (2006) 'Gandhigiri; A Philosophy of Our Times', *The Hindu* Available at <http://www.hindu.com/2006/09/28/stories/2006092802241000.htm>, Accessed: 14.04.2013.

A. Ghosh and T. Babu, (2006) 'Lage Raho Munna Bhai: Unravelling Brand 'Gandhigiri'', *Economic and Political Weekly*, 41 (51), pp. 5225 – 5227.

H. Trivedi (2011) 'Literary and Visual Portrayal of Gandhi', in J Brown and A Parel (eds) *Cambridge Companion to Gandhi*, Cambridge University Press 2011, pp. 199-218.

IV. Gandhi and the Idea of Political

Essential Readings:

P. Chatterjee, (1986) 'The Moment of Maneuver', in *Nationalist Thought and the Colonial World: A derivative discourse?*, Delhi: Zed Books.

Indian Council for Historical Research (1976) 'The Logic of Gandhian Nationalism: Civil Disobedience and the Gandhi – Irwin Pact, 1930-31', *Indian Historical Review*, Available at <http://www.ichrindia.org/journal.pdf>, Accessed: 18.04.2013.

D. Dalton, (1996) 'Swaraj: Gandhi's Idea of Freedom', in *Mahatma Gandhi: Selected Political Writings*, USA: Hackett Publishing, pp. 95-148.

A. Parel (ed.) (1997) 'Editor's Introduction', in *Gandhi, Hind Swaraj and Other Writings* Cambridge: Cambridge University Press.

Additional Readings:

A. Baviskar, (1995) 'National Development, Poverty and the environment', in *In the Belly of the River: Tribal Conflict Over Development in the Narmada Valley*, Delhi: Oxford University Press, pp. 18-33.

B. Parekh, (1997) 'Religious Thought', in *Gandhi: A Brief Insight*, Delhi: Sterling Publishing Company.

R. Iyer, (1993) *The Essential Writings of Mahatma Gandhi*, New Delhi: Oxford University Press, pp. 299-344; 347-373.

S. Sarkar, (1982) *Modern India 1885-1947*, New Delhi: Macmillan, pp. 432-39.

R. Iyer, (2001) *The Moral and Political Thought of Mahatma Gandhi*, New Delhi: Oxford University Press. pp. 344-358.

H. Coward, (2003) 'Gandhi, Ambedkar, and Untouchability', in H. Coward (ed) *Indian Critiques of Gandhi*, New York: State University of New York Press, pp. 41-66.

J. Lipner, (2003) 'A Debate for Our Times', in Harold Coward (ed) *Indian Critiques of Gandhi*, New York: State University of New York Press, pp. 239-58

M. Gandhi, (1941) 'Chapter 1, 2, 9, 15, and 16', in *Constructive Programme: Its Meaning and Place*, Ahmedabad: Navjivan Trust.

R. Terchek, (1998) *Gandhi: Struggling for Autonomy*, USA: Rowman and Littlefield Publishers.

N. Dirks, (2001), 'The Reformation of Caste: Periyar, Ambedkar and Gandhi', in *Castes of Mind: Colonialism and the making of Modern India*, Princeton: Princeton University

Press.

R. Mukharjee, (ed) (1995), *The Penguin Gandhi Reader*, New Delhi: Penguin.

T. Weber, (2006) 'Gandhi is dead, Long live Gandhi- The Post Gandhi Gandhian Movement in India', in *Gandhi, Gandhism and the Gandhians*, New Delhi: Roli.

A. Taneja, (2005) *Gandhi Women and the National Movement 1920-1947*, New Delhi: Haranand Publishers.

J. Brown, (2008) *Gandhi and Civil Disobedience: The Mahatma in Indian Politics*, Cambridge: Cambridge University Press, 2008

R. Ramashray, (1984) 'What Beyond the Satanic Civilization?', in *Self and Society: A Study in Gandhian Thought*, New Delhi: Sage Publication.

Activities

Topic 1

1. Reading of primary texts:- M K Gandhi Chapter VI and XIII "Hind Swaraj" Navjeevan Trust, Ahmedabad, 1910

2. A site visit to any on-going developmental project preferably in NCT Delhi by students and submission of report on Environmental law Violation and Resistance by People in a Gandhian Way.

Topic 2

1. Reading of primary texts:- M K Gandhi Chapter XII&XIII, "Satyagraha in South Africa, Navjivan Trust, Ahmedabad, 1928, pp. 95-107

2. A Report followed by presentation on functioning of Cooperative and Community engagement for example Amul and/or SEWA in Gujarat to understand Trusteeship and its relevance

Topic 3

1. Movie Screenings (Movies like Lage Raho Munna Bhai, Gandhi by Richard Attenborough and Student's Participation in reviewing/discussing the movie from a Gandhian perspective or Cultural engagement of Students with Gandhian Ideas through Staging of a street play.

Topic 4

Student Visit to Any Gandhian Institution in Delhi like, Gandhi Darshan and Smriti to understand on-going Gandhian work and programme and interacting with Gandhian activists.

3. GOVERNANCE: ISSUES AND CHALLENGES

Objectives: This paper deals with concepts and different dimensions of governance highlighting the major debates in the contemporary times. There is a need to understand the importance of the concept of governance in the context of a globalising world, environment, administration, development. The essence of governance is explored through the various good governance initiatives introduced in India.

1. GOVERNMENT AND GOVERNANCE: CONCEPTS [12 lectures]

Role of State In The Era Of Globalisation State, Market and Civil Society

2. GOVERNANCE AND DEVELOPMENT [12 lectures]

Changing Dimensions of Development Strengthening Democracy through Good Governance

3. ENVIRONMENTAL GOVERNANCE [12 lectures]

Human-Environment Interaction

Green Governance: Sustainable Human Development

4. LOCAL GOVERNANCE [12 lectures]

Democratic

Decentralisation

n

People's Participation In Governance

5. GOOD GOVERNANCE INITIATIVES IN INDIA: BEST PRACTICES [20 lectures]

- a. Public Service Guarantee Acts
- b. Electronic Governance
- c. Citizens Charter & Right to Information
- d. Corporate Social Responsibility

READINGS

GOVERNMENT AND GOVERNANCE: CONCEPTS

B. Chakrabarty and M. Bhattacharya, (eds.) *The Governance Discourse*. New Delhi: Oxford University Press, 1998

Surendra Munshi and Biju Paul Abraham [eds.], *Good Governance, Democratic Societies And Globalisation*, Sage Publishers, 2004

United Nation Development Programme, *Reconceptualising Governance*, New York, 1997

Carlos Santiso, *Good Governance and Aid Effectiveness: The World Bank and Conditionality*

Johns Hopkins University, The Georgetown Public Policy Review ,Volume VII, No.1, 2001

Vasudha Chotray and Gery Stroker , *Governance Theory: A Cross Disciplinary Approach* ,

Palgrave Macmillan ,2008

J. Rosenau, 'Governance, Order, and Change in World Politics', in J. Rosenau, and E. Czempiel (eds.) *Governance without Government: Order and Change in World Politics*, Cambridge: Cambridge University Press ,1992

B. Nayar (ed.), *Globalization and Politics in India*. Delhi: Oxford University Press, 2007 pp. 218-240.

Smita Mishra Panda , *Engendering Governance Institutions: State, Market And Civil Society*, Sage Publications,2008

Neera Chandhoke, *State And Civil Society Explorations In Political Theory* , Sage Publishers,1995

GOVERNANCE AND DEVELOPMENT

B. C. Smith, *Good Governance and Development*, Palgrave, 2007

World Bank Report, *Governance And Development*, 1992

P. Bardhan, 'Epilogue on the Political Economy of Reform in India', in *The Political Economy of Development in India*. 6th edition, Delhi: Oxford University Press, 2005

J. Dreze and A. Sen, *India: Economic Development and Social Opportunity*. New Delhi: Oxford University Press, 1995

Niraja Gopal Jayal[ed.], *Democracy in India*, Oxford University Press, 2007

ENVIRONMENTAL GOVERNANCE

Ramachandra Guha, *Environmentalism: A Global History*, Longman Publishers, 1999

J.P. Evans, *Environmental Governance*, Routledge , 2012

Emilio F. Moran, *Environmental Social Science: Human - Environment interactions and Sustainability*, Wiley-Blackwell, 2010

Burns H Weston and David Bollier, *Green Governance: Ecological Survival, Human Rights, and the Law of the Commons*, Cambridge University Press, 2013

Bina Agarwal, *Gender And Green Governance* , Oxford University Press, Oxford, 2013

J. Volger, 'Environmental Issues', in J. Baylis, S. Smith and P. Owens (eds.) *Globalization of World Politics*, New York: Oxford University Press, 2011, pp. 348- 362.

A. Heywood, *Global Politics*, New York: Palgrave, 2011, pp. 383-411.

N. Carter, *The Politics of Environment: Ideas, Activism, Policy*, Cambridge: Cambridge University Press, 2007, pp. 13-81.

LOCAL GOVERNANCE

Pranab Bardhan and Dilip Mookherjee, *Decentralization And Local Governance In Developing Countries: A Comparative Perspective*, MIT Press, 2006

T.R. Raghunandan, *Decentralization And Local Governments: The Indian Experience, Readings On The Economy, Polity And Society*, Orient Blackswan, 2013

Pardeep Sachdeva, *Local Government In India*, Pearson Publishers, 2011

P. de Souza, (2002) 'Decentralization and Local Government: The Second Wind of Democracy in India', in Z. Hasan, E. Sridharan and R. Sudarshan (eds.) *India's Living Constitution: Ideas, Practices and Controversies*, New Delhi: Permanent Black, 2002

Mary John, 'Women in Power? Gender, Caste and Politics of Local Urban Governance', in *Economic and Political Weekly*, Vol. 42(39), 2007

GOOD GOVERNANCE INITIATIVES IN INDIA: BEST PRACTICES

Niraja Gopal Jayal, *Democracy and the State: Welfare, Secularism, and Development in Contemporary India*, Oxford University Press, 1999

Reetika Khera [ed.], *The Battle for Employment Guarantee*, Oxford University Press, 2011

Nalini Juneja, *Primary Education for All in the City of Mumbai: The Challenge Set By Local Actors*, International Institute For Educational Planning, UNESCO : Paris, 2001

Maxine Molyneux and Shahra Razavi, *Gender, Justice, Development, and Rights*, Oxford University Press, 2002

Jugal Kishore, *National Health Programs of India: National Policies and Legislations*, Century Publications, 2005

Jean Drèze and Amartya Sen, *India, Economic Development and Social Opportunity*, Oxford University Press, 1995

K. Lee and Mills, *The Economic Of Health In Developing Countries*, Oxford University Press, 1983

Marmar Mukhopadhyay and Madhu Parhar (eds.) *Education in India: Dynamics of Development*, Shipra Publications, 2007

K. Vijaya Kumar, *Right to Education Act 2009: Its Implementation as to Social Development in India*, Akansha Publishers, 2012

Amartya Sen and Jean Dreze, *Omnibus: Poverty and Famines, Hunger and Public Action, India- Economic Development and Social Opportunity*, Oxford University Press, 1998

Jean Dreze and Amartya Sen, *An Uncertain Glory: India And Its Contradictions*, Princeton University Press, 2013

Reetika Khera- *Rural Poverty And Public Distribution System*, EPW, Vol- XLVIII, No. 45-46, Nov 2013

Pradeep Chaturvedi , *Women And Food Security: Role Of Panchayats* , Concept Publishing House, 2002

Bidyut Mohanty, "Women, Right to Food and Role of Panchayats", *Mainstream*, Vol. LII, No. 42, October 11, 2014

D. Crowther, *Corporate Social Responsibility*, Deep and Deep Publishers, 2008

Sanjay K. Agarwal, *Corporate Social Responsibility in India*, Sage Publishers, 2008

Pushpa Sundar, *Business & Community: The Story of Corporate Social Responsibility in India*, New Delhi: Sage Publications, 2013

4. UNITED NATIONS AND GLOBAL CONFLICTS

Course Objective: This course provides a comprehensive introduction to the most important multilateral political organization in international relations. It provides a detailed account of the organizational structure and the political processes of the UN, and how it has evolved since 1945, especially in terms of dealing with the major global conflicts. The course imparts a critical understanding of the UN's performance until now and the imperatives as well as processes of reforming the organization in the context of the contemporary global system.

I. The United Nations (29 Lectures)

(a) An Historical Overview of the United Nations

(b) Principles and Objectives

(c) Structures and Functions: General Assembly; Security Council, and Economic and Social Council; the International Court of Justice and the specialised agencies (International Labour Organisation [ILO], United Nations Educational, Scientific and Cultural Organisation [UNESCO], World Health Organisation [WHO], and UN programmes and funds: United Nations Children's Fund [UNICEF], United Nations Development Programme [UNDP], United

Nations Environment Programme [UNEP], United Nations High Commissioner for Refugees [UNHCR])

(d) Peace Keeping, Peace Making and Enforcement, Peace Building and Responsibility to Protect (e) Millennium Development Goals

II. Major Global Conflicts since the Second World War (20 Lectures)

(a) Korean War

(b) Vietnam War

(c) Afghanistan Wars

(d) Balkans: Serbia and Bosnia

III. Assessment of the United Nations as an International Organisation: Imperatives of Reforms and the Process of Reforms (11 Lectures)

Essential Readings I. The United Nations (a) An Historical Overview of the United Nations

Moore, J.A. Jr. and Pubantz, J. (2008) *The new United Nations*. Delhi: Pearson Education, pp. 39-62.

Goldstein, J. and Pevehouse, J.C. (2006) *International relations*. 6th edn. New Delhi: Pearson, pp. 265-282.

Taylor, P. and Groom, A.J.R. (eds.) (2000) *The United Nations at the millennium*. London: Continuum, pp. 1-20.

Gareis, S.B. and Varwick, J. (2005) *The United Nations: an introduction*. Basingstoke: Palgrave, pp. 1-40.

Gowan, P. (2010) 'US: UN', in Gowan, P. 'A calculus of power: grand strategy in the twenty-first century. London: Verso, pp. 47-71.

Baylis, J. and Smith, S. (eds.) (2008) *The globalization of world politics. an introduction to international relations*. 4th edn. Oxford: Oxford University Press, pp. 405-422.

Thakur, R. (1998) 'Introduction', in Thakur, R. (eds.) *Past imperfect, future uncertain: The UN at Fifty*. London: Macmillan, pp. 1-14.

Basu, Rumki (2014) *United Nations: Structure and Functions of an international organization*, New Delhi, Sterling Publishers

(b) Principles and Objectives

Gareis, S.B. and Varwick, J. (2005) *The United Nations: An introduction*. Basingstoke: Palgrave, pp. 15-21.

(c) Structures and Functions: General Assembly; Security Council, and Economic and Social Council; the International Court of Justice and the specialised agencies (International Labour Organisation [ILO], United Nations Educational, Scientific and Cultural Organisation [UNESCO], World Health Organisation [WHO], and UN programmes and funds: United Nations Children's Fund [UNICEF], United Nations Development Programme [UNDP], United Nations Environment Programme [UNEP], United Nations High Commissioner for Refugees [UNHCR])

Taylor, P. and Groom, A.J.R. (eds.) (2000) *The United Nations at the millennium*. London: Continuum, pp. 21-141.

Moore, J.A. Jr. and Pubantz, J. (2008) *The new United Nations*. Delhi: Pearson Education, pp. 119-135.

(d) Peace Keeping, Peace Making and Enforcement, Peace Building and Responsibility to Protect

Nambiar, S. (1995) 'UN peace-keeping operations', in Kumar, S. (eds.) *The United Nations at fifty*. New Delhi, UBS, pp. 77-94.

Whittaker, D.J. (1997) 'Peacekeeping', in *United Nations in the contemporary world*. London: Routledge, pp. 45-56.

White, B. et al. (eds.) (2005) *Issues in world politics*. 3rd edn. New York: Macmillan, pp. 113-132.

(e) Millennium Development Goals

Moore, J.A. Jr. and Pubantz, J. (2008) *The new United Nations*. Delhi: Pearson Education, pp.264-266.

Sangal, P.S. (1986) 'UN, peace, disarmament and development', in Saxena, J.N. et.al. *United Nations for a better world*. New Delhi: Lancers, pp.109-114.

Baxi, U. (1986) 'Crimes against the right to development', in Saxena, J.N. et.al. *United Nations for a better world*. New Delhi: Lancers, pp.240-248.

Ghali, B.B. (1995) *An agenda for peace*. New York: UN, pp.5-38.

United Nations Department of Public Information. (2008) *The United Nations Today*. New York: UN.

II. Major Global Conflicts since the Second World War (a) Korean War

Calvocoressi, P. (2001) *World Politics: 1945-200*. 3rd edn. Harlow: Pearson Education, pp. 116-124.

Armstrong, D., Lloyd, L. and Redmond, J. (2004) *International organisations in world politics*. 3rd edn. New York: Palgrave Macmillan, pp. 42-43.

Moore, J.A. Jr. and Pubantz, J. (2008) *The new United Nations*. Delhi: Pearson Education, pp. 64-65 and 172-173.

(b) Vietnam War

Calvocoressi, P. (2001) *World Politics: 1945-200*. 3rd edn. Harlow: Pearson Education, pp. 528-546.

Baylis, J. and Smith, S. (eds.) (2008) *The globalization of world politics. an introduction to international relations*. 4th edn. Oxford: Oxford University Press, pp. 562-564.

(c) Afghanistan Wars

Achcar, G. (2004) *Eastern cauldron*. New York: Monthly Review Press, pp. 29-45 and 234-241.

Achcar, G. (2003) *The clash of barbarisms: Sept. 11 and the making of the new world disorder*. Kolkata: K.P. Bachi & Co., pp. 76-81.

Prashad, V. (2002) *War against the planet*. New Delhi: Leftword, pp. 1-6. Ali, T. (ed.) (2000) *Masters of the Universe*. London: Verso, pp. 203-216.

Calvocoressi, P. (2001) *World Politics: 1945-200*. 3rd edn. Harlow: Pearson Education, pp. 570-576.

(d) Balkans: Serbia and Bosnia Ali, T. (ed.) (2000) *Masters of the Universe*. London: Verso, pp. 230-245 and 271-284.

Kaldor, M. and Vashee, B. (eds.) (1997) *New wars*. London: Wider Publications for the UN University, pp. 137-144 and 153-171.

Viotti, P.R. and Kauppi, M.V. (2007) *International relations and world politics- security, economy, identity*. 3rd edn. New Delhi: Pearson Education, pp. 470-471.

Goldstein, J.S. (2003) *International relations*. 3rd edn. Delhi: Pearson Education, pp. 43-51.

Moore, J.A. Jr. and Pubantz, J. (2008) *The new United Nations*. Delhi: Pearson Education, pp. 24-27.

III. Political Assessment of the United Nations as an International Organisation: Imperatives of Reforms and the Process of Reforms

Roberts, A. and Kingsbury, B. (eds.) (1994) *United Nations, Divided World*. 2nd edn. Oxford: Clarendon Press, pp. 420-436.

Taylor, P. and Groom, A.J.R. (eds.) (2000) *The United Nations at the millennium*. London: Continuum, pp. 196-223 and 295-326.

Gareis, S.B. and Varwick, J. (2005) *The United Nations: An introduction*. Basingstoke: Palgrave, pp. 214-242.

Moore, J.A. Jr. and Pubantz, J. (2008) *The new United Nations*. Delhi: Pearson Education, pp. 91-112.

Additional Readings

Claude, I. (1984) *Swords into plowshares: the progress and problems of international organisation*. 4th edn. New York: Random House.

Dodds, F. (ed.) (1987) *The way forward: beyond the agenda 21*. London: Earthscan.

Rajan, M.S., Mani, V.S and Murthy, C.S.R. (eds.) (1987) *The nonaligned and the United Nations*. New Delhi: South Asian Publishers.

South Asia Human Rights Documentation Centre. (2006) *Human rights: an overview*. New Delhi: Oxford University Press.

Anan, K. (1997) *Renewing the United Nations: A Programme for Survival*. General Assembly Document: A/51/950; 14 July 1997. Available from:

[http://daccessdds.un.org/doc/UNDOC/GEN/N97/189/79/1MG/n9718979.pdf](http://daccessdds.un.org/doc/UNDOC/GEN/N97/189/79/1MG/n9718979.pdf?OpenElement), Open Element (accessed on 13 October 2011).

(C) DISCIPLINE SPECIFIC ELECTIVE -4 (DSE)

1.

Human Rights in a Comparative Perspective

Course objective: This course attempts to build an understanding of human rights amongst students through a study of specific issues in a comparative perspective. It is important for students to see how debates on human rights have taken distinct forms historically and in the contemporary world. The course seeks to anchor all issues in the Indian context, and pulls out another country to form a broader comparative frame. Students will be expected to use a range of resources, including films, biographies, and official documents to study each theme. Thematic discussion of sub-topics in the second and third sections should include state response to issues and structural violence questions.

I. Human Rights: Theory and Institutionalization (3 weeks)

- a. Understanding Human Rights: Three Generations of Rights
- b. Institutionalization: Universal Declaration of Human Rights
- c. Rights in National Constitutions: South Africa and India

II. Issues (5 weeks)

- a. Torture: USA and India
- b. Surveillance and Censorship: China and India

c. Terrorism and Insecurity of Minorities: USA and India

III. Structural Violence (4 weeks)

a. Caste and Race: South Africa and India

b. Gender and Violence: India and Pakistan

c. Adivasis/Aboriginals and the Land Question: Australia and India

READING LIST

I. Human Rights: Theory and Institutionalization

Essential Readings:

J. Hoffman and P. Graham, (2006) 'Human Rights', *Introduction to Political Theory*, Delhi, Pearson, pp. 436-458.

SAHRDC (2006) 'Introduction to Human Rights'; 'Classification of Human Rights: An Overview of the First, Second, and Third Generational Rights', in *Introducing Human Rights*, New Delhi: Oxford University Press.

The Constitution of the Republic of South Africa, Chapter 2: Bill of Rights.

The Constitution of India, Chapter 3: Fundamental Rights

II. Issues

a. Torture: USA and India

Essential Readings:

M. Lippman, (1979) 'The Protection of Universal Human Rights: The Problem of Torture' *Universal Human Rights*, Vol. 1(4), pp. 25-55

J. Lokaneeta, (2011) 'Torture in the TV Show 24: Circulation of Meanings'; 'Jurisprudence on Torture and Interrogations in India', in *Transnational Torture Law, Violence, and State Power in the United States and India*, Delhi: Orient Blackswan,

D. O'Byrne, (2007) 'Torture', in *Human Rights: An Introduction*, Delhi: Pearson, pp. 164-197.

b. Surveillance and Censorship: China and India

Essential Readings:

D. O'Byrne, (2007) 'Censorship', in *Human Rights: An Introduction*, Delhi: Pearson, pp. 106-138.

D. Lyon, (2008) Surveillance Society, Talk for Festival del Diritto, Piacenza, Italia, September 28, pp.1-7.

Fu Hualing, (2012) 'Politicized Challenges, Depoliticized Responses: Political Monitoring in China's Transitions', paper presented at a conference on States of Surveillance: Counter-Terrorism and Comparative Constitutionalism, at the

University of New South Wales, Sydney, 13-14 December.

U. Singh, (2012) 'Surveillance Regimes in India', paper presented at a conference on States of Surveillance: Counter-Terrorism and Comparative Constitutionalism, at the University of New South Wales, Sydney, 13-14 December.

c. Terrorism and Insecurity of Minorities: USA and India

Essential Readings:

E. Scarry, (2010) 'Resolving to Resist', in *Rule of Law, Misrule of Men*, Cambridge: Boston Review Books, MIT, pp.1-53.

M. Ahmad, (2002) 'Homeland Insecurities: Racial Violence the Day after September 11', *Social Text*, 72, Vol. 20(3), pp. 101-116.

U. Singh, (2007) 'The Unfolding of Extraordinariness: POTA and the Construction of Suspect Communities', in *The State, Democracy and Anti-terror Laws in India*, Delhi: Sage Publications, pp.165-219

3. Structural Conflicts

a. Caste and Race: South Africa and India

Essential Readings:

A. Pinto, (2001) 'UN Conference against Racism: Is Caste Race?', in *Economic and Political Weekly*, Vol. 36(30)

D. O'Byrne, (2007) 'Apartheid', in *Human Rights: An Introduction*, Delhi: Pearson, pp. 241-262.

R. Wasserstorm, (2006), 'Racism, Sexism, and Preferential Treatment: An approach to the Topics', in R. Goodin and P. Pettit, *Contemporary Political Philosophy: an Anthology*, Oxford: Blackwell, pp-549-574

R. Wolfrum, (1998) 'Discrimination, Xenophobia and Racism' in J. Symonides, *Human Rights: New Dimensions and Challenges*, Aldershot, Ashgate/UNESCO, pp.181-198.

b. Gender and Violence: India and Pakistan

Essential Readings:

A. Khan and R. Hussain, (2008), 'Violence Against Women in Pakistan: Perceptions and Experiences of Domestic Violence', *Asian Studies Review*, Vol. 32, pp. 239 – 253

K. Kannabiran (2012) 'Rethinking the Constitutional Category of Sex', in *Tools of Justice: Non-Discrimination and the Indian Constitution*, New Delhi, Routledge, pp.425-443

N. Menon (2012) 'Desire', *Seeing Like a Feminist*, New Delhi: Zubaan/Penguin, pp. 91-146

c. Adivasis/Aboriginals and the Land Question: Australia and India

Essential Readings:

H. Goodall, (2011) 'International Indigenous Community Study: Adivasi Indigenous People in India', in A. Cadzow and J. Maynard (eds.), *Aboriginal Studies*, Melbourne: Nelson Cengage Learning, pp.254-259.

K. Kannabiran, (2012) 'Adivasi Homelands and the Question of Liberty', in *Tools of Justice: Non-Discrimination and the Indian Constitution*, New Delhi: Routledge, pp.242-271.

N. Watson (2011) 'Aboriginal and Torres Strait Islander Identities' in A. Cadzow and J. Maynard (eds.), *Aboriginal Studies*, Melbourne: Nelson Cengage Learning, pp.43-52.

W. Fernandes (2008) 'India's Forced Displacement Policy and Practice. Is Compensation up to its Functions?', in M. Cernea and H. Mathus (eds), *Can Compensation Prevent Impoverishment? Reforming Resettlement through Investments and Benefit-Sharing*, pp.181-207, New Delhi: Oxford University Press.

Additional Readings:

A. Laws and V. Iacopino, (2002) 'Police Torture in Punjab, India: An Extended Survey', in *Health and Human Rights*, Vol. 6(1), pp. 195-210

D. O'Byrne, (2007) 'Theorizing Human Rights', in *Human Rights: An Introduction*, Delhi, Pearson, pp.26-70.

J. Morsink, (1999) *The Universal Declaration of Human Rights: Origins, Drafting and Intent*, Philadelphia: University of Pennsylvania Press, pp. ix-xiv

J. Nickel, (1987) *Making Sense of Human Rights: Philosophical Reflections on the Universal Declaration of Human Rights*, Berkeley: University of California Press.

J. Goldman, (2005) 'Of Treaties and Torture: How the Supreme Court Can Restrain the Executive', in *Duke Law Journal*, Vol. 55(3), pp. 609-640.

K. Tsutsui and C. Wotipka, (2004) Global Civil Society and the International Human Rights Movement: Citizen Participation in Human Rights International Nongovernmental Organizations, in *Social Forces*, Vol. 83(2), pp. 587-620.

L. Rabben, (2001) Amnesty International: Myth and Reality, in *Agni*, No. 54, Amnesty International Fortieth Anniversary pp. 8-28

M. Mohanty, (2010) 'In Pursuit of People's Rights: An Introduction', in M. Mohanty et al., *Weapon of the Oppressed: Inventory of People's Rights in India*, New Delhi: Danish Books, pp.1-11

M. Cranston, (1973) *What are Human Rights?* New York: Taplinger

M. Ishay, (2004) *The History of Human Rights: From Ancient Times to the Globalization Era*, Delhi: Orient Blackswan.

R. Sharan, (2009) 'Alienation and Restoration of Tribal Land in Jharkhand in N Sundar (ed.) *Legal Grounds*, New Delhi: Oxford University Press, pp. 82-112

Text of UDHR available at <http://www.un.org/en/documents/udhr/index.shtml>

U. Baxi, (1989) 'From Human Rights to the Right to be Human: Some Heresies', in S. Kothari and H. Sethi (eds.), *Rethinking Human Rights*, Delhi: Lokayan, pp.181-166

2. Development Process and Social Movements in Contemporary India

Course objective: Under the influence of globalization, development processes in India have undergone transformation to produce spaces of advantage and disadvantage and new geographies of power. The high social reproduction costs and dispossession of vulnerable social groups involved in such a development strategy condition new theatres of contestation and struggles. A variety of protest movements emerged to interrogate and challenge this development paradigm that evidently also weakens the democratic space so very vital to the formulation of critical consensus. This course proposes to introduce students to the conditions, contexts and forms of political contestation over development paradigms and their bearing on the retrieval of democratic voice of citizens.

I. Development Process since Independence (2 weeks)

a. State and planning

b. Liberalization and reforms

II. Industrial Development Strategy and its Impact on the Social Structure (2 weeks)

a. Mixed economy, privatization, the impact on organized and unorganized labour

b. Emergence of the new middle class

III. Agrarian Development Strategy and its Impact on the Social Structure (2 weeks)

a. Land Reforms, Green Revolution

b. Agrarian crisis since the 1990s and its impact on farmers

IV. Social Movements (6 weeks)

a. Tribal, Peasant, Dalit and Women's movements

b. Maoist challenge

c. Civil rights movements

READING LIST

I. The Development Process since Independence

Essential Readings:

A. Mozoomdar, (1994) 'The Rise and Decline of Development Planning in India', in T. Byres (ed.) *The State and Development Planning in India*. Delhi: Oxford University Press, pp. 73-108.

A. Varshney, (2010) 'Mass Politics or Elite Politics? Understanding the Politics of India's Economic Reforms' in R. Mukherji (ed.) *India's Economic Transition: The Politics of Reforms*, Delhi: Oxford University Press, pp 146-169.

P. Chatterjee, (2000) 'Development Planning and the Indian State', in Zoya Hasan (ed.), *Politics and the State in India*, New Delhi: Sage, pp.116-140.

P. Patnaik and C. Chandrasekhar, (2007) 'India: Dirigisme, Structural Adjustment, and the Radical Alternative', in B. Nayar (ed.), *Globalization and Politics in India*. Delhi: Oxford University Press, pp. 218-240.

P. Bardhan, (2005) 'Epilogue on the Political Economy of Reform in India', in *The Political Economy of Development in India*. 6th impression, Delhi: Oxford University Press.

T. Singh, (1979) 'The Planning Process and Public Process: a Reassessment', *R. R. Kale Memorial Lecture*, Pune: Gokhale Institute of Politics and Economics.

II. Industrial development strategy and its impact on social structure

Essential Readings:

A. Aggarwal, (2006) 'Special Economic Zones: Revisiting the Policy Debate', in *Economic and Political Weekly*, XLI (43-44), pp.4533-36.

B. Nayar (1989) *India's Mixed Economy: The Role of Ideology and its Development*, Bombay: Popular Prakashan.

F. Frankel, (2005) 'Crisis of National Economic Planning', in *India's Political Economy (1947-2004): The Gradual Revolution*, Delhi: Oxford University Press, pp. 93-340.

L. Fernandes, (2007) *India's New Middle Class: Democratic Politics in an Era of Economic Reform*, Delhi: Oxford University Press.

S. Shyam, (2003) 'Organizing the Unorganized', in *Seminar*, [Footloose Labour: A Symposium on Livelihood Struggles of the Informal Workforce, 531] pp. 47-53.

S. Chowdhury, (2007) 'Globalization and Labour', in B. Nayar (ed.) *Globalization and Politics in India*, Delhi: Oxford University Press, pp.516-526.

V. Chibber, (2005) 'From Class Compromise to Class Accommodation: Labor's Incorporation into the Indian Political Economy' in R. Ray, and M.F. Katzenstein (eds.) *Social Movements in India*, Delhi: Oxford University Press, pp 32-60.

III. Agrarian development strategy and its impact on social structure

Essential Readings:

A. Desai, (ed.), (1986) *Agrarian Struggles in India After Independence*, Delhi: Oxford University Press, pp. xi-xxxvi

F. Frankel, (1971) *India's Green Revolution: Economic Gains and Political Costs*, Princeton and New Jersey: Princeton University Press.

F. Frankel, (2009) *Harvesting Despair: Agrarian Crisis in India*, Delhi: Perspectives, pp. 161-169.

J. Harriss, (2006) 'Local Power and the Agrarian Political Economy' in Harriss, J. (ed) *Power Matters: Essays on Institutions, Politics, and Society in India*, Delhi. Oxford University Press, pp. 29-32.

K. Suri, (2006) 'Political economy of Agrarian Distress', in *Economic and Political Weekly*, XLI(16) pp. 1523-1529.

P. Joshi, (1979) *Land Reforms in India: Trends and Perspectives*, New Delhi: Allied publishers.

P. Appu, (1974) 'Agrarian Structure and Rural Development', in *Economic and Political Weekly*, IX (39), pp.70 – 75.

P. Sainath, (2010) 'Agrarian Crisis and Farmers', Suicide', *Occasional Publication 22*, New Delhi: India International Centre (IIC).

M. Sidhu, (2010) 'Globalisation vis-à-vis Agrarian Crisis in India', in R. Deshpande and S. Arora, (eds.) *Agrarian Crises and Farmer Suicides (Land Reforms in India Series)*, New Delhi: Sage, pp. 149-174.

V. Sridhar, (2006) 'Why Do Farmers Commit Suicide? The Case Study of Andhra Pradesh', in *Economic and Political Weekly*, XLI (16).

IV. Social Movements

Essential Readings:

G. Haragopal, and K. Balagopal, (1998) 'Civil Liberties Movement and the State in India', in M. Mohanty, P. Mukherji and O. Tornquist, (eds.) *People's Rights: Social Movements and the State in the Third World* New Delhi: Sage, pp. 353-371.

M. Mohanty, (2002) 'The Changing Definition of Rights in India', in S. Patel, J. Bagchi, and K. Raj (eds.) *Thinking Social Sciences in India: Essays in Honour of Alice Thorner*

Patel, New Delhi: Sage.

G. Omvedt, (2012) 'The Anti-caste Movement and the Discourse of Power', in N. Jayal (ed.) *Democracy in India*, New Delhi: Oxford India Paperbacks, sixth impression, pp.481-508.

P. Ramana, (2011) 'India's Maoist Insurgency: Evolution, Current Trends and Responses', in M. Kugelman (ed.) *India's Contemporary Security Challenges*, Woodrow Wilson International Centre for Scholars Asia Programme, Washington D.C., pp.29-47.

A.Ray, (1996) 'Civil Rights Movement and Social Struggle in India', in *Economic and Political Weekly*, XXI (28). pp. 1202-1205.

A.Roy, (2010) 'The Women's Movement', in N.Jayal and P. Mehta (eds.) *The Oxford Companion to Politics in India*, New Delhi: Oxford University Press, pp.409-422.

N. Sundar, (2011) 'At War with Oneself: Constructing Naxalism as India's Biggest Security Threat', in M. Kugelman (ed.) *India's Contemporary Security Challenges*, Woodrow Wilson International Centre for Scholars Asia Programme, Washington D.C., pp.46-68.

M. Weiner, (2001) 'The Struggle for Equality: Caste in Indian Politics', in A.Kohli. (ed.) *The Success of India's Democracy*, Cambridge: CUP, pp.193-225.

S. Sinha, (2002) 'Tribal Solidarity Movements in India: A Review', in G. Shah. (ed.) *Social Movements and the State*, New Delhi: Sage, pp. 251-266.

Additional Readings:

S. Banerjee, (1986) 'Naxalbari in Desai', in A.R. (ed.) *Agrarian Struggles in India After Independence*. Delhi: Oxford University Press, pp.566-588.

B. Nayar, (ed.), (2007) *Globalization and Politics in India*. Delhi: Oxford University Press. S. Roy and K. Debal, (2004) *Peasant Movements in Post-Colonial India: Dynamics of Mobilization and Identity*, Delhi: Sage.

G. Omvedt, (1983) *Reinventing Revolution, New Social Movements and the Socialist Tradition in India*, New York: Sharpe.

G. Shah, (ed.), (2002) *Social Movements and the State*. New Delhi: Sage Publications.

G. Shah, (2004) *Social Movements in India: A Review of Literature*, New Delhi: Sage Publications.

G. Rath, (ed.), (2006) *Tribal development in India: The Contemporary Debate*,

New Delhi: Sage Publications.

J. Harris, (2009) *Power Matters: Essays on Institutions, Politics, and Society in India*. Delhi: Oxford University press.

K. Suresh, (ed.), (1982) *Tribal Movements in India*, Vol I and II, New Delhi: Manohar (emphasis on the introductory chapter).

M. Mohanty, P. Mukherji and O.Tornquist, (1998) *People's Rights: Social Movements and the State in the Third World*. New Delhi: Sage Publications.

M. Rao, (ed.), (1978) *Social Movements in India*, Vol. 2, Delhi: Manohar.

N. Jayal, and P. Mehta, (eds.), (2010) *The Oxford Companion to Politics in India*, Delhi:Oxford University Press.

P. Bardhan, (2005) *The Political Economy of Development in India*, 6th impression, Delhi: Oxford University Press.

R. Mukherji, (ed.), (2007) *India's Economic Transition: The Politics of Reforms*, Delhi: Oxford University Press.

R, Ray and M. Katzenstein, (eds.), (2005) *Social Movements in India*, Delhi: Oxford University Press.

S. Chakravarty, (1987) *Development Planning: The Indian Experience*, Delhi: Oxford University Press.

3.

India's Foreign Policy in a globalizing world

Course objective: This course's objective is to teach students the domestic sources and the structural constraints on the genesis, evolution and practice of India's foreign policy. The endeavour is to highlight integral linkages between the 'domestic' and the 'international' aspects of India's foreign policy by stressing on the shifts in its domestic identity and the corresponding changes at the international level. Students will be instructed on India's shifting identity as a postcolonial state to the contemporary dynamics of India attempting to carve its identity as an 'aspiring power'. India's evolving relations with the superpowers during the Cold War and after, bargaining strategy and positioning in international climate change negotiations, international economic governance, international terrorism and the United Nations facilitate an understanding of the changing positions and development of India's role as a global player since independence.

I. India's Foreign Policy: From a Postcolonial State to an Aspiring Global Power (7 lectures)

II. India's Relations with the USA and USSR/Russia (9

lectures) III. India's Engagements with China (6 lectures)

IV. India in South Asia: Debating Regional Strategies (9 lectures)

V. India's Negotiating Style and Strategies: Trade, Environment and Security Regimes (11 lectures)

VI. India in the Contemporary Multipolar World (6 lectures)

READING LIST

I. India's Foreign Policy: From a Postcolonial State to an Aspiring Global Power

Essential Readings:

S. Ganguly and M. Pardesi, (2009) 'Explaining Sixty Years of India's Foreign Policy', in *IndiaReview*, Vol. 8 (1), pp. 4–19.

Ch. Ogden, (2011) 'International 'Aspirations' of a Rising Power', in David Scott (ed.), *Handbook of India's International Relations*, London: Routledge, pp.3-31

W. Anderson, (2011) 'Domestic Roots of Indian Foreign Policy', in W. Anderson, *Trusts with Democracy: Political Practice in South Asia*, Anthem Press: University Publishing Online.

Additional Reading:

J. Bandhopadhyaya, (1970) *The Making Of India's Foreign Policy*, New Delhi: Allied Publishers.

II: India's Relations with the USA and USSR/Russia

Essential Readings:

S. Mehrotra, (1990) 'Indo-Soviet Economic Relations: Geopolitical and Ideological Factors', in *India and the Soviet Union: Trade and Technology Transfer*, Cambridge University Press: Cambridge, pp. 8-28.

R. Hathaway, (2003) 'The US-India Courtship: From Clinton to Bush', in S. Ganguly (ed.), *India as an Emerging Power*, Frank Cass: Portland.

A. Singh, (1995) 'India's Relations with Russia and Central Asia', in *International Affairs*, Vol. 71 (1): 69-81.

M. Zafar, (1984), 'Chapter 1', in *India and the Superpowers: India's Political Relations with the Superpowers in the 1970s*, Dhaka, University Press.

Additional Readings:

H. Pant, (2008) 'The U.S.-India Entente: From Estrangement to Engagement', in H. Pant, *Contemporary Debates in Indian Foreign and Security Policy: India Negotiates Its Rise in the International System*, Palgrave Macmillan: London.

D. Mistry, (2006) 'Diplomacy, Domestic Politics, and the U.S.-India Nuclear Agreement', in *Asian Survey*, Vol. 46 (5), pp. 675-698.

III: India's Engagements with China

Essential Readings:

H. Pant, (2011) 'India's Relations with China', in D. Scott (ed.), *Handbook of India's International Relations*, London: Routledge, pp. 233-242.

A. Tellis and S. Mirski, (2013) 'Introduction', in A. Tellis and S. Mirski (eds.), *Crux of Asia: China, India, and the Emerging Global Order*, Carnegie Endowment for International Peace: Washington.

S. Raghavan, (2013) 'Stability in Southern Asia: India's Perspective', in A. Tellis and S. Mirski (eds.), *Crux of Asia: China, India, and the Emerging Global Order*, Carnegie Endowment for International Peace: Washington.

Additional Reading:

Li Li, (2013) 'Stability in Southern Asia: China's Perspective', in A. Tellis and S. Mirski (eds.), *Crux of Asia: China, India, and the Emerging Global Order*, Carnegie Endowment for International Peace: Washington.

IV: India in South Asia: Debating Regional Strategies

Essential Readings:

S. Muni, (2003) 'Problem Areas in India's Neighbourhood Policy', in *South Asian Survey*, Vol. 10 (2), pp. 185-196.

S. Cohen, (2002) *India: Emerging Power*, Brookings Institution Press. V. Sood, (2009) 'India and regional security interests', in Alyssa Ayres and C. Raja Mohan (eds), *Power realignments in Asia: China, India, and the United States*, New Delhi: Sage.

Additional Readings:

M. Pardesi, (2005) 'Deducing India's Grand Strategy of Regional Hegemony from Historical and Conceptual Perspectives', IDSS Working Paper, 76, Available at <http://www.rsis.edu.sg/publications/WorkingPapers/WP76.pdf>, Accessed: 19.04.2013.

D. Scott, (2009) 'India's "Extended Neighbourhood" Concept: Power Projection for a Rising Power', in *India Review*, Vol. 8 (2), pp. 107-143

V: India's Negotiating Style and Strategies: Trade, Environment and Security Regimes

Essential Readings:

S. Cohen, (2002) 'The World View of India's Strategic Elite', in S. Cohen, *India: Emerging Power*, Brookings Institution Press, pp. 36-65.

A. Narlikar, (2007) 'All that Glitters is not Gold: India's Rise to Power', in *Third World Quarterly*, Vol. 28 (5) pp. 983 – 996.

N. Dubash, (2012) 'The Politics of Climate Change in India: Narratives of Enquiry and Co-benefits', Working Paper, New Delhi: Centre for Policy Research.

N. Jayaprakash, (2000) 'Nuclear Disarmament and India', in *Economic and Political Weekly*, Vol. 35 (7), pp. 525-533.

Additional Readings:

P. Bidwai, (2005) 'A Deplorable Nuclear Bargain', in *Economic and Political Weekly*, Vol. 40 (31), pp. 3362-3364.

A. Anant, (2011) 'India and International Terrorism', in D. Scott (ed.), *Handbook of India's International Relations*, London: Routledge, pp. 266-277.

VI: India in the Contemporary Multipolar World

Essential Readings:

R. Rajgopalan and V. Sahni (2008), 'India and the Great Powers: Strategic Imperatives, Normative Necessities', in *South Asian Survey*, Vol. 15 (1), pp. 5– 32.

C. Mohan, (2013) 'Changing Global Order: India's Perspective', in A. Tellis and S. Mirski (eds.), *Crux of Asia: China, India, and the Emerging Global Order*, Carnegie Endowment for International Peace: Washington.

A. Narlikar, (2006) 'Peculiar Chauvinism or Strategic Calculation? Explaining the Negotiating Strategy of a Rising India', in *International Affairs*, Vol. 82 (1), pp. 59-76.

Additional Reading:

P. Mehta, (2009) 'Still Under Nehru's Shadow? The Absence of Foreign Policy Frameworks in India', in *India Review*, Vol. 8 (3), pp. 209–233.

Online Resources:

Government of India's Ministry of External Relations website at <http://www.mea.gov.in/> and specially its library which provides online resources at <http://mealib.nic.in/>

The Council of Foreign Relations has a regularly updated blog on India's foreign policy: <http://www.cfr.org/region/india/ri282> Centre for Policy Research's blog on IR and strategic affairs though it is not exclusively on India's foreign policy. <http://www.cprindia.org/blog/international-relations-and-security-blog>

Institute for Defence Studies and Analyses: <http://www.idsa.in/>
Research and Information System: www.ris.org.in/

Indian Council of World Affairs: www.icwa.in/
Institute of Peace and Conflict Studies:
www.ipcs.org/

Indian Council for Research on International Economic Relations: www.icrier.org/

4. Women, Power and Politics

Course objective: This course opens up the question of women's agency, taking it beyond 'women's empowerment' and focusing on women as radical social agents. It attempts to question the complicity of social structures and relations in gender inequality. This is extended to cover new forms of precarious work and labour under the new economy. Special attention will be paid to feminism as an approach and outlook. The course is divided into broad units, each of which is divided into three sub- units.

I. Groundings (6 weeks)

1. Patriarchy (2 weeks)

- a. Sex-Gender Debates
- b. Public and Private
- c. Power

2. Feminism (2 weeks)

3. Family, Community,
State (2weeks)

- a. Family
- b. Community
- c. State

II. Movements and Issues (6 weeks)

1. History of the Women's Movement in India (2 weeks)

2. Violence against women (2 weeks)

3. Work and Labour (2 weeks)

- a. Visible and Invisible work
- b. Reproductive and care work
- c. Sex work

Reading List

I. Groundings

1. Patriarchy

Essential Readings:

T. Shinde, (1993) 'Stree Purusha Tulna', in K. Lalitha and Susie Tharu (eds), *Women Writing in India*, New Delhi, Oxford University Press, pp. 221-234

U. Chakravarti, (2001) 'Pitrasatta Par ek Note', in S. Arya, N. Menon & J. Lokneeta (eds.) *Naarivaadi Rajneeti: Sangharsh evam Muddey*, University of Delhi: Hindi Medium Implementation Board, pp.1-7

a. Sex Gender Debates

Essential Reading:

V. Geetha, (2002) *Gender*, Kolkata, Stree, pp. 1- 20 **b.**

Public and Private

Essential Reading:

M. Kosambi, (2007) *Crossing the Threshold*, New Delhi, Permanent Black, pp. 3-10; 40-46 **c.**

Power

Essential Reading:

N. Menon, (2008) 'Power', in R. Bhargava and A. Acharya (eds), *Political Theory: An Introduction*, Delhi: Pearson, pp.148-157

2. Feminism

Essential Readings:

B. Hooks, (2010) 'Feminism: A Movement to End Sexism', in C. Mc Cann and S. Kim (eds), *The Feminist Reader: Local and Global Perspectives*, New York: Routledge, pp. 51-57

R. Delmar, (2005) 'What is Feminism?', in W. Kolmar & F. Bartkowski (eds) *Feminist Theory: A Reader*, pp. 27-37

3. Family, Community and State

a. Family

Essential Readings:

R. Palriwala, (2008) 'Economics and Patriliney: Consumption and Authority within the Household' in M. John. (ed) *Women's Studies in India*, New Delhi: Penguin, pp. 414-423

b. Community

Essential Reading:

U. Chakravarti, (2003) *Gendering Caste through a Feminist Lens*, Kolkata, Stree, pp. 139-159.

c. State

Essential Reading:

C. MacKinnon, 'The Liberal State' from *Towards a Feminist Theory of State*, Available at <http://fair-use.org/catharine-mackinnon/toward-a-feminist-theory-of-the-state/chapter-8>, Accessed: 19.04.2013.

Additional Readings:

K. Millet, (1968) *Sexual Politics*, Available at <http://www.marxists.org/subject/women/authors/millett-kate/sexual-politics.htm>, Accessed: 19.04.2013.

N. Menon (2008) 'Gender', in R. Bhargava and A. Acharya (eds), *Political Theory: An Introduction*, New Delhi: Pearson, pp. 224-233

R.Hussain, (1988) 'Sultana's Dream', in *Sultana's Dream and Selections from the Secluded Ones – translated by Roushan Jahan*, New York: The Feminist Press

S.Ray 'Understanding Patriarchy', Available at http://www.du.ac.in/fileadmin/DU/Academics/course_material/hrge_06.pdf, Accessed: 19.04.2013.

S.de Beauvoir (1997) *Second Sex*, London: Vintage.

Saheli Women's Centre, (2007) *Talking Marriage, Caste and Community: Women's Voices from Within*, New Delhi: monograph

II. Movements and Issues

1. History of Women's Movement in India

Essential Readings:

I. Agnihotri and V. Mazumdar, (1997) 'Changing the Terms of Political Discourse: Women's Movement in India, 1970s-1990s', *Economic and Political Weekly*, 30 (29), pp. 1869-1878.

R. Kapur, (2012) 'Hecklers to Power? The Waning of Liberal Rights and Challenges to Feminism in India', in A. Loomba *South Asian Feminisms*, Durham and London: Duke University Press, pp. 333-355

2. Violence against Women

Essential Readings:

N. Menon, (2004) 'Sexual Violence: Escaping the Body', in *Recovering Subversion*, New Delhi: Permanent Black, pp. 106-165

3. Work and Labour

a. Visible and Invisible work

Essential Reading:

P. Swaminathan, (2012) 'Introduction', in *Women and Work*, Hyderabad: Orient Blackswan, pp.1-17

b. Reproductive and care work

Essential Reading:

J. Tronto, (1996) 'Care as a Political Concept', in N. Hirschmann and C. Stephano, *Revisioning the Political*, Boulder: Westview Press, pp. 139-156

c. Sex work

Essential Readings:

Darbar Mahila Samanwaya Committee, Kolkata (2011) 'Why the so-called Immoral Traffic (Preventive) Act of India Should be Repealed', in P. Kotiswaran, *Sex Work*, New Delhi, Women Unlimited, pp. 259-262

N. Jameela, (2011) 'Autobiography of a Sex Worker', in P. Kotiswaran, *Sex Work*, New Delhi: Women Unlimited, pp. 225-241

Additional Readings:

C. Zetkin, 'Proletarian Woman', Available at <http://www.marxists.org/archive/zetkin/1896/10/women.htm>, Accessed: 19.04.2013.

F. Engels, *Family, Private Property and State*, Available at <http://readingfromtheleft.com/PDF/EngelsOrigin.pdf>, Accessed: 19.04.2013.

J. Ghosh, (2009) *Never Done and Poorly Paid: Women's Work in Globalising India*, Delhi: Women Unlimited

Justice Verma Committee Report, Available at <http://nlrd.org/womens-rights-initiative/justice-verma-committee-report-download-full-report>, Accessed: 19.04.2013.

N. Gandhi and N. Shah, (1992) *Issues at Stake – Theory and Practice in the Women's Movement*, New Delhi: Kali for Women.

V. Bryson, (1992) *Feminist Political Theory*, London: Palgrave-MacMillan, pp. 175- 180; 196-200

M. Mies, (1986) 'Colonisation and Housewifisation', in *Patriarchy and Accumulation on a World Scale* London: Zed, pp. 74-111, Available at

<http://caringlabor.wordpress.com/2010/12/29/maria-mies-colonization-and-housewifization/>, Accessed: 19.04.2013.

R. Ghadially, (2007) *Urban Women in Contemporary India*, Delhi: Sage Publications.

S. Brownmiller, (1975) *Against our Wills*, New York: Ballantine.

Saheli Women's Centre (2001) 'Reproductive Health and Women's Rights, Sex Selection and feminist response' in S Arya, N. Menon, J. Lokneeta (eds), *Nariwadi Rajneeti*, Delhi, pp. 284-306

V. Bryson (2007) *Gender and the Politics of Time*, Bristol: Polity Press

Readings in Hindi:

D. Mehrotra, (2001) *Bhartiya Mahila Andolan: Kal, Aaj aur Kal*, Delhi: Books for Change

G. Joshi, (2004) *Bharat Mein Stree Asmaanta: Ek Vimarsh*, University of Delhi: Hindi Medium Implementation Board

N. Menon (2008) 'Power', in R. Bhargava and A. Acharya (eds) *Political Theory: An Introduction*, New Delhi: Pearson

N. Menon (2008) 'Gender', in R. Bhargava and A. Acharya (eds) *Political Theory: An Introduction*, New Delhi, Pearson

R. Upadhyay and S. Upadhyay (eds.) (2004) *Aaj ka Stree Andolan*, Delhi: Shabd Sandhan.

S. Arya, N. Menon and J. Lokneeta (eds.) (2001) *Naarivaadi Rajneeti: Sangharsh evam Muddey*, University of Delhi: Hindi Medium Implementation Board.

(D) Ability Enhancement (Skill Based)-2 1.

Legislative Practices and Procedures

Course objective: To acquaint the student broadly with the legislative process in India at various levels, introduce them to the requirements of peoples' representatives and provide elementary skills to be part of a legislative support team and expose them to real life legislative work. These will be, to understand complex policy issues, draft new legislation, track and analyse ongoing bills, make speeches and floor statements, write articles and press releases, attend legislative meetings, conduct meetings with various stakeholders, monitor media and public developments, manage constituent relations and handle inter-office communications. It will also deepen their understanding and appreciation of the political process and indicate the possibilities of making it work for democracy.

I. Powers and functions of people's representative at different tiers of governance (6 lectures)

Members of Parliament, State legislative assemblies, functionaries of rural and urban local self-government from Zila Parishad, Municipal Corporation to Panchayat/ward.

II. Supporting the legislative process (2 lectures)

How a bill becomes law, role of the Standing committee in reviewing a bill, legislative consultants, the framing of rules and regulations.

III. Supporting the Legislative Committees (6 lectures)

Types of committees, role of committees in reviewing government finances, policy, programmes, and legislation.

IV. Reading the Budget Document (6 lectures)

Overview of Budget Process, Role of Parliament in reviewing the Union Budget, Railway Budget, Examination of Demands for Grants of Ministries, Working of Ministries.

V. Support in media monitoring and communication (4 lectures)

Types of media and their significance for legislators; Basics of communication in print and electronic media.

READING LIST

I. Powers and functions of people's representative at different tiers of governance

Essential Readings:

M. Madhavan, and N. Wahi, (2008) *Financing of Election Campaigns* PRS, Centre for Policy Research, New Delhi, Available at:

http://www.prsindia.org/uploads/media/conference/Campaign_finance_brief.pdf, Accessed: 19.04.2013

S. Vanka, (2008) *Primer on MPLADS*, Centre for Policy Research, New Delhi, Available at <http://www.prsindia.org/parliamenttrack/primers/mplads-487/>, Accessed: 19.04.2013

H. Kalra, (2011) *Public Engagement with the Legislative Process* PRS, Centre for Policy Research, New Delhi, Available at:

<http://www.prsindia.org/administrator/uploads/media/Conference%202011/Public%20Engagement%20with%20the%20Legislative%20Process.pdf>, Accessed: 19.04.2013.

Government of India (Lok Sabha Secretariat), (2009) *Parliamentary Procedures (Abstract Series)*, Available at <http://164.100.47.132/LssNew/abstract/index.aspx>, Accessed: 19.04.2013

II. Supporting the legislative process

Essential Readings:

Government of India, (Ministry of Parliamentary Affairs), (2009) *Legislation, Parliamentary Procedure*, Available at http://mpa.nic.in/Manual/Manual_English/Chapter/chapter-09.htm, Accessed: 19.04.2013

Government of India, (Ministry of Parliamentary Affairs) (2009), *Subordinate Legislation, Parliamentary Procedure*, Available at: http://mpa.nic.in/Manual/Manual_English/Chapter/chapter-11.htm Accessed: 19.04.2013

D. Kapur and P. Mehta, (2006) 'The Indian Parliament as an Institution of Accountability', *Democracy, Governance and Human Rights*, Programme Paper Number 23, United Nations Research Institute for Social Development, Available at: [http://www.unrisd.org/UNRISD/website/document.nsf/240da49ca467a53f80256b4f005ef245/8e6fc72d6b546696c1257123002fcceb/\\$FILE/KapMeht.pdf](http://www.unrisd.org/UNRISD/website/document.nsf/240da49ca467a53f80256b4f005ef245/8e6fc72d6b546696c1257123002fcceb/$FILE/KapMeht.pdf), Accessed: 19.04.2013

O. Agarwal and T. Somanathan, (2005) '*Public Policy Making in India: Issues and Remedies*', Available at: http://www.cprindia.org/admin/paper/Public_Policy_Making_in_India_14205_TV_SO_MANA_THAN.pdf, Accessed: 19.04.2013

B. Debroy, (2001) 'Why we need law reform' *Seminar* January.

III. Supporting the Legislative Committees

Essential Readings:

P. Mehta, 'India's Unlikely Democracy: The Rise of Judicial Sovereignty', *Journal of Democracy*, Vol. 18(2), pp.70-83.

Government link: <http://loksabha.nic.in/>; <http://rajyasabha.nic.in/>; <http://mpa.nic.in/>

K. Sanyal, (2011) *Strengthening Parliamentary Committees* PRS, Centre for Policy Research, New Delhi, Available at: <http://www.prsindia.org/administrator/uploads/media/Conference%202011/Strengthening%20Parliamentary%20Committees.pdf>, Accessed: 19.04.2013

IV. Reading the Budget Document

Essential Readings

A. Celestine, (2011) *How to Read the Union Budget* PRS, Centre for Policy Research, New Delhi, Available at <http://www.prsindia.org/parliamenttrack/primers/how-to-read-the-union-budget-1023/>, Accessed: 19.04.2013

V. Support in media monitoring and communication

Essential Reading:

G. Rose, (2005) 'How to Be a Media Darling: There's No getting Away From It', *State Legislatures*, Vol. 31(3).

Additional Readings:

N. Jayal and P. Mehta (eds), (2010) *The Oxford Companion to Politics in India*, Oxford University

Press: New Delhi,

B. Jalan, (2007) *India's Politics*, New Delhi: Penguin.

Initiating Discussion on Various Type of Debates in *Rajya Sabha*, Available at http://rajyasabha.nic.in/rsnew/publication_electronic/75RS.pdf, Accessed: 19.04.2013. *Praxis of Parliamentary Committees: Recommendations of Committee on Rules* published by *Rajya Sabha*, available at: http://rajyasabha.nic.in/rsnew/publication_electronic/Praxis.pdf, Accessed: 19.04.2013.

S.J. Phansalkar, *Policy Research in the Indian Context*

N. Singh, '*Some Economic Consequences of India's Institutions of Governance: A Conceptual Framework*', Available at: http://econ.ucsc.edu/faculty/boxjenk/wp/econ_conseq_2003_rev2.pdf, Accessed: 19.04.2013.

R. Guha, (2007), *India After Gandhi*, Macmillan: New Delhi. *Parliamentary Procedures (Abstract Series)* published by *Lok Sabha*, Available at <http://164.100.47.132/LssNew/abstract/index.aspx>, website: www.loksabha.nic.in, Accessed: 19.04.2013.

Committees of Lok Sabha, Available at: http://164.100.47.134/committee/committee_list.aspx Accessed: 19.04.2013. *Ethics Committee of Rajya Sabha*, available at: http://rajyasabha.nic.in/rsnew/publication_electronic/ethics_committee.pdf, Accessed: 19.04.2013.

Committees of Parliament, Parliamentary Procedure, Ministry of Parliamentary Affairs, Available at http://mpa.nic.in/Manual/Manual_English/Chapter/chapter-12.htm, Accessed: 19.04.2013.

Nomination of Members of Parliament on Committees, Councils, Boards and Commissions, etc., set up by the Government, Ministry of Parliament Affairs, Available at http://mpa.nic.in/Manual/Manual_English/Chapter/chapter-14.htm, Accessed: 19.04.2013.

Parliamentary Procedures: Problems and Perspectives 2009 Published by *Rajya Sabha*, Available at http://rajyasabha.nic.in/rsnew/publication_electronic/parl_procedure2009.pdf, Accessed: 19.04.2013.

Primer on the Budget Process published by PRS, Available at <http://www.prsindia.org/parliamenttrack/primers/the-budget-process-484/>, Accessed: 19.04.2013.

Background note on Financial Oversight by Parliament published by PRS, Available at <http://www.prsindia.org/administrator/uploads/media/Conference%20note/Conference%20note%20on%20financial%20oversight.pdf>, Accessed: 19.04.2013.

P. Keefer and S Khemani, (2009) 'When Do Legislators Pass On "Pork"? The Determinants of Legislator Utilization of a Constituency Development Fund in India', in *World Bank Policy Research Working Paper Series* 4929, pp. 1-45, Available at SSRN: <http://ssrn.com/abstract=1405160>, Accessed: 19.04.2013.

Parliamentary Procedures (Abstract Series), Lok Sabha, Available at<http://164.100.47.132/LssNew/abstract/process.htm>
Budget, Parliamentary Procedure, Ministry of Parliamentary Affairs, available athttp://mpa.nic.in/Manual/Manual_English/Chapter/chapter-07.htm, Accessed: 19.04.2013. <http://mpa.nic.in/mpahandbook/parlia13.pdf>

2. Peace and Conflict Resolution

Course Objective: The objective of an undergraduate application course for common students in Peace and Conflict Studies will cover in-depth knowledge of conflict analysis, conflict resolution, conflict prevention, as well as the historical and cultural context of organized violence. Peace and Conflict Resolution addresses the sources of war, social oppression and violence and the challenges of promoting peace and justice internationally and domestically. It also introduces more equitable, cooperative and nonviolent methods that can be used to transform unjust, violent or oppressive world situations. This course provides students with an overview of the Peace and Conflict Studies discipline, including key concepts and related theories. The course is designed to familiarize students with the historical background of various peace movements, to analyze principles used to resolve conflict, and to provide a view of how peace and conflict resolution are being pursued today. The course will also cover extensive understanding of current research and development within the field of peace and conflict studies and perspective of the environment, gender, migration, and ethnicity.

Unit-1 International Peace and Conflict Resolution: Sources of War: International and Domestic Issues and Trends

Unit-2-What is Conflict: Introduction to International Conflict Resolution

Unit-3 International Conflict Resolution Theory: Models developed by Johan Galtung, Joseph Montville, Morton Deutsch, William Zartman, Levy Jack

Unit-4-Conflict resolution: Back ground of Various Peace Movements and Concepts, Principles used to resolve conflict

Unit-5-Cross-boarder relationships between the world's peaceful and war-torn zones (migration and information flows, economic transactions, international rules and regulations, normative concepts and political decisions)

Unit-6 -Conflict Transformation: is Peace Possible? Resolve problems through conflict analyses and instrumentation of peace concepts

Unit-7 -Current perspective of peace and conflict resolution: Grass-roots level perspective on war and Peace

READING LIST

Essential Readings

International Conflict Resolution: Sources of War: International and Domestic Issues and Trends

Kriesberg, Louis, *Constructive Conflicts: From Escalation to Resolution*, Rowman & Littlefield, Maryland, 1998, pp. 58-150

Starkey, Boyer, and Wilkenfield, *Negotiating a Complex World*. Rowman & Littlefield, Maryland, 1999, pp. 1-74

Desirable Readings:

Zartman, William (ed.), *Collapsed States: The Disintegration and Restoration of Legitimate Authority*, Reiner, Boulder, 1995, pp. 1-14 and 267-273

Zartman, William & Touval, Saadia "International Mediation in the Post- Cold War Era", in Crocker et al., *Managing Global Chaos*, USIP, 1996, pp. 445-461

Essential Readings

What is Conflict: Introduction to International Conflict Resolution

Zartman, William, "Dynamics and Constraints in Negotiations in Internal Conflicts", in Zartman, William (ed), *Elusive Peace: Negotiating an End to Civil Wars*, The Brookings Institution, Washington, 1995, pp. 3-29

Desirable Readings

Zartman, William (ed.), *Collapsed States: The Disintegration and Restoration of Legitimate Authority*, Reiner, Boulder, 1995, pp. 1-14 and 267-273

Zartman, William & Touval, Saadia "International Mediation in the Post- Cold War Era", in Crocker et al., *Managing Global Chaos*, USIP, 1996, pp. 445-461

Essential Readings

International Conflict Resolution Theory: Models developed by Johan Galtung, Joseph Montville, Morton Deutsch, William Zartman, Levy Jack

Levy, Jack, "Contending Theories of International Conflict: A Levels-of- Analysis Approach" in Crocker et al, *Managing Global Chaos*, USIP, 1995, pp. 3-24

Carr, Edward H., "Realism and Idealism," Richard Betts (ed), *Conflict After the Cold War*, Boston: Simon & Schuster, 1994.

Desirable Readings

Carr, Edward H., "Realism and Idealism," Richard Betts (ed), *Conflict After the Cold War*, Boston: Simon & Schuster, 1994.

Waltz, Kenneth N., "Structural Causes and Economic Effects," Richard Betts (ed), *Conflict After the Cold War*, Boston: Simon & Schuster, 1994.

Conflict resolution: Back ground of Various Peace Movements and Concepts, Principles used to

resolve conflict

Essential Readings

Hampson, Fen Osler, Nurturing Peace, USIP, 1996, pp. 3-25

Galtung, Johan, There Are Alternatives: Four Roads to Peace and Security, Nottingham, Spokesman, 1984, pp. 162-205

Desirable Readings

Galtung, Johan, Peace by Peaceful Means: Peace and conflict, Development and Civilization, Sage, London, 1996, pp. 9-114

Galtung, Johan, The True Worlds: A Transnational Perspective, New York, Free Press, 1980, pp. 107-149

Cross-boarder relationships between the world's peaceful and war-torn zones (migration and information flows, economic transactions, international rules and regulations, normative concepts and political decisions)

Essential Readings

Kelman, Herbert C., "Interactive Problem Solving", in Fisher, Ronald J. (ed.) Interactive Conflict Resolution, Syracuse University Press, 1997, pp. 56-74

Kritz, Neil J., "The Rule of Law in the Post-conflict Phase: Building a Stable Peace", in Crocker et al, Managing Global Chaos, USIP, 1996, pp. 587-606

Desirable Readings

Galtung, Johan, "The Basic Need Approach", in Human Needs: a Contribution to the Current Debate, Verlag, Cambridge, 1980, pp. 55-126

Saunders, Harold H., A Public Peace Process: Sustained Dialogue to Transform Racial and Ethnic Conflicts, New York, 1999, pp. 1-80

Conflict Transformation: is Peace Possible: Resolve problems through conflict analyses and instrumentation of peace concepts

Essential Readings

Galtung, Johan, There Are Alternatives: Four Roads to Peace and Security, Nottingham, Spokesman, 1984, pp. 162-205

Galtung, Johan, "The Basic Need Approach", in Human Needs: a Contribution to the Current Debate, Verlag, Cambridge, 1980, pp. 55-126

Desirable Readings

Galtung, Johan, Peace by Peaceful Means: Peace and conflict, Development and Civilization, Sage, London, 1996, pp. 9-114

Galtung, Johan, The True Worlds: A Transnational Perspective, New York, Free Press, 1980, pp. 107-149

1980, pp. 107-149

Current perspective of peace and conflict resolution: Grass-roots level perspective on war and Peace: Grass-roots level perspective on war and Peace

Essential Readings

Deutsch, Morton, *The Resolution of Conflict: Constructive and Destructive Processes*, New Haven, Yale University Press, 1973, pp. 1-123

Galtung, Johan, *Peace by Peaceful Means: Peace and conflict, Development and Civilization*, Sage, London, 1996, pp. 9-114

Desirable Readings

Zartman, William, "Dynamics and Constraints in Negotiations in Internal Conflicts", in Zartman, William (ed), *Elusive Peace: Negotiating an End to Civil Wars*, The Brookings Institution, Washington, 1995, pp. 3-29

Kelman, Herbert C., "Interactive Problem Solving", in Fisher, Ronald J. (ed.) *Interactive Conflict Resolution*, Syracuse University Press, 1997, pp. 56-74

PSYCHOLOGY(HONOURS)

SEMESTER-I

C:1-INTRODUCTORY PSYCHOLOGY

(Credits:6, Theory-4, Practical-2) Lectures:
60 (Theory:40, Practical:20) Max.
Marks:100(Theory:70, Practical:30)

Introduction:

The course is designed to give the student a basic understanding of the psychology of human behavior. The students will be given exposure to concepts, terminology, principles, and theories that comprise an introductory course in psychology.

Learning Objectives:

1. To help the students to know the sources and processes of development of modern scientific psychology.
2. To help the students to develop a scientific temperament in studying and understanding human behavior.

Expected outcomes: Students will be able to

1. Define the term psychology and demonstrate command of the basic terminology, concepts, and principles of the discipline.
2. Gain knowledge of scientific methodology the variety of ways in which psychological data are gathered and evaluated / interpreted.
3. Identify and compare the major perspectives in psychology: Recognize how each approach views human thought and behavior.
4. Understand the physiological and biochemical links of human behavior.

UNIT-I: Introducing Psychology

- (i) Concept and definition of psychology, Roots of psychology, Psychology as a scientific discipline.
- (ii) Key Perspectives in Psychology- Behavioral, Cognitive, Humanistic, Psychodynamic, and Sociocultural

UNIT-II: Methods in Psychology

- (i) Natural Observation, Survey and Case Study- Nature, advantages and limitations.
- (ii) Experimental and Correlational methods-Nature, advantages and limitations.

UNIT-III: Biological Bases of Behavior

- (i) Structure and functions of the neurons, Communication within and between neurons, Chemical regulation of the endocrine glands.
- (ii) Structure and functions of the Central nervous system and Autonomic nervous system.

UNIT-IV: States of Mind

- (i) Nature of consciousness; changes in consciousness- sleep-wake schedules
- (ii) Extended states of Consciousness- Hypnosis, Meditation and Hallucinations

PRACTICAL

(i) R.L. by Method of Limits: To find out the R. L. of volar surface of the right arm of a subject by method of limits.

(ii) D.L. by Method of Constant Stimuli: To find out the D.L. for lifted weight of your subject by method of constant stimuli.

Recommended Books

1. Baron, R. A. (2002). Psychology (5th Edition), New Delhi: Pearson Education.
2. Dash, U.N., Dash, A.S., Mishra, H.C., Nanda, G.K. & Jena, N. (2004). Practical Exercises in Psychology: Learning about Yourself and Others. Panchasila, Bhubaneswar
3. Feldman, R.S. (2004). Understanding Psychology (6th Edition), New Delhi, Tata-McGraw Hill.
4. Gerrig, R.J. & Zimbardo, P.G. (2010). Psychology and Life (19th Ed.). Delhi: Allyn & Bacon.
5. Hilgard & Atkinson- Introduction to Psychology (2003) 14th Edition, Thomson Learning Inc.
6. Mohanty, N., Varadwaj, K. & Mishra, H.C. (2014). Explorations of Human Nature and Strength: Practicals in Psychology, Divya Prakashani, Samantarapur, Bhubaneswar.
7. Morgan, C.T., King, R.A., Weisz, J.R., & Schopler, J. (2008). Introduction to psychology (7th edition) Bombay: Tata-McGraw Hill.
8. Morris, C. G. (1990). Psychology: An Introduction. New Delhi: Prentice Hall.
9. Passer, M.W. & Smith, R.E. (2007). Psychology: The Science of Mind and Behaviour (3rd Ed.). New Delhi: Tata McGraw-Hill
10. Zimbardo, P.G. & Weber, A.L. (1997 Ed.)- Psychology- New York, Harper Collins College Publishers

C:2-BASIC DEVELOPMENTAL PROCESSES

(Credits:6, Theory-4, Practical-2) Lectures:
60 (Theory:40, Practical:20) Max.
Marks:100(Theory:70, Practical:30)

Introduction:

The course is designed to expose students to a basic understanding about the fundamental concerns of developmental psychology and provide examples of the following three dimensions of development: growth, differentiation, and orderly progression.

Learning Objectives:

1. To help students gain some key ideas about human development and the perspectives to understand and explain such developments.
2. To help the students to understand the significance of prenatal period for human development.
3. To help the students to understand the developmental preparations of the childhood and the implications of developmental milestones for the normal human development.

Expected outcomes: Students will be able to

1. Understand the nature, types, and principle of development.
2. Understand the processes of formation of life and development during pre- and post-natal periods.
3. Understand about the different aspects of preparation for future life.

UNIT-I: Basics of development

- (i) Meaning, nature, and types of development; Principles of development; Factors influencing development
- (ii) Perspectives of development- Psychoanalytic; Mechanistic; Organismic; Humanistic

UNIT-II: Life in formation

- (i) Fertilization, determination of sex, multiple birth; Prenatal development- germinal stage, embryonic stage, fetal stage; Factors influencing prenatal development
- (ii) Physical and motor developments, Social and emotional developments during childhood.

UNIT-III: Life in preparation

- (i) Physical and motor developments, Social and emotional developments during adolescence.
- (ii) Piagets stage of cognitive development; Kohlbergs stages of moral development

UNIT-IV: Self and identity

- (i) Emergence of self; Structure of the self; Development of personal identity

- (ii) Development of self control; Development of gender differences and gender roles

PRACTICAL

- (i) **Locus of Control:** To assess the Locus of Control of four college students by using Rotters Locus of Control Scale.
- (ii) **Emotional Intelligence:** To measure the emotional intelligence of four college students by using the Schuttles Emotional Intelligence Scale

Recommended Books

1. Baron, R. A. (2002). Psychology (5th Edition), New Delhi, Pearson Education.
2. Berk, L. E. (2010). Child Development (8th Ed.). New Delhi: Prentice Hall.
3. Dash, U.N., Dash, A.S., Mishra, H.C., Nanda, G.K. & Jena, N. (2004). Practical Exercises in Psychology: Learning about Yourself and Others. Panchasila, Bhubaneswar
4. Hurlock, E. Developmental Psychology (1995). IV Edition. New Delhi: Tata McGraw Hill.
5. Mohanty, N., Varadwaj, K. & Mishra, H.C. (2014). Explorations of Human Nature and Strength: Practicals in Psychology, DivyaPrakashani, Samantarapur, Bhubaneswar.
6. Papilia, Diane E., Sally Wendos Olds (2006). Human Development. 9th Edition. New Delhi: Tata McGraw Hill
7. Santrock, J. W. (2008). Child Development (11th Ed.). New Delhi: Tata McGraw Hill.
8. Sigelman, G.K. & Schaffer, D.R. (1995). Life-span Human Development, Brooks / Cole Publishing Co. Pacific Grove, California

GE:1-INTRODUCTORY PSYCHOLOGY

(Credits:6, Theory-4, Practical-2) Lectures:
60 (Theory:40, Practical:20) Max.
Marks:100(Theory:70, Practical:30)

Introduction:

The course is designed to give the student a basic understanding of the psychology of human behavior. The students will be given exposure to concepts, terminology, principles, and theories that comprise an introductory course in psychology.

Learning Objectives:

1. To help the students to know the sources and processes of development of modern scientific psychology.
2. To help the students to develop a scientific temperament in studying and understanding human behavior.

Expected outcomes: Students will be able to

1. Define the term psychology and demonstrate command of the basic terminology, concepts, and principles of the discipline.
2. Gain knowledge of scientific methodology the variety of ways in which psychological data are gathered and evaluated / interpreted.
3. Identify and compare the major perspectives in psychology: Recognize how each approach views human thought and behavior.
4. Understand the physiological and biochemical links of human behavior.

UNIT-I: Introducing Psychology

- (i) Concept and definition of psychology, Roots of psychology, Psychology as a scientific discipline.
- (ii) Key Perspectives in Psychology- Behavioral, Cognitive, Humanistic, Psychodynamic, and Sociocultural

UNIT-II: Methods in Psychology

- (i) Natural Observation, Survey and Case Study- Nature, advantages and limitations.
- (ii) Experimental and Correlational methods- Nature, advantages and limitations.

UNIT-III: Biological Bases of Behavior

- (i) Structure and functions of the neurons, Communication within and between neurons, Chemical regulation of the endocrine glands.
- (ii) Structure and functions of the Central nervous system and Autonomic nervous system.

UNIT-IV: States of Mind

- (i) Nature of consciousness; changes in consciousness- sleep-wake schedules
- (ii) Extended states of Consciousness- Hypnosis, Meditation and Hallucinations

PRACTICAL

- (i) R.L. by Method of Limits:** Students are required to find out the R. L. of volar surface of the right arm of a subject by method of limits
- (ii) D.L. by Method of Constant Stimuli:** To find out the D.L. for lifted weight of your subject by method of constant stimuli.

Recommended Books

1. Baron, R. A. (2002). Psychology (5th Edition), New Delhi: Pearson Education.

2. Dash, U.N., Dash, A.S., Mishra, H.C., Nanda, G.K. & Jena, N. (2004). Practical Exercises in Psychology: Learning about Yourself and Others. Panchasila, Bhubaneswar
3. Feldman, R.S. (2004). Understanding Psychology (6th Edition), New Delhi, Tata-McGraw Hill.
4. Gerrig, R.J. & Zimbardo, P.G. (2010). Psychology and Life (19th Ed.). Delhi: Allyn & Bacon.
5. Hilgard & Atkinson- Introduction to Psychology (2003) 14th Edition, Thomson Learning Inc.
6. Mohanty, N., Varadwaj, K. & Mishra, H.C. (2014). Explorations of Human Nature and Strength: Practicals in Psychology, Divya Prakashani, Samantarapur, Bhubaneswar.
7. Morgan, C.T., King, R.A., Weisz, J.R., & Schopler, J. (2008). Introduction to psychology (7th edition) Bombay: Tata-McGraw Hill.
8. Morris, C. G. (1990). Psychology: An Introduction. New Delhi: Prentice Hall.
9. Passer, M.W. & Smith, R.E. (2007). Psychology: The Science of Mind and Behaviour (3rd Ed.). New Delhi: Tata McGraw-Hill
10. Zimbardo, P.G. & Weber, A.L. (1997 Ed.)- Psychology- New York, Harper Collins College Publishers

SEMESTER-II

C:3-BASIC PSYCHOLOGICAL PROCESSES

(Credits:6, Theory-4, Practical-2) Lectures:
60 (Theory:40, Practical:20) Max.
Marks:100(Theory:70, Practical:30)

Introduction:

The course is designed to provide the student a basic understanding of the psychological processes from sensation to thought and communication. The student will be given exposure to the concepts, terminology, principles, and theories relating to each of the mental processes that constitute human psychology.

Learning Objectives:

1. To help the students to understand the mental processes to begin with sensation and perception up to how it results in thoughts and communication.
2. To help the students gather knowledge about the structural and functional dynamics of each of the mental processes and their interconnectedness.

Expected outcomes: Students will be able to

1. Understand the bases sensory actions and the processes of integration of sensory actions in creating and interpreting perceptual events.

2. Gain knowledge of the important processes and principles of human learning as well as the structural functional attributes of human memory to help conserve the learning outcomes.
3. Understand the structural and functional properties of language and the way it helps thought, communication, problem solving and decision making through development of concepts, ideas, images, and so on.

UNIT-I: Sensation and Perception

- (i) Basics of sensation- Sensory receptors (eye and ear), transduction, sensory thresholds, and sensory adaptation
- (ii) Nature of perceptual process- Figure and ground, Grouping (Gestalt laws), Perceptual constancies, and illusions, Perception of distance and depth.

UNIT-II: Learning and Memory

- (i) Nature and principles of Classical conditioning, Operant conditioning, and Observational learning
- (ii) The Atkinson and Shiffrin Model of Memory; Types of Memory- episodic, semantic and procedural; Causes of Forgetting- interference, repression, and amnesia

UNIT-III: Language and Communication

- (i) Properties and structure of language, Linguistic hierarchy, Language acquisition-predisposition, Nature of effective communication
- (ii) Stages of language development; critical period controversy; speech error and its implications

UNIT-IV: Thinking and Reasoning

- (i) Thinking process; concepts, categories and prototypes, Decision making and factors of influencing decision making.
- (ii) Inductive and deductive reasoning; Problem solving approaches; Steps in problem solving

PRACTICAL

- (i) Learning Curve:** To demonstrate the Learning Curve as a function of Learning trials using Nonsense Syllables.
- (ii) Serial Position Effect:** To demonstrate the serial position effect on memory in learning a list of nonsense syllables.

Recommended Books

1. Baron, R. A. (2002). Psychology (5th Edition), New Delhi, Pearson Education.
2. Dash, U.N., Dash, A.S., Mishra, H.C., Nanda, G.K. & Jena, N. (2004). Practical Exercises in Psychology: Learning about Yourself and Others. Panchasila, Bhubaneswar
3. Feldman, R.S. (2004). Understanding Psychology (6th Edition), New Delhi, Tata Mc. Graw Hill.
4. Gallotti, K.M.: Cognitive Psychology In and Out of the Laboratory. 3rd Ed, Int. Thomson Pub. Co. Bangalore, 2004

5. Gerrig, R.J. & Zimbardo, P.G. (2010). Psychology and Life (19th Ed.). Delhi: Allyn & Bacon.
6. Mohanty, N., Varadwaj, K. & Mishra, H.C. (2014). Explorations of Human Nature and Strength: Practicals in Psychology, DivyaPrakashani, Samantarapur, Bhubaneswar.
7. Morgan, C.T., King, R.A., Weisz, J.R., & Schopler, J. (2008). Introduction to psychology (7th edition) Bombay: Tata-McGraw Hill.
8. Morris, C. G. (1990). Psychology: An Introduction. New Delhi: Prentice Hall.
9. Passer, M.W. & Smith, R.E. (2007). Psychology: The Science of Mind and Behavior (3rd Ed.). New Delhi: Tata McGraw-Hill
10. Solso, R.L. (2000). Cognitive Psychology (6th Edition), USA, Allyn Bacon.
11. Zimbardo, P.G. & Weber, A.L. (1997 Ed.)- Psychology- New York, Harper Collins College Publishers

C:4-PROCESSES OF HUMAN EMPOWERMENT

(Credits:6, Theory-4, Practical-2) Lectures:
60 (Theory:40, Practical:20) Max.
Marks:100(Theory:70, Practical:30)

Introduction:

Human empowerment is ultimately an individual condition of gaining the power to control and modulate changes in one's own life those are considered important to one's identity and adjustment. The purpose of the course is to introduce students to the basics of human empowerment and how the empowerment processes are strengthened and improved.

Learning Objectives:

1. To help students gain ideas about intelligence and personality as foundations of human empowerment.
2. To make students understand how motivation and emotion are empowering processes to human development.
3. To help students gain insight into human behavior as products of empowerment

Expected outcomes: Students will be able to

1. Know the structural components and functional dynamics of both intelligence and personality.
2. Understand the significance of emotion and motivation in behavior management.
3. Understand significant aspects of social behavior as resulting in happiness, well-being and personal growth.

UNIT-I: Basics of empowerment

- (i) Intelligence- Theories of Gardner, and Stenberg; Heredity, environment, and intelligence

- (ii) Measuring Intelligence: intelligence tests; Interpretation of test score, Cross-cultural issues in testing intelligence

UNIT-II: Sources of Power (1)

- (i) Personality- Freuds theory, Humanistic theories, and Social cognitive theory
- (ii) Personality-Trait and type approach, Biological and sociocultural determinants, Psychometric and projective assessment.

UNIT-III: Sources of Power(2)

- (i) Motivation-Drive theory, Arousal theory, Expectancy theory, Maslows need hierarchy
- (ii) Emotion-Theories of James-Lange, Cannon-Bard, Schachter-Singer, and Opponent-Process

UNIT-IV: Proving empowered

- (i) Social behavior- Meaning of attribution and errors in attribution, Meaning of social cognition and processing of social information Motivation-Drive theory, Arousal theory, Expectancy theory, Maslows need hierarchy
- (ii) Positive Psychology-Scope and aims, Nature and characteristics of happiness, Subjective well-being and personal growth

PRACTICAL

- (i) Intelligence test-** To test the non-verbal intelligence of Two college students using Ravens Standard Progressive Matrices
- (ii) Personality Type-** To assess the personality type of a student obtaining responses from the student and two other significant persons in his /her life by using Glazers test of Personality Type

Recommended Books

1. Baron, R. A. & Byrne, D. (2003). Social Psychology, 10th Edition, Prentice Hall
2. Baron, R.A. (1995). Psychology- The Essential Science, Pearson Education Company of India Pvt. Ltd.
3. Dash, U.N., Dash, A.S., Mishra, H.C., Nanda, G.K. & Jena, N. (2004). Practical Exercises in Psychology: Learning about Yourself and Others. Panchasila, Bhubaneswar
4. Gerrig, R.J. & Zimbardo, P.G. (2010). Psychology and Life (19th Ed.). Delhi: Allyn & Bacon
5. Hilgard & Atkinson. Introduction to Psychology (2003). 14th Edition Thomson Learning Inc.
6. Misra, G. (2009). Psychology in India, Vol 1: Basic Psychological Processes and Human Development. India: Pearson

7. Mohanty, N., Varadwaj, K. & Mishra, H.C. (2014). Explorations of Human Nature and Strength: Practicals in Psychology, DivyaPrakashani, Samantarapur, Bhubaneswar.
8. Sigelman, G.K. & Schaffer, D.R. (1995 Eds.) Lifespan Human Development, Brooks/ Cole Publishing Co. , Pacific Group
9. Snyder, C.R. & Shane, J.L. (2005) Handbook of Positive Psychology: Oxford University Press.

GE:2-BASIC PSYCHOLOGICAL PROCESSES

(Credits:6, Theory-4, Practical-2) Lectures:
60 (Theory:40, Practical:20) Max.
Marks:100(Theory:70, Practical:30)

Introduction:

The course is designed to provide the student a basic understanding of the psychological processes from sensation to thought and communication. The student will be given exposure to the concepts, terminology, principles, and theories relating to each of the mental processes that constitute human psychology.

Learning Objectives:

1. To help the students to understand the mental processes to begin with sensation and perception up to how it results in thoughts and communication.
2. To help the students gather knowledge about the structural and functional dynamics of each of the mental processes and their interconnectedness.

Expected outcomes: Students will be able to

1. Understand the bases sensory actions and the processes of integration of sensory actions in creating and interpreting perceptual events.
2. Gain knowledge of the important processes and principles of human learning as well as the structural functional attributes of human memory to help conserve the learning outcomes.
3. Understand the structural and functional properties of language and the way it helps thought, communication, problem solving and decision making through development of concepts, ideas, images, and so on.

UNIT-I: Sensation and Perception

- (i) Basics of sensation- Sensory receptors (eye and ear), transduction, sensory thresholds, and sensory adaptation
- (ii) Nature of perceptual process- Figure and ground, Grouping (Gestalt laws), Perceptual constancies, and illusions, Perception of distance and depth.

UNIT-II: Learning and Memory

- (i) Nature and principles of Classical conditioning, Operant conditioning, and Observational learning
- (ii) The Atkinson and Shiffrin Model of Memory; Types of Memory- episodic, semantic and procedural; Causes of Forgetting- interference, repression, and amnesia

UNIT-III: Language and Communication

- (i) Properties and structure of language, Linguistic hierarchy, Language acquisition-predisposition, Nature of effective communication
- (ii) Stages of language development; critical period controversy; speech error and its implications

UNIT-IV: Thinking and Reasoning

- (i) Thinking process; concepts, categories and prototypes, Decision making and factors of influencing decision making.
- (ii) Inductive and deductive reasoning; Problem solving approaches; Steps in problem solving

PRACTICAL

(i) Learning Curve: To demonstrate the Learning Curve as a function of Learning trials using Non-sense Syllables.

(ii) Serial Position Effect: To demonstrate the serial position effect on memory in learning a list of nonsense syllables.

Recommended Books

1. Baron, R. A. (2002). Psychology (5th Edition), New Delhi, Pearson Education.
2. Dash, U.N., Dash, A.S., Mishra, H.C., Nanda, G.K. & Jena, N. (2004). Practical Exercises in Psychology: Learning about Yourself and Others. Panchasila, Bhubaneswar
3. Feldman, R.S. (2004). Understanding Psychology (6th Edition), New Delhi, Tata Mc. Graw Hill.
4. Gallotti, K.M.: Cognitive Psychology In and Out of the Laboratory. 3rd Ed, Int. Thomson Pub. Co. Bangalore, 2004
5. Gerrig, R.J. & Zimbardo, P.G. (2010). Psychology and Life (19th Ed.). Delhi: Allyn & Bacon.
6. Mohanty, N., Varadwaj, K. & Mishra, H.C. (2014). Explorations of Human Nature and Strength: Practicals in Psychology, DivyaPrakashani, Samantarapur, Bhubaneswar.
7. Morgan, C.T., King, R.A., Weisz, J.R., & Schopler, J. (2008). Introduction to psychology (7th edition) Bombay: Tata-McGraw Hill.
8. Morris, C. G. (1990). Psychology: An Introduction. New Delhi: Prentice Hall.
9. Passer, M.W. & Smith, R.E. (2007). Psychology: The Science of Mind and Behavior (3rd Ed.). New Delhi: Tata McGraw-Hill
10. Solso, R.L. (2000). Cognitive Psychology (6th Edition), USA, Allyn Bacon.
11. Zimbardo, P.G. & Weber, A.L. (1997 Ed.)- Psychology- New York, Harper Collins College Publishers

SEMESTER-III

C:5-PSYCHOLOGICAL STATISTICS

(Credits:6, Theory-4, Practical-2) Lectures:
60 (Theory:40, Practical:20) Max.
Marks:100(Theory:70, Practical:30)

Introduction:

The course is designed to equip students with knowledge in the fundamentals of statistics and research methods so that they understand the application of statistics to different research problems in psychology.

Learning Objectives:

1. To help students develop knowledge and understanding of the application of Statistics within Psychology
2. To help students develop Critical Thinking for application of appropriate statistical analysis in Psychological research

Expected outcomes: Students will be able to

1. The nature psychological variables and how to measure them with appropriate scale.
2. The processes of describing and reporting statistical data.
3. The methods of drawing inferences and conclusions for hypothesis testing by using appropriate statistical analysis.

UNIT-I: Fundamentals of statistics

- (i) Meaning and scope of statistics, Nature of variables- Categorical and Continuous, Levels of Measurement- Nominal, Ordinal, Interval, and Ratio
- (ii) Drawing frequency distribution; Graphical representation of grouped data-Polygon, Histogram, Ogive.

UNIT-II: Measures of Statistics

- (i) Measures of Central Tendency- Characteristics of mean, median and mode; Computation of mean, median, and mode
- (ii) Measures of Variability- Concept of variability, computation of semi-inter quartile range, Standard deviation and variance, Co-efficient of variation

UNIT-III: Sources and Applications

- (i) Concept of Probability; Characteristics of Normal Probability curve, Applications of NPC, Deviation from NPC- Skewness and Kurtosis
- (ii) Concept of correlation, Product-moment correlation (ungrouped data), Rank order correlation, Chi-square test (Contingency Table)

UNIT-IV: Hypothesis Testing

(i) Level of significance; Type I and Type II error; Computation of t for independent and dependent samples, The Mann-Whitney U test

(ii) Purpose and assumptions of ANOVA; One-way and two-way ANOVA; Kruskal-Wallis H test

PRACTICAL

(i) **Reporting of Statistical Results:** To collect data of 60 (30 boys and 30 girls) High School students about their Annual examination marks in four subjects and to report by descriptive statistical analyses.

(ii) **Computer Awareness:** To be familiar with software packages of statistics and their applications.

Recommended Books

1. Aron, A., Aron, E.N., & Coups, E.J. (2007). Statistics for Psychology. (4thEd.) India: Pearson Education, Prentice Hall.
2. Dash, U.N., Dash, A.S., Mishra, H.C., Nanda, G.K. & Jena, N. (2004). Practical Exercises in Psychology: Learning about Yourself and Others. Panchasila, Bhubaneswar
3. Ferguson, G.A. & Takane, Y. (1989). Statistical Analysis in Psychology & Education, Tata McGraw Hill Publishing Company, New Delhi
4. Garrett, H. E. & Woodworth, R.S. (1985). Psychology in Statistics and Education, Vakils, Feffer & Simons Ltd. Mumbai
5. Mangal, S.K. (2002) Statistics in Psychology and Education. (2ndedt). New Delhi: Prentice Hall of India.
6. Mohanty, N., Varadwaj, K. & Mishra, H.C. (2014). Explorations of Human Nature and Strength: Practicals in Psychology, DivyaPrakashani, Samantarapur, Bhubaneswar.
7. Siegal, S. (1994). Nonparametric Statistics. McGraw Hill, New Delhi
8. Singh, A.K. (1986). Tests, Measurements, & Research Methods in Behavioral Sciences, Tata McGraw Hill Publishing Company, New Delhi
9. Walaram, G. Statistics for Behavioral Sciences

C:6-SOCIAL PSYCHOLOGY

(Credits:6, Theory-4, Practical-2) Lectures:
60 (Theory:40, Practical:20) Max.
Marks:100(Theory:70, Practical:30)

Introduction:

Social psychology is the scientific study of the nature and causes of human behavior in a social context. This course is designed to introduce the students to the field of social psychology, to explain how social psychologists think about and study human behavior; to introduce the body of knowledge and underlying principles that currently exist in the field and to encourage reflection about the implications of social psychology for the situations we encounter in everyday life.

Learning Objectives:

1. To help students develop awareness of the concepts, problems and issues in the discipline of social psychology

2. To make students understand the individuals and groups in respect to patterns of social behavior and attitudes
3. To help students gain insight into the dynamics of intergroup relationships, conflict, prejudice and cooperation.

Expected outcomes: Students will be able to

1. Know the scope of studying social psychology and the methods to gather data in the social context to explain them.
2. Understand the significance of social cognition, attitudes, stereotypes and prejudices in explaining human behavior in the social contexts.
3. Understand the significant aspects group behavior and social influence that constitute the core of human relationships.

UNIT-I: Introduction

- (i) Nature, goal, and scope of Social Psychology; Methods of Social Psychology- Observation; Questionnaire, Interview, and Experiment
- (ii) Social Cognition- Perceiving ourselves: self-concept, self-esteem, self-presentation and self expression; Perceiving others and forming impressions

UNIT-II: Attitude, Prejudice and Stereotypes

- (i) Attitudes- Nature, characteristics and functions of attitude; Attitude formation and change; Attitude measurement
- (ii) Measures of Variability- Concept of variability, computation of semi-inter quartile range, Standard deviation and variance, Co-efficient of variation

UNIT-III: Group and Leadership

- (i) Group- Group structure and function, Task performance: Social facilitation, Social loafing; Conformity, Obedience and social modeling; Group cohesiveness-
- (ii) Leadership- Definitions and functions, Trait, situational, interactional and contingency approaches to leadership; Leadership effectiveness, The charismatic leadership

UNIT-IV: Social Behavior

- (i) Prosocial behavior-Cooperation and helping, personal, situational and socio-cultural determinants, Theoretical explanations of prosocial behavior.
- (ii) Aggression- Theoretical perspectives, Trait, situational and social learning approaches, social and personal determinants of aggression, prevention and control of aggression.

PRACTICAL

- (i) Ethical Values:** To assess the ethical values of five adolescents by using Donelsons Ethical Position Questionnaire (EPQ)
- (ii) Attitude towards Women:** To measure the attitude of three boys and three girls towards Women by using Spence, Helmrich & Stapps Attitude towards Women scale.

Recommended Books

1. Baron R. A & Byrne. D. (2003). Social Psychology. 10th Edition, Prentice Hall
2. Baron. R.A., Byrne, D. & Bhardwaj. G (2010). Social Psychology (12th Ed). New Delhi: Pearson
3. Dash, U.N., Dash, A.S., Mishra, H.C., Nanda, G.K. & Jena, N. (2004). Practical Exercises in Psychology: Learning about Yourself and Others. Panchasila, Bhubaneswar
4. Developments (ICSSR survey of advances in research). New Delhi: Pearson.
5. Misra, G. (1990) .Applied Social Psychology. New Delhi: Sage.
6. Misra, G. (2009). Psychology in India, Volume 4: Theoretical and Methodological
7. Mohanty, N., Varadwaj, K. & Mishra, H.C. (2014). Explorations of Human Nature and Strength: Practicals in Psychology, DivyaPrakashani, Samantarapur, Bhubaneswar.
8. Myers, David G. (2002). Social Psychology. 7th Edition, McGraw Hill Book Co.
9. Taylor,S.E., Peplau,L.A. & Sears, D.O. (2006). Social Psychology (12th Ed). New Delhi: Pearson

C:7-ENVIRONMENTAL PSYCHOLOGY

(Credits:6, Theory-4, Practical-2) Lectures:
60 (Theory:40, Practical:20) Max.
Marks:100(Theory:70, Practical:30)

Introduction:

Environmental psychology is an interdisciplinary field focused on the interplay between individuals and their surroundings. The field defines the term environment broadly, encompassing natural environments, social settings, built environments, learning environments, and informational environments. The course is designed to introduce to the students about all these aspects of environment.

Learning Objectives:

1. To highlight the simultaneous mutual interaction of environment and behavior.
2. To delineate psychological approaches to the study of environment.
3. To discuss the impact of ecological degradation and the need for enhanced awareness programs

Expected outcomes: Students will be able to

1. understand the interactional relationships between environment and behavior
2. understand the problems occurring to ecology and environment at the present time
3. understand different psychological approaches to the study of man-environment relationship.

UNIT-I: Environment and Behavior

- (i) Earth as a living system: The gala hypothesis, Deep ecology; Man-environment relationship-physical, social, cultural, orientation and product.
- (ii) Effects of Environment on behavior: Noise pollution, Air pollution, Crowding and population explosion.

UNIT-II: Ecology and Development

- (i) Human behavior Environmental Problems: Global warming, Greenhouse effect, energy depletion; Pro-environmental behaviors.
- (ii) Ecosystem and their components; Sustainable development; Resource use: Common property resources. Ecology: Acculturation and psychological adaptation

UNIT-III: Psychological Approaches to environment

- (i) Field theory approach; Eco-cultural Psychology (Berry); Biosocial Psychology (Dawson);
- (ii) Person environment transaction (Sokols & Ittelson); Ecological Psychology (Barker); Ecological system approach (Bronfenbrenner)

UNIT-IV: Environmental Assessment

- (i) Socio-psychological dimensions of environmental impact; Environmental deprivation-nature and consequences.
- (ii) Creating environmental awareness; Social movements- Chipko, Tehri, Narmada.

PRACTICAL

- (i) To assess the environmental literacy of 4 college students using Bob Simpsons Environment literacy and awareness survey questionnaire.
- (ii) To assess the environmental attitude, concern and sensitivity of 4 college students using Bob Simpsons Environment literacy and awareness survey questionnaire.

Recommended Books

1. Dash, U.N., Dash, A.S., Mishra, H.C., Nanda, G.K. & Jena, N. (2004). Practical Exercises in Psychology: Learning about Yourself and Others. Panchasila, Bhubaneswar
2. Dreze, J. and Sen, A. (1992). Indian Development. Delhi: Oxford University Press.
3. Gadgil, M. and Guha. R. (1995). Ecology and Equity. New Delhi, Penguin Books
4. Goldsmith, E. (1991). The way: The ecological World View. Boston: Shambhala
5. Mohanty, N., Varadwaj, K. & Mishra, H.C. (2014). Explorations of Human Nature and Strength: Practicals in Psychology, DivyaPrakashani, Samantarapur, Bhubaneswar.

GE:3-PSYCHOLOGICAL STATISTICS

(Credits:6, Theory-4, Practical-2) Lectures:
60 (Theory:40, Practical:20) Max.
Marks:100(Theory:70, Practical:30)

Introduction:

The course is designed to equip students with knowledge in the fundamentals of statistics and research methods so that they understand the application of statistics to different research problems in psychology.

Learning Objectives:

1. To help students develop knowledge and understanding of the application of Statistics within Psychology
2. To help students develop Critical Thinking for application of appropriate statistical analysis in Psychological research

Expected outcomes: Students will be able to

1. The nature psychological variables and how to measure them with appropriate scale.
2. The processes of describing and reporting statistical data.
3. The methods of drawing inferences and conclusions for hypothesis testing by using appropriate statistical analysis.

UNIT-I: Fundamentals of statistics

- (i) Meaning and scope of statistics, Nature of variables- Categorical and Continuous, Levels of Measurement- Nominal, Ordinal, Interval, and Ratio
- (ii) Drawing frequency distribution; Graphical representation of grouped data-Polygon, Histogram, Ogive.

UNIT-II: Measures of Statistics

- (i) Measures of Central Tendency- Characteristics of mean, median and mode; Computation of mean, median, and mode
- (ii) Measures of Variability- Concept of variability, computation of semi-inter quartile range, Standard deviation and variance, Co-efficient of variation

UNIT-III: Sources and Applications

- (i) Concept of Probability; Characteristics of Normal Probability curve, Applications of NPC, Deviation from NPC- Skewness and Kurtosis
- (ii) Concept of correlation, Product-moment correlation (ungrouped data), Rank order correlation, Chi-square test (Contingency Table)

UNIT-IV: Hypothesis Testing

- (i) Level of significance; Type I and Type II error; Computation of t for independent and dependent samples, The Mann-Whitney U test
- (ii) Purpose and assumptions of ANOVA; One-way and two-way ANOVA; Kruskal-Wallis H test

PRACTICAL

- (i) **Reporting of Statistical Results:** To collect data of 60 (30 boys and 30 girls) High School students about their Annual examination marks in four subjects and to report by descriptive statistical analyses.

(ii) Computer Awareness: To be familiar with software packages of statistics and their applications.

Recommended Books

1. Aron, A., Aron, E.N., & Coups, E.J. (2007). Statistics for Psychology. (4thEd.) India: Pearson Education, Prentice Hall.
2. Dash, U.N., Dash, A.S., Mishra, H.C., Nanda, G.K. & Jena, N. (2004). Practical Exercises in Psychology: Learning about Yourself and Others. Panchasila, Bhubaneswar
3. Ferguson, G.A. & Takane, Y. (1989). Statistical Analysis in Psychology & Education, Tata McGraw Hill Publishing Company, New Delhi
4. Garrett, H. E. & Woodworth, R.S. (1985). Psychology in Statistics and Education, Vakils, Feffer & Simons Ltd. Mumbai
5. Mangal, S.K. (2002) Statistics in Psychology and Education. (2ndedt). New Delhi: Prentice Hall of India.
6. Mohanty, N., Varadwaj, K. & Mishra, H.C. (2014). Explorations of Human Nature and Strength: Practicals in Psychology, DivyaPrakashani, Samantarapur, Bhubaneswar.
7. Siegal, S. (1994). Nonparametric Statistics. McGraw Hill, New Delhi
8. Singh, A.K. (1986). Tests, Measurements, & Research Methods in Behavioral Sciences, Tata McGraw Hill Publishing Company, New Delhi
9. Walaram, G. Statistics for Behavioral Sciences

C:8-PSYCHOPATHOLOGY

(Credits:6, Theory-4, Practical-2) Lectures:
60 (Theory:40, Practical:20) Max.
Marks:100(Theory:70, Practical:30)

Introduction:

Psychopathology refers to the study of mental illness. This course is designed to expose students to the key concepts in psychopathology as well as the major theories associated with the etiology and treatment of psychological disorders and disabilities. Students will be able to understand the distinction between normal and abnormal and the qualities that are used to differentiate what is typical versus atypical through citations of different disorders.

Learning Objectives:

1. To help students define and understand the basic concepts underlying psychopathology and the perspectives which contributed to the development of modern psychopathology.
2. To help students understand the assessment techniques for identifying and classifying maladaptive behavior and mental disorders.

3. To guide students to gain specific knowledge about different types of mental disorders.

Expected outcomes: Students will be able to

1. Understand the differences between normality and abnormality along with the perspectives explaining them.
2. Know the importance and the use of assessment techniques in identifying different forms of maladaptive behavior.
3. Learn the symptoms, causes and treatment of anxiety disorders, mood disorders and schizophrenia.

UNIT-I: Basics of Pathology

- (i) Concept of abnormality; Perspectives of abnormal behavior- Psychodynamic, Behavioral, Cognitive, Humanistic-Existential, and Sociocultural
- (ii) Classification of maladaptive behavior-DSM-IV; Assessment techniques- Diagnostic tests, Rating scales, History taking interview, Projective tests

UNIT-II: Anxiety and Mood disorder

- (i) Symptoms, causes and treatment of Generalized anxiety disorder, Phobic disorder, Obsessive-Compulsive disorder
- (ii) Depressive disorder Symptoms, causes and treatment of Bipolar affective disorder, and Dysthymia

UNIT-III: Personality Disorders

- (i) Paranoid, Schizoid, Dissociative, Impulsive
- (ii) Borderline, Anxious, Avoidance, Dependent personality

UNIT-IV: Schizophrenia and Therapies

- (i) Characteristics, Major subtypes, Causes and treatment of Schizophrenia
- (ii) Psychodynamic, and Cognitive Behavior therapy.

PRACTICAL

(i) Anxiety: Assessment of Anxiety of a subject by Hamilton Anxiety Rating Scale (HARS)

(ii) Depression: Assessment of Depression Profile of a subject by Becks Depression Inventory (BDI)

Recommended Books

1. Ahuja N. (2011). A Short Textbook of Psychiatry (7th Ed). New Delhi: Jaypee

2. Barlow D.H. and Durand V.M. (2005). Abnormal Psychology: An Integrated Approach (4th Ed.).Wadsworth: New York.
3. Baron, R.A. (1995 Edition)-Psychology- The Essential Science, Pearson Education Company of India Pvt. Ltd.
4. Carson R.C., Butcher J.N., Mineka, S., & Hooley J.M. (2007). Abnormal Psychology (13th Ed.).ND: Pearson Education.
5. Dash, U.N., Dash, A.S., Mishra, H.C., Nanda, G.K. & Jena, N. (2004). Practical Exercises in Psychology: Learning about Yourself and Others. Panchasila, Bhubaneswar
6. Irwin G. Sarason, Barbara Sarason (2005). Abnormal Psychology. New Delhi: Prentice Hall Publication
7. James C. Coleman (1981). Abnormal Psychology and Modern Life. D.B. Taraporevala with Scott, Foresman and Company, Mumbai
8. Kring,A.M.,Johnson,S.L.,Davison G.C. & Neale J.M. (2010). Abnormal Psychology (11th Ed.).NY: John Wiley
9. Mohanty, N. (2008). Psychological Disorders: Text and Cases. New Delhi: Neelkamal Publications Pvt. Ltd.
10. Mohanty, N., Varadwaj, K. & Mishra, H.C. (2014). Explorations of Human Nature and Strength: Practicals in Psychology, DivyaPrakashani, Samantarapur, Bhubaneswar.

C:9-EDUCATIONAL PSYCHOLOGY

(Credits:6, Theory-4, Practical-2) Lectures:
60 (Theory:40, Practical:20) Max.
Marks:100(Theory:70, Practical:30)

Introduction:

This course provides an introduction to concepts, theories, and research in educational psychology. The topics covered include cognitive development during the school years, classroom management, instructional approaches, motivation, assessment, and individual differences.

Learning Objectives:

1. To provide students with an overview of the purposes and uses of educational psychology.
2. To help students understand human development focusing mainly on the years of formal education including those with ability differences
3. To make students understand the ways that educators motivate their students to learn and strive for excellence
4. To make students explore the ways that educators manage learning environments to maximize learning and social cohesion

Expected outcomes: Students will be able to

1. Define educational psychology and give examples of the different topics educational psychologists study.
2. Describe the developmental issues faced by school age children.
3. Describe the challenges presented by children with ability differences.
4. Explain the role of motivation on learning and classroom behavior.
5. Describe classroom management techniques.
6. Identify commonly used standardized tests, their strengths and limitations, and use in school settings.

UNIT-I Foundations of Educational Psychology

- (i) Concepts and principles of educational psychology, The teaching-learning process, Goals of teaching and objectives for learning.
- (ii) Theories of cognitive development-Piaget, Bruner and Vygotsky.

UNIT- II Motivation and Classroom Management

- (i) Meaning of motivation, Intrinsic and extrinsic motivation, Approaches to understand classroom motivation, Motivational techniques in classroom teaching.
- (ii) The goals of classroom management, Creating a positive learning environment, Characteristics of an effective teacher, Teacher expectation and students performance.

UNIT III Creativity and Aptitude

- (i) Nature and characteristics of creativity; Theories of creativity; Fostering creativity among children.
- (ii) Nature and characteristics of aptitude; Types of aptitude; Measurement of aptitude; Utility of aptitude tests.

UNIT -IV Dealing with ability differences and Testing

- (i) Teaching children with mental retardation, learning disability, social class differences, and attention deficit Hyperactive disorder.
- (ii) Types of standardized tests- Achievement test, and aptitude tests, Advantages and limitations of standardized test.

PRACTICAL

- (i) Academic Behavior: To assess the academic attitude and behavior of college students by using Sias Academic Behavior Scale.
- (ii) Academic Stress: To assess the academic stress of two higher Secondary students using Raos Academic Stress Scale.

Recommended Books

1. Agrawal, J.C. (2009). Essentials of Educational Psychology (2ndEdn.) Vikas Publishing House, New Delhi.
2. Dash, U.N., Dash, A.S., Mishra, H.C., Nanda, G.K. & Jena, N. (2004). Practical Exercises in Psychology: Learning about Yourself and Others. Panchasila, Bhubaneswar

3. Gage, N. L., & Berliner, D. C. (2009) Educational psychology (5th ed.). Boston, MA: Houghton Mifflin.
4. Mangal, S.K. (2013). Advanced Educational Psychology (2ndEdn.) PHI Learning Pvt. Ltd., New Delhi
5. Mohanty, N., Varadwaj, K. & Mishra, H.C. (2014). Explorations of Human Nature and Strength: Practicals in Psychology, DivyaPrakashani, Samantarapur, Bhubaneswar.
6. Slavin, Robert E. (2012). Educational Psychology: Theory and Practice. Delhi, Pearson,
7. Woolfolk, A.E. (2004). Educational Psychology (9th Ed.), Allyn & Bacon, London / Boston.

C:10-PSYCHOLOGICAL ASSESSMENT

(Credits:6, Theory-4, Practical-2) Lectures:
60 (Theory:40, Practical:20) Max.
Marks:100(Theory:70, Practical:30)

Introduction:

The course is designed to expose students to a basic understanding about approaches to psychological assessment and develop skill in the administration and interpretation of psychological tests.

Learning Objectives:

1. To train students in various psychological assessment techniques
2. To impart skills necessary for selecting and applying different tests for different purposes such as evaluation, training, rehabilitation etc.

Expected outcomes: Students will be able to

1. Understand the basic facts about psychological assessment.
2. Understand the processes of test construction and standardization.
3. Understand about the assessment of different types of skills and abilities.

UNIT-I Introduction

- (i) Nature and Scope of human assessment;Parameters of assessment.
- (ii) Psychological scaling, Methods of scaling.

UNIT- II Psychological Tests

- (i) Principles of test construction and standardization- Item analysis, reliability, validity and development of norms.
- (ii) Types of psychological tests- Individual, group, performance, verbal, nonverbal.

UNIT III Assessment of Ability

- (i) Assessment of general abilities- Intelligence, interest, interpersonal interaction.
- (ii) Assessment of personality- Use of self report inventories, interview, projective and non-projective tests.

UNIT IV Classroom Assessment

- (i) Classroom as assessment context, Traditional tests, Alternative assessment.
- (ii) Grading and reporting of performance, Computer and assessment.

PRACTICAL

(i) Empathy: To assess the empathy behavior of Five college students using Sprengs Empathy questionnaire.

(ii) Sense of Humor: To assess the Sense of Humor of 4 College Students Using McGhees Scale of Sense of Humor (MSSH).

Recommended Books

1. Baron, R. A. (2002). Psychology (5th Edition), New Delhi, Pearson Education.
2. Berk, L. E. (2010). Child Development (8th Ed.). New Delhi: Prentice Hall.
3. Dash, U.N., Dash, A.S., Mishra, H.C., Nanda, G.K. & Jena, N. (2004). Practical Exercises in Psychology: Learning about Yourself and Others. Panchasila, Bhubaneswar
4. Hurlock, E. Developmental Psychology (1995). IV Edition. New Delhi: Tata McGraw Hill.
5. Mohanty, N., Varadwaj, K. & Mishra, H.C. (2014). Explorations of Human Nature and Strength: Practicals in Psychology, DivyaPrakashani, Samantarapur, Bhubaneswar.
6. Papilia, Diane E., Sally Wendos Olds (2006). Human Development. 9th Edition. New Delhi: Tata McGraw Hill
7. Santrock, J. W. (2008). Child Development (11th Ed.). New Delhi: Tata McGraw Hill.
8. Sigelman, G.K. & Schaffer, D.R. (1995). Life-span Human Development, Brooks / Cole Publishing Co. Pacific Grove, California

GE:6-PSYCHOPATHOLOGY

(Credits:6, Theory-4, Practical-2) Lectures:
60 (Theory:40, Practical:20) Max.
Marks:100(Theory:70, Practical:30)

Introduction:

Psychopathology refers to the study of mental illness. This course is designed to expose students to the key concepts in psychopathology as well as the major theories associated with the etiology and treatment of psychological disorders and disabilities. Students will be able to understand the distinction between normal and abnormal and the qualities that are used to differentiate what is typical versus atypical through citations of different disorders **Learning Objectives:**

1. To help students define and understand the basic concepts underlying psychopathology and the perspectives which contributed to the development of modern psychopathology.
2. To help students understand the assessment techniques for identifying and classifying maladaptive behavior and mental disorders.
3. To guide students to gain specific knowledge about different types of mental disorders.

Expected outcomes: Students will be able to

1. Understand the differences between normality and abnormality along with the perspectives explaining them.
2. Know the importance and the use of assessment techniques in identifying different forms of maladaptive behavior.
3. Learn the symptoms, causes and treatment of anxiety disorders, mood disorders and schizophrenia.

UNIT-I Basics of Pathology

- (i) Concept of abnormality; Perspectives of abnormal behavior- Psychodynamic, Behavioral, Cognitive, Humanistic-Existential, and Sociocultural.
- (ii) Classification of maladaptive behavior-DSM-IV; Assessment techniques- Diagnostic tests, Rating scales, History taking interview, Projective tests.

UNIT- II Anxiety and Mood disorder

- (i) Symptoms, causes and treatment of Generalized anxiety disorder, Phobic disorder, Obsessive-Compulsive disorder.
- (ii) Depressive disorder Symptoms, causes and treatment of Bipolar affective disorder, and Dysthymia.

UNIT III Personality Disorders

- (i) Paranoid, Schizoid, Dissociative, Impulsive. (ii) Borderline, Anxious, Avoidance, Dependent personality.

UNIT IV Schizophrenia and Therapies

- (i) Characteristics, Major subtypes, Causes and treatment of Schizophrenia.
- (ii) Psychodynamic, and Cognitive Behavior therapy.

PRACTICAL

- (i) Anxiety: Assessment of Anxiety of a subject by Hamilton Anxiety Rating Scale (HARS).
- (ii) Depression: Assessment of Depression Profile of a subject by Becks Depression Inventory (BDI).

Recommended Books

1. Ahuja N. (2011). A Short Textbook of Psychiatry (7th Ed). New Delhi: Jaypee.
2. Barlow D.H. and Durand V.M. (2005). Abnormal Psychology: An Integrated Approach (4th Ed.). Wadsworth: New York.
3. Baron, R.A. (1995 Edition)-Psychology- The Essential Science, Pearson Education Company of India Pvt. Ltd.
4. Carson R.C., Butcher J.N., Mineka, S., & Hooley J.M. (2007). Abnormal Psychology (13th Ed.). ND: Pearson Education.
5. Dash, U.N., Dash, A.S., Mishra, H.C., Nanda, G.K. & Jena, N. (2004). Practical Exercises in Psychology: Learning about Yourself and Others. Panchasila, Bhubaneswar.
6. Irwin G. Sarason, Barbara Sarason (2005). Abnormal Psychology. New Delhi: Prentice Hall Publication.
7. James C. Coleman (1981). Abnormal Psychology and Modern Life. D.B. Taraporevala with Scott, Foresman and Company, Mumbai.
8. Kring, A.M., Johnson, S.L., Davison G.C. & Neale J.M. (2010). Abnormal Psychology (11th Ed.). NY: John Wiley.
9. Mohanty, N. (2008). Psychological Disorders: Text and Cases. New Delhi: Neelkamal Publications Pvt. Ltd.

10. Mohanty, N., Varadwaj, K. & Mishra, H.C. (2014). Explorations of Human Nature and Strength: Practicals in Psychology, DivyaPrakashani, Samantarapur, Bhubaneswar.
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SEMESTER-V

C:11-ORGANIZATIONAL BEHAVIOR

(Credits:6, Theory-4, Practical-2) Lectures:
60 (Theory:40, Practical:20) Max.
Marks:100(Theory:70, Practical:30)

Introduction:

The course provides an overview of the main fields of organizational and personnel psychology. It focuses on topics such as organizational system; work behavior, attitudes and motivation as related to organizational set up; management of power and politics in the organizations; and finally development and evaluation of human resources for sustainable growth of an organizations. **Learning Objectives:**

1. To help students able to understand the structure, functions, and designs of different organizations.
2. To make students understand the processes of group decision making and leadership functions in different organizations.
3. To make students understand the theories of work motivation and related issues of power and politics in the organizational set up.
4. To help students demonstrate professional skills in the evaluation, management, and development of human resources in the organizations.

Expected outcomes: Students will be able to

1. Understand different concepts and dynamics related to organizational system, behavior, and management.
2. Identify steps managers can take to motivate employees in the perspectives of the theories of work motivation.
3. Understand the tricks of power and politics management in the organizations.
4. Understand significance of human resource development, evaluation and management for the interest and benefit of the organization.

UNIT-I Historical context of organizational behavior

- (i) Contributions of Taylor, Weber and Fayoll; Challenges, Scope and opportunities for OB.
- (ii) OB perspectives-Open system approach, Human relations perspective, Socio-technical approach, OB model responsive to Indian realities.

UNIT- II Organization System

- (i) Structure and functions of organization, Common organizational designs, Management roles, functions and skills.
- (ii) Group decision making processes in organizations, Organizational leadership and types of leadership in organizations.

UNIT III Work, Power and Politics

(i) Contemporary theories of work motivation- ERG theory, McClelland's theory of needs, Cognitive evaluation theory, Goal-setting theory, Reinforcement theory.

(ii) Defining power in organization, Bases of power, Power tactics, Nature of organizational politics, Impression management, and defensive behavior.

UNIT IV Human resource development and Evaluation

(i) Human Skills and Abilities, Selection Practices for Optimal Use of Human Resources; Training Programs for the Development of Human Resources.

(ii) Performance Evaluation- Purpose, Methods, Potential Problems and methods to overcome them.

PRACTICAL

(i) **Leadership Style:** To measure his basic leadership style of 4 college students by using Green- berg Basic Leadership Style scale.

(ii) **Conflict-Handling:** To measure the conflict-handling style of 4 college students by using Rahims scale to identify their conflict handling style.

Recommended Books

1. Dash, U.N., Dash, A.S., Mishra, H.C., Nanda, G.K. & Jena, N. (2004). Practical Exercises in Psychology: Learning about Yourself and Others. Panchasila, Bhubaneswar.
2. Greenberg, J. & Baron, R.A. (2007). Behaviour in Organizations (9th Ed.). India: Dorling Kindersley.
3. Luthans, F. (2009). Organizational behavior. New Delhi: McGraw Hill.
4. Mohanty, N., Varadwaj, K. & Mishra, H.C. (2014). Explorations of Human Nature and Strength: Practicals in Psychology, DivyaPrakashani, Samantarapur, Bhubaneswar.
5. Pareek, U.(2010). Understanding organizational behaviour. Oxford: Oxford University Press.
6. Robbins, S.P.; Timothy, A.J. & Vohra, N. (2012). Organizational Behavior, 15th Edn. Pearson Education: New Delhi
7. Schultz, D. and Schultz, S.E. (2004). Psychology and Work Today. Delhi: Pearson Inc.
8. Singh, K. (2010). Organizational Behaviour: Texts & Cases. India: Dorling Kindersley.

C:12-HEALTH PSYCHOLOGY

(Credits:6, Theory-4, Practical-2) Lectures:
60 (Theory:40, Practical:20) Max.
Marks:100(Theory:70, Practical:30)

Introduction:

Health psychology is a specialty area that focuses on how biology, psychology, behavior and social factors influence health and illness. This course is designed to provide an introduction to the area of health psychology to help students understand how Health Psychology as a specialty within psychology addresses the role of behavioral factors in health and illness. Basic theories, models and applications are also included.

Learning Objectives:

1. To help the students understand the issues of Health Psychology and how to address them by the bio-psychosocial model of health and illness.
2. To help the students to describe behavioral factors that influence health and illness.
3. To guide the students understand about health enhancing behaviors including coping with illness.

Expected outcomes: Students will be able to

1. Know the basics of health and illness from the Bio-psychosocial perspectives.
2. Understand the significance of behavioral and psychological correlates of health and illness.
3. Understand the significant aspects coping and importance of health enhancing behavior.

UNIT-I Introduction

- (i) Goals of Health Psychology, , Biopsychosocial model of health and illness.
- (ii) Basic nature of stress, Cognitive appraisal of stressors, Some major causes of stress, Management of stress.

UNIT- II Health and Illness

- (i) Behavioral and psychological correlates of illness, Approaches to promoting wellness, Some common health beliefs and their implications.
- (ii) Models of health- The cognition models- The health belief model, The protection motivation model, Leventhals self regulatory model.

UNIT III Health and Coping

- (i) Individual differences in symptom perception, Coping with the crises of illness; Compliance behavior and improving compliance.
- (ii) Health enhancing behavior- Diet management, Yoga and Exercise.

UNIT IV Health Issues

- (i) Children health issues- Malnutrition, Immunization, Autism, ADHD.
- (ii) Health issues of women and elderly:Diabetes,Osteoporosis, Alzheimers Disease, Depression.

PRACTICAL

- (i) **Sleep Quality:** To assess the Sleep quality of 4 college students The Pittsburgh Sleep Quality Index (PSQI).
- (ii) **Coping Strategies:** To assess of the Coping Strategies of 4 college students by Tobins Coping Strategy Inventory (TCSI).

Recommended Books

1. Baron, R.A. (1995 Edition)-Psychology- The Essential Science, Pearson Education Company of India Pvt. Ltd.
2. Brannon and Feist. Health Psychology.
3. Carr, A. (2004). Positive Psychology: The science of happiness and human strength.UK: Routledge.
4. Dash, U.N., Dash, A.S., Mishra, H.C., Nanda, G.K. & Jena, N. (2004). Practical Exercises in Psychology: Learning about Yourself and Others. Panchasila, Bhubaneswar
5. Edward P.Sarafino (1994). Health Psychology. John Wiley and Sons
6. Khatoon, N. (2012). Health Psychology, Dorling Kindersley (India) Pvt. Ltd. New Delhi
7. Mohanty, N., Varadwaj, K. & Mishra, H.C. (2014). Explorations of Human Nature and Strength: Practicals in Psychology, DivyaPrakashani, Samantarapur, Bhubaneswar.
8. Sarafino, E.P. (2002). Health psychology: Bio psychosocial interactions (4th Ed.).NY: Wiley.
9. Snyder, C.R., & Lopez,S.J.(2007).Positive psychology :The scientific and practical explorations of human strengths. Thousand Oaks, CA: Sage.
10. Taylor, S.E. (2006). Health Psychology (6th Ed.). New York: Tata McGraw Hill

DISCIPLINE SPECIFIC ELECTIVES

DSE-1: PSYCHOLOGICAL RESEARCH & MEASUREMENT

(Credits:6, Theory-4, Practical-2) Lectures:
60 (Theory:40, Practical:20) Max.
Marks:100(Theory:70, Practical:30)

Introduction:

The research methods course is among the most frequently required in the psychology and with good reason. It helps the students know about the difference between an experiment and a correlational study, the function of independent and dependent variables, the importance of reliability and validity in psychological measurement, and the need for replication in psychological research. In other words, psychologists research methods are at the very core of their discipline. The course is designed to train the students in psychological research and measurement. **Learning Objectives:**

1. To provide an overview of scientific approaches to psychological research in term of sampling techniques, scientific method, and experimental designs.
2. To acquaint the students with respect to psychometric, projective techniques and non-testing approaches like interview.

Expected outcomes: Students will be able to

UNIT-I Psychological Research

- (i) Assumptions of science, Characteristics of scientific methods, Psychological research: Correlational and experimental.
- (ii) Sampling frame: probability and non-probability samples, sample size, sampling error.

UNIT- II Psychological Scaling and Construction of test

- (i) Purpose of scaling and types of psychological data, Psychological scaling methods: Familiarity with Thurstone, Likert and Guttman scale.
- (ii) Construction of test: Theory of measurement error; Operationalizing a concept, Generating items, Item analysis, Item response theory.

UNIT III Experimental Designs

- (i) Pretest- post-test design, Factorial designs, RandomizedBlock design Standardization of tests.
- (ii) Reliability and validity of tests, Development of norms and interpreting test scores.

UNIT IV Assessment of Personality

- (i) Psychometric and projective techniques, Familiarity with MMPI, Rorachs, WAT, and TAT Interviewing.
- (ii) Principles and procedures of interviewing, gaining cooperation, motivating respondents, training of interviewers, ethics of interviewing.

PRACTICAL

- (i) **TAT**: To administer the TAT on a subject and give summary report.
- (ii) **Word Association test**: To administer the Jung / Kent-Rosanoff list of WAT on a subject and report on his areas of emotional difficulties.

Recommended Books

1. Anastasi, A. (1988). Psychological Testing. New York: MacMillan.
2. Minium, E.W., King, B.M. & Bear, G. (1993). Statistical Reasoning in Psychology and Education. New York: John Willey.
3. Kerlinger, F.N. (1983). Foundations of Behavioral Research. New York: Surjeet Publications.
4. Freeman, F.S. (1972). Theory and Practice of Psychological Testing. New Delhi: Oxford & IBH.

DSE-2: PSYCHOLOGY & SOCIAL ISSUES

(Credits:6, Theory-4, Practical-2) Lectures:
60 (Theory:40, Practical:20) Max.
Marks:100(Theory:70, Practical:30)

Introduction:

Psychologists can play a larger role in the solution of important social problems. Psychology brings two important qualities to the study of social problems: attention to psychological process and rigorous methodology. The key task in the designed course is to define social problems in part as psychological problems.

Learning Objectives:

1. The course will provide social psychological analysis of some major social issues in India.

Expected outcomes: Students will be able to

UNIT-I Understanding Social Systems

- (i) Indian Family System; Social stratification; caste, class, power, Religious ethics Poverty and Deprivation.
- (ii) Theories of poverty, Concomitants of poverty, Sources of deprivation, inequality and social justice.

UNIT- II Health and wellbeing

- (i) Role of behavior in health problems, Shortcomings of the biomedical model, Behavioral sciences in disease prevention and control, India's health scenario.

Political Behavior

- (ii) Development of ideology, Use of small groups in politics, Issues of human and social development, Quality of life and development.

UNIT III Antisocial Behavior

- (i) Corruption and bribery, Juvenile delinquency, terrorism, Crime and criminal behavior, Alcoholism and drug abuse.

(ii) Crime and criminal behavior, Alcoholism and drug abuse, Psychopath.

UNIT IV Social integration

(i) The concept of social integration; Causal factors of social conflicts and prejudices; Psychological strategies for handling the conflicts and prejudices; Measures to achieve social integration.

Violence

(ii) Nature and categories of violence, violence in family and marriage, rape, Collective violence for social change.

PRACTICAL

(i) **Quality of Life:**To assess the quality of life family of 4 families using Beach Center Family Quality of Life Scale.

(ii) **Community Integration:**To assess the community integration of a village by using Community integration questionnaire (CIQ) of Barry Willer.

Recommended Books

1. Banerjee, D. (1998). Poverty, class and health culture in India, Vol. I, Delhi Prachi Prakashan
2. Dube, S.C. (1987) Modernization and Development. ND: Sage
3. Fonseca, M. (1998). Family and Marriage in India. Jaipur: Sachin
4. Mishra, G. (1990). Applied Social Psychology in India. ND: Sage
5. Mishra, G. (1999). Psychological perspectives on stress and Health. New Delhi: Concept
6. Mishra, H.C. and Misra, S. (2009). Psychology of Deviants, Divya Prakashani, Bhubaneswar
7. Mohanty, A .K. and Mishra, G. (Eds.) (2000). Psychology of Poverty and Disadvantage. New Delhi: Concept
8. Sen, A. & Sen A.K. (Eds.). (1998). Challenges of contemporary Realities: A psychological Perspective. New Delhi: New Age International
9. Srinivas, M.N. (1966). Social change in modern India. Bombay: Allied.

SEMESTER-VI

C:13-COUNSELING PSYCHOLOGY

(Credits:6, Theory-4, Practical-2) Lectures:
60 (Theory:40, Practical:20) Max.
Marks:100(Theory:70, Practical:30)

Introduction:

The course is designed to develop entry level counseling psychologists who will be capable of understanding and demonstrating behavior and attitudes in the basic areas of professional counseling.

Learning Objectives:

1. To help students able to understand and integrate current scientific knowledge and theory into counseling practice.
2. To make students learn the history and professional issues related to counseling psychology.
3. To help students integrate and convey information in the core areas of counseling practice.
4. To help students demonstrate professional behavior in their various roles as counseling psy³²⁸

chologists.

Expected outcomes: Students will be able to

1. Understand the purpose of counseling and practice counseling ethically following different approaches.
2. Understand the basics of counseling process and use them for counseling students, families, couples, distressed, and handicaps.

UNIT-I Basics of Counseling

(i) Meaning, scope and purpose of counseling with special reference to India; The counseling process, counseling relationship, counseling interview.

(ii) Characteristics of a good counselor, Ethics and values in counseling; Education and training of the counselor.

UNIT- II Theories and Techniques of Counseling

(i) Psychodynamic approach-Freud and Neo Freudians; Humanistic approach-Existential and Client centered. (ii) Cognitive approach- Rational-emotive and transaction analysis; Behavioral approach- Behavior modification; Indian contribution- yoga and meditation.

UNIT III Counseling Programs

(i) Working in a counseling relationship, transference and counter transference, termination of counseling relationship, Factors influencing counseling.

(ii) Student counseling, Emphases, roles and activities of the school, and college counselor.

UNIT IV Counseling application

(i) Family and Marriage Counseling, Family life and family cycle, Models and methods of family counseling.

(ii) Alcohol and drug abuse counseling; Counseling the persons with Suicidal tendencies, and Victims of Harassment and Violence.

PRACTICAL

(i) **Marital Relationship-** To assess the marital relationship of 2 couples using Lerner's Couple adjustment scale.

(ii) **Case Reporting:** To complete four case studies of high school students with problem behavior in the appropriate case record proforma.

Recommended Books

1. Burnard Philip. (1995). Counselling Skills Training A sourcebook of Activities. New Delhi: Viva Books Private Limited.
2. Dash, U.N., Dash, A.S., Mishra, H.C., Nanda, G.K. & Jena, N. (2004). Practical Exercises in Psychology: Learning about Yourself and Others. Panchasila, Bhubaneswar
3. Feltham, C and Horton, I. (2000). Handbook of Counseling and Psychotherapy. London: Sage.
4. Gibson, R.L & Mitchell M.H. (2003). Introduction to counseling and Guidance. 6th edn. Delhi: Pearson Education
5. Gladding, S.T. (2009). Counselling: A comprehensive profession (6th Ed.). New Delhi: Pearson India
6. Mishra, H.C. & Varadwaj, K. (2009). Counseling Psychology: Theories, Issues and Applications, DivyaPrakashini, Samantarapur, Bhubaneswar, Odisha

7. Misra, G. (Ed) (2010). Psychology in India, Volume 3: Clinical and Health Psychology. New Delhi: Pearson India.
8. Mohanty, N., Varadwaj, K. & Mishra, H.C. (2014). Explorations of Human Nature and Strength: Practicals in Psychology, DivyaPrakashani, Samantarapur, Bhubaneswar.
9. Nelson-Jones. (1995). The theory and practice of counseling. 2ndEdn. London: Holt, Rinehart and Winston Ltd
10. Rao, S. (2002). Counselling and Guidance (2nd Ed.). New Delhi: McGraw Hill.

C:14-POSITIVE PSYCHOLOGY

(Credits:6, Theory-4, Practical-2) Lectures:
60 (Theory:40, Practical:20) Max.
Marks:100(Theory:70, Practical:30)

Introduction:

Positive psychology is the scientific study of optimal human functioning to help people flourish. This is a foundation course in positive psychology to help students not only to understand the core themes of positive psychology, but also to equip them with the helpful positive interventions in various areas of professional psychology, such as clinical, health, education, organization and community.

Learning Objectives:

1. To help students to understand the rationale behind positive psychology.
2. To guide students to identify and analyze the key conceptual and theoretical frameworks underpinning positive psychology.
3. To encourage students to appreciate the contributions of scholars from a range of disciplines and their influence on developing a positive approach to mental health.
4. To make students understand and apply a strengths-based approach to mental health issues.

Expected outcomes: Students will be able to

1. The goal of positive psychology and the basic behavior patterns that result in positive human growth from the point of view of leading positive psychologists
2. The concepts of flow and happiness and the related theories and models explaining happiness behavior and its consequences.
3. All the precursors to positive psychology from character strength and altruism to resilience.

UNIT-I: Foundations

- (i) Historical roots and goals of positive psychology, Positive emotions, Positive Individual traits, and positive subjective experience.
- (ii) Contribution of Martin Seligman, Albert Bandura, Carol Dweck and Abraham Maslow to positive psychology

UNIT-II: Flow and Happiness

- (i) Components of flow, Conditions and mechanisms of flow, Positive and negative consequences of flow experience.
- (ii) Meaning and nature of happiness, Sources of happiness, Theories of happiness- Set-point theory, Life satisfaction and Affective state theories.

UNIT-III: Precursors to Positive Psychology

- (i) Character strength, Altruism, Hope and Optimism, Positive thinking, Resilience
- (ii) Psychology of well-being: Meaning of well-being, The well-being models, Factors affecting well-being, Promoting well-being among people

UNIT-IV: Ways to Positive Psychology

- (i) Discovering strength, Increasing optimism, Self-direction, Purpose, gratitude, Mindfulness, and Activities and experience
- (ii) Effects of exercise, Yoga, meditation and spiritual intelligence on development of positive psychology; Positive psychology in building relationship

PRACTICAL

(i) Happiness: To measure the happiness of 4 adults using Oxford Happiness questionnaire

(ii) Spiritual Intelligence: To measure the spiritual intelligence of 4 adults using Kings Spiritual Intelligence test.

Recommended Books

1. Carr, A. (2004). Positive Psychology: The science of happiness and human strength.UK: Routledge.
2. Dash, U.N., Dash, A.S., Mishra, H.C., Nanda, G.K. & Jena, N. (2004). Practical Exercises in Psychology: Learning about Yourself and Others. Panchasila, Bhubaneswar
3. Mohanty, N., Varadwaj, K. & Mishra, H.C. (2014). Explorations of Human Nature and Strength: Practicals in Psychology, DivyaPrakashani, Samantarapur, Bhubaneswar.
4. Peterson, C. (2006). A Primer in Positive Psychology; Oxford University Press
5. Seligman, M.E. (2002).Authentic Happiness: Using the New Positive Psychology to Realize Your Potential for Lasting Fulfillment: Oxford University Press
6. Seligman, M.E. (2012). Flourish:A Visionary New Understanding of Happiness and Well-being. Oxford University Press
7. Snyder, C.R. & Shane, J.L. (2005). Handbook of Positive Psychology. .Oxford University Press
8. Snyder, C.R., & Lopez,S.J.(2007).Positive psychology :The scientific and practical explorations of human strengths. Thousand Oaks, CA: Sage.

DSE-3: CONTEMPORARY APPLIED PSYCHOLOGY

(Credits:6, Theory-4, Practical-2) Lectures:
60 (Theory:40, Practical:20) Max.
Marks:100(Theory:70, Practical:30)

Introduction:

Applied psychology is the use of psychological principles and theories to overcome problems in real life situations. Mental health,organizational psychology, counseling psychology, clinical psychology, business management, education, and law are just a few of the areas that have been influenced by the application of psychological principles and findings. Some of the current areas of applied psychology include community psychology, Psychology of the disadvantaged, psychology of economic development, population psychology, gender psychology, and defense psychology. The course is designed to help students understand the application of psychology to these new fields.

Learning Objectives:

...

Expected outcomes: Students will be able to

...

UNIT-I: Community Psychology:

(i) Definition and concept of Community Psychology; Use of small groups in social action, Arousing community consciousness, Effective strategies for social change.

(ii) **Rehabilitation Psychology:** Primary, secondary, tertiary rehabilitation programs, Rehabilitation of physically, mentally and socially challenged persons including the old persons

UNIT-II:

(i) **Helping the disadvantaged:** Concept of disadvantaged and deprivation, social, physical, cultural and economic consequences of disadvantaged groups, Educating and motivating the disadvantaged

(ii) **Psychology and IT:** Psychological consequences of the developments in IT; Role of psychologists in the present scenario of IT

UNIT-III:

(i) **Psychology in economic development:** Achievement motivation and Economic development; Characteristics of entrepreneurial behavior, Consumer rights and awareness

(ii) **Population psychology:** Psychological consequences of population explosion and high population density; Psychosocial effects of crowding; motivating for small family norms

UNIT-IV

(i) **Psychology of Gender:** Issues of discrimination; Glass ceiling effect, Self-fulfilling prophecy, Management of diversity

(ii) **Defense psychology:** Psychological tests for defense personnel; Promoting positive mental health of defense personnel, Human engineering in defense

PRACTICAL

(i) To assess the sense of gender equality of 8 college students by using Student Gender equality Questionnaire

(ii) To assess the attitude and knowledge of 4 women towards family planning using the Family Planning Knowledge Attitude Survey Questionnaire.

Recommended Books

1. Banerjee, D. (1998). Poverty, class and health culture in India, Vol. I, Delhi Prachi Prakashan
2. Dalton, J.H. (2006). Community Psychology: Linking Individuals and Communities: :Oxford University Press
3. Dube, S.C. (1987) Modernization and Development. ND: Sage
4. Fonseca, M. (1998). Family and Marriage in India. Jaipur: Sachin

5. Mishra, G. (1990). Applied Social Psychology in India. ND: Sage
6. Mishra, G. (1999). Psychological perspectives on stress and Health. New Delhi: Concept
7. Mishra, H.C. , Mishra, G.C. & Varadwaj , K. (2014). Fundamentals of Applied Psychology, Divya Prakashani, Bhubaneswar
8. Mishra, H.C. and Misra, S. (2009). Psychology of Deviants, Divya Prakashani, Bhubaneswar
9. Mohanty, A .K. and Mishra, G. (Eds.) (2000). Psychology of Poverty and Disadvantage. New Delhi: Concept
10. Sen, A. & Sen A.K. (Eds.). (1998). Challenges of contemporary Realities: A psychological Perspective. New Delhi: New Age International
11. Srinivas, M.N. (1966). Social change in modern India. Bombay: Allied
12. Swain, S. Applied Psychology

DSE-4: RESEARCH PROJECT

(Credits:6, Theory-4, Practical-2) Lectures:
60 (Theory:40, Practical:20) Max.
Marks:100(Theory:70, Practical:30)

Introduction:

The research experience of students is greatly enriched by early exposure to conducting research. There are numerous benefits of undergraduate students who get involved in research. They are better off in understanding published works, determine an area of interest, can discover their passion for research and may start their career as a researcher. Further students will be able develop ability for scientific inquiry and critical thinking, ability in the knowledge base and communication of psychology. This course is included to promote above mentioned abilities among the students.

Learning Objectives:

1. To help students to learn how to develop scientific research designs in the study of psychology.
2. To guide students to understand the previous research in their field of interest and review them to arrive at a research problem
3. To encourage the students to learn ways to describe and measure human behavior.
4. To help students understand the logic of hypothesis testing and application of appropriate statistical analysis.
5. To make students to learn the methods of writing a research report.

Expected outcomes: Students will be able to

1. Independently prepare a research design to carry out a research project
2. Review the related research papers to find out a research problem and relevant hypotheses
3. Understand the administration, scoring and interpretation of the appropriate instrument for measurement of desired behavior
4. Learn the use of statistical techniques for interpretation of data.
5. Learn the APA style of reporting a research project.

UNIT-I: A student is required to carry out a project on an issue of interest to him / her under the guidance and supervision of a teacher. In order to do so s/he must have the knowledge in research methodology and of steps in planning and conducting a research. The supervisors may help the students to go on field study / study tour relevant to their work. Thirty hours of class may be arranged in the routine to help students understand research methodology, and planning, conduction and reporting on the research. An external examiner with the supervisor as the internal examiner will evaluate the research project on the basis of scientific methodology in writing the report, and presentation skill and performance in the viva.

Format

1. **Abstract** 150 words including problem, method and results.
2. **Introduction** Theoretical considerations leading to the logic and rationale for the present research
3. **Review-** Explaining current knowledge including substantive findings and theoretical and methodological contributions to the topic, objectives and hypotheses of the present research
4. **Method** Design, Sample, Measures, Procedure
5. **Results-** Quantitative analysis of group data (Raw data should not be attached in Appendix) Graphical representation of data wherever required. Qualitative analysis wherever done should indicate the method of qualitative analysis.

6. Discussion

7. References (APA Style) & Appendices

1. Project should be in Soft binding. It should be typed in Times New Roman 14 letter size with 1.5 spacing on one sides of the paper. Total text should not exceed 50 pages (References & Appendices extra).
2. Two copies of the project should be submitted to the College.

3. Project - American Psychological Association (APA) Publication Manual 2006 to be followed for project writing

**SYLLABUS FOR B.A. (HONORS) SANSKRIT UNDER
CHOICE BASED CREDIT SYSTEM OF UTKAL UNIVERSITY,
BHUBANESWAR**

1st YEAR

SEMESTER-I

CC- 1 MORAL TEACHINGS AND BASICS OF SANSKRIT

1. *Hitopodeśa Mitralabha* (From *Kathāmukha* to *Ḡḍhravidalakatha*) 30Marks
2. *Yaksaprasna of Mahabharata*(*Aranyakaparva, ch.313*
from Verses no. 41 to 133) 30Marks
3. *Śabdarupa&Dhaturupa* 20 Marks

('a' karanta, 'i' karanta, 'ī'karanta, 'u'karanta, 'ū' karanta, 'in' bhaganta, Mātr, Pitṛ, Asmad, Yusmad, Tad(sabdarupas).Lat, Lañ, Vidhiliñ, Lrt, Lot and Litlakarar dPath, Ni, Kṛ, Sev, Han, Pā, Dā, Śru, Śī and Krīñ in the form of Ātmanepada, Parasmaipada or Ubhayapada whichever is applicable. (Dhaturupas)

- Unit-I & II *HitopodeśaMitralabha* (From *Kathamukha* to *Ḡḍhravidalakatha*) 30 Marks
- Long Questions -1 15 Marks
- Short Questions -3 5×3=15 Marks
- Unit-III & IV *Yaksaprasna of Mahabharata* 30 Marks
- Long Questions-1 15 Marks
- Explanation - 1 8 Marks
- Translation of a textualVerse 7 Marks

- Unit-V *Śabdarupa&Dhaturupa* 20 Marks
- Śabdarupa* - 5 2×5= 10 Marks
- Dhaturupa* - 5 2×5= 10 Marks

Books for Reference:

3. *Hitopadesah*(*Mitralabhah*) (Ed.) Kapildev Giri, Chaukhamba Publications, Varanasi.
4. *Hitopadesah* (*Mitralabhah*) (Ed.) N.P. Dash and N.S. Mishra, Kalyani Publishers, New Delhi
5. *Vyakaranadarpana*, The Odisha State Bureau of Text Book Preparation and Production, Bhubaneswar, 2013
6. Critical edition of the *Mahabharata*, (Ed.) V.S. Sukthankar, BORI, Pune
7. *Mahabharata*, Gitapress, Gorakhpur (Prescribed Text)
8. *Yaksaprasna*, T. K. Ramaayiyar, R. S. Vadhyar & Sons. Palkad, Kerala

CC-2 . DRAMA-I & HISTORY OF SANSKRIT LITERATURE - I

1. *Abhijnanasakuntalam* (Act I-IV) 50 Marks
2. *History of Sanskrit Literature-I* 30 Marks

(*Ramayana, Mahabharata*, General out lines of *Puranas* and Sanskrit Drama)

1. **Abhijnanasakuntalam (Act I-IV)**

Unit-I	Long Questions -1	14 Marks
Unit- II	Short Questions -2	7×2=14 Marks
	Explanation of Verse- 1	8 Marks
Unit-III	Textual Grammar	14 Marks
	i) <i>Sandhi</i>	1×2= 2 Marks
	ii) <i>Prakṛti- Pratyaya</i>	2×2= 4 Marks
	iii) <i>Karaka&Vibhakti</i>	2×2= 4 Marks
	iv) <i>Samasa</i>	2×2= 4 Marks

2. **History of Sanskrit Literature-I**

30 Marks

Unit- IV *Ramayana & Mahabharata*

Long Questions -1	10 Marks
Short Questions -1	05 Marks

3. **General Outlines of Puranas and Sanskrit Drama**

Unit- V General Outlines of *Puranas* and Sanskrit Drama

(Defination and Classification of *Puranas*, *Bhasa*, *Kalidasa*, *Sudraka*, *Visakhadatta*, *Bhavabhuti*, *Bhattanarayana*)

Long Questions -1	10 Marks
Short Questions -1	05 Marks

Books for Reference:

1. *Abhijnanasakuntalam* (Ed.) R.M. Bose, Modern Book Agency Pvt. Ltd., 10 BankimChatterjee Street, Calcutta
2. *Abhijnanasakuntalam* (Ed.) M.R. Kale, Motilal Banarsidass Publishers Pvt. Ltd., NewDelhi-11007, 8th Reprint-2010
3. *Abhijnanasakuntalam* (Ed.) R.M Mohapatra, Books & Books, Cuttack
4. *Abhijnanasakuntalam* (Ed.) H.K. Satapathy, Students Store, Cuttack
4. *History of Sanskrit literature*, Baladev Upadhyay, Chaukhamba Publications, Varanasi.
5. *Sanskrit Drama*, A.B.Keith, Oxford University Press, London
6. *Samskrta Sahiytara Itihasa*, (Odia) H.K. Satapathy, Kitab Mahal, Cuttack- 753003.

SEMESTER-II

CC - 3 DRAMA - II & DRAMATURGY

1. *Abhijnanasakuntalam* (Acts V-VII) 50 Marks

2. *Dramaturgy* 30 Marks

(*Nandi*, *Prastavana*, *Purvaranga*, *Pancha-arthaprakṛti*, *Panchasandhi*, *Pancha-arthopaksepaka*, *Nataka*, *Prakarana*.)

1. **Abhijnanasakuntalam (Acts V-VII)**

Unit-I	Long Questions - 1	14 Marks
Unit- II	Short Questions - 2	8×2= 16 Marks
Unit-III	i) Explanation of Verse- 1	8 Marks
	ii) Verse/ Dialogue Translation-1	7 Marks
	iii) Translation from Prakṛit to Sanskrit	5 Marks

2. Dramaturgy (Sahityadarpana, Chapter- VI)	30 Marks
Unit-IV	
Nandi, Prastavana, Purvaranga, Nataka, Prakarana, Pancasandhi	
Short Notes on any three	5× 3= 15 Marks
Unit-V	
Panca - arthaprakrti and Panca- arthopaksepaka	
(Short Notes on any three))	5×3= 15Marks

Books for Reference:

4. *Abhijnanasakuntalam* (Ed.) R.M. Bose, Modern Book Agency Pvt. Ltd., 10 BankimChatterjee Street, Calcutta
5. *Abhijnanasakuntalam* (Ed.) M.R. Kale, Motilal Banarsidass Publishers Pvt. Ltd., NewDelhi-11007, 8th Reprint-2010
6. *Abhijnanasakuntalam* (Ed.) R.M.Mohapatra, Books &Books , Cuttack
4. *Abhijnanasakuntalam* (Ed.) H.K. Satapathy, Students Store, Cuttack
4. For Dramaturgy- *Sahitya Darpana* (Ed.) P.V.Kane, Motilal Banarsidass Publishers Pvt. Ltd., New Delhi
5. *Odia Translation of Sahityadarpana* by Narayana Mohapatra, Odisha Sahitya Academy, Bhubaneswar.
6. *Sahitya Darpana* with Laksmi Tika (Sanskrit) and Vimala Tika, (Hindi) (Ed.) K.M.Sastri, Chaukhamba Publications, Varanasi.
7. *Sahityadarpana* evam Chanda (Ed.) Dr. Braja Sundar Mishra, Satyanarayan Book Store, Cuttack
9. *Sahityadarpanao Chanda* (Ed.) Niranjan Pati, Vidyapuri, Cuttack

CC- 4 AN INTRODUCTION TO THE TECHNIQUE OF PANINIAN GRAMMAR & PROSODY

1. **Vocabulary relevant to Sanskrit Grammar and Arrangement of Paninian Grammar** 15 Marks
2. **Samjna-prakaranam** 45 Marks
3. **Chanda** 20 Marks

1. Vocabulary relevant to Sanskrit Grammar and Arrangement of Paninian Grammar

Unit- I 15 Marks

(Astadyayi, Siddhantakaumudi, Ganapatha, Dhatupatha, Dhatu, Antaranga, Bahiranga, Apavada, Agama, Adesa, Nadi, Nistha, Krdanta, Taddhita, Tinanta, Nijanta, Sananta, Yananta, Namadhatu, Vikarana, Luk, Lopa, Sarvadhataka, Ardhadhataka, ti & Upadha = 26)

Short Notes on any – 5 3×5= 15Marks

2. Samjnaprakaranam 45Marks

Unit- II Two Sutras / Vrttis out of 1st 10 Sutras (Upto *tulyasyaprayatnam savarnam*) to be explained. 7½ ×2=15 Marks

Unit- III Two Sutras / Vrttis out of 2nd 10Sutras (From *a a* upto *cadayo'sattve*) to be explained. 7½ ×2= 15 Marks

Unit- IV Two Sutras / Vrttis out of rest Sutras (From *pradayah* upto *dirgham ca*) to be explained. 7½ ×2= 15 Marks

3. Chanda (Prosody)-Srutabodhah

20Marks

Unit- V Definition and Examples of 4 Chandas - out of 7

5×4=20 marks

(Chandas such as -: Arya, Anustubh, Indravajra, Upendravajra, Upajati, Vamsastha, Vasantatilaka, Mandakranta, Malini, Shikharini, Shardula-vikridita, Sragdhara.)

Books for Reference:

1. Siddhanta-kaumudi with Balamanorama and Tattvabodhini, Vol.I (Ed.) Giridhara Sharma Chaturveda, Motilal Banarsidass
2. Siddhanta-kaumudi with Mitabhasini Com., (Ed.) S.R. Ray, Sanskrit Pustak Bhandar, 38 Cornwallis St., Calcutta
3. Siddhanta-kaumudi with Eng Tr. (Ed.), S.C. Basu, Motilal Banarsidass, New Delhi-110007, Rpt-1995
4. Vaiyakarana Siddhanta Kaumudi (Ed.) M.V. Mahashabde, Dadar Book depot, Bombay.
5. Siddhanta-kaumudi (Ed.) Prof. G.K. Dash & Dr(Mrs) K.Dash with Navanita tika, A.K.Mishra Publishers Pvt. Ltd, Cuttack.
6. Siddhanta-kaumudi (Ed.) Minati Mishra, Vidyapuri, Cuttack
7. Siddhanta-kaumudi (Ed.) Dr. Niranjana Pati, Kalyani Publishers, New Delhi
8. Siddhanta-kaumudi (Ed.) P.R.Ray, Sailabala Womens College, (Skt.Deptt.) Cuttack.
9. Vyakaranadarpana, The Odisha State Bureau of Text Book Preparation and Production, Bhubaneswar- 2013
10. Shrutabodha, Hari Prasad Sharma, Nirnaya Sagar Press
11. Sahityadarpana Evam Chhanda (Ed.) Dr. Brajasundar Mishra, Satyanarayana Book Store, Cuttack.

2nd YEAR

SEMESTER-III

CC-5 POETRY & HISTORY OF SANSKRIT LITERATURE- II

1. Meghadutam- (Purvamegha) 50 Marks
 2. History of Sanskrit Literature-II 30 Marks
- (Gitikavyas, Khandakavyas, Gadyakavyas and Kathasahitya)

1. Meghadutam- (Purvamegha) 50 Marks

- Unit-I Long Questions - 1 15 Marks
- Unit- II Short Questions - 2 7 ½ × 2 = 15 Marks
- Unit-III i) Explanation of One Verse 12 Marks
- ii) Translation of One Verse 8 Marks

2. History of Sanskrit Literature-II 30 Marks

- Unit-IV (Gitikavyas & Khandakavyas)
- Long Questions -1 10 Marks
- Short Questions -1 05 Marks
- Unit- V (Gadyakavyas, Kathasahitya)
- Long Questions -1 10 Marks
- Short Questions -1 05 Marks

Books for Reference:

1. *Meghadutam* (Ed.) S.R. Ray, Sanskrit Pustak Bhandar, 38 Cornwallis St., Calcutta
2. *Meghadutam* (Ed.) M.R. Kale, Motilal Banarsidass, Delhi
3. *Meghadutam* (Ed.) Radhamohan Mahapatra, Books and Books, Vinodvihari, Cuttack, 1984
4. *Meghadutam* (Ed.) Dr. Braja Sundar Mishra, Vidyapuri, Cuttack, 1st Edn-1999
5. *Samskrta Sahitya ka Itihasa*, Baladeva Upadhyaya, Choukhamba, Varanasi.
6. *Samskrta Sahitya ka Ruparekha*, Vacaspati Goreilla, Choukhamba Vidyabhavan, Varanasi.
4. *Samskrta Sahitya Itihasa*, H.K. Satapathy, Kitab Mahal, Cuttack
5. *Samskrta Sahitya Itihasa*, Text Book Bureau, Govt. of Odisha, Bhubaneswar

CC-6 META - RULES OF PANINIAN GRAMMAR, POETICS & FIGURES OF SPEECH

1. *Paribhasaprakaranam of Siddhantakaumudi* 30 Marks
2. *Sahityadarpanah(Ch.I &II)* 30 Marks
3. *Sahityadarpanah (Selected Alamkaras from Ch.X)* 20 Marks

1. **Paribhasaprakaranam** 30 Marks
Unit- I Four *Sutras* to be explained. 5×4= 20 Marks
Unit- II Two *Vrttis/ Vartikas* to be explained. 5×2= 10 Marks

2. Poetics

- Unit- III *Sahityadarpana Ch. I*
Long Questions -1 10 Marks
Short Questions -1 05 Marks
- Unit- IV *Sahityadarpana Ch. II (Vakya, Pada, Abhidha, Laksana, Vyanjana)*
Long Questions -1 10 Marks
Short Questions -1 05 Marks

3. Figures of speech (without Sub-division)

- Unit- V *Sahityadarpana(Ch.X)* 5×4= 20 Marks

(Alamkarassuch

as *Anuprasa, Yamaka, Slesa, Upama, Rupaka, Utpreksa, Bhrantiman, Nidarsana, Arthantaranyasa, Aprastuta-prasamsa, Apahnuti, Vyatireka, Vibhavana, Visesukti, Samasukti, Svabhavokti*)

Definition and Examples of **Four Alamkaras** (figures of speech) out of **seven**.

Books for Reference:

1. *Siddhanta-kaumudi* with Balamanorama and Tattvabodhini, Vol.I (Ed.) Giridhara Sharma Chaturveda, Motilal Banarsidass
2. *Siddhanta-kaumudi* with Mitabhasini Com., (Ed.) S.R. Ray, Sanskrit Pustak Bhandar, 38 Cornwallis St., Calcutta
3. *Siddhanta-kaumudi* with Eng Tr. (Ed.), S.C. Basu, Motilal Banarsidass, New Delhi-110007, Rpt-1995
4. *Vaiyakarana Siddhanta Kaumudi* (Ed.) M.V. Mahashabde, Dadar Book depot, Bombay.
5. *Siddhanta-kaumudi* (Ed.) Prof. G.K. Dash & Dr(Mrs) K.Dash with Navanita tika, A.K. Mishra Publishers Pvt. Ltd, Cuttack.

4. Siddhanta-kaumudi (Ed.) Minati Mishra, Vidyapuri, Cuttack
5. Siddhanta-kaumudi (Ed.) Dr. Niranjan Pati, Kalyani Publishers, New Delhi
6. Siddhanta-kaumudi (Ed.) P.R.Ray, Sailabala Womens College,(Skt.Deptt.) Cuttack.
7. Sahitya Darpana (Ed.) P.V. Kane, Motilal Banarsidass Publishers Pvt. Ltd., New Delhi
8. Odia Translation of Sahityadarpana by Narayana Mohapatra, Odisha Sahitya Academy, Bhubaneswar.
9. Sahitya Darpana with Laksmi Tika (Sanskrit) and Vimala Tika, (Hindi) (Ed.) K.M. Sastri, Chaukhamba Publications, Varanasi.
10. Sahityadarpana evam Chhanda (Ed.) Braja Sundar Mishra, Satyanarayan Book Store, Cuttack
11. Sahityadarpana o Chhanda (Ed.) Niranjan Pati, Vidyapuri, Cuttack
12. Samskrta Kavyatattva Vicara, Ketaki Nayak, Odisha Text Book Bureu, Bhubaneswar.

CC-7 CASES AND CASE ENDINGS IN PANINIAN GRAMMAR & TRANSLATION - I

1. *Siddhantakaumudi(Karaka-Vibhakti I-IV)* 50 Marks
2. Translation from Sanskrit unseen passage to Odia/ English 30 Marks

1. *Siddhantakaumudi(Karaka-Vibhakti I-IV)* 50 Marks

- Unit- I & II (*Prathama&Dvitiya*)
 Four *Sutras/ Vrtti/ Vartika* to be explained. 5×4= 20 Marks
- Unit- III (*Trtiya*)
 Two *Sutras/ Vrtti/ Vartika* to be explained 5×2= 10 Marks
- Unit- IV (*Caturthi*)
 Four *Sutras/ Vrtti/ Vartika* to be explained. 5×4= 20 Marks
- Unit -V *Translation from Sanskrit unseen passage into Odia/ English*
 One unseen Sanskrit Passage is to be given for Translation into Odia/ English
 (At least 10 sentences) 10×3= 30 Marks

Books for Reference:

1. Siddhanta-kaumudi with Balamanorama and Tattvabodhini, Vol.I (Ed.) Giridhara Sharma Chaturveda, Motilal Banarsidass
2. Siddhanta-kaumudi with Mitabhasini Com., (Ed.) S.R. Ray, Sanskrit Pustak Bhandar, 38 Cornwallis St., Calcutta
3. Siddhanta-kaumudi with Eng Tr. (Ed.), S.C. Basu, Motilal Banarsidass, New Delhi- 110007, Rpt-1995
4. Vaiyakarana Siddhanta Kaumudi (Ed.) M.V. Mahashabde, Dadar Book depot, Bombay.
5. Siddhanta-kaumudi (Ed.) Prof. G.K. Dash & Dr(Mrs) K.Dash with Navanita tika, A.K. Mishra Publishers Pvt. Ltd, Cuttack.
6. Siddhanta-kaumudi (Ed.) Minati Mishra, Vidyapuri, Cuttack
7. Siddhanta-kaumudi (Ed.) Dr. Niranjan Pati, Kalyani Publishers, New Delhi
8. Siddhanta-kaumudi (Ed.) P.R.Ray, Sailabala Womens College,(Skt.Deptt.) Cuttack.
9. *Vyakaranadarpana*, The Odisha State Bureau of Text Book Preparation and Production, Bhubaneswar- 2013
A Guide to Sanskrit Composition and Translation, M.R.Kale, Motilal Banarsidass, New Delhi
11. *Brhat Anuvada Candrika*, Chakradhara Hamsa Nautial Shastri, Motilal Banarsidass, New Delhi

CC-8 INSCRIPTIONS , UPANISAD&BHAGAVADGITA

1. Incriptions	30 Marks
2. Kathopanisad(Vallis-I,II&III)	30 Marks
3. Bhagavadgita (Chap.XV)	20 Marks

1. Incriptions	30 Marks
(Girnar inscription of Rudradaman, Allahabad Stone Pillar Inscription of Samudragupta and Mandasore Inscription of Yasodharman)	
Unit- I Long Questions -1	15 Marks
Unit- II Short Questions -3	5×3= 15 Marks

2. Kathopanisad(Adhyaya I, Vallis-I,II&III)	30 Marks
Unit- III Long Questions -1	15 Marks
Unit- IV i) Explanation - 1 Mantra	08 Marks
ii) Translation- 1 Mantra	07 Marks
3. Bhagavadgita(Ch.XV)	20 Marks
Unit- V Long Questions -1	12 Marks
Translation- 1 Verse	08 Marks

Books for Reference:

1. *Selected Sanskrit Incriptions* (Ed.) D.B. Pusalkar, Classical Publishers, New Delhi
2. *Abhilekhamala* (Ed.) Sarojini Bhuyan, Cuttack
3. *Abhilekhamala* (Ed.) Sujata Dash, Cuttack
4. *Abhilekhacayana*(Ed.) Jayanta Tripathy, Vidyapuri, Cuttack
5. *Isadi Nau Upanisad* with Sankarabhasya - Gita Press, Gorakhpur
6. *Kathopanisad* with *Sankarabhasya*(Ed.) V.K. Sharma, Sahitya Bhandar, SubhasBazar, Meerut
7. *The Message of the Upanisad* , Swami Ranganathananda, Bharatiya VidyaBhavan,K.M. Munsii Marg Mumbai.
8. *Shrimad-bhagavad-gita* (Ed.) S. Radhakrishnan, Bharatiya Vidya Bhavan
9. *Shrimad-bhagavad-gita* (Ed.) Gambhirananda, Ramakrishna Mission
10. *Shrimad-bhagavad-gita*, Gita Press, Gorakhpur

CC-9 CASE AND CASE ENDINGS OF PANINIAN GRAMMAR, TRANSLATION- I IAND LEXICON

1. Siddhantakaumudi(Karaka-Vibhakti V-VII)	40 Marks
2. Translation of an unseen Odia/ English passage into Sanskrit	30Marks
3. Amarakosa	10 marks

1. Siddhantakaumudi(Karaka- Vibhakti V-VII)	
Unit-I (CASE-V) Answer any two Sutras/ Vrtti/ Vartika	5×2= 10 Marks
Unit-II (CASE-VI) Answer any four Sutras/ Vrtti/ Vartika	5×4= 20 Marks
Unit-III (CASE-VII) Answer any two Sutras/ Vrtti/ Vartika	5×2= 10 Marks
2. Translation- II	30 Marks
Unit-IV	30 Marks

One unseen Passage of Odia is to be translated into Sanskrit.

(At least Ten sentences)

3. Amarakosa (Devata, Svarga, Visnu, Laksmi, Durga, Surya, Brahma,Siva, Kartikeya, Ganesa, Sarasvati from Svargavarga)

Unit- V Answer any Two Questions s 5×2= 10 Marks

Books for Reference:

1. Siddhanta-kaumudi with Balamanorama and Tattvabodhini, Vol.I (Ed.) Giridhara Sharma Chaturveda, Motilal Banarsidass
2. Siddhanta-kaumudi with Mitabhasini Com., (Ed.) S.R. Ray, Sanskrit Pustak Bhandar, 38 Cornwallis St., Calcutta
3. Siddhanta-kaumudi with Eng Tr. (Ed.), S.C. Basu, Motilal Banarsidass, New Delhi-110007, Rpt-1995
4. Vaiyakarana Siddhanta Kaumudi (Ed.) M.V. Mahashabde, Dadar Book depot, Bombay.
5. Siddhanta-kaumudi (Ed.) Prof. G.K. Dash & Dr(Mrs) K.Dash with Navanita tika, A.K. Mishra Publishers Pvt. Ltd, Cuttack.
6. Siddhanta-kaumudi (Ed.) Minati Mishra, Vidyapuri, Cuttack
7. Siddhanta-kaumudi (Ed.) Dr. Niranjan Pati, Kalyani Publishers, New Delhi
8. Siddhanta-kaumudi (Ed.) P.R.Ray, Sailabala Womens College,(Skt.Deptt.) Cuttack.
9. *Vyakaranadarpana*, The Odisha State Bureau of Text Book Preparation and Production, Bhubaneswar- 2013
10. *A Guide to Sanskrit Composition and Translation*, M.R.Kale, Motilal Banarsidass, New Delhi
11. *Brhat Anuvada Candrika*, Chakradhara Hamsa Nautial Shastri, Motilal Banarsidass, New Delhi
12. *Namalinganuasanam (Amarakosa)*, D.G. Padhye et al. Choukhamba Sanskrit Series, New Delhi
13. *Amarakosa* with Ramasrami tika, Choukhamba Sanskrit Series office, Varanasi

CC-10 ORNATE PROSE & PROSE WRITING

- | | |
|--|-----------------|
| 1. <i>Dasakumaracaritam</i> (<i>Purvapithika, Dvitiya Ucchvasa</i>) | 25 Marks |
| 2. <i>Sukanasopadesa</i> | 25 Marks |
| 2. <i>Essay in Sanskrit</i> | 20 Marks |
| 3. <i>Expansion of Idea in Sanskrit</i> | 10 Marks |
| 1. <i>Dasakumaracaritam</i>(<i>Purvapithika Dvitiya Ucchvasa</i>) | 25 Marks |
| Unit-I Long Questions – 1 | 15 Marks |
| Unit-II Short Questions – 2 | 5×2=10Marks |
| 2. <i>Sukanasopadesa</i> | 25 Marks |
| Unit-III One Long Question | 15 Marks |
| Unit-IV One Explanation | 10Marks |
| 3. <i>Essay in Sanskrit</i> | 20 Marks |
| Unit-V Essay in Sanskrit (One) | 20 Marks |
| 4. <i>Expansion of Idea in Sanskrit</i> | 10 Marks |
| Expansion of Idea in Sanskrit- One | 10 Marks |

Books for Reference:

1. *Dasakumaracarita* (Ed.) M.R. Kale, Motilal Banarsidass, Delhi
2. *Dasakumaracarita*, Chaukhamba Publications, Varanasi.
3. *Samskrta-nibandha-shatakam*, Kapila Dev Dvivedi
4. *Brhat Anuvada Shiksha*. Chakradhara Hansa Nautiyal, MLBD, Delhi
5. *Samskrta-nibandhadarshah*, Ramamurti Sharma, Sahitya Niketan, Kanpur
6. *Sukanasopadesa*, (Ed.) Ramakanta Jha, Choukhamba Vidyabhavan, Varanasi
7. *Sukanasopadesa* (Ed.) Nimal Sundar Mishra, Kalyani Publishers, New Delhi
8. *Kadambari (Purvardham)* with the Com. of Bhanuchandra Siddhanjani, MLBD, New Delhi

3rd YEAR**SEMESTER-V****CC-11 ORNATE POETRY IN SANSKRIT & HISTORY OF SANSKRIT LITERATURE -III**

1. <i>Sisupalabadham</i> (Canto-I Verses 01-48)	30 Marks
2. <i>Kiratarjuniyam</i> (Canto-I)	30 Marks
3. History of Sanskrit literature- III (<i>Mahakavya and Campu</i>).	20 Marks
1. <i>Sisupalabadham</i> (Canto-I Verses 01-48)	30 Marks
Unit-I Long Questions -1	15 Marks
Unit- II i) Explanation of One Verse	10 Marks
ii) Translation of One Verse	05 Marks
2. <i>Kiratarjuniyam</i> (Canto-I)	30 Marks
Unit-III Long Questions -1	15 Marks
Unit- IV i) Explanation of One Verse	10 Marks
ii) Translation of One Verse	05 Marks
3. <i>History of Sanskrit literature- III (Mahakavya and Campu)</i>	20 Marks
Unit- V i) Long Questions -1	12 Marks
ii) Short Notes- 2	4×2= 8 Marks

Books for Reference:

1. *Sisupalabadham* (Ed.) S.R. Ray/ Vallabhatika, Bharatiya Vidya Prakashan, New Delhi.
2. *Sisupalabadham - Canto-I* (Ed.), Devanarayan Mishra, (With *Sarvankasa-tika* of Mallinatha) Sahitya Bhandar, Meerut
3. *Kiratarjuniyam* (Cantos I-III) (Ed.) M.R. Kale, Motilal Banarsidass Publishers Pvt. Ltd., Delhi, 4th Edn-1966, Rpt-1993
4. *Kiratarjuniyam* (Canto- I) (Ed.) Niranjan Pati, Vidyapuri, Cuttack.
4. *History of Sanskrit Literature*, H.R. Agarwal, Mohanlal Munsiram, Delhi
5. *History of Indian Literature* (Vol.III) M. Winternitz, Motilal Banarsidass Publishers Pvt. Ltd.

CC- 12 VEDA,VEDIC GRAMMAR & HISTORY OF VEDIC LITERATURE

1. *Vaidika Suktas* 30 Marks
2. *Vedic Grammar* 20 Marks
3. *History of Vedic Literature* 30 Marks

1. *Veda* 30 Marks

Vedic Suktas from different *Samhitas*

Agni (RV- I.1), Indra (RV- II.12) , Savitr (RV- I.35), Usas (RV- I.48), Purusa-sukta (YV XXXI.1.16), Siva-samkalpa (YV-XXX.1.6), Samjnana(RV X.191), Vak(RV X.125)

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| Unit-I | i) Long Questions -1 | 12 Marks |
| | i) Explanation - 1 Mantra | 08 Marks |
| Unit- II | i) Translation -1 Mantra | 05 Marks |
| | ii) Grammar from the text- 2 Questions | 2 ^{1/2} ×2=05 Marks |

2. *Vedic Grammar* 20 Marks

The following Sutras are to be taught:

Chandasi pare'pi, Vyavahitasca, Caturthyarthe bahulam chandasi, Chandasi lun-lan-litah, Linarthe let,Leto'datau, Sibbahulam leti, Itasca lopah parasmaipadesu, Sa uttamasya, Ata ai, Vaito'nyatra, Hr-grahor bhaschandasi, Chandasi ubhayatha, Tumarthe se-sen-ase-asen- kse-kasen-adhyai-adhyain-kadhyai-kadhyain-shadhyai-shadhyain-tavai-taven-tavenah, Va chandasi, Ses chandasi bahulam, Prakrtya'ntapadam avyapare, Nipatasya ca, Supam suluk purva-savarnac che-ya-da-dya- ya-jalah, Idanto masi, Ajjaserasuk, Dirghadati samanapade

- | | | |
|-----------|--------------------------------|--------------|
| Unit- III | Two sutras to be explained | 5×2=10Marks |
| | Two <i>sadhanas</i> to be done | 5×2=10 Marks |

3. *History of Vedic Literature* 30Marks

(*Samhita, Brahmana, Aranyaka, Upanisad*)

- | | | |
|---------|---------------------|------------------|
| Unit-IV | Long Questions -1 | 15 Marks |
| Unit- V | Short Questions - 2 | 7 ½ ×2= 15 Marks |

Books for Reference:

1. *New Vedic Selection* (Part-I) (Ed.) Telang and Chaubey, Bharatiya Vidya Prakashan, NewDelhi
2. *Veda O Vaidika Prakarana*,(Ed) Niranjan Pati, Vidyapuri, Cuttack.
- 3.*History of Indian Literature* Vol. I, M.Winternitz, MLBD, New Delhi
4. *Vaidika Sahitya aur Samskrti*, Baladeva Upadhyaya, Chaukhamba, Varanasi
- 5.*Vaidik sahyaki Ruparekha*,Umashankar Sharma Rsi,Chawkhamba Vidyaprkashan, Varanasi
6. *Vaidika sahyta o Samskrti* , A.C. Das, Grantha Mandira, Cuttack
7. *Vaidika Sahitya O Samskrti*, Bholanath Rout, Chitrotpala Publication, Salipur

SEMESTER-VI

CC-13 ARTHASASTRA, DHARMASASTRA AND AYURVEDA

1. *Arthasastra* (*Vinayadhikarana* Ch., II - VIII) from *Vidyasamuddesa* to *Amatyotpatti*. 30Marks
2. *Manusmṛti* (Chap- II. Verses from 1 to 52) 30 Marks
- 3.*Ayurveda* (*Carakasamhita, Dirghamjivitiyadhyaya*-Verses 53-103) 20 Marks
1. *Arthasastra* (*Adhikarana* I. II–VIII) 30 Marks

Unit I & Unit- II *Arthasastra* from the beginning up to *Vinayadhikarana, Adhikarana* I.1-4 Short Notes-4 7½ ×4= 30 Marks

2. Manusmṛti (Chap- II. Verses from 1 to 52)	30 Marks
Unit- III & IV Manusmṛti Chap.II, Verses 1-52	
Short Notes-4	7½ ×4=30 Marks
3.Ayurveda(Carakasamhita, Dirghajivitiyadyaya-Verses 53-103)	20 marks
Unit- V Long Questions -1	10 Marks
Short Questions -2	5 ×2= 10 Marks

Books for reference:

1. *Kautilya Arthashastra*, (Ed. &Trans.) R.P. Kangle, 3 Vols., Motilal Banarsidass, New Delhi
2. *TheArthashastra*. (Ed.& Trans),L.N. Rangarajan, Penguin Classics, India, 1992
3. *TheArthashastra*. (Ed.) N.P. Unni, Bharatiya Vidya Prakashan, New Delhi
4. *Arthashastra* (Odia Trans.) Anantarma Kar, Odisha Sahitya Academy, Bhubaneswar
 - *Manu's Code of Law: A Critical Edition and Translation of the Mānava-Dharmaśāstra*.(Ed. Olivelle, Patrick, Oxford: Oxford University Press
 - *Kautilya Arthashastra*, (Ed.) Vachaspati Gairala, Chaukhamba publication,Varansi
7. *Manusmṛti*, (Ed.) Braja Kishor Swain, Sadgrantha Niketan, Srimandira,Puri
8. *The Charaka Samhita*, (Trans.) A.C. Kaviratna and P. Sharma, 5 Vols., Indian Medical Science Series, Sri Sadguru Publications, a division of Indian Books Centre, Delhi 81
9. *Caraka-Samhitā: Agniveśa's Treatise Refined and annotated byCaraka and Redactedby Drdhabala* (text with English translation), Sharma, P. V. , Chaukhambha Orientalia, 1981--1994.
10. *Agniveśa's Caraka Samhitā* (Text with English Translation & Critical Exposition Based on Cakrapāṇi Datta's Āyurveda Dīpikā), R.K. Sharma & Bhagwan Dash, Chowkhamba Sanskrit Series Office, 1976--2002. Another good English translation of the whole text, with paraphrases of the commentary of Cakrapānidatta.

CC – 14 TECHNICAL LITERATURE IN SANSKRIT (JYOYISA & VASTU)

1. Jyotisa (Jyotihsara-ratnavali, Chap I)	40 Marks
(Graha-naksatra-paricaya-prakaranam)	
2. Vastu (Vasturatnakara, Chap-I)	40 Marks
(Bhuparigraha-prakaranam)	
1. Jyotisa	40 Marks
Unit-I,II& III Four Questions	10×4= 40 Marks
2. Vastu	40 Marks
Unit-IV & V Four Questions	10 ×4= 40 Marks

Books for Reference:

1. *Jyotihsara-ratnavali*(Part-I) (Ed.) Pandit Baikoli Mahapatra, Radhakrishna Pustakalaya, Satyanarayan Temple Road, Berhampur,Ganjam,Odisha
2. *Vasturatnakar* (Ed.) Vindhreshwari Prasad Dwivedi, Chowkhamba Krishnadas Academy, Varanasi

DETAILS OF ABILITY ENHANCEMENT COMPULSORY COURSE (AECC)

50 Marks /02 Credits each

SEMESTER-II

AECC-2 M.I.L.(SANSKRIT) (10 Mid+40 End) 02 Credits

M.I.L. (ALTERNATIVE SANSKRIT) 40 Marks 3 Credits

UNIT- I : SANSKRIT PROSE

10 Marks

- Shri-bhojarajasya rajyapraaptih* from the text *Bhojaprabandhah, Samskrta Pravesa*, Utkal University
- Yasya bhavah tasya devah* from the text *Madhurah kathah*, Samskrtabharati, Bangaluru
- Ambarisha-charitam, Samskrta pravesa*, Utkal University

2 Questions to be answered out of 4 asked

5 ×2= 10 Marks

UNIT-II: SANSKRIT POEMS (The following Poems)

10 Marks

1. *Canakyanitih* 3rd Chapter from the text *Chanakya-niti-darpanah*, Swami JagadishaParananda Saraswati, Vijaya Kumar Govindaram Ashananda, 4408, Newsadak, Delhi- 110006, 2014. (Prescribed Text)
2. *Raksa raksa bharamam* by Prof. Srinivasa Rath from the Anthology *Tadeva gaganam saiva dhara*, Rashtriya Sanskruta Samsthan, New Delhi, 1995
3. *Samyogah* by Prof. Radhavallabh Tripathi, from the Anthology *Kavyagodavari*, (Ed.)P.K. Mishra, Rashtriya Sanskrit Sansthan, New Delhi, 2011
4. *Krusakasyakatha (Verses 1-15)* by Prof. Prafulla Kumar Mishra from the anthology *Kavita bhuvanesvari*, P.G. Dept. of Sanskrit, Utkal University, Vanivihar, Bhubaneswar
5. *Jangama-dura-bhasini* by Sri Sundararaja from the anthology *Kavita bhuvanesvari*, P.G. Dept. of Sanskrit, Utkal University, Vanivihar, Bhubaneswar
6. *Dhanurbhanga* by Sri Bhubaneswar Kar, from the anthology *Kavya-vaitarani*, Vidyapuri, Cuttack
7. *Arunapranamah (Verses 10-21 of Kargil Kavyam)* by Dr. Braja Sundar Mishra, Adisaila Publications, Kendrapada, 2008.

2 Questions to be answered out of 4 asked

5×2= 10 Marks

UNIT-III : TRANSLATION

20 Marks

Translation from Odia/ English to Sanskrit

5 sentences to be translated out of 8 asked

4 × 5 =20 Marks

DETAILS OF SKILL ENHANCEMENT COURSES (50 Marks /02 Credits each) (A Students has to choose any two Papers out of these four groups namely P, Q, R & S)
Group- P YOGA (10 Mid +40 End)

(Patanjalayogasutram ch.I sutra 1-25)

Unit-I& II (Sutra 1-15)	03 Questions	8×3= 24 Marks
Unit-III (Sutra 16-25)	02 Questions	8×2= 16 Marks

Books for References

1. *Pātañjalayogadarśanam* (Ed.) Narayana Mishra, Choukhamba Prakashan, NewDelhi
2. *Yogasūtra of Patañjali*, (Ed.) M.R. Yardi, BORI, Poona
3. *Pātañjalayogadarśana* (Odia Tr.) Priyabratya Das, Arya samaj, Bhubaneswar

Group- Q PRIESTLY TRAINING IN SANSKRIT LITERATURE (KARMAKĀṆḌA)
(10 Mid +40 End)

Unit-I <i>Ācamanavidhi, Saṁkalpa, Snāna, Tarpaṇa, Aṅganyāsa</i> and <i>Karanyāsa</i>	4'2= 8 Marks
<u>Two</u> Questions s <i>Sandhyā (Gāyatrī, Prāṇāyāma), Dhyāna, mantras</i> of Gaṇeśa, Viṣṇu, Śiva, Bhāskara, Durgā, Sarasvatī and Lakṣmī	4*2= 8 Marks
<u>Two</u> Questions s	4*2= 8 Marks
Unit-II <i>Ṣoḍaśopacārapūjā</i>	
<u>Two</u> Questions <i>Vivāhapaddhati</i> from <i>Biharilal Karmakāṇḍa</i> –topics such as <i>Vivāha-bheda</i> (Verse 378), <i>Vivāha-lakṣaṇa</i> (416), <i>Svikaraṇavidhi</i> (417), <i>Varunapuja</i> (419)	4*2= 8 Marks
<u>Two</u> Questions	4*2= 8 Marks
Unit-III <i>Vivāhapaddhati</i> from <i>Biharilal Karmakāṇḍa</i> - <i>Mahāvākya</i> (422), <i>Kanyādāṇa</i> (442) <i>Hastagranthi</i> (443), <i>Lajāhoma</i> (461) and <i>Saptapadi</i> (465) <u>Two</u> Questions	

Books for References

1. *Nityakarma-pujā-prakasa*, Sriramabhabanji Mishra and Lalbihariji Mishra, Gitapress, Gorakhpur
2. *Ṣoḍaśa-upacāra*, Gitapress, Gorakhpur
3. *Biharilal Karmakāṇḍa*, Dharmagrantha Store, Cuttack

Group- R VASTU (VASTU RATNAKAR) (10 Mid +40 End)

(*Vastupurusa, Vastuyantra, Subhasubhavrksanirupana, Grhacchadanavyavasta, Prakosthasthananirupana, Jalasayakhodana*)

Unit-I & II(<i>Vastupurusa, Vastuyantra, Subhasubhavrksanirupana, Grhacchadanavyavasta</i>)	03 Questions.	8×3=2 4 Marks
Unit-III (<i>Prakosthasthananirupana, Jalasayakhodana</i>)	02 Questions.	8×2=16 Marks

Books for References

1. *Vasturatnakar* (Ed.) Vindhreshwari Prasad Dwivedi, Chowkhamba KrishnadasAcademy, Varanasi
2. *Brhatsamhita* varahmihira,(Ed.) N. Chidambaram Iyer, Divine Books, New Delhi.

Group- S TRANSLATION AND EDITING SKILL

(10 Mid +40 End)

- Unit-I Anuvada Kala- 10 Marks
Translation of one Odia/ English Paragraph in to Sanskrit
- Unit-II Precises Writing- 10 Marks
One Sanskrit Paragraph is to be precised in 1/3rd words and a suitable title is to be suggested.
- Unit-III Proof Correction and Transliteration 20 Marks
i. Proof Correction-
Two wrongly printed Sanskrit Verses from the Prescribe text are to set for necessary Proof Correction- 5*2= 10 Marks
ii. Two Sanskrit Verses from Prescribe text are to be written in Roman/ Italic script with diacritical marks. 5*2= 10 Marks

Books for References

1. Samskrta Vyakaranadarpana, Odisha Text Book Bureau, Bhubaneswar

DETAILS OF THE DSE COURSES (80 Term-end + 20 Mid-Term)

(A Student has to choose two DSE Papers in 5th Semester and two DSE Papers in 6th Semester including one Project work)

SEMESTER-V (A Student has to opt two DSE papers out of Groups- A, B, C & D)

Group- A

THE SCIENCE OF VĀSTU AND VṚKṢĀ

80+20 = 100

1. Vāstuvidyā in Bṛhatsamhitā (Chap-53) 50 Marks
 2. Vṛkṣāyurveda in Bṛhatsamhitā (Chap- 52) 30 Marks
- Units I, II & III – (Vāstuvidyā in Bṛhatsamhitā) Five Questions 10*5= 50 Marks
2. Vṛkṣāyurveda in Bṛhatsamhitā (Chap- 52) 30 Marks
- Units IV & V - Three Questions 10*3= 30 Marks

Books for References

1. Bṛhatsamhitā of Varāhamihira, (Ed.) N. Chidambaram Iyer, Divine Books, New Delhi
2. Bṛhatsamhitā with Vattapaliya vivrti (Ed.) Sudhakar Dwivedi and (re-edited by) Krushnachandra Dwivedi, Sampurnananda Samskrta Viswavidyalaya, Varanasi
3. Bṛhatsamhitā (Hindi Trans.), Achyutananda Jha, Choukhamba Prakashan, Varanasi
4. Vṛkṣāyurveda in Ancient India (with original text and translation), Lallanji Gopal, Sandeep Prakashan, New Delhi
5. Vṛkṣāyurveda of Bṛhatsamhitā, (Ed.), N.P. Dash, Vidyapuri, Cuttack

Group- B

SOCIO-POLITICAL THOUGHT IN ANCIENT INDIA

80+20 = 100

1. *Yājñavalkyasmṛti* (Vyavahārādhyāya verses 1-65) 40 marks
2. *Manusmṛti* (Chap- VII Verses 1-60) 40 marks
- Units- I & II - *Yājñavalkyasmṛti* Five Short Questions 7'5= 35 marks
- Units III & IV - *Manusmṛti* Five Short Questions 7'5=35 marks
- Unit- V Translation of Two verses from the above Units 5'2= 10 marks

Books for References

1. *Yājñavalkyasmṛti*, (Ed.) M.N. Dutta, Parimal Publications, New Delhi
2. *Yājñavalkyasmṛti* (Vyavahārādhyāya), (Ed.) Kishore Chandra Mahapara, Jageswarilane, Balighat, Puri
3. *Manusmṛti*, (Ed.) Braja Kishore Swain, Sadgrantha Niketana, Puri
4. *Manu's Code of Law: A Critical Edition and Translation of the Mānava Dharmasāstra*, (Ed.) Ollivele, Patrick, Oxford University Press

Group- C

YOGA : THEORY AND PRACTICE

80+20 = 100 MARKS

1. *Pātañjalayogadarśana* (Chap-I upto Iswara) 40marks
2. *Haṭhayogapradīpikā* of Svātmārāma (Chap-II) 40marks

1. *Aṣṭāṅgayoga*

Unit-I One Long Questions 15 marks

Unit-II Two Short Questions 7.5'2= 15 marks

2. *Haṭhayogapradīpikā*

Unit-III One Long Questions 15 marks

Unit-IV Two Short Questions 7.5'2= 15 marks

Unit-V Demonstration of Two *Yogāsanas* 10'2= 20 marks

Books for References

1. *Pātañjalayogadarśanam* (Ed.) Narayana Mishra, Choukhamba Prakashan, New Delhi
2. *Yogasūtra of Patañjali*, (Ed.) M.R. Yardi, BORI, Poona
3. *Pātañjalayogadarśana* (Odia Tr.) Priyabratya Das, Arya samaj, Bhubaneswar.
4. *Hathayogapradipika*, with *jyotsna Vyakhya*, chowkhamba Sanskrit series office, Varanasi.

Group- D

TRENDS OF INDIAN PHILOSOPHY

80+20 = 100 Marks

1. *Āstikas* 45 marks
2. *Nāstikas* 35 marks

1. *Astikas* 45 marks

Unit-I *Sāṃkhya* and *Yoga*

Twenty-five elements of *Sāṃkhya* and *Aṣṭāṅgayoga* of *Yogadarśana*

Two Short Questions s

7.5'2= 15 marks

Unit-II *Nyāya-Vaiśeṣika*
Asatkāryavāda, Saptapadārthas
Two Short Questions s

7.5*2= 15 marks

Unit-III *Vedānta* and *Mīmāṃsā*
Śaktidvaya of *Māyā* in *Vedānta* and *Karma* in *Mīmāṃsā*
Two Short Questions s

7.5*2= 15 marks

2. *Nāstikas*

35 marks

Unit-IV *Nāstikas* : *Cārvāk* and *Jaina*

Yadrcchāvāda and *Nairātmyavāda* of *Cārvāka*, *Sapta-bhaṅga-nyāya* of *Jaina*

Two Short Questions s

7.5*2= 15 marks

Unit-V *Bauddhadarśana Āryasatyas*

and Eight Noble-paths

Four Short Questions s

5*4= 20 marks

Books for References

1. *History of Indian Philosophy*, S.N. Dasgupta, MLBD, New Delhi
2. *Indian Philosophy*, S. Radhakrishnan, George Allen and Unwin Ltd., New York
3. *A Critical Survey of Indian Philosophy*, MLBD, New Delhi
4. *Outlines of Indian Philosophy*, M. Hiriyana, MLBD, New Delhi
5. *Bharatiya Darshana* (Odia), Gouranga Charan nayak, The Odisha State Bureau of Text Book Preparation and Production, Bhubaneswar

SEMESTER-VI (A Student has to opt one DSE paper out of Groups- E, F, G and one project work of 100 marks)

Group- E

ETHICAL LITERATURE IN SANSKRIT

80+20 = 100 Marks

1. *Cāṅkyaṇīti* (Chaps- I, II and III from *Cāṅkyaṇītidarpaṇa*) 30 marks
 2. *Nītiśataka* of *Bhartrhari* (Verses 1-30) 30 marks
 3. *Viduranīti* (Ch.I Verse 20-60) 20 marks
- Units-I & II *Cāṅkyaṇīti* -Four Verses are to be explained - 7^{1/2}*4= 30 marks
- Units -III & IV *Nītiśataka* -Four Verses are to be explained - 7^{1/2}*4= 30 marks
- Unit-V *Viduranīti* Short Questions - 4 5x4= 20 marks

Books for References

1. *Cāṅkyaṇītidarpaṇa* (Ed.) Gunjeswar Choudhury, Choukhamba SurabharatiPrakashan, Varanasi
2. *Nītiśataka* (Ed.) M.R. Kale, MLBD, New Delhi(Text)
3. *Nītiśataka* (Ed.) Naresh Jha, Choukhamba Prakashan, New Delhi
4. *Viduranīti*, Gunjeswar Choudhury, Chawkhamba Surabharati Prakashan, Varanasi
5. *Viduranīti*, Gitapress, Gorakh Pur, *Bhartrhari Satakatrāyam*, B. S. Mishra, Vidyapuri, Cuttack.

Group- F**SCIENTIFIC LITERATURE IN SANSKRIT****80+20 = 100 Marks**

Unit- I	(i) <i>Bhūmidevyāḥkimivayaḥ</i> by A.R. Vasudevamurty (ii) <i>Bhāratasya vaijñāniketiḥāsaḥ</i> by M.M. Joshi <u>One</u> long Questions	15 marks
Unit-II	(iii) <i>Mahābhārata vaijñānikaḥamśaḥ</i> by A.R. Vasudevamurti (iv) <i>Vaidika-saṁskṛteḥ jagadvyāpyatvam</i> by M.R. Rao <u>One</u> long Questions	15 marks
Unit-III	(v) <i>Vṛkṣāyurvedaḥ -I</i> by Aurobindo Ghose (vi) <i>Vṛkṣāyurvedaḥ -I I</i> by V. Nagraj <u>One</u> long Questions	15 marks
Unit-IV	(vii) <i>Pūrvajaiḥparigaṇitam āsīt paramāṇoḥ parimāṇam</i> by A.R. Vasudevamurti (viii) <i>Prācīnaṁ rasāyanaśāstram</i> by K. Venkatesha Murty <u>One</u> long Questions	15 marks
Unit-V	<u>Four</u> short Questions s from the above four units -	5*4= 20 marks

Books for References

1. *Bhāratasya vaijñānika-paramparā*, V. Nagraj & others, Samskratabharati, MataManira Gali, Jhandewalan, New Delhi, 110055
2. *Ancient Indian Science and its Relevance to the Modern World*, (Eds.) K.E.Govindan & Others, Rashtriya Sanskrit Vidyapitha, Tirupati- 517507
3. *Scientific Knowledge in the Vedas*, P.V. Vartak, Dharam Hinduja International Centre of Indic Research, Delhi, Nag Publishers, 11 A/UA, Jawahar Nagar, Delhi-110007
4. *Science in Sanskrit*, Samskratabharati, Mata Manira Gali, Jhandewalan, New Delhi,110055
5. *Saṁskṛta-vijñāna-Dīpikā*, Nirmal Trikha, Eastern Book Linkers, 5825, NewChandrabala, Jawahar Nagar, Delhi- 110007

Group- G**GENERAL LINGISTICS AND PHILOLOGY****80+20 = 100 Marks**

Unit-I	Bhāṣā-lakṣaṇa, Bhāṣā-svarūpa, bhāṣā-prakārabheda, Bhaṣoṭpatti	One long Questions	15 marks
Unit-II	Bhāṣā-vijñānasya mukhyāṅgāni, Gauṇāṅgāni, Dhvanivijñānam, Rūpavijñānam, Vākyavijñānam, Arthavijñānam	One long Questions	15 marks
Unit-III	Dhvaniparivattanasya karaṇāni, Dhanivijñānasya prasiddha-niyamāḥ, Arthaparivarttanasya prakāraḥ, Arthaparivarttanasya karaṇāni	One Long Questions	15 marks

Unit-IV Bhāṣāṇām vargīkaraṇam- Parivārika, Rūpagata, Vividha-bhāṣā-parivārāḥ One long Questions

15 marks

Unit-V Bharopīya-bhāṣāparivārānam sāmānya-paricayaḥ, Āryabhāṣā-parivārasya bhedadvayam- bhāratīya-īrānīyau, Vaidika-laukika-saṁskṛtam, Avesta

Four short Questions

5*4= 20 marks

Books for References

1. Elements of Science of Language, I.J.S. Taraporewalla, Samskrta Pustaka Bhandara, Kolkata
2. An Introduction to Comparative Philology, Chapters-I, II and III, P.D. Gune,
3. Bhāṣāvijñāna o bhāṣāsastra, Kapildev Dwivedi, Vishvavidyalaya Prakashan, Varanasi, Fourth Edn 1994
4. Linguistic Introduction to Sanskrit Chaps I, II & IV, B.K. Ghosh
5. Dhvanivijñāna, G.B. Dhal, The Odisha State Bureau of Text Book Preparation and Production, Bhubaneswar

DETAILS OF THE GENERIC ELECTIVE (G E) COURSES (80 Term - End + 20

Mid-Term) SEMESTER - I GE - I (A student has to opt one paper from group H & I)

Group: H Grammar, History of Sanskrit Literature, Drama & Prose - 100 Marks

(Mid Term 20 Marks + End Term 80 Marks)

Unit I-Śabdarūpa & Dhāturūpa-10 Marks

Śabda :Bālaka, Kavi, Bhānu, Piṭṛ, Latā, Mati, Nadī, Dhenū, Vadhū, Mātr, Phala, Karman, Vāri, Madhū, Marut, Ātman, Guṇin, Vāk, Sarit, Sarva, Tad, Etad, Yad, Idam, Jagat, Asmad and Yuṣmad.

Dhātu :Bhū, Paṭh, pac, Kṛ, As, Ad, Han, Śī Cur, Sev, Śī, Kri, Bhī, Dīś, Vad.

Form of 5 Śabda 5 Marks

Form of 5 Dhātu 5 Marks

Unit II- History of Sanskrit Literature (Rāmāyaṇa&Mahābhārata) - 20 Marks

One Long Questions 12 Marks

Two Short Questions 08 Marks

Unit III- Hitopadeśa Mitralābha 20 Marks

Hitopadeśa Mitralābha : Kathāmukha with the following Stories :

Vṛddhavyāghra pathika kathā, Mṛga kāka śṛgāla kathā, Gṛdhra mārjāra kathā,

Ati lobhi śṛgāla kathā, Hastī dhūrtta śṛgāla Kathā

One Long Questions 12 Marks

One Explanation

08 Marks

Unit IV & V - Abhijñānaśākuntalam (Act 1- 4) - 30 Marks

Unit IV - One Long Questions - 12 Marks

One Explanation - 06 Marks

Unit V - Two Short Questions 12

Marks

Books Recommended :

1. Vyākaraṇadarpaṇa, Published by Odisha State Bureau of Text Book Preparation and production, Pustak Bhavan, Bhubaneswar, 2013.
2. History of Indian Literature (Vol.III), M. Winternitz, MLBD, Delhi.
3. History of Classical Sanskrit Literature, M. Krishnamachariar, MLBD, Delhi.
4. Saṁskṛta Sāhitya kā Itihāsa, Baladev Upadhyaya, Sarada Niketan, Varanasi.
5. Saṁskṛta Sāhitya Itihāsa, Prof. Harekrushna Satapathy, Kitab Mahal, Cuttack.
6. Hitopadeśa of Nārāyaṇa, M.R. Kale, Motilal Banarsidass, Delhi.
7. Hitopadeśa Mitralābha, Kapil Dev Giri, Chowkhamba Publications, Varanasi, 1988.
8. Hitopadeśa Mitralābha, Dr. Braja Sundar Mishra, Vidyapuri, Cuttack.
9. Abhijñānaśākuntalam, M.R. Kale, MLBD, New Delhi.
10. Abhijñānaśākuntalam, R.M. Bose, Modern Book Agency Private Limited, Calcutta - 12, 1976.
11. Abhijñānaśākuntalam, Dr. Ganga Sagar Rai, Chowkhamba Sanskrit Bhawan, Varanasi, 2000.
11. Abhijñānaśākuntalam, Prof. Hare Krushna Satpathy, Kitab Mahal, Cuttack.

Group: I

Mastering Sanskrit Language - 100 Marks

(Mid Term 20 Marks + End Term 80 Marks)

Unit I : History of Sanskrit Literature (Mahākāvya & Gītikāvya)- 20 Marks

Origin and development of Sanskrit *Mahākāvyas* and *Gītikāvyas* with special reference to the following :

Mahākāvya: *Kumārasambhava, Raghuvamśa, Kirātārjunīya, Śīsupālavadhā* and *Naiṣadhīyacarita*.

Gītikāvya : *Meghadūta, Ṛtusamhāra, Nitiśataka, Śṛṅgāraśataka, Vairāgyaśataka, Caṇḍīśataka, Sūryaśataka, Amaruśataka, Mohamudgara* and *Gītagovinda*.

One Long Questions from <i>Mahākāvya</i> -	12 Marks
Two short Questions from <i>Gītikāvya</i> -	08 Marks
Unit II- Śukanāśopadeśa from Kādambarī-	20 Marks
One Long Questions -	12 Marks
One Explanation	08
Marks	
Unit III & IV - Abhijñānaśākuntalam (Act5- 7) - 30 Marks	
Unit III - One Long Questions	12 Marks
One Explanation	06 Marks
Unit IV - Two Short Questions	12 Marks
Unit V - Dramaturgy -	10 Marks
The following Portions to be studied from Sāhityadarpaṇa Chapter VI:	
<i>Nāṭaka , Prakaraṇa , Prastāvanā , Pūrvaraṅga , Nāndī and Pañca sandhi.</i>	
Two Short Notes -	2 X 5= 10 Marks

Books Recommended :

11. History of Indian Literature (Vol.III), M. Winternitz, MLBD, Delhi.
12. History of Classical Sanskrit Literature, M. Krishnamachariar, MLBD, Delhi.
13. Saṁskṛta Sāhitya kā Itihāsa, Baladev Upadhyaya, Sarada Niketan, Varanasi.
14. Saṁskṛta Sāhitya Itihāsa, Prof. Harekrushna Satapathy, Kitab Mahal, Cuttack.
15. Śukanāśopadeśaḥ, Mohandev Panth and Harishcandra Vidyalamkara, Motilal Banarsidass, Delhi, 2010.
16. Kādambarī - Śukanāśopadeśaḥ, Ramakanta Jha and Harihara Jha, Chowkhamba Vidya Bhavan, Varanasi, 2011.
17. Śukanāśopadeśaḥ, Dr. Nirmal Sundar Mishra, Kalyani Publishers, New Delhi.
18. Abhijñānaśākuntalam, M.R. Kale, MLBD, New Delhi.
19. Abhijñānaśākuntalam, R.M. Bose, Modern Book Agency Private Limited, Calcutta - 12, 1976.
20. Abhijñānaśākuntalam, Dr. Ganga Sagar Rai, Chowkhamba Sanskrit Bhawan, Varanasi, 2000.
21. Abhijñānaśākuntalam, Prof. Hare Krushna Satpathy, Kitab Mahal, Cuttack.
22. Sāhityadarpaṇa, Sheshraja Sharma Regmi, Chowkhamba Krishnadasa Academy, Varanasi.
23. Sāhityadarpaṇa, Odisha Sahitya Akademi, Bhubaneswar.

14. Sāhityadarpaṇa evaṁ Chanda, Dr. Braja Sundar Mishra, Satyanarayan BookStore, Binod Behari, Cuttack -2.

SEMESTER – II GE - 2 (A student has to opt one paper from group J & K)

Group: J Functional Sanskrit– 100 Marks

(Mid Term 20 Marks + End Term 80 Marks)

Unit I - Sanskrit conversation - 20 Marks

A Specific incident/ Occurrence will be given in the Questions Paper (in Sanskrit) and the students will be asked to present that in Sanskrit with Conversation style.

Unit II - General idea about Vācya. The divisions of Vācya like Karttṛvācya, Karma Vācya and Bhāvavācya. - 20 Marks

The students will be asked to change the voice (Vācya) of any 10 sentences as directed. 10 x 2 = 20 Marks

Unit III - Saṁjñā Prakaraṇam from Laghu Siddhānta kaumudī- 20 Marks

Four Sūtras. 4 x 5 = 20 Marks

Unit IV & V - Nītiśataka of Bhartṛhari (Verses 1 - 20) - 20

Marks Four Short Questions

4 x 5 = 20 Marks

Books Recommended :

1. Functional Sanskrit: Its Communicative Aspect, Dr. Narendra, Sri Aurovindo Ashram, Pondicherry.
2. Vyākaraṇadarpaṇa, Published by Odisha State Bureau of Text Book Preparation and production, Pustak Bhavan, Bhubaneswar, 2013.
3. Laghu Siddhānta Kaumudī , Sridharananda Sashtri , MLBD , New Delhi.
4. Laghu Siddhānta Kaumudī, Isvara Chandra, Samskrta Granthagara, New Delhi, 2007.
5. Laghu Siddhānta Kaumudī , Sadasiva Shastri, Chowkhamba Sanskrit Office, Varanasi.
6. The Nīti and Vairāgya Śataka of Bhartṛhari, M.R. Kale, MLBD, New Delhi.
7. Śatakatraya , Dr. Braja Sundar Mishra, Vidya puri, Cutack , 2010.

Group: K History of Sanskrit Literature, Poetry, Philosophy and Poetics. - 100 Marks

(Mid Term 20 Marks + End Term 80 Marks)

Unit I & II - History of Sanskrit Literature - 20 Marks

(Gadyakāvya, Fairy Tales & Fables, Campū)

Unit I - One Long Questions - 12 Marks

Unit II - Two Short Notes - 08 Marks

Unit III - Meghadūta :Pūrvamegha(Verses 1 - 39) - 20 Marks

One Long Questions - 12 Marks

Two Short Questions - 08 Marks

Unit IV - Śrīmad Bhagavad Gītā : (Chapter XV)- 20 Marks

One Long Questions - 12 Marks

Two Short Questions - 08 Marks

Unit V - Alamkāra (From Sāhityadarpaṇa Ch -x) - 20 Marks

Anuprāsa, Yamaka, Śleṣa, Upamā, Rūpaka, Utprekṣā, Apahnuti, Samāsokti, Vyājastuti and Arthāntaranyāsa.

Lakṣa-lakṣaṇa-samanvaya of any four. 4x5 = 20 Marks

Books Recommended :

1. History of Indian Literature (Vol.III), M. Winternitz, MLBD, Delhi.
2. History of Classical Sanskrit Literature, M. Krishnamachariar, MLBD, Delhi.
3. Saṁskṛta Sāhitya kā Itihāsa, Baladev Upadhyaya, Sarada Niketan, Varanasi.
4. Saṁskṛta Sāhitya Itihāsa, Prof. Harekrushna Satapathy, Kitab Mahal, Cuttack.
5. Meghadūta of Kālidasa , M.R. Kale, MLBD, New Delhi.
6. Meghasandeśa, N. P. Unni, Bharatiya Vidya Prakashan, New Delhi.
7. Meghadūta, Dr. Braja Sundar Mishra, Vidyapuri, Cuttack.
8. Śrīmad Bhagavad Gītā (With Sāṅkara Bhāṣya), Gita Press, Gorakh Pur.
9. Sāhityadarpaṇa evaṁ Chanda, Dr. Braja Sundar Mishra, Satyanarayan Book Store, Binod Behari, Cuttack.
10. Sāhityadarpaṇa , P. V. Kane , MLBD , New Delhi.

SEMESTER - III GE - 3 (A student has to opt one paper from group L & M)

Group: L Poetry, Grammar and Composition - 10 Marks

(Mid Term 20 Marks + End Term 80 Marks)

Unit I - Kirātārjunīyam : Canto I- 20

Marks

One Long Questions - 12 Marks

One Explanation - 08 Marks

Unit II - Vibhaktiyartha Prakaraṇa from Laghu Siddhāntakaumudī- 15Marks

Three *Sūtras*. 3 X 5 = 15 Marks

Unit III - Essay in Sanskrit - 20 Marks

Unit IV - Translation from Odia/ English to Sanskrit-15 Marks

Unit V - Retranslation from Sanskrit to Odia/ English - 10 Marks

Books Recommended :

1. Kirātārjunīyam (Canto - I- III), M.R.Kale, MLBD, Delhi.
2. Kirātārjunīyam (Canto - I) Kanta Bhatia and Amaldhari Singh, Bharatiya Vidya Prakashan, Delhi.
3. Kirātārjunīyam O Nātyatattava, Dr. Niranjan Pati, Kalyani Publishers, New Delhi.
4. Laghu Siddhānta Kaumudī , Sridharananda Sashtri , MLBD , New Delhi.
5. Laghu Siddhānta Kaumudī, Isvara Chandra, Samskrta Granthagara, New Delhi, 2007.
6. Laghu Siddhānta Kaumudī , Sadasiva Shastri, Chowkhamba Sanskrit Office, Varanasi.
7. Laghusiddhanta Kaumudi, Ghanashyama Dora, A.K.Mishra Agency, Cuttack.
8. Vyākaraṇadarpaṇa, Published by Odisha State Bureau of Text Book Preparation and production, Pustak Bhavan, Bhubaneswar, 2013.
9. Saṃskṛta nibandhaśatakam, Kapildev Dwivedi.

Group: M Darśana, Prosody and Poetics - 100 Marks

(Mid Term 20 Marks + End Term 80 Marks)

Unit I - Pātañjala Yogadarśana- 20 Marks

The following *sūtras* from *Samādhipāda* :

*Atha yogānusāsanam (1), Yogaścittavṛtti-nirodhaḥ (2), Pratyakṣānumānāgamāḥ
pramāṇāni (7), Anubhūtaṅgāyāsāṃpramoṣaḥ smṛtiḥ (11),
Abhyāsavairāgyābhyām tannirodhaḥ (12), dīpānuśravikaviśayavitr̥ṣṇasya
vaśīkārasamjñā vairāgyam (15), tatparam puruṣakhyāter guṇavair̥ṣṇyam (16) and
kleśakarmavipākāśayair aparāmit̥ṣṭaḥ puruṣaviśeṣa īśvaraḥ (24).*

Four Sutras to be explained. 4 X 5 = 20 Marks

Unit II - Prosody - 20 Marks

The following Chandas from *Śrutabodha*.

*Āryā, Śloka, Indravajrā, Upendra vajrā, Upajāti, Varṣastha, Vasanta tilakā,
Mālinī, sikhariṇī and Mandākrāntā.*

4 Chandas to be explained with exmpals. 4 X 5 = 20 Marks

Unit III - General idea about *Kāvya prayojana, Kāvyalakṣaṇa,*

Kāvya hetu and Kāvya bheda from *Sāhityadarpaṇa* - 10 Marks

Two Short Notes - 2 X 5 = 10 Marks

Unit IV - General idea about *Abhidhā,*

Lakṣaṇā and Vyañjanā from *Sāhityadarpaṇa* -10

Marks

Two Short Notes - 2 X 5 = 10

Marks Unit V - Comprehension - 20 Marks

One Sanskrit passage will be given and the students will be asked to answer five Questions in Sanskrit that follow the passage. 5 X 4 = 20

Marks

Books Recommended :

- Pātañjala yogasutratīṭh, Vimala Karnataka, Krishnadas Academy, Varanasi.
- Siddhāntakaumudī, Dr. Minati Mishra, Vidyapuri, Cuttack.
- Siddhāntakaumudī, Dr. Gopal Krishna Dash & Dr. Kadambini Dash, A.K.Mishra Agency, Cuttack.
- Sāhityadarpaṇa, P.V.Kane, MLBD, New Delhi.
- Sāhityadarpaṇa evaṃ Chanda, Dr. Braja Sundar Mishra, Satyanarayan Book Store, Binod Behari, Cuttack.
- Vyākaraṇadarpaṇa, Published by Odisha State Bureau of Text Book Preparation and production, Pustak Bhavan, Bhubaneswar, 2013.

SEMESTER – IV GE - 4 (A student has to opt one paper from group N & O)

Group: N SOCIO-POLITICAL THOUGHT IN ANCIENT INDIA

80+20 = 100

1. *Yājñavalkyasmṛti* (Vyavahārādhyāya verses 1-65) 40 marks
2. *Manusmṛti* (Chap- VII Verses 1-60) 40 marks
- Units- I & II - *Yājñavalkyasmṛti* Five Short Questions 7*5= 35 marks
- Units III & IV - *Manusmṛti* Five Short Questions 7*5= 35 marks
- Unit- V Translation of Two verses from the above Units 5*2= 10 marks

Books for References

- D. *Yājñavalkyasmṛti*, (Ed.) M.N. Dutta, Parimal Publications, New Delhi
- E. *Yājñavalkyasmṛti* (Vyavahārādhyāya), (Ed.) Kishore Chandra Mahapara, Jageswari lane, Balighat, Puri
- F. *Manusmṛti*, (Ed.) Braja Kishore Swain, Sadgrantha Niketana, Puri
- G. *Manu's Code of Law: A Critical Edition and Translation of the Mānava Dharmaśāstra*, (Ed.) Ollivele, Patrick, Oxford University Press

Group: O ETHICAL LITERATURE IN SANSKRIT

1. *Cāṇakyanīti* (Chaps- I, II and III from *Cāṇakyanītidarpaṇa*) 30 marks
 2. *Vairagyaśataka* of Bhartrhari (Verses 1-30) 30 marks
 3. *Viduranīti* (Ch.I Verse 20-60)
- Units-I & II *Cāṇakyanīti*-Four Verses are to be explained - $7^{1/2} \cdot 4 = 30$ marks Units –
- III & IV *Nītiśataka*-Four Verses are to be explained - $7^{1/2} \cdot 4 = 30$ marks Unit-V Short
- Questions - 4 5x4= 20 marks

Books for References

- M. *Cāṇakyanītidarpaṇa* (Ed.) Gunjeswar Choudhury, Choukhamba Surabharati Prakashan, Varanasi
- N. *Vairagyaśataka* (Ed.) M.R. Kale, MLBD, New Delhi (Text)
- O. *Viduranīti*, Gunjeswar Choudhury, Chawkhamba Surabharati Prakashan, Varanasi
- P. *Viduranīti*, Gitapress, Gorakh Pur
- Q. *Bhartrhari Satakātrayam* B.S. Mishra, Vidyapuri, Cuttack.

**SYLLABUS FOR B.A. (HONORS) SOCIOLOGY UNDER CHOICE
BASED CREDIT SYSTEM OF UTKAL UNIVERSITY,
BHUBANESWAR**

CORE PAPERS

(SOC-1) Introduction to Sociology

This introductory paper intends to acquaint the students with Sociology as a social science and the basic concepts used in the discipline. It also focuses on the social processes and the social institutions that man encounters as a member of the society.

Objectives: After studying these two papers, the student can

- Can get to know the convergence and divergence of Sociology with other social science disciplines in terms of the subject matter, nature and scope of the discipline and its approach.
- Develop knowledge about its historicity.
- Can get acquainted with the basic concepts used in the subject.
- Can generate ideas about the social processes and social institutions man encounters as a member of the society.

Learning Outcomes: This paper is expected to clarify and broaden the student's notion about the subject, the basic concepts used and some universal societal processes. This will provide a wholesome picture about what the subject is all about.

Unit-1: Sociology: Definition and Subject matter, Nature and Scope, Emergence of Sociology, Sociology and its relationship with Anthropology, Political Science, Economics, and History

Unit-2: Basic Concepts: Society, Culture, Community, Institutions, Association, Social Structure, Status and Role, Norms and Values, Folkways and Mores, Associative and Dissociative processes – Cooperation, Assimilation, Accommodation, Competition, and conflict

Unit-3 : Individual and Society : Individual and society, Socialization, Stages and Agencies of Socialization, Development of Self – Contributions of George Herbert Mead, C.H. Cooley's Looking Glass Self The Concept of Group : Types of Groups – Primary and Secondary groups, In-Group and Out-group, Reference Group

Unit-4: Social Stratification: Meaning and definition, Dimensions of Stratification, Theories of Stratification – Functionalist, Marxist, Weberian. Social mobility and its determinants.

Unit-5: Social Control: Meaning and types, Formal and Informal social control, Agencies of Social control

Essential readings:

1. Bottommore. T.B. 1972, Sociology: A guide to problems and literature. Bombay :George Allen and Unwin (India)
2. Harlambos, M.1998. Sociology: Themes and perspectives. New Delhi Oxford University Press
3. Inkeles, Alex, 1987. What is Skociology? New Delhi: Prentice-Hall of India
4. Jaaram, No. 1988 . What is Sociology .Madras:Macmillan, India :
5. Johnson, Harry M. 1995. Sociology: A Systematic Introduction. New Delhi , Allied Publishers
- 6.Schaefer, Richard T. and Robert P. Lamm. 1999 Sociology. New Delhi Tata-Mac Graw Hill.

(SOC-2) Indian Society

Every society has its own peculiar structure and there are some institutions universal to every society, but with their unique manifestations in each society. There are some change agents and initiatives that enable the society to change with the passage of time. This paper focuses on the structure of the Indian society and the changing aspects with the processes operating, change agents and initiatives.

Objectives: After studying these two papers on Indian society, the student can

- Get an impression about the basic composition of Indian society, its historical moorings, basic philosophical foundations of the society and the institutions.
- Learn about the changing institutions, the processes, the agents and the interventions that bring about change in the Indian society.

Learning Outcomes: This paper is expected to bring familiarity in a student about Indian society. It will present a comprehensive, integrated and empirically –based profile of Indian society. It is hoped that the structure and processes operative in the society, the change agents operating in Indian society presented in this course will also enable students to gain a better understanding of their own situation and region.

Unit-1 : Composition of Indian Society : Caste, Tribe, Religion, Language. Unity in Diversities, Threats to national integration

Unit-2 Hindu Social Organisation: Bases of Hindu Social Organization, Varna, Ashrama and Purushartha. Doctrine of Karma.

Unit-3 : Marriage and Family in India: Hindu marriage as Sacrament, Forms of Hindu Marriage. The Hindu joint family:Patriarchal and Matriarchal systems. Marriage and family among the Muslims. Changes in the institutions of Marriage and Family.

Unit-4 : The Caste system in India: Origin, Features and Functions. Caste and Class, The Dominant Caste,Changes in Caste system, Caste and Politics in India Constitutional and legal provisions for the Scheduled Castes, Scheduled Tribes.

Unit-5 : Social Change in Modern India : Sanskritization, Westernization, Secularization, and Modernization

Essential readings:

1. Bose, N.K. 1967, Culture and Society in India. Bombay : Asia Publishing House
2. Bose, N.K. 1975, Structure of Hindu Society. New Delhi
3. Dube, S.C. 1990, Society in India.(New Delhi: National Book Trust.)
4. Dube, S.C. 1995, Indian Village (London : Routledge)
5. Dube, S.C. 1958: India's changing Villages (London: Routledge and Kegan Paul).
6. Karve, Irawati, 1961 : Hindu Society : An Interpretation(Poona : Deccan-College) :: Lannoy,
7. Mandelbaum, D.G. 1970 : Society in India (Bombay: Popular Prakashan)
8. Srinivas, M.N. 1980 : India: Social Structure (New Delhi: Hindustan - Publishing Corporation)
9. Srinivas, M.N. 1963: Social Change in Modern India (California, Berkeley: University of California Press).
10. Singh, Yogendra, 1973: Modernization of Indian Tradition (Delhi: Thomson Press).

(SOC-3) Sociological Thought

Sociology originated as an intellectual response to the crisis confronting the mid nineteenth century European society. Its development over two centuries has been influenced by a variety of socio-economic and political conditions. It is now established as a multi-paradigmatic academic discipline, with its body of theoretical knowledge enriched and its methodological techniques and procedures systemized. This paper is intended to familiarize the students with the social, political, economic and intellectual contexts in which sociology emerged as a distinctive discipline. It deals with the contributions of the forerunners of the discipline and with the contributions of the founders who gave a systematic shape to the subject.

Objectives: After going through these two papers, the student can

- Gain an understanding of some of the classical contributions in Sociology, and their contemporary relevance.
- Learn about the methodological shift in the discipline over the years.

Learning Outcomes: This paper is expected to clarify and broaden the student's knowledge about the theoretical and methodological contributions of the classical contributors to the subject and the contemporary relevance of these theories.

Unit-1 : Auguste Comte : Law of the Three Stages, Hierarchy of Sciences, Positivism

Unit-2 : Herbert Spencer : Organismic Analogy, Theory of Social Evolution

Unit-3 : Karl Marx : Dialectical Materialism, Class struggle, Alienation, Sociology of Capitalism

Unit-4 : Emile Durkheim : Division of Labour in Society, Rules of Sociological Method, Theory of Suicide.

Unit-5 : Max Weber : Social Action, Protestant ethic and the spirit of capitalism, Ideal type, Bureaucracy, Authority

Essential readings:

1. Aron, Ramond. 1967(1982 reprint) Main currents in sociological thoughts (2 volumes). Harmondsworth, Middlesex: Penguin Books
2. Barnes, H.E. 1959. Introduction to the history to the sociology The University of Chicago press
3. Coser, Lewis A. 1979. Masters of Sociological Thought. New York : Harcourt Brance Jovanovich
4. Fletcher, Ronald. 1994.The Making of Sociology (2 volumes) Jaipur-Rawat
5. Morrison, Ken.1995 Marx, Durkheim, Weber: Formation of Modern Social Thought. London; sage
6. Ritzer, George. 1996. Sociological Theory New Delhi. Tata-McGraw Hill
7. Singh, Yogendra. 1986 Indian Sociology: social conditioning and emerging Trends. New Delhi: Vistaar
8. Zeitlin, Irving.1998 (Indian Edition). Rethiking Sociology: A critique of Contemporary Theory. Jiapur: Rawat.

(SOC-4) Social Change and Development

Change is the law of nature and every society is subject to change. Social change has always been a central concern of Sociological study. Change takes different forms. Change has its pattern which is spelt out by various theories. Change is often propelled by various factors. This paper is designed to provide some ideas to the student about such process, theories and factors.

Objectives: After going through this paper, the student can

- Derive knowledge about the meaning, nature, forms and patterns of change.
- Get an idea about the theories that explain change and their adequacy in explaining so.
- Get an impression about the factors that propel change in the society.

Learning Outcomes: This paper is expected to provide a wholesome idea to the students about the process of social change. They can relate their experience with the theoretical explanations.

Unit-1 : Social Change : Meaning and nature. Social Progress, Evolutuion and Development.

Unit-2 : Theories of Social Change : Evolutionary theory, Cyclical theory, Conflict Theory, Functionalist theory.

Unit-3 : Factors of Social Change: Cultural, Economic, Technological, Ideological, Demographic

Unit-4 : Economic Growth and Social Development : Indicators of Social Development, Human Development Index, Gender Development Index

Unit-5 : Models of Development : Capitalist, Socialist, and Gandhian.

Essential readings:

1. Moore, W.E. 1965 Social Change, Prentice-Hall of India. New Delhi
2. Gandhi M.K., Hind Swaraj
3. Schumacher, E.F., Small is Beautiful
4. Narain, Shreeman, Principles of Gandhian Planning
5. Mishra, B., Capitalism, Socialism and Planning.
6. UNDP, Human Development Report

(SOC-5) Research Methodology

Since the days of August Comte, a debate and a deliberate attempt has been initiated to provide a scientific character to social sciences. In this attempt empirical research has been introduced as an integral part of observing social reality and generalising it objectively without any subjective predisposition. Gradually, research methods have been developed and introduced in social sciences to bring it in par with scientific observations. The essence of this paper lies in introducing the students with these methods of research to ensure objectivity as far as practicable in social research.

Objectives: By going through this paper, the student can

- Get an understanding of the nature of scientific methods, nature of social Phenomena and the way of attaining value neutrality.
- Have a grip over the basic steps involved in social research and the types of social research with their applicability
- Develop an insight into the need and types of research design and the use of sampling method for attaining objectivity and scientific study.

Learning Outcomes: This paper is designed and incorporated to acquaint the students with the scientific ways of studying social phenomena. This provides them with a research insight that will enable them to capture the most relevant data in an objective manner. The market demand of this paper will be very high as the students well versed with this paper will be highly demanded in academics, fundamental research, and policy research undertaken both by Government and Non- Government agencies.

Unit-1 : Meaning and Significance of Social Research, Nature of scientific Method, Applicability of scientific method to the study of social phenomena, Major steps in social research.

Unit-2 : Research Design, Types of Research Design: Exploratory, Diagnostic, Descriptive, and Experimental research Design.

Unit-3 : Hypothesis: Meaning, Characteristics, Types and sources of Hypothesis, Role of Hypothesis in Social Research

Sampling: Meaning, and characteristics, Types: Probability and Non-Probability

Sampling. Role of Sampling in Social Research

Unit-4 : Qualitative social Research : Observation, Case Study, Content Analysis

Unit-5 : Quantitative methods in Social Research: Survey research, Questionnaires,

Recommended Readings:

1. Bajaj and Gupta 1972 Elements of Statistics. New Delhi: R.Chand and Co., New Delhi
2. Beteille, A. and T.N. Madan 1975 Encounter and experience: Personal Accounts of Fieldwork. Vikas Publishing House, New Delhi
3. Bryman, Alan 1988 Quality and Quantity in Social Research Unwin Hyman, London
4. Jayram, N. 1989. Sociology: Methods and Theory. Madras: MacMillan, Madras
5. Kothari, C.R. Research Methodology : Methods and Techniques, Bangalore, Wiley Eastern.
6. Punch, Keith. 1996. Introduction to Social Research, Sage, London
7. Shipman, Martin, 1988 The Limitations of Social Research Sage, London
8. Young, P.V. 1988 Scientific Social Survey and Research Prentice Hall, New Delhi

(SOC-6) Gender and Society

The biological basis to the differences between the sexes does not explain the inequalities faced by the sex groups in the society. In the society variations are marked in the roles, responsibilities, rights of and relations between sex groups depending on the social prescriptions relating to sex affiliations. The differences, inequalities and the division of labour between men and women are often simply treated as consequences of 'natural' differences between male and female humans. But, in reality the social norms, institutions, societal expectations play a significant role in deciding and dictating the behaviour of each sex group. This is the fundamental of the study of Gender and Society.

Objectives: After studying this paper, the student can

- Conceptualize what is "Gender" and what is "Sex" and draw a line of distinction between the two.
- Note the difference in gender roles, responsibilities, rights and relations.
- Trace out the evolution and institutionalization of the institution of "Patriarchy".
- Get to know the theories of Feminism that brought women issues and demands to the forefront.
- Assess the initiatives undertaken for gender development with the paradigm shift from time to time.

Learning Outcomes: This paper is expected to generate ideas and sensitivity about gender in a student which he/she can put into practice in daily life. This will lead to change the prevalent biases and gender practices and create a gender neutral social world where both men and women can enjoy their basic rights and cherish to achieve their dreams.

Unit-1 : Social Construction of Gender : Sex and Gender, Gender stereotyping and socialization, Gender Role and Identity. Gender stratification and Inequality, Gender discrimination and Patriarchy.

Unit-2 : Feminism: Meaning, origin and growth of Feminist Theories. Theories of Feminism : Liberal, Radical, Socialist, and Eco-Feminism.

Unit-3 : Gender and Development: History and Approaches, WID,WAD and GAD. Women Empowerment: Meaning and Dimensions. World Conference of Women, Mexico, Copenhagen, Nairobi and Beijing. Gender- Related Development Index (GDI) and Gender Empowerment Index (GEM).

Unit-4: Status of Women in India : Ancient and Medieval period, women in pre-independence India, Social Reform movements, The Nationalist movement, Women in Independent India.

Unit-5 : Major Challenges and Issues Affecting Women in India: Women and Education, Women and Health, Women and Work. Policy provisions for women.

Recommended Readings:

1. Bhasin, Kamla, 2003 Understanding Gender, Kali for Women
2. Bhasin, Kamala , 1986 Khanv, Said Nighat Some Questions on Feminism and Its Relevance in Sourth Asia, Kali for Women, New Delhi
3. Chaudhuri, Maitrayee 2004 Feminism in India: Issues in Contemporary Indian Feminism Kali for Women, New Delhi
4. Kabeer, Naila 1994 Reversed Realities: Gender Hierarchies in Development Thought: Gender Hierarchies in Development
5. Srivastava Gouri, 2005 Women Education in India Issues and Dimensions, Academic Excellence Publishers & Distributors
6. Agarwal, S.P 2001 Women's Education in India, Concept Publishing Company
7. **Satia, J, Misra, M, Arora, R, Neogi, S**, ed. Innovations in Maternal Health - Case studies from India. New Delhi, India: SAGE Publications Pvt. Ltd.
8. Dube, Leela 1990 Structures and Strategies –Women, Work and Family, SAGE Publications, New Delhi
9. Kalia, Anil 1998 “Women Workers: Invisible and Unprotected”, Social Welfare, Vol.45, No.1, April
10. Cahwala, Monioca 2006 Gender Justice: Women and Law in India, Deep and Deep Publications

(SOC-7) Rural Sociology

Rural Sociology is a specialized branch of Sociology describing the society of villages and rural areas. As the rural areas or the villages mark the beginning of human civilization, this paper is designed to bring out the distinct features of the rural society with their typologies and typicalities. In the present paper an attempt is made to introduce the student with the development of this branch overtime with its focus on the typicality of Indian villages, their structures, changing features and social problems faced by the rural people.

Objectives: After studying this paper, the student can

- Get an impression about the emergence of the sub discipline Rural Sociology and the forces contributing for its origin.

- Learn about the nature of this branch of knowledge, its subject matter and significance.
- Collect information and knowledge about the mooring of the sub discipline in the Indian context.
- Generate an idea about the typicalities of the rural society and the institutions operating therein and their dynamics.
- Derive ideas about rural social problems of the country.

LearningOutcomes: India thrives in her villages. By going through this paper, the student can have a grip on the grass roots of Indian society. This will enable the student to understand the society in a better manner, to note the heterogeneities in culture, institutions and their functions, changes, the contrasts found between the rural urban societies and the problems faced by the people.

Unit-1 : Origin and Scope of Rural Sociology., Nature and Importance of Rural Sociology.

Unit-2 : Rural social Structure: Village Community, Agrarian Economy, Caste System, Mobility and Migration. Rural-Urban Contrast and Continuum

Unit-3: Rural Social problems: Poverty, Unemployment, , Food Security, Landlessness, Indebtedness, Health care and Sanitation

Unit-4 : History and Evolution: Community Development Programme, Land Reforms, Green Revolution. Cooperative Movement, Panchayati Raj Institutions- Constitutional provisions and Structure. Role of Panchayats in Rural Development

Unit-5 Rural Development Programmes: MGNREGA, SGSY, Indira Awas Yojana, Livelihood Mission, Health Mission

Recommended Books:

1. Doshi S.L. & P.C. Jain 2002 Rural Sociology, Jaipur, Rawat
2. Desai A.R. Rural Sociology in India 1997 Bombay Popular Prakasan
3. Dhanagare D.N. 1988 Peasant movements in India, New Delhi, Oxford
4. Gupta D.N. 2001 Rural development System New Delhi Books India International
5. Dube, S.C. 1988 India's changing Village: Human Factor in Community Development Himalayan Publishing House, Bombay
6. Maheshwari, S.R. 1985 Rural Development In India, Sage Publication, New Delhi
7. Vivek, R. & Bhattacharya 1985 The New Strategies of Development in Village India, Metropolitan
8. Jain, Gopal Lal 1985 Rural development Mangaldeep Publication, Jaipur
9. Joshi R P., and S. Narawam 1985 Panchayat Raj in India : Emerging Trends across the States Rawat, Jaipur
10. Singh, Katar 1995 Rural development: Principle policies and Management Sage, New Delhi

(SOC-8) Globalization and Society

Globalisation is the dominant process of social change in the contemporary world. It has resulted in the sinking of time and space and collapse of borders. It is a new coinage for an old process. It has its own dimensions, distinct features and impacts on society. It has given birth to new role players. All these are the focal points of discussion of this paper.

Objectives: Bygoing through this paper, the student can

- Collect information about the meaning and nature of this process, its historical mooring.
- Amass knowledge about its dimensions and impacts, both positive and negative.
- Get introduced to the agencies that manage the process.

Expected Outcomes: This paper is expected to acquaint the student with an ongoing social process bringing tremendous changes in the nations.

Unit-1 : Meaning and characteristics of Globalization. Historical context, Liberalization, Privatization and Globalization.

Unit-2: Dimensions of Contemporary Globalization: Economic, Technological, Political and Cultural.

Unit-3: Consequences of Globalization: Rising Inequality, Environmental impact, Consumerism, Health and Security. Emergence of Anti-Globalization movements.

Unit-4 Globalisation and Indian Society: Understanding the concepts of liberalization, privatization and globalization in the Indian context; Growth of information technology and communication and its impact manifested in everyday life

Unit-5 Impact of globalisation on Religion, Culture, Education, Family, Marriage, Women, Tribes

Essential Readings:

1. Appadurai, Arjun 1996, Modernity at Large, University of Minnesota Press
2. Applebaum, R. and Robinson, W., 2005, Critical Global Studies, Routledge, New York.
3. Bremen, Yan, 1993, Footlose Labour, Cambridge University Press, Cambridge
4. Browning, Halcli, Webster(ed), 1996, Understanding contemporary society: Theories of the present, SAGE Publications, London
5. Cohen Robin and Shirin M.(ed), Global Social Movements, The Athlone Press, London
6. Dubhashi P.R., 2002, Peoples Movement against Global Capitalism : EPW Feb.9

7. Giddens, Anthony, 2000, Runaway World : How globalization is reshaping our lives, Routledge, New York.
8. Jha, Avinash, 2000, Background to Globalization, Centre for Education and Documentation, Mumbai
9. Chander Sekhran Bal krishnana - Impact of Globalization on developing countries and India.
10. C, Rangarajan, 2002 Globalization and its impact

(SOC-9) Marriage, Family and Kinship

This course provides a brief account of the classical approaches to the study of family and kinship. It exposes the students to the distinct aspects of these three interrelated institutions in the Indian context. Finally, it discusses some contemporary issues that pose a challenge to the normative model of these institutions.

Objectives:Bygoing through this paper, the student can

- Understand the three institutions that are the foundations of the society.
- Comprehend the theoretical perspectives on these institutions.
- Get to know the rules governing these institutions.
- Estimate the changes coming over these institutions with the process of social change.

Expected Outcomes:This paper is expected to instill knowledge about the foundational institutions, their governing principles and the continuity and change features of these institutions.

Unit-1: Theoretical Perspectives:Overview of theoretical developments Descent theory ,Alliance theory ,Recent theorizations and their implications

Unit-2: Marriage: Marriage as social Institutions, Functions of Marriage. Rules of Marriage: Endogamy, Exogamy; Monogamy and Polygamy; Levirate and Sororate; Hypogamy and Hypergamy. Dowry and Bride Price.

Unit-3: The Family: Types of Family on the basis of Rules of Authority, Descent and Residence. Functions of Family. Contemporary changes and problems: Divorce and Family Disintegration.

Unit-4:Contemporary Issues: Changing demographic patterns Migration, Diasporas and Impact on Family Implications of new reproductive technologies Domestic violence Challenges to the normative model of family

Unit-5 : The Kinship and Clan System: Meaning and Definition of Kinship and Clan. Types. Clan, Family, Lineage and Totemism and Taboos.

Essential Readings:

- 1.Fox Robin 1967 Kinship and Marriage: An Anthropological Perspective, Pelican.
- 2.Parkin, Robert 1997 Kinship: An Introduction to Basic Concepts, Blackwell, Oxford.
- 3.Parkin, Robert and Linda Stone(ed.) (2004) Kinship and Family : An

Anthropological Reader, Blackwell Publishing, USA.

4. Patel, Tulsi (ed.) (2005) The Family in India : Structure and Practice, Sage Publications, New Delhi.

5. Uberoi, Patricia(ed.) (1993) Family, Kinship and Marriage in India, Oxford University Press, Delhi

(SOC-10) Social Disorganization and Deviance

No society is fully organized in character. Disorganization is apt to occur from time to time. Disorganization is a manifestation of the deviant behavior found among some individuals. This deviance occurs when the individuals feel that the normative order of the society and its institutions are not need fulfilling in character. This present paper makes an attempt to provide an impression about the scenario of disorganization, its forms, causes and consequences with the theories explaining the situation.

Objectives: After going through this paper, the student can

- Understand the meaning, causes, consequences and forms of social disorganization.
- Learn about the theories explaining the disorganization situations.
- Comprehend the concept of crime and the existing theories of punishment.

Learning Outcomes: This paper is designed with an expectation to impress upon a student the concept of deviant behavior leading to social disorganization, forms, theoretical foundations and criminal activities which he encounters in real life situations.

Unit-1 : Social Disorganization: Meaning and Nature. Family Disorganization and Personality Disorganization Causes and Consequences.

Unit- 2: Theories of Deviant Behaviour : Contributions of Durkheim and Merton. Ecological theory, Delinquent Sub-Culture theory, Differential Association theory, Differential Opportunity theory.

Unit- 3 : Crime and Punishment : Concepts of Crime and Delinquency. Causes and consequences. Theories of Punishment: Retributive, Deterrant,Reformative.

Unit-4: Social Problems: Poverty, Unemployment, Alcholism, Indebtedness,Terrorism

Unit-5 Atrocities against women, Domestic violence, Dowry, Divorce

Essential Readings:

1. Mamoria, C.B.,1981 Social Problems and Social Disorganization in India
2. Carrabine;Eamonn,Iganski,Paul,Lee ,Maggy,Plummer Ken,South,Nigel(2004)[Criminology: A Sociological Introduction](#)
3. [Sutherland](#), Edwin Hardin Sutherland(1949) White Collar Crime, Dryden Press
4. Ahuja, Ram(2012) Social problems in India,Rawat
5. Chakraborty, Dipangshu(1999) Atrocities on Indian Women, APH

(SOC-11) Political Sociology

Polity constitutes a vital part of every society. It helps in the system of governance. But the social variables to a great extent determine the course of polity. They decide and detect the system of governance, distribution of power, political institutions like parties and pressure groups, nature of political participation, political socialization. In the same vein, the political institutions, political processes, political culture influence the society and the course of its progress. The present paper highlights the close nexus between society and polity and how dynamism in one brings dynamism in the other.

Objectives: After going through this paper, the student can

- Comprehend the existing forms of states and their relative merits and demerits.
- Differentiate between power, authority and influence which guide and govern the political processes.
- Get to know about the political processes, participation types and determinants and the political institutions.

Learning Outcomes: The very aim of this paper is to generate an insight in the student about the political institutions, political processes, political culture he/she encounters in his/her daily life as a member of the society.

Unit-1 State: Characteristics, Aristotle's classification of types of state: Theological, Monarchical, Aristocratic, Democratic and Totalitarian forms.

Unit-2 Influence, Power and Authority: Meaning and types of influence, characteristics of Power, distribution of power: the Constant sum and the Variable sum approach to power, theories of political elites, authority: Weberian classification of authority, different ways of acquiring legitimacy.

Unit-3 Political culture and political socialization: Meaning and dimensions of political culture, meaning and types of political socialization agencies of political socialization and their role.

Unit-4 Political participation: meaning and types of political participation, political apathy – reasons for political apathy, Determinants of political participation – psychological, social and political.

Unit-5 Political parties and pressure groups: Political parties – features and functions, structures of political parties; meaning of pressure groups and their relationship with political parties, types of pressure groups and their role.

Reference:

1. A.K. Mukhopadhyay 1980 Political Sociology, K.P. Begchi & Company. Calcutta, 1980
2. Ali Ashaf and Sharma B.N. 2001 Political Sociology, University Press, Hyderabad
3. Bhattacharya, D.C. Political Sociology
4. Baral, J.K. Political Sociology
5. T. Bottomore, Political Sociology, Blackie & Sons, Bombay, 1975
6. Lipset S.M. Modern Political Analysis, Printice Hall, New Delhi 1983
7. Dhal, Robert A, Who Governs

(SOC-12)Environment and Society

Environment and society are in constant interaction with each other. It is the environment which sustains life in society and it is the society that is responsible for the preservation and the degradation of the environment. In the recent years environmental challenges have posed a threat to the lives on the planet. Keeping this in view, the present paper tries to create awareness among the students about the major environmental issues and the efforts geared to tackle them.

Objectives: After going through this paper, the student can

- Derive knowledge about the close interaction between society and environment.
- Gain substantial idea about the environmental issues and their repercussions on humanity.
- Accumulate ideas about the ideological currents, issues that drive environment movements.
- Get aware about the global and national efforts to conserve environment.

Learning Outcomes:The very aim of this paper is to disseminate knowledge about the significance of environment for society, to change the practices that can protect and preserve the environment and to make the students participate in the mission to preserve, protect and promote the cause of environment.

UNIT – I Environment and its Concepts: Ecology, Eco-system, Environment and Society – their inter-relations; Eco-Feminism

UNIT – 2 Environmental Issues: Sustainable Development, Industrialization and Development, Urbanization and Development, Environmental Degradation

UNIT – 3 Environmental Movements: Chipko Movement, Narmada Bachao Andolan, Ganga Bachao Abhiyan; The Silent valley movement, Forest Rights.

UNIT – 4 Contemporary Environmental Problems: Problems of Water, Deforestation, Urban Wastes, Slums, Global-Warming and Climate Change.

Unit-5 Environment protection efforts at the global level and the national level in India.

Essential Readings:

1. Albrow, Martin & Elizabeth King (Ed.)1990, Globalisation, Knowledge and Society, Sage: London
2. Baviskar. Amita 1995, In the Valley of the River: Tribal Conflict over Development in the Narmada Valley, Delhi: OUP.
3. Bhatt, Anil 1989 Development and Social Justice: Micro Action by Weaker Section, Sage: New Delhi.
4. Chauhan, I.S 1998, Environmental Degradation, Delhi: Rawat Publications.
5. Desh Bandhu and Garg, R.K.(eds) 1986 Social Forestry and Tribal Development, Dehradun: Natraj Publishers.
6. Dubey, S.M. and Murdia, Ratno(ed)1980 Land Alienation and Restoration in Tribal Communities in India, Bombay: Himalaya Publishing House.
7. Gadgil, Madhav & Ram Chandra. Guha 1996 Ecology and Equity: The use and Abuse of Nature in contemporary India:: New Delhi: OUP.
8. Ghai, Dharam (ed) 1994 Development and Environment: Sustaining People

and Nature. UNRISD: Blackwell Publication.

9. Giddens, Anthony 1996 "Global Problems and Ecological Crisis", 2nd edition New York:W.W.Norton and Co.
10. Guha, Ramechandra 1995 The Unquiet Woods: Ecological Change and Peasant Resistance in the Himalaya, OUP: Delhi.
11. Mehta S.R. (ed) 1997 Poverty, Population and Sustainable Development, New Delhi: Rawat Publications.
12. Plumwood, Val 1992 Gender and Ecology: Feminism and Making of Nature, London: Routledge.

(SOC-13)Urban Sociology

Urbanisation is an important social process that changed the face of human civilization. It was initiated with the process of modernization, transport revolution, coming up of river valley civilizations, establishment of trade links and industrial revolution. Urbanisation has brought both prosperity and problems. It is one of the earnest tasks of Sociology to trace out the evolution of the process, social; problems associated with it and policy planning and measures undertaken to overcome these challenges. This paper Urban Sociology concentrates upon these tasks.

Objectives: After going through this paper, the student can

- Understand the specific traits of urban areas, its historical patterns of growth.
- Develop knowledge about urban social institutions and problems
- Gain insight into urban development plans, programmes and efforts.

Learning Outcomes:The very aim of this paper is to acquaint the students with the process of urbanization, to give an impression about the pattern of evolution of cities, urban institutions, their contrasts with rural institutions, urban problems and the responses developed to arrest them.

Unit-1 Meaning, Nature, Scope and importance of Urban Sociology, Rural Urban Differences: Specific traits of rural world vs. urban world- Socio-cultural differences ,urbanization,Urbanism as a way of life.

Unit-2 Theories of patterns of city growth: Concentric zone theory- Sector model- Multiple nuclei theory.

Unit-3 Social institutions of Indian urban communities: Family, marriage and kinships in urban India – Caste in urban India – Urban politics and urban economy

Unit-4 Urban social problems: Crime and Juvenile delinquency, Slums, Beggary , Prostitution

Unit-5 Urban development in Indian plans, Urban development programmes, Slum development programmes, Urban Basic Services

Essential readings:

1. Lin, Jan and Mele Christopher (edt.)2012The Urban Sociology Reader,

- Routledge
2. Flanagan, W.,1993 *Contemporary Urban Sociology* Cambridge: University of Cambridge
 3. Patel Sujata and Deb, Kushal(edt.) *Urban Studies*
 4. Rao,M.S.A.1992*Urban Sociology in India*
 5. Ramachandran,R 1997 Oxford University Press
 6. Jayapalan, N 2002 *Urban Sociology*,Atlantic Publishers
 7. Wilson, Robert,A Schultz,David, A1978 *Urban Sociology*, prentice Hall

(SOC-14)

Practical: Field Work and Dissertation

(Dissertation: 80 marks and Viva-voce: 20 marks)

- Dissertation may be written on any social institution, problem or may be an evaluative study.
- It should be based on empirical study.
- Size of the dissertation should be around 5000 words.
- Dissertation paper will be examined jointly by one Internal and one External Examiner to be appointed by the University. Marks will be awarded jointly by the Internal and External Examiners on the basis of the written Dissertation and Viva-voce.

(SOC-DSE-1)

Sociology of Movements

Movements reflect the voices raised against the prevailing practices of a society. Every society witnesses social movement in some form or the other. Movements bring social change and transformation. It is a collective effort that is driven by particular issues and brings forth changes. The present paper tries to provide a rudimentary impression to the students about the concept, nature and types of movements with a thrust on the movements witnessed by Indian society.

Objectives:

- To introduce to the students with the concept of social movements and their dynamics.
- To introduce the students to the role of social movements in social transformation .
- To help them understand the various approaches to the study of social movements.

Learning Outcomes:The very aim of this paper is to disseminate knowledge about the concept of social movements and its process and change making role in the society.

Unit:1Social Movements:Nature, Definitions, Characteristics of social movement ,types: Revolutionary, Reform, Revival, Counter movements
Basis of social movements: Leadership, ideology, resource

**Unit-2 Religious movements in India: The SNDP Movements in Kerala
The Brahmo Samaj and The Arya Samaj**

**Unit-3 Peasants Movements in India: The Champaran Satyagraha
(1917), The Kheda Peasant Struggle, The Bardoli Movement in Gujarat.
The Peasant Revolt in Telangana ,The Tebhaga Movement in Bengal.**

**Unit-4 Backward Class Movements in India: Mahar Movement in
Maharashtra, Dalit Movement in Tamil Nadu, The Non Brahmin
Movement in Tamil Nadu**

**Unit-5 Women's Movements in India: In the Pre independence era and
the post independence period**

Essential readings:

1. Foweraker Joe, 1995 Theorising Social Movements, Pluto Press, London,
2. Buechler, S. 1997 'New Social Movement Theories' in Buechler, S. and Cylke, F.K., Jr. (eds.) Social Movements: Perspectives and Issues. Mountain View: Mayfield Publishing Company
3. Rao, M.S.A. ed. 1979 Social Movements in India Vol. I and II, Manohar, New Delhi
4. Dhanagare, D.N. 1983 Peasant Movements in India 1920-1950, OUP, Delhi, 1983
5. Kaur, Manmohan, 1968 "Role of Women in the Freedom Movement 1857-1947", Sterling, New Delhi
6. Basu, Aparna, 1976 "Role of Women in the Freedom Movement", in B.R. Nanda, ed, Indian Women From Purdah to Modernity, Vikas, Delhi.
7. Chattopadhyaya, Kamaladevi, 1983 "Indian Women's Battle for Freedom", Abhinav Publications, New Delhi

(SOC-DSE-2)

Industrial Sociology

Industrialisation as a social process has changed the face of humanity over the years. Industrialisation in its wake has brought several social problems and changes in social institutions, practices. The aim of this paper is to analyse the structure and process of industrial organisations from the sociological perspective. It also deals with the social effects of industrialization on Indian Social Systems and institutions.

Objectives: After going through this paper, the student can

- Understand the nature and scope of industrial sociology as a branch of Sociology.
- The developmental stages of industry.
- The organizational structure of industries and employee and employer relations in the industry.

Learning Outcomes:The very aim of this paper is to impress upon the students of sociology the role they can play in creating effective industrial relations with their knowledge of sociology.

Unit-I Introduction:

Meaning and definition of Industrial sociology. Nature and scope of Industrial Sociology. Significance of Industrial Sociology in India.

Unit-2 Social – industrial Thought:

A. Classical Theories: Adam Smith, Karl Marx, Max Weber, Durkheim and Mayo

B. Sociological Theories: Likert, Herzberg, Maslow, McClelland.

Unit-3 The Development of Industry:

The Manorial system, the Guild system, Domestic system, the Factory system. Industrial evolution in India.

Unit-4 Industrial Organisation:

Formal Organisation: Its nature and features, problems build-in in the formal organization Informal Organisation: Origin and function of informal organization. Informal Organisation of Management.

Unit-5 Industrial and Labour Relations:

Industrial Relations, International Labour Organisation, Labour Legislation, Industrial Relations in India. Industrial Disputes/conflicts.

Workers' participation in Management (WPM): Industrial Democracy: Levels of participation of WPM: Objectives, WPM Models in India.

Reference:

1. Gisbert, Pascal, 1972 Fundamentals of Industrial Sociology, New Delhi, Tata McGraw Hill
2. Davis, Keith, 1984 Human Behaviour at work, New Delhi, McGraw Hill
3. Ramaswamy, E.A. 1978 Industrial Relations in India, Delhi, MacMillan
4. Schneider, Eugene 1971 Industrial Sociology, McGraw Hill- London

(SOC-DSE-3)

Population Studies

Demography is both an index and instrument of development and change. India as a country is plagued by population explosion which retards, the economy and blocks social progress. Irrespective of several positive attempts undertaken by the government, India has failed to control its population problem. This paper is designed to provide an idea to the students about population dynamics and its impact on society.

Objectives: After going through this paper, the student can

- Understand the various facets of population studies and the theories that depict population change.
- Develop specific idea on Indian population structure, policies adopted and programmes launched in the country to check population.
- Assess the role of various agencies in population control.

Learning Outcomes:The very aim of this paper is to acquaint the students with a perennial problem of the Indian society that is population growth and the measures introduced to control it.

Fertility, Mortality and Migration

UNIT – 2 Population Theories: Malthusian, Demographic Transition and Optimum

Population Theory

UNIT – 3 Population Compositions in India: Age Structure, Sex-Ratio, Rural-Urban Composition, Literacy in India

UNIT – 4 Population Planning and Policies: Needs and Objectives; Population Policy of India, National Rural Health Mission

Unit-5 Population Control: Role of technology, women's empowerment, voluntary organisations

Essential Readings:

1. Agarwal, S.N. 1989 Population Studies with Special Reference to India, New Delhi: Lok Surjeet Publication.
2. Bose, Ashish 1991 Demographic Diversity in India, Delhi: B.R.Publishing Corporation.
3. Banarjee, D. 1985 Health and Family Planning Services in India, New Delhi: Lok Parkshan.
4. Chandrasekhar, S. (ed.) 1974 Infant Mortality, Population Growth and Family Planning in India, London: George Alen and Unwin Ltd.
5. Dubey, Surendra Nath 2001 Population of India, Delhi: Authors Press.
6. Kohli, S. 1977 Family Planning in India, New Delhi.
7. Malthus, T.R. 1986 An Essay on the Principle of Population, London: William Pickering.
8. Premi, M.K. 2004 Social Demography, Delhi: Jawahar Publishers and Distributors.
9. Sharma, Rajendra 1997 Demography and Population Problems, New Delhi: Atlantic Publishers.
10. Srivastava, O.S. 1998 Demography and Population Studies, New Delhi: Vikas Publishing House.
11. National Rural Health Mission 2006 Govt. of India, New Delhi.

(SOC-DSE-4)

Sociology of Social Institutions

Social institutions play a significant role in the functioning of a society by regulating the activities of the individuals and fulfilling their needs. Though they are universal to every society, they are not uniform in their characteristics and in terms of the norms they prescribe. They vary from society to society and across cultures. The present paper is designed to introduce to the students the basic social institutions which are fundamental to the lives of the people and significant to the functioning of the society.

Objectives: After going through this paper, the student can

- Understand the basic institutions which are vital to the functioning of the society.
- Learn the variations in the structure and functioning of these institutions across time and societies.
- Get an idea about the emerging features of these institutions.

Learning Outcomes: The very aim of this paper is to impress upon the students the vital role played by the institutions in social life, their typologies and changing features and functions.

Unit-1 Community, Groups, Institutions and Organizations.

Unit-2 Family, Marriage and Kinship: Key concepts; Different forms of family and marriage; Changes in family pattern worldwide; Importance of Kinship.

Unit-3 Religion : Defining religion; Varieties of religion; Theories of religion.

Unit-4 Education : The development of literacy and schooling; Gender and the education system; Education and ethnicity; Theories of schooling; Education and cultural reproduction; Education and inequality

Unit-5 Economy : Importance of work; Organisation of work; Work and technology; Formal Economy and Informal Economy; Market and Society.

Polity: Modern State; Concepts of Power and Authority; Forms of social distribution of power : Marxist, Elitist, Pluralist

Essential readings:

1. Ken Browne : An Introduction to Sociology ,Polity, 3rd ed.
2. Anthony Giddens : Sociology (4th ed) : Human Societies
3. Bilton and others : Introductory Sociology ,Macmillan
4. G. Rocher : A General Introduction to Sociology
5. P. Worsely : New Introducing Sociology
6. Smelser, Neil.J Sociology
7. S.K.Pramanik & R.Ganguly(eds) : Globalization in India ,PHI Learning

(SOC-GE-1)

Introduction to Sociology

This introductory paper intends to acquaint the students with Sociology as a social science and the basic concepts used in the discipline. It also focuses on the social processes and the social institutions that man encounters as a member of the society.

Objectives: After studying these two papers, the student can

- Can get to know the convergence and divergence of Sociology with other social science disciplines in terms of the subject matter, nature and scope of the discipline and its approach.
- Develop knowledge about its historicity.
- Can get acquainted with the basic concepts used in the subject.
- Can generate ideas about the social processes and social institutions man encounters as a member of the society.

Learning Outcomes:This paper is expected to clarify and broaden the student's notion about the subject, the basic concepts used and some universal societal processes. This will provide a wholesome picture about what the subject is all about.

Unit-1: Sociology: Definition and Subject matter, Nature and Scope, Emergence of Sociology, Sociology and its relationship with Anthropology, Political Science, Economics, and History

Unit-2: Basic Concepts: Society, Culture, Community, Institutions, Association, Social Structure, Status and Role, Norms and Values, Folkways and Mores, Associative and Dissociative processes – Cooperation, Assimilation, Accommodation, Competition, and conflict

Unit-3 : Individual and Society : Individual and society, Socialization, Stages and Agencies of Socialization, Development of Self – Contributions of George Herbert Mead, C.H. Cooley's Looking Glass Self The Concept of Group : Types of Groups – Primary and Secondary groups, In-Group and Out-group, Reference Group

Unit-4: Social Stratification: Meaning and definition, Dimensions of Stratification, Theories of Stratification – Functionalist, Marxist, Weberian. Social mobility and its determinants.

Unit-5: Social Control: Meaning and types, Formal and Informal social control, Agencies of Social control

Essential readings:

1. Bottomore. T.B. 1972, Sociology: A guide to problems and literature. Bombay :George Allen and Unwin (India)
2. Harlambos, M.1998. Sociology: Themes and perspectives. New Delhi Oxford University Press
3. Inkeles, Alex, 1987. What is Sociology? New Delhi: Prentice-Hall of India
4. Jaikumar, No. 1988 . What is Sociology .Madras:Macmillan, India :
5. Johnson, Harry M. 1995. Sociology: A Systematic Introduction. New Delhi , Allied Publishers
6. Schaefer, Richard T. and Robert P. Lamm. 1999 Sociology. New Delhi Tata-Mac Graw Hill.

(SOC-GE-2) **Indian Society**

Every society has its own peculiar structure and there are some institutions universal to every society, but with their unique manifestations in each society. There are some change agents and initiatives that enable the society to change with the passage of time. This paper focuses on the structure of the Indian society and the changing aspects with the processes operating, change agents and initiatives.

Objectives: After studying these two papers on Indian society, the student can

- Get an impression about the basic composition of Indian society, its historical moorings, basic philosophical foundations of the society and the institutions.
- Learn about the changing institutions, the processes, the agents and the interventions that bring about change in the Indian society.

Learning Outcomes: This paper is expected to bring familiarity in a student about Indian society. It will present a comprehensive, integrated and empirically –based profile of Indian society. It is hoped that the structure and processes operative in the society, the change agents operating in Indian society presented in this course will also enable students to gain a better understanding of their own situation and region.

Unit-1 : Composition of Indian Society : Caste, Tribe, Religion, Language. Unity in Diversities, Threats to national integration

Unit-2 Hindu Social Organisation: Bases of Hindu Social Organization, Varna, Ashrama and Purushartha. Doctrine of Karma.

Unit-3 : Marriage and Family in India: Hindu marriage as Sacrament, Forms of Hindu Marriage. The Hindu joint family: Patriarchal and Matriarchal systems. Marriage and family among the Muslims. Changes in the institutions of Marriage and Family.

Unit-4 : The Caste system in India: Origin, Features and Functions. Caste and Class, The Dominant Caste, Changes in Caste system, Caste and Politics in India Constitutional and legal provisions for the Scheduled Castes, Scheduled Tribes.

**Unit-5 : Social Change in Modern India :
Sanskritization, Westernization, Secularization,
and Modernization**

Essential readings:

11. Bose, N.K. 1967, Culture and Society in India. Bombay :

Asia Publishing House

12. Bose, N.K. 1975, Structure of Hindu Society. New Delhi
13. Dube, S.C. 1990, Society in India.(New Delhi: National Book Trust.)
14. Dube, S.C. 1995, Indian Village (London : Routledge)
15. Dube, S.C. 1958: India's changing Villages (London: Routledge and Kegan Paul).
16. Karve, Irawati, 1961 : Hindu Society : An Interpretation(Poona : Deccan- College) :: Lannoy,
17. Mandelbaum, D.G. 1970 : Society in India (Bombay: Popular Prakashan)
18. Srinivas, M.N. 1980 : India: Social Structure (New Delhi: Hindustan - Publishing Corporation)
19. Srinivas, M.N. 1963: Social Change in Modern India (California, Berkeley: University of California Press).
20. Singh, Yogendra, 1973: Modernization of Indian Tradition (Delhi: Thomson Press).

(SOC-GE-3)

Sociological Thought

Sociology originated as an intellectual response to the crisis confronting the mid nineteenth century European society. Its development over two centuries has been influenced by a variety of socio-economic and political conditions. It is now established as a multi-paradigmatic academic discipline, with its body of theoretical knowledge enriched and its methodological techniques and procedures systemized. This paper is intended to familiarize the students with the social, political, economic and intellectual contexts in which sociology emerged as a distinctive discipline. It deals with the contributions of the forerunners of the discipline and with the contributions of the founders who gave a systematic shape to the subject.

Objectives: After going through these two papers, the student can

- Gain an understanding of some of the classical contributions in Sociology, and their contemporary relevance.
- Learn about the methodological shift in the discipline over the years.

Learning Outcomes:This paper is expected to clarify and broaden the student's knowledge about the theoretical and methodological contributions of the classical contributors to the subject and the contemporary relevance of these theories.

Unit-1 : Auguste Comte : Law of the Three Stages, Hierarchy of

Sciences, Positivism Unit-2 : Herbert Spencer : Organismic

Analogy, Theory of Social Evolution

Unit-3 : Karl Marx : Dialectical Materialism, Class struggle, Alienation, Sociology of Capitalism

Unit-4 : Emile Durkheim : Division of Labour in Society, Rules of Sociological Method, Theory of Suicide.

Unit-5 : Max Weber : Social Action, Protestant ethic and the spirit of capitalism, Ideal type, Bureaucracy, Authority

Essential readings:

1. Aron, Ramond. 1967(1982 reprint) Main currents in sociological thoughts (2 volumes). Harmondsworth, Middlesex: Penguin Books
2. Barnes, H.E. 1959. Introduction to the history to the sociology The University of Chicago press
3. Coser, Lewis A. 1979. Masters of Sociological Thought. New York : Harcourt Brance Jovanovich
4. Fletcher, Ronald. 1994.The Making of Sociology (2 volumes) Jaipur-Rawat
5. Morrison, Ken.1995 Marx, Durkheim, Weber: Formation of Modern Social Thought. London; sage
6. Ritzer, George. 1996. Sociological Theory New Delhi. Tata-McGraw Hill
7. Singh, Yogendra. 1986 Indian Sociology: social conditioning and emerging Trends. New Delhi: Vistaar
8. Zeitlin, Irving.1998 (Indian Edition). Rethinking Sociology: A critique of Contemporary Theory. Jaipur: Rawat.

(SOC-GE-4)

Social Change and Development

Change is the law of nature and every society is subject to change. Social change has always been a central concern of Sociological study. Change takes different forms. Change has its pattern which is spelt out by various theories. Change is often propelled by various factors. This paper is designed to provide some ideas to the student about such process, theories and factors.

Objectives: After going through this paper, the student can

- Derive knowledge about the meaning, nature, forms and patterns of

change.

- Get an idea about the theories that explain change and their adequacy in explaining so.
- Get an impression about the factors that propel change in the society.

Learning Outcomes: This paper is expected to provide a wholesome idea to the students about the process of social change. They can relate their experience with the theoretical explanations.

Unit-1 : Social Change : Meaning and nature. Social Progress, Evolution and Development.

Unit-2 : Theories of Social Change : Evolutionary theory, Cyclical theory, Conflict Theory, Functionalist theory.

Unit-3 : Factors of Social Change: Cultural, Economic, Technological, Ideological, Demographic

Unit-4 : Economic Growth and Social Development : Indicators of Social Development, Human Development Index, Gender Development Index

Unit-5 : Models of Development : Capitalist, Socialist, and Gandhian.

Essential readings:

1. Moore, W.E. 1965 Social Change, Prentice-Hall of India. New Delhi
2. Gandhi M.K., Hind Swaraj
3. Schumacher, E.F., Small is Beautiful
4. Narain, Shreeman, Principles of Gandhian Planning
5. Mishra, B., Capitalism, Socialism and Planning.
6. UNDP, Human Development Report

 Skill Development
 Employability
 Entrepreneurship
 All the three
 Skill Development and Employability
 Skill Development and Entrepreneurship
 Employability and Entrepreneurship

UTKAL UNIVERSITY

REGULATIONS & SYLLABUS UNDER GRADUATE PROGRAMME IN BACHELOR OF SCIENCE

(HONOURS & PASS)- CBCS PATTERN Effective from Admission Batch: 2016 - 2017

(Applicable to Autonomous Colleges)

REGULATIONS

1. Eligibility

- 1.1 Higher Secondary/+2/ Senior Secondary or any other equivalent examination passed from any Board/Council established by the Govt. of India or any State Govt. or any other equivalent examination recognized by Central Board of Secondary Education/Council of Higher Secondary Education, Govt. of Odisha/Dept of Higher Education/Dept. of Industry or any other Dept of Govt. of Odisha or Utkal University. Those joining B.Sc. Programme must have passed the above examination under the faculty of Science/Technology/Engineering/Pharmacy etc. There shall be no such restriction for joining BA/ B.Com stream.
- 1.2 Students ordinarily may be selected for admission through Entrance Test, Group Discussion and Personal Interview and/or a combination of these with due weighage to career to bedecided by the Autonomous College or Director, Higher Education. DDCE would admit students on first come first serve basis. The Govt. of Odisha may lay down admission process forcolleges under its control.
- 1.3 Admission Policy would be decided by the Academic Council of the respective Autonomous Colleges and for affiliated colleges Government will decide the admission policy.
- 1.4. Directorate of Distance & Continuing Education would decide its own admission policy.

2. Duration

- 2.1 At least three years of six semesters in toto. In case of professional courses the duration may be more as per the direction of regulatory bodies established under Law.
- 2.2 Odd semester is from June to December (i.e., Sem.-I, Sem.-III & Sem.-V semester). The examination shall be held normally in the month of November - December.
- 2.3 Even semester is from January to June (i.e., Sem.-II, Sem.-IV & Sem.-VI semester). The examination shall be held normally in the month of May - June. However the FinalSemester shall be conducted in April and result shall be published by end of May.
- 2.4 A student would be required to complete the course within six academic years from the date of admission.
- 2.5 A student may opt for fast track of completing all the six semesters in two years provided she/he has at least 2(two) years industry/organizational experience after +2. Such permission would be granted at the discretion of the Principal of the Autonomous Colleges and DDCE. This clause shall not be applicable to affiliated, non autonomous colleges.

3. Compulsory Registration in Semester-I

- 3.1 Registration for Semester-I is compulsory. A candidate admitted to +3 Courses but not registered for 1st semester examination, his/her admission will be automaticallycancelled.
- 3.2 A candidate may take a blank Semester: A blank Semester has to be clubbed with next Odd or Even Semester as the case may be i.e. Sem.-II, Sem.-IV and Sem.-VI/Sem.-I, Sem.-III and Sem.-V. The Hostel policy for blank semester is to be decided by colleges as per their suitability. Hostel accommodation cannot be claimed as a right for a blank semester. (Blank semester is not to be confused as repetition due to failure).
- 3.3 75% attendance for non DDCE students is a requirement for being eligible to appear at

Examination Up to 15% waiver may be granted by the College Principal at discretion on Health Ground or participation in sports, cultural activities, NCC and NSS activities etc.

3.4 A student may clear backlog papers within 6 years. Improvement if any has to be completed within 4 years.

3.5 A student may register for extra credit i.e. register for additional papers under the same faculty or outside the faculty under an autonomous college or DDCE provided they are in a position to facilitate such teaching.

4. Weightage Distribution (Percentage) for Evaluation

• Theory Subjects

Mid Term Test-I	Mid Term Test-II	End Term Test	Total
10	10	80	100

• Subjects with Practical

Unit Test-I	Unit Test-II	End Term Test	Total
		A-Theory B-Practical	
10	10	A-50 B-30(20+10-Record)	100

• Dissertation/Project Work

Identification of problem	Review of Literature	Methodology	Findings	Analysis	Viva-Voce	Total
10	10	10	25	25	20	100

Note: For the DDCE unit tests, quizzes, presentation, seminar etc. may not be introduced immediately.

5. Grading System

5.1

<u>Grade</u>		<u>Marks secured out of 100</u>	<u>Grade points</u>
Outstanding	^J O ^J	90 – 100	10
Excellent	^J A ⁺ ^J	80 – 89	9
Very Good	^J A ^J	70 – 79	8
Good	^J B ⁺ ^J	60 – 69	7
Above average	<i>B</i>	50 – 59	6
Fair	^J C ^J	40 – 49	5
Pass	^J D ^J	30 – 39	4
Failed	^J F ^J	Below 30	0

NOTE:

- A Candidate has to secure 30% or above to pass in each of the Papers.

- The candidate obtaining Grade-*F* is considered failed and will be required to clear the back paper(s) in the subsequent examinations within the stipulated time.
- The candidate securing Grade-*B* and above in Core/Honours papers in aggregate will be awarded Honours.
- The candidate securing Grade-*B +* and above in aggregate in first appearance will be awarded Honours with Distinction/Distinction(for pass/regular course).
- Any candidate filling the forms for appearing in back papers/improvement shall not be awarded Distinction.

5.2 A transitory letter Grade-I (carrying points 2) shall be introduced for cases where the results are incomplete. This grade shall automatically be converted into appropriate grade(s) as and when the results are complete.

5.3 A student's level of competence shall be categorized by a **GRADE POINT AVERAGE**

to be specified as:

SGPA: Semester Grade Point Average CGPA: Cumulative Grade Point Average

(a) **POINT:** Integer equivalent of each letter grade.

(b) **CREDIT:** Integer signifying the relative emphasis of individual course item(s) in a semester as indicated by the Course structure and syllabus.

CREDIT POINT: $(b) \times (a)$ for each course item.

CREDIT INDEX: \sum CREDIT POINT of course items.

$$\text{GRADE POINT AVERAGE: } \frac{\text{CREDIT INDEX}}{\sum \text{CREDIT}} \quad \frac{\text{CREDIT INDEX for a semester}}{\sum \text{CREDIT}}$$

SEMESTER GRADE POINT AVERAGE(SGPA)=

CUMULATIVE GRADE POINT AVERAGE(CGPA)

$$= \frac{\text{CREDIT INDEX of all previous Semester up to the 6th semester}}{\sum \text{CREDIT}}.$$

5.4 In addition to the points marks/ percentage would also be awarded and shall also be reflected in the Mark Sheet.

5.5 The details of grading system shall be printed on the backside of University Mark-sheet.

6. Repeat Examination

6.1 A student has to clear back papers (i.e., in the paper/papers one has failed) by appearing at subsequent semester examinations within six years from the date of admission.

6.2 A student may appear improvement (repeat) in any number of papers in the immediate subsequent examination. The higher marks shall be retained.

6.3 Improvement has to be completed with 4-yrs. from the date of admission.

7. Hard case Rule

7.1 2% of grace mark on the aggregate mark subject to maximum of 5(five) marks in single paper shall be given. This shall be applicable in each semester.

7.2 0.5(point five percent) grace mark can be given for award of B Grade in each semester provided grace mark under 7.1 has not been awarded.

8. Examination Question Pattern(Suggestive)

8.1 The end semester examination will be of three hours irrespective of marks.

8.2 **For subject without having practical** full marks are 100 per paper out of which 20 marks is allotted for Mid-Semester Examination (Internal) and 80 marks for end semester examination. The question papers shall be divided into two parts such as Group-A & Group-B. Group-A will carry 10 short questions of two marks each. The answer should be within two sentences.

There shall be 5 long type questions in Group B with one alternative each have to be attempted and all questions shall be of equal value (12 marks ×5).

For subject with practical full marks are 100 per paper out of which 20 marks is allotted for Mid-Semester Examination, 50 is for End Semester Examination and 30 is for practical.

The question papers shall be divided into two parts such as Group-A & Group-B.

Group-A will carry 10 short questions of one mark each. The answer should be within two sentences.

There shall be 5 long-type questions with one alternative each have to be attempted for subjects having practical. The questions shall be of equal value (8 Marks ×5).

Practical will carry 30 marks out of which 10 will be for records.

8.3 Model answers for long questions should be between 700 – 1000 words.

9. Each Department shall have a designated Teacher in-charge of Examination to be decided by the Principal in addition to the Controller of Examinations of the College (applicable to autonomous colleges).
10. The Internal Evaluation would be the sole responsibility of Teacher offering the course.
11. Suitable modifications may be made by the Autonomous Colleges keeping in view the UGC guideline for Autonomous Colleges, University guidelines from time to time and State Govt. guidelines from time to time.

12. Broad Principles of Credit Transfer

There should be a small group to consider all cases of credit transfer. The group should consist of the following:

Chairman: Chairman P.G Council (for University affiliated colleges)/Director, DDCE for DDCE/Principals of the Autonomous College/Controller of Examinations, Utkal University.

Convener: Dy. Controller of Examinations for University affiliated colleges/Faculty member of DDCE for DDCE/Controller of Examinations of respective Autonomous colleges for Autonomous colleges.

Members: Four teachers to be nominated by the Chairman, P.G. Council/Director, DDCE/Principal of Autonomous Colleges as the case may be.

Waiver for courses covered under other colleges notwithstanding differences in detailed course can be granted. Papers which one has not studied even though they are prescribed for earlier semesters can be covered by the students.

Other Broad Principles: Student transferred after Semester-I examination cannot be given position or medal under autonomous colleges. Students who have failed/remained absent/appeared for improvement shall not be eligible for University Gold medal or Rank. Students who have been granted credit waiver under credit transfer system cannot be awarded Gold medal or position.

DETAILS OF COURSES UNDER BACHELOR OF SCIENCE(HONOURS)

Course	Theory+Practical	Theory + Tutorial
I. Core Course (6 Credits) (14 Papers)	$14 \times 4 = 56$	$14 \times 5 = 70$
Core Course Practical / Tutorial* (14 Papers)	$14 \times 2 = 28$	$14 \times 1 = 14$
II. Elective Course (6 Credits) (8 Papers)		
A.1. Discipline Specific Elective (4 Papers)	$4 \times 4 = 16$	$4 \times 5 = 20$
A.2. Discipline Specific Elective (4 Papers) Practical/ Tutorial*	$4 \times 2 = 8$	$4 \times 1 = 4$
Disciplinary (4 Papers) Tutorials*(4		
B.1. Generic Elective/Interdis- Papers)	$4 \times 4 = 16$	$4 \times 5 = 20$
B.2. Generic Elective, Practical/	$4 \times 2 = 8$	$4 \times 1 = 4$
• Optional Dissertation or Project Work in place of one Discipline Specific elective paper (6 credits) in Semester-VI.		
III. Ability Enhancement Courses		
1. Ability Enhancement Compulsory Courses(AECC) (2 Papers of 4 credit each)	$2 \times 4 = 8$	$2 \times 4 = 8$
Environmental Science/English/ Hindi/MIL Communication		
2. Skill Enhancement Courses(SEC) (Min.2)(2 Papers of 4 credit each)	$2 \times 4 = 8$	$2 \times 4 = 8$
Total Credit	148	148

- Institute should evolve a system/policy about ECA/General Interest/Hobby/Sports NCC/NSS/related courses on its own.
- Wherever there is a practical there will be no tutorial and vice-versa.
- For Generic Elective, there shall be two subjects other than the Core subject having two papers each.

SCHEME FOR CHOICE BASED CREDIT SYSTEM BACHELOR OF SCIENCE(HONOURS)

Semester	Core Course(14)	Ability Enhancement Compulsory Course (AECC)(2)	Skill Enhancement Course (SEC)(2)	Discipline Specific Elective (DSE)(4)	Generic Elective (GE)(4)
I	C-1 C-2	Environmental Science			GE-1A
II	C-3 C-4	MIL Communication (Oriya/Hindi)			GE-2A
III	C-5 C-6 C-7		SEC-1(English Communication)		GE-1B
IV	C-8 C-9 C-10		SEC-2		GE-2B
V	C-11 C-12		DSE-1 DSE-2		
VI	C-13 C-14		DSE-3 DSE-4		

DETAILS OF COURSES UNDER BACHELOR OF SCIENCE(REGULAR/PASS)

Course	Theory+Practical	Theory + Tutorial
I. Core Course (6 Credits)		
(12 Papers)	$12 \times 4 = 48$	$12 \times 5 = 60$
(4 Courses from each of the 3 Disciplines of choice)		
Core Course Practical / Tutorial*		
(12 Practical/Tutorials*)	$12 \times 2 = 24$	$12 \times 1 = 12$
(4 Courses from each of the 3 Disciplines of choice)		
II. Elective Course (6 Credits)		
(6 Papers)	$6 \times 4 = 24$	$6 \times 5 = 30$
(Two papers from each discipline of choice including paper of interdisciplinary nature)		
Elective Course Practical/Tutorials*		
(6 Practical/Tutorials*)	$6 \times 2 = 12$	$6 \times 1 = 6$
(Two Papers from each Disciplines of choice including paper of interdisciplinary nature)		
<ul style="list-style-type: none"> • Optional Dissertation/Project Work in place of one Discipline elective paper (6 credits) in Semester-VI. 		
III. Ability Enhancement Courses		
1. Ability Enhancement Compulsory Courses(AECC)		
(2 Papers of 4 credit each)	$2 \times 4 = 8$	$2 \times 4 = 8$
Environmental Science/English/ Hindi/MIL Communication		
2. Skill Enhancement Courses(SEC)		
(4 Papers of 4 credit each)	$4 \times 4 = 16$	$4 \times 4 = 16$
<hr/>		
Total Credit	132	132

- Institute should evolve a system/policy about ECA/General Interest/Hobby/Sports NCC/NSS/related courses on its own.
- Wherever there is a practical, there will be no tutorial and vice-versa.

**SCHEME FOR CHOICE BASED CREDIT SYSTEM BACHELOR OF SCIENCE
(REGULAR/ PASS)**

Semester	Core Course(12)	Ability Enhancement Compulsory Course (AECC)(2)	Skill Enhancement Course (SEC)(2)	Discipline Specific Elective (DSE)(6)
I	DSC-1A DSC-2A DSC-3A	Environmental Science		
II	DSC-1B DSC-2B DSC-3B	MIL Communication (Oriya/Hindi)		
III	DSC-1C DSC-2C DSC-3C		SEC-1(English Communication)	
IV	DSC-1D DSC-2D DSC-3D		SEC-2	
V			SEC-3	DSE-1A DSE-2A DSE-3A
VI			SEC-4	DSE-1B DSE-2B DSE-3B

**COLOUR SCHEME OF MAPPING THE SYLLABI FOR ENTREPRENEURSHIP,
EMPLOYABILITY AND SKILL DEVELOPMENT**



Skill Development



Employability



Entrepreneurship



All the three



Skill Development and Employability



Skill Development and Entrepreneurship



Employability and Entrepreneurship

**ABILITY ENHANCEMENT COMPULSORY
COURSES (AECC)
(For all Subjects)**

SEMESTER-I

AECC-I: Environmental Science

Max. Marks:100 (End-Sem.:80 Marks, Mid-Sem.: 20 Marks)

UNIT-I

The Environment: The Atmosphere, Hydrosphere, Lithosphere, Biosphere, Ecology, Ecosystem, Biogeochemical Cycle (Carbon Cycle, Nitrogen Cycle).

UNIT-II

Environment Pollution: Air Pollution, Water Pollution, Soil Pollution, Noise Pollution, Thermal Pollution, Radiation Pollution, Natural Disasters and their Management.

UNIT-III

Population Ecology: Individuals, Species, Pollution, Community, Control Methods of Population, Urbanization and its effects on Society, Communicable Diseases and its Transmission, Non-Communicable Diseases.

UNIT-IV

Environmental Movements in India: Grassroot Environmental movements in India, Role of women, Environmental Movements in Odisha, State Pollution Control Board, Central Pollution Control Board.

UNIT-V

Natural Resources: Conservation of Natural Resources, Management and Conservation of Wildlife, Soil Erosion and Conservation, Environmental Laws: Water Act, 1974, Air Act, 1981, The Wildlife (Protection) Act, 1972, Environment Protection, 1986.

SEMESTER-II

AECC-II: MIL Communication (Odia/Sanskrit/Alt. Eng.)

Max. Marks:100 (End-Sem.:80 Marks, Mid-Sem.: 20 Marks)

(Detailed syllabus for this paper is available in MIL Odia/Sanskrit/Alt. Eng Communication syllabus).

BOTANY(HONOURS)

SEMESTER-I

C-I: MICROBIOLOGY & PHYCOLOGY

(Credits-6: Theory-4, Practical-2)-Max. Marks: 100

THEORY (Each class 1 hr.): Marks-70 PRACTICAL

(Each class 2 hrs.): Marks-30 Lectures: 60 (40

Theory + 20 Practical classes)

Unit-I

Introduction to microbial world, microbial nutrition, growth and metabolism. (2 lectures)

Unit-II

Bacteria: Discovery, general characteristics, types-archaeobacteria, eubacteria, wall-less forms (mycoplasma and spheroplasts), cell structure, nutritional types, reproduction-vegetative, asexual and recombina-

tion (conjugation, transformation and transduction). Economic importance of bacteria with reference to their role in agriculture and industry (fermentation and medicine). (5 lectures)

Unit-III

Algae:- General characteristics; Ecology and distribution; range of thallus organization; Cell structure and components; cell wall, pigment system, reserve food (of only groups represented in the syllabus), flagella; and methods of reproduction, classification; criteria, system of Fritsch, and evolutionary classification of Lee (only upto groups); significant contributions of important phycologists (F.E. Fritsch, G.M. Smith, R.N. Singh, T.V. Desikachary, H.D. Kumar, M.O.P. Iyengar). Role of algae in the environment, agriculture, biotechnology and industry. (6 lectures)

Unit-IV

Cyanophyta:- Ecology and occurrence, range of thallus organization, cell structure, heterocyst, reproduction. economic importance; role in biotechnology. Morphology and life-cycle of Nostoc.(5 lectures)

Chlorophyta:- General characteristics, occurrence, range of thallus organization, cell structure and reproduction. Morphology and life-cycles of Chlamydomonas, Volvox, Oedogonium, Coleochaete. Evolutionary significance of Prochloron. (5 lectures)

Unit-V

Charophyta:- General characteristics; occurrence, morphology, cell structure and life-cycle of Chara; evolutionary significance.(2 lectures)

Xanthophyta:- General characteristics; range of thallus organization; Occurrence, morphology and life-cycle of Vaucheria.(3 lectures)

Phaeophyta:- Characteristics, occurrence, range of thallus organization, cell structure and reproduction. Morphology and life-cycles of Ectocarpus and Fucus.(3 lectures)

Rhodophyta:- General characteristics, occurrence, range of thallus organization, cell structure and reproduction. Morphology and life-cycle of Polysiphonia.(4 lectures)

PRACTICAL

Microbiology:

1. Electron micrographs/Models of viruses T-Phage and TMV, Line drawings/ Photographs of Lytic and Lysogenic Cycle.
2. Types of Bacteria to be observed from temporary/permanent slides/photographs. Electron micrographs of bacteria, binary fission, endospore, conjugation, root Nodule.
3. Gram staining.
4. Endospore staining with malachite green using the (endospores taken from soil bacteria).

Phycology:

Study of vegetative and reproductive structures of Nostoc, Chlamydomonas (electron micrographs), Volvox, Oedogonium, Coleochaete, Chara, Vaucheria, Ectocarpus, Fucus and Polysiphonia, Prochloron through electron micrographs, temporary preparations and permanent slides.

Suggested Readings:

1. Lee, R.E. (2008). Phycology, Cambridge University Press, Cambridge. 4th edition.
2. Prescott, L.M., Harley J.P., Klein D. A. (2005). Microbiology, McGraw Hill, India. 6th edition.
3. Kumar, H.D. (1999). Introductory Phycology. Affiliated East-West Press, Delhi.
4. Sahoo, D. (2000). Farming the ocean: seaweeds cultivation and utilization. Aravali International, New Delhi.
5. Campbell, N.A., Reece J.B., Urry L.A., Cain M.L., Wasserman S.A. Minorsky P.V., Jackson R.B. (2008). Biology, Pearson Benjamin Cummings, USA. 8th edition.
6. Pelczar, M.J. (2001) Microbiology, 5th edition, Tata McGraw-Hill Co, New Delhi.

C-2: BIOMOLECULES & CELL BIOLOGY

(Credits-6: Theory-4, Practical-2)-Max. Marks: 100

THEORY (Each class 1 hr.): Marks-70 PRACTICAL

(Each class 2 hrs.): Marks-30 Lectures: 60 (40
Theory + 20 Practical classes)

Unit-I

Biomolecules: Types and significance of chemical bonds; Structure and properties of water; pH and buffers. (2 lectures)

Carbohydrates: Nomenclature and classification; Role of monosaccharides (glucose, fructose, sugar alcohols mannitol and sorbitol); Disaccharides (sucrose, maltose, lactose), Oligosaccharides and polysaccharides (structural-cellulose, hemicelluloses, pectin, chitin, mucilage; storage, starch, insulin) (3 lectures)

Lipids: Definition and major classes of storage and structural lipids. Storage lipids. Fatty acids

structure and functions. Essential fatty acids. Triacyl glycerols structure, functions and properties. (2 lectures)

Proteins: Structure of amino acids; Peptide bonds; Levels of protein structure-primary, secondary, tertiary and quaternary; Isoelectric point; Protein denaturation and biological roles of proteins. (2 lectures)

Nucleic acids: Structure of nitrogenous bases; Structure and function of nucleotides; Types of nucleic acids; Structure of A, B, Z types of DNA; Types of RNA; Structure of tRNA. (4 lectures) **Unit-II**

Bioenergenetics: Laws of thermodynamics, concept of free energy, endergonic and exergonic reactions, coupled reactions, redox reactions. ATP: structure, its role as a energy currency molecule. (3 lectures)

Enzymes: Structure of enzyme: holoenzyme, apoenzyme, cofactors, coenzymes and prosthetic group; Classification of enzymes; Features of active site, substrate specificity, mechanism of action (activation energy, lock and key hypothesis, induced - fit theory), Michaelis Menten equation, enzyme inhibition and factors affecting enzyme activity. (4 lectures)

Unit-III

The cell: Cell as a unit of structure and function; Characteristics of prokaryotic and eukaryotic cells; Origin of eukaryotic cell (Endosymbiotic theory). (2 lectures)

Cell wall and plasma membrane: Chemistry, structure and function of Plant Cell Wall. Overview of membrane function; fluid mosaic model; Chemical composition of membranes; Membrane transport Passive, active and facilitated transport, endocytosis and exocytosis. (3 lectures)

Unit-IV

Cell organelles: Nucleus; Structure-nuclear envelope, nuclear pore complex, nuclear lamina, molecular organization of chromatin; nucleolus. (3 lectures)

Cytoskeleton: Role and structure of microtubules, microfilaments and intermediary filament. (2 lectures)

Chloroplast, mitochondria and peroxisomes: Structural organization; Function; Semiautonomous nature of mitochondria and chloroplast. (2 lectures)

Endoplasmic Reticulum, Golgi Apparatus, Lysosomes (2 lectures)

Unit-V

Cell division: Eukaryotic cell cycle, different stages of mitosis and meiosis. Cell cycle, Regulation of cell cycle. (6 lectures)

PRACTICAL

1. Qualitative tests for carbohydrates, reducing sugars, non-reducing sugars, lipids and proteins.
2. Study of plant cell structure with the help of epidermal peel mount of Onion/Rhoeo/Crinum.
3. Demonstration of the phenomenon of protoplasmic streaming in Hydrilla leaf.
4. Measurement of cell size by the technique of micrometry.
5. Counting the cells per unit volume with the help of haemocytometer. (Yeast/pollen grains).
6. Study of cell and its organelles with the help of electron micrographs.
7. Study the phenomenon of plasmolysis and deplasmolysis.
8. Study different stages of mitosis and meiosis using aceto carmine and aceto orcin method.

Suggested Readings:

1. Campbell, MK (2012) Biochemistry, 7th ed., Published by Cengage Learning.
2. Campbell, PN and Smith AD (2011) Biochemistry Illustrated, 4th ed., Published by Churchill

Livingstone.

3. Tymoczko JL, Berg JM and Stryer L (2012) Biochemistry: A short course, 2nd ed., W.H. Freeman
4. Berg JM, Tymoczko JL and Stryer L (2011) Biochemistry, W.H. Freeman and Company
5. Nelson DL and Cox MM (2008) Lehninger Principles of Biochemistry, 5th Edition., W.H. Freeman and Company.
6. Karp, G. (2010). Cell Biology, John Wiley & Sons, U.S.A. 6th edition.
7. Hardin, J., Becker, G., Skliensmith, L.J. (2012). Beckers World of the Cell, Pearson Education Inc. U.S.A. 8th edition.
8. Cooper, G.M. and Hausman, R.E. 2009 The Cell: A Molecular Approach. 5th edition. ASM Press & Sunderland, Washington, D.C.; Sinauer Associates, MA.
9. Becker, W.M., Kleinsmith, L.J., Hardin. J. and Bertoni, G. P. 2009 The World of the Cell. 7th edition. Pearson Benjamin Cummings Publishing, San Francisco

SEMESTER-II

C-3: MYCOLOGY & PHYTOPATHOLOGY

(Credits-6: Theory-4, Practical-2)-Max. Marks: 100

THEORY (Each class 1 hr.): Marks-70 PRACTICAL

(Each class 2 hrs.): Marks-30 Lectures: 60 (40

Theory + 20 Practical classes)

Unit-I

Introduction to true fungi: Definition, **General characteristics**; Affinities with plants and animals; Thallus organization; Cell wall composition; Nutrition; Classification.

Chytridiomycetes: **General account** (5 lectures)

Zygomycota: **General characteristics**; Ecology; Thallus organisation; Life cycle with reference to Rhizopus. (4 lectures)

Ascomycota: **General characteristics** (asexual and sexual fruiting bodies); Ecology; Life cycle, Heterokaryosis and parasexuality; life cycle and classification with reference to Saccharomyces, Aspergillus, Penicillium, Alternaria and Neurospora, Peziza. (5 lectures)

Unit-II

Basidiomycota: **General characteristics**; Ecology; Life cycle and Classification with reference to black stem rust on wheat Puccinia (Physiological Specialization), loose and covered smut (symptoms only), Agaricus; Bioluminescence, Fairy Rings and Mushroom Cultivation. (5 lectures)

Allied Fungi: **General characteristics**; Status of Slime molds, Classification; Occurrence; Types of plasmodia; Types of fruiting bodies. (3 lectures)

Oomycota: **General characteristic**; Ecology; Life cycle and classification with reference to Phytophthora, Albugo. (4 lectures)

Unit-III

Symbiotic associations: Lichen Occurrence; **General characteristics**; Growth forms and range of thallus organization; Nature of associations of algal and fungal partners; Reproduction. **Mycorrhiza-Ectomycorrhiza, Endomycorrhiza and their significance.** (4 lectures)

Unit-IV

Applied Mycology: **Role of fungi in biotechnology, Application of fungi in food industry (Flavour &**

texture, Fermentation, Baking, Organic acids, Enzymes, Mycoproteins); Secondary metabolites (Pharmaceutical preparations); Agriculture (Biofertilizers); Mycotoxins; Biological control (Mycofungicides, Mycoherbicides, Mycoinsecticides, Myconematicides); Medical mycology. (5 Lectures)

Unit-V

Phytopathology: Terms and concepts; General symptoms; Geographical distribution of diseases; etiology; symptomology; Host-Pathogen relationships; disease cycle and environmental relation; prevention and control of plant diseases, and role of quarantine. Bacterial diseases Citrus canker and angular leaf spot disease of Cotton. Viral diseases Tobacco Mosaic viruses, vein clearing. Fungal diseases Early blight of potato, Black stem rust of wheat, white rust of crucifers. (5 lectures)

PRACTICAL

1. Introduction to the world of fungi (Unicellular, coenocytic/septate mycelium, ascocarps & basidiocarps).
2. Rhizopus: study of asexual stage from temporary mounts and sexual structures through permanent slides.
3. Aspergillus and Penicillium: study of asexual stage from temporary mounts. Study of Sexual stage from permanent slides/photographs.
4. Peziza: sectioning through ascocarp.
5. Alternaria: Specimens/photographs and temporary mounts.
6. Puccinia: Herbarium specimens of Black Stem Rust of Wheat and infected Barberry leaves; sections/ mounts of spores on wheat and permanent slides of both the hosts.
7. Agaricus: Specimens of button stage and full grown mushroom; sectioning of gills of Agaricus, fairy rings and bioluminescent mushrooms to be shown.
8. Albugo: Study of symptoms of plants infected with Albugo; asexual phase study through section/temporary mounts and sexual structures through permanent slides.
9. Lichens: Study of growth forms of lichens (crustose, foliose and fruticose) on different substrates. Study of thallus and reproductive structures (soredia and apothecium) through permanent slides. Mycorrhizae: ectomycorrhiza and endo mycorrhiza (Photographs)
10. Phytopathology: Herbarium specimens of bacterial diseases; Citrus Canker; Viral diseases: TMV, Fungal diseases: Early blight of potato, and White rust of crucifers.

Suggested Readings:

1. Agrios, G.N. 1997 Plant Pathology, 4th edition, Academic Press, U.K.
2. Alexopoulos, C.J., Mims, C.W., Blackwell, M. (1996). Introductory Mycology, John Wiley & Sons (Asia) Singapore. 4th edition.
3. Webster, J. and Weber, R. (2007). Introduction to Fungi, Cambridge University Press, Cambridge. 3rd edition.
4. Sethi, I.K. and Walia, S.K. (2011). Text book of Fungi and Their Allies, Macmillan Publishers India Ltd.
5. Sharma, P.D. (2011). Plant Pathology, Rastogi Publication, Meerut, India.

C-4: ARCHEGONIATE

(Credits-6: Theory-4, Practical-2)-Max. Marks: 100

THEORY (Each class 1 hr.): Marks-70 PRACTICAL

(Each class 2 hrs.): Marks-30 Lectures: 60 (40

Theory + 20 Practical classes)

Unit-I

Introduction: **Unifying features of archegoniates**; Transition to land habit; Alternation of generations. (2 lectures)

Unit-II

Bryophytes: **General characteristics**; Adaptations to land habit; Classification; Range of thallus organization. Classification (up to family). Riccia, Marchantia, Pellia, Porella, Anthoceros, Sphagnum and Funaria; Reproduction and evolutionary trends in Riccia, Marchantia, Anthoceros and Funaria (developmental stages not included). **Ecological and economic importance of bryophytes with special reference to Sphagnum.** (12 lectures)

Unit-III

Pteridophytes: **General characteristics**, classification. Classification (up to family), morphology, anatomy and reproduction of Psilotum, Selaginella, Equisetum and Pteris. (Developmental details not to be included). Apogamy, and apospory, heterospory and seed habit, telome theory, stellar evolution. **Ecological and economic importance.** (10 lectures)

Unit-IV

Gymnosperms: **General characteristics**, classification (up to family), morphology, anatomy and reproduction of Cycas, Pinus, Ginkgo and Gnetum. (Developmental details not to be included). **Ecological and economic importance.** (8 lectures)

Unit-V

Fossils: Geographical time scale, fossils and fossilization process. **Morphology, anatomy and affinities of Rhynia, Calamites, Lepidodendron, Lyginopteris and Cycadeoidea.** (8 lectures)

PRACTICAL

1. Riccia Morphology of thallus.
2. Marchantia- Morphology of thallus, whole mount of rhizoids & Scales, vertical section of thallus through Gemma cup, whole mount of Gemmae (all temporary slides), vertical section of Antheridiophore, Archegoniophore, longitudinal section of Sporophyte (all permanent slides).
3. Anthoceros- Morphology of thallus, dissection of sporophyte (to show stomata, spores, pseudoelaters, columella) (temporary slide), vertical section of thallus (permanent slide).
4. Pellia, Porella- Permanent slides.
5. Sphagnum- Morphology of plant, whole mount of leaf (permanent slide only).
6. Funaria- Morphology, whole mount of leaf, rhizoids, operculum, peristome, annulus, spores (temporary slides); permanent slides showing antheridial and archegonial heads, longitudinal section of capsule and protonema.
7. Psilotum- Study of specimen, transverse section of synangium (permanent slide).
8. Selaginella- Morphology, whole mount of leaf with ligule, transverse section of stem, whole mount of strobilus, whole mount of microsporophyll and megasporophyll (temporary slides), longitudinal section of strobilus (permanent slide).

9. Equisetum- Morphology, transverse section of internode, longitudinal section of strobilus, transverse section of strobilus, whole mount of sporangiophore, whole mount of spores (wet and dry) (temporary slide), transverse section of rhizome (permanent slide).
10. Pteris- Morphology, transverse section of rachis, vertical section of sporophyll, whole mount of sporangium, whole mount of spores (temporary slides), transverse section of rhizome, whole mount of prothallus with sex organs and young sporophyte (permanent slide).
11. Cycas- Morphology (coralloid roots, bulbil, leaf), whole mount of microsporophyll, transverse section of coralloid root, transverse section of rachis, vertical section of leaflet, vertical section of microsporophyll, whole mount of spores (temporary slides), longitudinal section of ovule, transverse section of root (permanent slide).
12. Pinus- Morphology (long and dwarf shoots, whole mount of dwarf shoot, male and female cones), transverse section of Needle, transverse section of stem, longitudinal section of transverse section of male cone, whole mount of microsporophyll, whole mount of Microspores (temporary slides), longitudinal section of female cone, tangential longitudinal section & radial longitudinal sections stem (permanent slide).
13. Gnetum- Morphology (stem, male & female cones), transverse section of stem, vertical section of ovule (permanent slide)
14. Botanical excursion.

Suggested Readings:

1. Vashista, P.C., Sinha, A.K., Kumar, A. (2010). Pteridophyta. S. Chand. Delhi, India.
2. Bhatnagar, S.P. & Moitra, A. (1996). Gymnosperms. New Age International (P) Ltd Publishers, New Delhi, India.
3. Parihar, N.S. (1991). An introduction to Embryophyta: Vol. I. Bryophyta. Central Book Depot. Allahabad.
4. Raven, P.H., Johnson, G.B., Losos, J.B., Singer, S.R. (2005). Biology. Tata McGraw Hill, Delhi.
5. Vander-Poorteri 2009 Introduction to Bryophytes. COP.

SEMESTER-III

C-5: ANATOMY OF ANGIOSPERMS

(Credits-6: Theory-4, Practical-2)-Max. Marks: 100

THEORY (Each class 1 hr.): Marks-70 PRACTICAL

(Each class 2 hrs.): Marks-30 Lectures: 60 (40

Theory + 20 Practical classes)

Unit-I

Introduction and scope of Plant Anatomy: Applications in systematics, forensics and pharmacognosy. (2 Lectures)

Tissues: Classification of tissues; Simple and complex tissues (no phylogeny); cytodifferentiation of tracheary elements and sieve elements; Pits and plasmodesmata; Wall ingrowths and transfer cells, adcrustation and incrustation, Ergastic substances. (5 Lectures)

Unit-II

Stem: Organization of shoot apex (Apical cell theory, Histogen theory, Tunica Corpus theory, continuing meristematic residue, cytohistological zonation); Types of vascular bundles; Structure of dicot

and monocot stem. (5 Lectures)

Leaf: Structure of dicot and monocot leaf, Kranz anatomy. (4 Lectures)

Root: Organization of root apex (Apical cell theory, Histogen theory, Korper-Kappe theory); Quiescent centre; Root cap; Structure of dicot and monocot root; Endodermis, exodermis and origin of lateral root. (4 Lectures)

Unit-III

Vascular Cambium: Structure, function and seasonal activity of cambium; Secondary growth in root and stem. (4 Lectures)

Wood: Axially and radially oriented elements; Types of rays and axial parenchyma; Cyclic aspects and reaction wood; Sapwood and heartwood; Ring and diffuse porous wood; Early and late wood, tyloses; Dendrochronology. (5 Lectures)

Periderm: Development and composition of periderm, rhytidome and lenticels. (3 Lectures)

Unit-IV

Adaptive and Protective Systems Epidermal tissue system, cuticle, epicuticular waxes, trichomes (uni- and multicellular, glandular and nonglandular, two examples of each), stomata (classification); Adcrustation and incrustation; Anatomical adaptations of xerophytes and hydrophytes. (5 Lectures)

Unit-V

Secretory System: Hydathodes, cavities, lithocysts and laticifers. (3 Lectures)

PRACTICAL

1. Study of anatomical details through permanent slides/temporary stain mounts/macerations/museum specimens with the help of suitable examples.
2. Apical meristem of root, shoot and vascular cambium.
3. Distribution and types of parenchyma, collenchyma and sclerenchyma.
4. Xylem: Tracheary elements-tracheids, vessel elements; thickenings; perforation plates; xylem fibres.
5. Wood: ring porous; diffuse porous; tyloses; heart- and sapwood.
6. Phloem: Sieve tubes-sieve plates; companion cells; phloem fibres.
7. Epidermal system: cell types, stomata types; trichomes: non-glandular and glandular.
8. Root: monocot, dicot, secondary growth.
9. Stem: monocot, dicot - primary and secondary growth; periderm; lenticels.
10. Leaf: isobilateral, dorsiventral, C4 leaves (Kranz anatomy).
11. Adaptive Anatomy: xerophytes, hydrophytes.
12. Secretory tissues: cavities, lithocysts and laticifers.

Suggested Readings:

1. Dickison, W.C. (2000). Integrative Plant Anatomy. Harcourt Academic Press, USA.
2. Fahn, A. (1974). Plant Anatomy. Pergmon Press, USA.
3. Mauseth, J.D. (1988). Plant Anatomy. The Benjamin/Cummings Publisher, USA.
4. Esau, K. (1977). Anatomy of Seed Plants. John Wiley & Sons, Inc., Delhi.

C-6: ECONOMIC BOTANY

(Credits-6: Theory-4, Practical-2)-Max. Marks: 100

THEORY (Each class 1 hr.): Marks-70 PRACTICAL

(Each class 2 hrs.): Marks-30 Lectures: 60 (40

Theory + 20 Practical classes)

Unit-I

Origin of Cultivated Plants: Concept of Centres of Origin, their importance with reference to Vavilovs work. Examples of major plant introductions; Crop domestication and loss of genetic diversity; evolution of new crops/varieties, importance of germplasm diversity. (3 Lectures)

Unit-II

Cereals : Wheat and Rice (origin, morphology, processing & uses), brief account of millets. (3 lectures)

Legumes: General account, importance to man and ecosystem. (3 Lectures)

Sugars & Starches: Morphology and processing of sugarcane, products and by-products of sugarcane industry. Potato morphology, propagation & uses. (3 lectures)

Unit-III

Spices:Listing of important spices, their family and part used, economic importance with special reference to fennel, saffron, clove and black pepper (4 Lectures)

Beverages: Tea, Coffee (morphology, processing & uses)(4 lectures) Drug-yielding plants: Therapeutic and habit-forming drugs with special reference to Cinchona, Digitalis, Papaver and Cannabis. (4 Lectures)

Tobacco: Tobacco (Morphology, processing, uses and health hazards) (2Lectures)

Unit-IV

Oils & Fats: General description, classification, extraction, their uses and health implications groundnut, coconut, linseed and Brassica and Coconut (Botanical name, family & uses) (4 lectures) Essential

Oils: General account, extraction methods, comparison with fatty oils & their uses. (4 Lectures)

Unit-V

Natural Rubber: Para-rubber: tapping, processing and uses. (2 Lectures)

Timber plants: General account with special reference to teak and pine. (2 Lectures)

Fibres: Classification based on the origin of fibres, Cotton and Jute (morphology, extraction and uses). (2 Lectures)

PRACTICAL

1. Cereals: Rice (habit sketch, study of paddy and grain, starch grains, micro-chemical tests).
2. Legumes: Soya bean, Groundnut, (habit, fruit, seed structure, micro-chemical tests).
3. Sugars & Starches: Sugarcane (habit sketch; cane juice- micro-chemical tests), Potato(habit sketch, tuber morphology, T.S. tuber to show localization of starch grains, w.m. starch grains, micro-chemical tests).
4. Spices: Black pepper, Fennel and Clove (habit and sections).

5. Beverages: Tea (plant specimen, tea leaves), Coffee (plant specimen, beans).
6. Oils & Fats: Coconut- T.S. nut, Mustard plant specimen, seeds; tests for fats in crushed seeds.
7. Essential oil-yielding plants: Habit sketch of Rosa, Vetiveria, Santalum and Eucalyptus (specimens/photographs).
8. Rubber: specimen, photograph/model of tapping, samples of rubber products.
9. Drug-yielding plants: Specimens of Digitalis, Papaver and Cannabis.
10. Tobacco: specimen and products of Tobacco.
11. Woods: Tectona, Pinus: Specimen, Section of young stem.
12. Fibre-yielding plants: Cotton (specimen, whole mount of seed to show lint and fuzz; whole mount of fibre and test for cellulose), Jute (specimen, transverse section of stem, test for lignin on transverse section of stem and fibre).

Suggested Readings:

1. Kochhar, S.L. (2012). Economic Botany in Tropics, MacMillan & Co. New Delhi, India.
2. Wickens, G.E. (2001). Economic Botany: Principles & Practices. Kluwer Academic Publishers, The Netherlands.
3. Chrispeels, M.J. and Sadava, D.E. (2003). Plants, Genes and Agriculture. Jones & Bartlett Publishers.

C-7: GENETICS

(Credits-6: Theory-4, Practical-2)-Max. Marks: 100
 THEORY (Each class 1 hr.): Marks-70 PRACTICAL
 (Each class 2 hrs.): Marks-30 Lectures: 60 (40
 Theory + 20 Practical classes)

Unit-I

Mendelian genetics and its extension Mendelism: History; Principles of inheritance; Chromosome theory of inheritance; Autosomes and sex chromosomes; Probability and pedigree analysis; Incomplete dominance and codominance; Multiple alleles, Lethal alleles, Epistasis, Pleiotropy, Recessive and Dominant traits, Penetrance and Expressivity, Numericals; Polygenic inheritance. (16 lectures)

Unit-II

Extrachromosomal Inheritance: Chloroplast mutation: Variegation in Four o'clock plant; Mitochondrial mutations in yeast; Maternal effects-shell coiling in snail; Infective heredity- Kappa particles in Paramecium. (6 lectures)

Unit-III

Linkage, crossing over and chromosome mapping: Linkage and crossing over-Cytological basis of crossing over; Recombination frequency, two factor and three factor crosses; Interference and coincidence; Numericals based on gene mapping; Sex Linkage. (12 lectures)

Unit-IV

Variation in chromosome number and structure: Deletion, Duplication, Inversion, Translocation, Position effect, Euploidy and Aneuploidy (8 lectures)

Gene mutations: Types of mutations; Molecular basis of Mutations; Mutagens physical and chemical (Base analogs, deaminating, alkylating and intercalating agents); Detection of mutations: CIB method. Role of Transposons in mutation. DNA repair mechanisms. (6 lectures)

Unit-V

Fine structure of gene: Classical vs molecular concepts of gene; Cis-Trans complementation test for functional allelism; Structure of Phage T4, rII Locus. (6 lectures)

Population and Evolutionary Genetics: Allele frequencies, Genotype frequencies, Hardy-Weinberg Law, role of natural selection, mutation, genetic drift. Genetic variation and Speciation. (6 lectures)

PRACTICAL

1. Meiosis through temporary squash preparation.
2. Mendel's laws through seed ratios. Laboratory exercises in probability and chi-square analysis.
3. Chromosome mapping using test cross data.
4. Pedigree analysis for dominant and recessive autosomal and sex linked traits with floral chart.
5. Incomplete dominance and gene interaction through seed ratios (9:7, 9:6:1, 13:3, 15:1, 12:3:1, 9:3:4).
6. Blood Typing: ABO groups & Rh factor.
7. Study of aneuploidy: Down's, Klinefelter's and Turner's syndromes.
8. Photographs/Permanent Slides showing Translocation Ring, Laggard's and Inversion Bridge.

Suggested Readings:

1. Gardner, E.J., Simmons, M.J., Snustad, D.P. (1991). Principles of Genetics, John Wiley & sons, India. 8th edition.
2. Snustad, D.P. and Simmons, M.J. (2010). Principles of Genetics, John Wiley & Sons Inc., India. 5th edition.
3. Klug, W.S., Cummings, M.R., Spencer, C.A. (2012). Concepts of Genetics. Benjamin Cummings, U.S.A. 10th edition.
4. Griffiths, A.J.F., Wessler, S.R., Carroll, S.B., Doebley, J. (2010). Introduction to Genetic Analysis. W. H. Freeman and Co., U.S.A. 10th edition.

SEMESTER-IV

C-8: MOLECULAR BIOLOGY

(Credits-6: Theory-4, Practical-2)-Max. Marks: 100

THEORY (Each class 1 hr.): Marks-70 PRACTICAL

(Each class 2 hrs.): Marks-30 Lectures: 60 (40

Theory + 20 Practical classes)

Unit-I

Nucleic acids : Carriers of genetic information: Historical perspective; DNA as the carrier of genetic information (Griffiths, Hershey & Chase, Avery, McLeod & McCarty, Fraenkel-Conrats experiment. (4 lectures)

Unit-II

The Structures of DNA and RNA / Genetic Material: DNA Structure: Miescher to Watson and Crick-historic perspective, DNA structure, Salient features of double helix, Types of DNA, Types of genetic material, denaturation and renaturation, cot curves; Organization of DNA Prokaryotes, Viruses, Eukaryotes. RNA Structure- Organelle DNA - mitochondria and chloroplast DNA. The Nucleosome - Chromatin structure- Euchromatin, Heterochromatin- Constitutive and Facultative heterochromatin. (8 lectures)

The replication of DNA: Chemistry of DNA synthesis (Kornbergs discovery); General principles bidirectional, semi-conservative and semi discontinuous replication, RNA priming; Various models of DNA replication, including rolling circle, (theta) mode of replication, replication of linear ds-DNA, replication of the 5' end of linear chromosome; Enzymes involved in DNA replication. (6 lectures)

Unit-III

Central dogma and genetic code: Key experiments establishing-The Central Dogma (Adaptor hypothesis and discovery of mRNA template), Genetic code (deciphering & salient features) (2 lectures)

Mechanism of Transcription: Transcription in prokaryotes; Transcription in eukaryotes (4 lectures)

Processing and modification of RNA: Split genes-concept of introns and exons, removal of introns, spliceosome machinery, splicing pathways, group I & group II intron splicing, alternative splicing eukaryotic mRNA processing(5' cap, 3' polyA tail); Ribozymes, exon shuffling; RNA editing and mRNA transport. (5 lectures)

Unit-IV

Translation (Prokaryotes and eukaryotes): Ribosome structure and assembly, mRNA; Charging of tRNA, aminoacyl tRNA synthetases; Various steps in protein synthesis, proteins involved in initiation, elongation and termination of polypeptides; Fidelity of translation; Inhibitors of protein synthesis; Post-translational modifications of proteins. (6 lectures)

Unit-V

Regulation of transcription in prokaryotes and eukaryotes: Principles of transcriptional regulation; Prokaryotes: Regulation of lactose metabolism and tryptophan synthesis in E.coli. Eukaryotes: transcription factors, heat shock proteins, steroids and peptide hormones; Gene silencing. (5 lectures)

PRACTICAL

1. Preparation of LB medium and raising E.Coli.
2. Isolation of genomic DNA from E.Coli.

3. DNA isolation and RNA estimation by orcinol method.

4. DNA estimation by diphenylamine reagent/UV Spectrophotometry.

5. Study of DNA replication mechanisms through photographs (Rolling circle, Theta replication and semi-discontinuous replication).

6. Study of structures of prokaryotic RNA polymerase and eukaryotic RNA polymerase II through photographs.

7. Photographs establishing nucleic acid as genetic material (Messelson and Stahls, Avery et al, Griffiths, Hershey & Chases and Fraenkel & Conrats experiments)

8. Study of the following through photographs: Assembly of Spliceosome machinery; Splicing mechanism in group I & group II introns; Ribozyme and Alternative splicing.

Suggested Readings:

1. Watson J.D., Baker, T.A., Bell, S.P., Gann, A., Levine, M., Losick, R. (2007). Molecular Biology of the Gene, Pearson Benjamin Cummings, CSHL Press, New York, U.S.A. 6th edition.

2. Snustad, D.P. and Simmons, M.J. (2010). Principles of Genetics. John Wiley and Sons Inc., U.S.A. 5th edition.

3. Klug, W.S., Cummings, M.R., Spencer, C.A. (2009). Concepts of Genetics. Benjamin Cummings. U.S.A. 9th edition.

4. Russell, P.J. (2010). iGenetics- A Molecular Approach. Benjamin Cummings, U.S.A. 3rd edition.

5. Griffiths, A.J.F., Wessler, S.R., Carroll, S.B., Doebley, J. (2010). Introduction to Genetic Analysis. W. H. Freeman and Co., U.S.A. 10th edition.

C-9: PLANT ECOLOGY & PHYTOGEOGRAPHY

(Credits-6: Theory-4, Practical-2)-Max. Marks: 100

THEORY (Each class 1 hr.): Marks-70 PRACTICAL

(Each class 2 hrs.): Marks-30 Lectures: 60 (40

Theory + 20 Practical classes)

Unit-I

Introduction Concept of ecology, Autoecology, Synecology, system ecology, Levels of organization. Inter-relationships between the living world and the environment, the components of environmental, concept of hydrosphere and lithosphere and dynamism, homeostasis. (2 lectures)

Unit-II

Soil: Importance; Origin; Formation; Composition; Physical; Chemical and Biological components; Soil profile; Role of climate in soil development. (5 lectures)

Water: Importance: States of water in the environment; Atmospheric moisture; Precipitation types (rain, fog, snow, hail, dew); Hydrological Cycle; Water in soil; Water table. (2 lectures)

Light, temperature, wind and fire: Variations; adaptations of plants to their variation. (4 lectures)

Unit-III

Biotic interactions: 2 lectures Population ecology: Characteristics and Dynamics .Ecological Speciation 4 lectures Plant communities: Concept of ecological amplitude; Habitat and niche; Characters: analytical and synthetic; Ecotone and edge effect; Dynamics: succession processes, types; climax concepts. (4 lectures)

Unit-IV

Ecological pyramids. (4 lectures)

Functional aspects of ecosystem: Principles and models of energy flow; Production and productivity; Ecological efficiencies; Biogeochemical cycles; Cycling of Carbon, Nitrogen and Phosphorus.(5 lectures)

Unit-V

Phytogeography: Principles; Continental drift; Theory of tolerance; Endemism; Brief description of major terrestrial biomes (one each from tropical, temperate & tundra); Phytogeographical division of India; Local Vegetation. (8 lectures)

PRACTICAL

1. Study of instruments used to measure microclimatic variables: Soil thermometer, maximum and minimum thermometer, anemometer, psychrometer/hygrometer, rain gauge and luxmeter.
2. Determination of pH of various soil and water samples (pH meter, universal indicator/Lovibond comparator and pH paper)
3. Analysis for carbonates, chlorides, nitrates, sulphates, organic matter and base deficiency from two soil samples by rapid field tests.
4. Determination of organic matter of different soil samples by Walkley & Black rapid titration method.
5. Comparison of bulk density, porosity and rate of infiltration of water in soils of three habitats.
6. Determination of dissolved oxygen of water samples from polluted and unpolluted sources.
7. (a) Study of morphological adaptations of hydrophytes and xerophytes (four each). (b) Study of biotic interactions of the following: Stem parasite (Cuscuta), Root parasite (Orobancha) Epiphytes, Predation (Insectivorous plants).
8. Determination of minimal quadrat size for the study of herbaceous vegetation in the college campus, by species area curve method (species to be listed).
9. Quantitative analysis of herbaceous vegetation in the college campus for frequency and comparison with Raunkiaers frequency distribution law.
10. Quantitative analysis of herbaceous vegetation for density and abundance in the college campus.

11. Field visit to familiarise students with ecology of different sites.

Suggested Readings:

1. Odum, E.P. (2005). Fundamentals of ecology. Cengage Learning India Pvt. Ltd., New Delhi. 5th edition.
2. Singh, J.S., Singh, S.P., Gupta, S. (2006). Ecology Environment and Resource Conservation. Anamaya Publications, New Delhi, India.
3. Sharma, P.D. (2010). Ecology and Environment. Rastogi Publications, Meerut, India. 8th edition.
4. Wilkinson, D.M. (2007). Fundamental Processes in Ecology: An Earth Systems Approach. Oxford University Press. U.S.A.
5. Kormondy, E.J. (1996). Concepts of ecology. PHI Learning Pvt. Ltd., Delhi, India. 4th edition.

C-10: PLANT SYSTEMATICS

(Credits-6: Theory-4, Practical-2)-Max. Marks: 100
THEORY (Each class 1 hr.): Marks-70 PRACTICAL
(Each class 2 hrs.): Marks-30 Lectures: 60 (40
Theory + 20 Practical classes)

Unit-I

Plant identification, Classification, Nomenclature; Biosystematics. (2 lectures)

Identification: Field inventory; Functions of Herbarium; Important herbaria and botanical gardens of the world and India; Virtual herbarium; E-flora; Documentation: Flora, Monographs, Journals; Keys: Single access and Multi-access. (5 lectures)

Unit-II

Taxonomic hierarchy: Concept of taxa (family, genus, species); Categories and taxonomic hierarchy; Species concept (taxonomic, biological, evolutionary). (5 lectures)

Botanical nomenclature: Principles and rules (ICN); Ranks and names; Typification, author citation, valid publication, rejection of names, principle of priority and its limitations; Names of hybrids. (5 lectures)

Unit-III

Systematics-an interdisciplinary science: Evidence from palynology, cytology, phytochemistry and molecular data. (6 lectures)

Systems of classification: Major contributions of Theophrastus, Bauhin, Tournefort, Linnaeus, Adanson, de Candolle, Bessey, Hutchinson, Takhtajan and Cronquist; Classification systems of Bentham and Hooker (upto series) and Engler and Prantl (upto series); Brief reference of Angiosperm Phylogeny Group (APG III) classification. (6 lectures)

Unit-IV

Biometrics, numerical taxonomy and cladistics: Characters; Variations; OTUs, character weighting and coding; cluster analysis; Phenograms, cladograms (definitions and differences). (4 lectures)

Unit-V

Phylogeny of Angiosperms: Terms and concepts (primitive and advanced, homology and analogy, parallelism and convergence, monophyly, Paraphyly, polyphyly and clades). origin & evolution of angiosperms; coevolution of angiosperms and animals; methods of illustrating evolutionary relationship (phylogenetic tree, cladogram). (7 lectures)

PRACTICAL

1. **Study of vegetative and floral characters of the following families** (Description, V.S. flower, section of ovary, floral diagram/s, floral formula/e and systematic position according to Bentham & Hookers system of classification):
Ranunculaceae - Ranunculus, Delphinium
Brassicaceae - Brassica, Alyssum / Iberis
Myrtaceae - Eucalyptus, Callistemon
Umbelliferae - Coriandrum /Anethum / Foeniculum
Asteraceae - Sonchus/Launaea, Vernonia/Ageratum, Eclipta/Tridax
Solanaceae - Solanum nigrum/Withania
Lamiaceae - Salvia/Ocimum
Euphorbiaceae - Euphorbia hirta/E.milii, Jatropha
Liliaceae - Asphodelus/Lilium/Allium
Poaceae - Triticum/Hordeum/Avena
2. **Field visit** (local) Subject to grant of funds from the university.
3. Mounting of a properly dried and pressed specimen of any wild plant with herbarium label (to be submitted in the record book)

Suggested Readings:

1. Singh, G. (2012). Plant Systematics: Theory and Practice. Oxford & IBH Pvt. Ltd., New Delhi. 3rd edition.
2. Jeffrey, C. (1982). An Introduction to Plant Taxonomy. Cambridge University Press, Cambridge.
3. Judd, W.S., Campbell, C.S., Kellogg, E.A., Stevens, P.F. (2002). Plant Systematics-A Phylogenetic Approach. Sinauer Associates Inc., U.S.A. 2nd edition.
4. Maheshwari, J.K. (1963). Flora of Delhi. CSIR, New Delhi.
5. Radford, A.E. (1986). Fundamentals of Plant Systematics. Harper and Row, New York.

SEMESTER-V

C-11: REPRODUCTIVE BIOLOGY OF ANGIOSPERMS

(Credits-6: Theory-4, Practical-2)-Max. Marks: 100

THEORY (Each class 1 hr.): Marks-70 PRACTICAL

(Each class 2 hrs.): Marks-30 Lectures: 60 (40

Theory + 20 Practical classes)

Unit-I

Introduction: History (contributions of G.B. Amici, W. Hofmeister, E. Strasburger, S.G. Nawaschin, P. Maheshwari, B.M. Johri, W.A. Jensen, J. Heslop-Harrison) and scope. (2 lectures)

Unit-II

Anther: Anther wall: Structure and functions, microsporogenesis, callose deposition and its significance. (2 lectures)

Pollen biology: Microgametogenesis; Pollen wall structure, MGU (male germ unit) structure, NPC system; Palynology and scope (a brief account); Pollen wall proteins; Pollen viability, storage and germination; Abnormal features: Pseudomonads, polyads, massulae, pollinia. (5 lectures)

Unit-III

Ovule: Structure; Types; Special structures: endothelium, obturator, aril, caruncle and hypostase; Female gametophyte megasporogenesis (monosporic, bisporic and tetrasporic) and megagametogenesis (details of Polygonum type); Organization and ultrastructure of mature embryo sac. (5 lectures)

Endosperm: Types, development, structure and functions.(3 lectures)

Embryo: Six types of embryogeny; General pattern of development of dicot and monocot embryo; Suspensor: structure and functions; Embryoendosperm relationship; Nutrition of embryo; Unusual features; Embryo development in Paeonia. (6 lectures)

Unit-IV

Pollination and fertilization: Pollination types and significance; adaptations; structure of stigma and style; path of pollen tube in pistil; double fertilization. (4 lectures)

Self incompatibility: Basic concepts (interspecific, intraspecific, homomorphic, heteromorphic, GSI and SSI); Methods to overcome selfincompatibility: mixed pollination, bud pollination, stub pollination; Intraovarian and in vitro pollination; Modification of stigma surface, parasexual hybridization; Cybrids, in vitro fertilization. (5 lectures)

Unit-V

Seed: Structure, importance and dispersal mechanisms (3 lectures)

Polyembryony and apomixes: Introduction; Classification; Causes and applications. (4 lectures)

Germline transformation: Pollen grain and ovules through pollen tube pathway method/ Agrobacterium/ electrofusion/floral dip/biostatic. (4 lectures)

PRACTICAL

1. Anther: Wall and its ontogeny; Tapetum (amoeboid and glandular); MMC, spore tetrads, uninucleate, bicelled and dehisced anther stages through slides/micrographs, male germ unit (MGU) through photographs and schematic representation.
2. Pollen grains: Fresh and acetolyzed showing ornamentation and aperture, pseudomonads, polyads, pollinia (slides/photographs, fresh material), ultrastructure of pollen wall(micrograph); Pollen viability: Tetrazolium test.germination: Calculation of percentage germination in different media using hanging drop method.
3. Ovule: Types-anatropous, orthotropous, amphitropous/campylotropous, circinotropous, unitegmic,

bitegmic; Tenuinucellate and crassinucellate; Special structures: Endothelium, obturator, hypostase, caruncle and aril (permanent slides/specimens/photographs).

4. Female gametophyte through permanent slides/ photographs: Types, ultrastructure of mature egg apparatus.
5. Intra-ovarian pollination; Test tube pollination through photographs.
6. Endosperm: Dissections of developing seeds for endosperm with free-nuclear haustoria.
7. Embryogenesis: Study of development of dicot embryo through permanent slides; dissection of developing seeds for embryos at various developmental stages; Study of suspensor through electron micrographs.

Suggested Readings:

1. Bhojwani, S.S. and Bhatnagar, S.P. (2011). The Embryology of Angiosperms, Vikas Publishing House. Delhi. 5th edition.
2. Shivanna, K.R. (2003). Pollen Biology and Biotechnology. Oxford and IBH Publishing Co. Pvt. Ltd. Delhi.
3. Raghavan, V. (2000). Developmental Biology of Flowering plants, Springer, Netherlands.
4. Johri, B.M. I (1984). Embryology of Angiosperms, Springer-Verlag, Netherlands.

C-12: PLANT PHYSIOLOGY

(Credits-6: Theory-4, Practical-2)-Max. Marks: 100
THEORY (Each class 1 hr.): Marks-70 PRACTICAL
(Each class 2 hrs.): Marks-30 Lectures: 60 (40
Theory + 20 Practical classes)

Unit-I

Plant water relationship: Water Potential and its components, water absorption by roots, aquaporins, pathway of water movement, symplast, apoplast, transmembrane pathways, root pressure, guttation. Ascent of sap cohesion-tension theory. Transpiration and factors affecting transpiration, antitranspirants, mechanism of stomatal movement. (6 lectures)

Translocation in the phloem: Experimental evidence in support of phloem as the site of sugar translocation. Pressure Flow Model; Phloem loading and unloading; Source-sink relationship. (5 lectures)

Unit-II

Mineral nutrition: Essential and beneficial elements, macro and micronutrients, methods of study and use of nutrient solutions, criteria for essentiality, mineral deficiency symptoms, roles of essential elements, chelating agents. (5 lectures)

Unit-III

Nutrient Uptake: Soil as a nutrient reservoir, transport of ions across cell membrane, passive absorption, electrochemical gradient, facilitated diffusion, active absorption, role of ATP, carrier systems, proton ATPase pump and ion flux, uniport, co-transport, symport, antiport. (5 lectures)

Unit-IV

Plant growth regulators: Discovery, chemical nature (basic structure), bioassay and physiological roles of Auxin, Gibberellins, Cytokinin, Abscisic acid, Ethylene, Brassinosteroids and Jasmonic acid. (10 lectures)

Unit-V

Physiology of flowering: Photoperiodism, flowering stimulus, florigen concept, vernalization, seed dormancy. (4 lectures)

Phytochrome: Discovery, chemical nature, role of phytochrome in photomorphogenesis, low energy responses (LER) and high irradiance responses (HIR), mode of action. (5 lectures)

PRACTICAL

1. Determination of osmotic potential of plant cell sap by plasmolytic method.
2. Determination of water potential of given tissue (potato tuber) by weight method.
3. Study of the effect of wind velocity and light on the rate of transpiration in excised twig/leaf.
4. Calculation of stomatal index and stomatal frequency from the two surfaces of leaves of a mesophyte and xerophyte.
5. To calculate the area of an open stoma and percentage of leaf area open through stomata in a mesophyte and xerophyte (both surfaces).
6. To study the phenomenon of seed germination (effect of light).
7. To study the induction of amylase activity in germinating barley grains.

Demonstration experiments:

(a) To demonstrate suction due to transpiration. (b) Fruit ripening/Rooting from cuttings (Demonstration). (c) Bolting experiment/Avena coleoptile bioassay (demonstration).

Suggested Readings:

1. Hopkins, W.G. and Huner, A. (2008). Introduction to Plant Physiology. John Wiley and Sons. U.S.A. 4th edition.
2. Taiz, L., Zeiger, E., Mller, I.M. and Murphy, A (2015). Plant Physiology and Development. Sinauer Associates Inc. USA. 6th edition.
3. Bajracharya D. (1999). Experiments in Plant Physiology-A Laboratory Manual. Narosa Publishing House, New Delhi.

SEMESTER-VI

C-13: PLANT METABOLISM

(Credits-6: Theory-4, Practical-2)-Max. Marks: 100
THEORY (Each class 1 hr.): Marks-70 PRACTICAL
(Each class 2 hrs.): Marks-30 Lectures: 60 (40
Theory + 20 Practical classes)

Unit-I

Concept of metabolism: Introduction, anabolic and catabolic pathways, regulation of metabolism, role of regulatory enzymes (allosteric, covalent modulation and Isozymes). (5 lectures) Carbohydrate metabolism: Synthesis and catabolism of sucrose and starch. (1 lectures)

Unit-II

Carbon assimilation: Historical background, photosynthetic pigments, role of photosynthetic pigments (chlorophylls and accessory pigments), antenna molecules and reaction centres, photochemical reactions, photosynthetic electron transport, PSI, PSII, Q cycle, CO_2 reduction, photorespiration, C4 pathways; Crassulacean acid metabolism; Factors affecting CO_2 reduction. (10 lectures)

Unit-III

Carbon Oxidation: Glycolysis, fate of pyruvate, regulation of glycolysis, oxidative pentose phosphate pathway, oxidative decarboxylation of pyruvate, regulation of PDH, NADH shuttle; TCA cycle, amphibolic role, anaplerotic reactions, regulation of the cycle, mitochondrial electron transport, oxidative phosphorylation, cyanide resistant respiration, factors affecting respiration. (6 lectures)

ATP-Synthesis: Mechanism of ATP synthesis, substrate level phosphorylation, chemiosmotic mechanism (oxidative and photophosphorylation), ATP synthase, Boyers conformational model, Racker's experiment, Jagendorf's experiment; role of uncouplers. (4 lectures)

Unit-IV

Lipid metabolism: Synthesis and breakdown of triglycerides, β -oxidation, glyoxylate cycle, gluconeogenesis and its role in mobilisation of lipids during seed germination, α oxidation. (5 lectures)

Unit-V

Nitrogen metabolism: Nitrate assimilation, biological nitrogen fixation (examples of legumes and non-legumes); Physiology and biochemistry of nitrogen fixation; Ammonia assimilation and transamination. (5 lectures)

Mechanisms of signal transduction: Calcium, phospholipids, cGMP, NO. (4 lectures)

PRACTICAL

1. Chemical separation of photosynthetic pigments.
2. Experimental demonstration of Hill's reaction.
3. To study the effect of light intensity on the rate of photosynthesis.
4. Effect of carbon dioxide on the rate of photosynthesis.
5. To compare the rate of respiration in different parts of a plant.
6. To demonstrate activity of Nitrate Reductase in germinating leaves of different plant sources.
7. To study the activity of lipases in germinating oilseeds and demonstrate mobilization of lipids during germination.
8. Demonstration of fluorescence by isolated chlorophyll pigments.
9. Demonstration of absorption spectrum of photosynthetic pigments.

Suggested Readings:

1. Hopkins, W.G. and Huner, A. (2008). Introduction to Plant Physiology. John Wiley and Sons. U.S.A. 4th edition.
2. Taiz, L., Zeiger, E., Miller, I.M. and Murphy, A (2015). Plant Physiology and Development. Sinauer Associates Inc. USA. 6th edition.
3. Harborne, J.B. (1973). Phytochemical Methods. John Wiley & Sons. New York.

C-14: PLANT BIO-TECHNOLOGY

(Credits-6: Theory-4, Practical-2)-Max. Marks: 100

THEORY (Each class 1 hr.): Marks-70 PRACTICAL

(Each class 2 hrs.): Marks-30 Lectures: 60 (40

Theory + 20 Practical classes)

Unit-I

Plant Tissue Culture: Historical perspective; Aseptic tissue culture techniques, Composition of media; Nutrient and hormone requirements (role of vitamins and hormones). (3 lectures)

Unit-II

Totipotency; Organogenesis; Embryogenesis (somatic and zygotic); Protoplast isolation, culture and fusion; Tissue culture applications (micropropagation, androgenesis, virus elimination, secondary metabolite production, haploids, triploids and hybrids; Cryopreservation; Germplasm Conservation). (7 lectures)

Unit-III

Recombinant DNA technology-I: Restriction Endonucleases (History, Types I-IV, biological role and application); Restriction Mapping (Linear and Circular); Cloning Vectors: Prokaryotic (pUC 18 and pUC19, pBR322, Ti plasmid, BAC); Lambda phage, M13 phagemid, Cosmid, Shuttle vector; Eukaryotic Vectors (YAC and briefly PAC, MAC, HAC). Gene Cloning (Recombinant DNA, Bacterial Transformation and selection of recombinant clones, PCR-mediated gene cloning). (10 lectures) **Unit-IV**

Recombinant DNA technology-II: Gene Construct; construction of genomic and cDNA libraries, screening DNA libraries to obtain gene of interest by genetic selection; complementation, colony hybridization; Probes-oligonucleotide, heterologous, PCR; Methods of gene transfer-Agrobacterium-mediated, Direct gene transfer by Electroporation, Microinjection, Microprojectile bombardment; Selection of transgenics selectable marker and reporter genes (Luciferase, GUS, GFP). (10 lectures)

Unit-V

Applications of Biotechnology: Pest resistant (Bt-cotton); herbicide resistant plants (RoundUp Ready soybean); Transgenic crops with improved quality traits (Flavr Savr tomato, Golden rice); Improved horticultural varieties (Moondust carnations); Role of transgenics in bioremediation (Su- perbug); edible vaccines; Industrial enzymes (Aspergillase, Protease, Lipase); Genetically Engineered Products Human Growth Hormone; Humulin; Biosafety concerns. (10 lectures)

PRACTICAL

1. (a) Preparation of MS medium.
(b) Demonstration of in vitro sterilization and inoculation methods using leaf and nodal explants of tobacco, Datura, Brassica etc.
2. Study of anther, embryo and endosperm culture, micropropagation, somatic embryogenesis & artificial seeds through photographs.
3. Isolation of protoplasts.
4. Construction of restriction map of circular and linear DNA from the data provided.

5. Study of methods of gene transfer through photographs: Agrobacterium-mediated, direct gene transfer by electroporation, microinjection, microprojectile bombardment.
6. Study of steps of genetic engineering for production of Bt cotton, Golden rice, Flavr Savr tomato through photographs.
7. Isolation of plasmid DNA.
8. Restriction digestion and gel electrophoresis of plasmid DNA.

Suggested Readings:

1. Bhojwani, S.S. and Razdan, M.K., (1996). Plant Tissue Culture: Theory and Practice. Elsevier Science Amsterdam. The Netherlands.
2. Glick, B.R., Pasternak, J.J. (2003). Molecular Biotechnology- Principles and Applications of recombinant DNA. ASM Press, Washington.
3. Bhojwani, S.S. and Bhatnagar, S.P. (2011). The Embryology of Angiosperms. Vikas Publication House Pvt. Ltd., New Delhi. 5th edition.
4. Snustad, D.P. and Simmons, M.J. (2010). Principles of Genetics. John Wiley and Sons, U.K. 5th edition.
5. Stewart, C.N. Jr. (2008). Plant Biotechnology & Genetics: Principles, Techniques and Applications. John Wiley & Sons Inc. U.S.A.
6. Chawla, H.S. (2010). Introduction to Plant Biotechnology. Oxford & IBH Publishing Co. Pvt. Ltd., New Delhi.
7. Singh, B. D. (2010) Biotechnology: Expanding Horizon. Kalyani Publishers. New Delhi.

DISCIPLINE SPECIFIC ELECTIVE COURSES

DSE-1A: ANALYTICAL TECHNIQUES IN PLANT SCIENCES

(Credits-6: Theory-4, Practical-2)-Max. Marks: 100

THEORY (Each class 1 hr.): Marks-70 PRACTICAL

(Each class 2 hrs.): Marks-30 Lectures: 60 (40

Theory + 20 Practical classes)

UNIT-I: Imaging and related techniques: Principles of microscopy; Light microscopy; Fluorescence microscopy; Confocal microscopy; Use of fluorochromes: (a) Flow cytometry (FACS); (b) Applications of fluorescence microscopy: Chromosome banding, FISH, chromosome painting; Transmission and Scanning electron microscopy sample preparation for electron microscopy, cryofixation, negative staining, shadow casting, freeze fracture, freeze etching. (10 lectures)

UNIT-II: Cell fractionation: Centrifugation: Differential and density gradient centrifugation, sucrose density gradient, CsCl₂ gradient, analytical centrifugation, ultracentrifugation, marker enzymes. (5 lectures)

UNIT-III: Radioisotopes: Use in biological research, auto-radiography, pulse chase experiment. (3 lectures)

Spectrophotometry: Principle and its application in biological research. 3 lectures Chromatography: Principle; Paper chromatography; Column chromatography, TLC, GLC, HPLC, Ion-exchange chromatography; Molecular sieve chromatography; Affinity chromatography. (6 lectures)

UNIT-IV: Characterization of proteins and nucleic acids: Mass spectrometry; X-ray diffraction; X-ray crystallography; Characterization of proteins and nucleic acids; Electrophoresis: AGE, PAGE, SDS-PAGE (5 lectures)

UNIT-V: Biostatistics: Statistics, data, population, samples, parameters; Representation of Data: Tabular, Graphical; Measures of central tendency: Arithmetic mean, mode, median; Measures of dispersion: Range, mean deviation, variation, standard deviation; Chi-square test for goodness of fit. (8 lectures)

PRACTICAL

1. Study of Blotting techniques: Southern, Northern and Western, DNA fingerprinting, DNA sequencing, PCR through photographs.
2. Demonstration of ELISA.
3. To separate nitrogenous bases by paper chromatography.
4. To separate sugars by thin layer chromatography.
5. Isolation of chloroplasts by differential centrifugation.
6. To separate chloroplast pigments by column chromatography.
7. To estimate protein concentration through Lowry's methods.

8. To separate proteins using PAGE.
9. To separation DNA (marker) using AGE.
10. Study of different microscopic techniques using photographs/micrographs (freeze fracture, freeze etching, negative staining, positive staining, fluorescence and FISH).
11. Preparation of permanent slides (double staining).
12. Estimation of plant pigments.

Suggested Readings:

1. Plummer, D.T. (1996). An Introduction to Practical Biochemistry. Tata McGraw-Hill Publishing Co. Ltd. New Delhi. 3rd edition.
2. Ruzin, S.E. (1999). Plant Microtechnique and Microscopy, Oxford University Press, New York. U.S.A.
3. Ausubel, F., Brent, R., Kingston, R. E., Moore, D.D., Seidman, J.G., Smith, J.A., Struhl, K. (1995). Short Protocols in Molecular Biology. John Wiley & Sons. 3rd edition.
4. Zar, J.H. (2012). Biostatistical Analysis. Pearson Publication. U.S.A. 4th ed

DSE-1B: BIO-INFORMATICS

(Credits-6: Theory-4, Practical-2)-Max. Marks: 100

THEORY (Each class 1 hr.): Marks-70 PRACTICAL

(Each class 2 hrs.): Marks-30 Lectures: 60 (40

Theory + 20 Practical classes)

UNIT-I: Introduction to Bioinformatics: Introduction, Branches of Bioinformatics, Aim, Scope and Research areas of Bioinformatics. (3 Lectures)

Databases in Bioinformatics: Introduction, Biological Databases, Classification format of Biological Databases, Biological Database Retrieval System. (4 Lectures)

UNIT-II: Biological Sequence Databases: National Center for Biotechnology Information (NCBI): Tools and Databases of NCBI, Database Retrieval Tool, Sequence Submission to NCBI, Basic local alignment search tool (BLAST), Nucleotide Database, Protein Database, Gene Expression Database. EMBL Nucleotide Sequence Database (EMBL-Bank): Introduction, Sequence Retrieval, Sequence Submission to EMBL, Sequence analysis tools. DNA Data Bank of Japan (DDBJ): Introduction, Resources at DDBJ, Data Submission at DDBJ. Protein Information Resource (PIR): About PIR, Resources of PIR, Databases of PIR, Data Retrieval in PIR. Swiss-Prot: Introduction and Salient Features. (15 Lectures)

UNIT-III: Sequence Alignments: Introduction, Concept of Alignment, Multiple Sequence Alignment (MSA), MSA by CLUSTALW, Scoring Matrices, Percent Accepted Mutation (PAM), Blocks of Amino Acid Substitution Matrix (BLOSUM). (8 Lectures)

UNIT-IV: Molecular Phylogeny: Methods of Phylogeny, Software for Phylogenetic Analyses, Consistency of Molecular Phylogenetic Prediction. (5 Lectures)

UNIT-V: Applications of Bioinformatics: Structural Bioinformatics in Drug Discovery, Quantitative structure-activity relationship (QSAR) techniques in Drug Design, Microbial genome applications, Crop improvement. (5 Lectures)

PRACTICAL

1. Nucleic acid and protein databases.
2. Sequence retrieval from databases.

3. Sequence alignment.
4. Sequence homology and Gene annotation.
5. Construction of phylogenetic tree.

Suggested Readings:

1. Ghosh Z. and Bibekanand M. (2008) Bioinformatics: Principles and Applications. Oxford University Press.
2. Pevsner J. (2009) Bioinformatics and Functional Genomics. II Edition. Wiley-Blackwell.
3. Campbell A. M., Heyer L. J. (2006) Discovering Genomics, Proteomics and Bioinformatics-II Edition. Benjamin Cummings.

DSE-2A: PLANT BREEDING

(Credits-6: Theory-4, Practical-2)-Max. Marks: 100
 THEORY (Each class 1 hr.): Marks-70 PRACTICAL
 (Each class 2 hrs.): Marks-30 Lectures: 60 (40
 Theory + 20 Practical classes)

UNIT-I: Plant Breeding: Introduction and objectives. Breeding systems: modes of reproduction in crop plants. Important achievements and undesirable consequences of plant breeding. (6 lectures)

UNIT-II; Methods of crop improvement: Introduction: Centres of origin and domestication of crop plants, plant genetic resources; Acclimatization; Selection methods: For self pollinated, cross pollinated and vegetatively propagated plants; Hybridization: For self, cross and vegetatively propagated plants Procedure, advantages and limitations. (15 lectures)

UNIT-III: Quantitative inheritance: Concept, mechanism, examples of inheritance of Kernel colour in wheat, Skin colour in human beings. Monogenic vs polygenic Inheritance. (6 lectures)

UNIT-IV: Inbreeding depression and heterosis: History, genetic basis of inbreeding depression and heterosis; Applications. (6 lectures)

UNIT-V: Crop improvement and breeding: Role of mutations; Polyploidy; Distant hybridization and role of biotechnology in crop improvement. (7 lectures)

PRACTICAL

Practical related to theory.

Suggested Readings:

1. Singh, B.D. (2005). Plant Breeding: Principles and Methods. Kalyani Publishers. 7th edition.
2. Chaudhari, H.K. (1984). Elementary Principles of Plant Breeding. Oxford IBH. 2nd edition.
3. Acquaah, G. (2007). Principles of Plant Genetics & Breeding. Blackwell Publishers.

DSE-2B: NATURAL RESOURCE MANAGEMENT

(Credits-6: Theory-4, Practical-2)-Max. Marks: 100
 THEORY (Each class 1 hr.): Marks-70 PRACTICAL
 (Each class 2 hrs.): Marks-30 Lectures: 60 (40
 Theory + 20 Practical classes)

UNIT-I: Natural resources: Definition and types. 2 lectures Sustainable utilization: Concept, approaches (economic, ecological and socio-cultural). (5 lectures)

UNIT-II: Land: Utilization (agricultural, pastoral, horticultural, silvicultural); Soil degradation and management. (5 lectures)

Water: Fresh water (rivers, lakes, groundwater, aquifers, watershed); Marine; Estuarine; Wetlands; Threats and management strategies. (4 lectures)

UNIT-III: Biological Resources: Biodiversity-definition and types; Significance; Threats; Management strategies; Bioprospecting; IPR; CBD; National Biodiversity Action Plan). (8 lectures) Forests: Definition, Cover and its significance (with special reference to India); Major and minor forest products; Depletion; Management. (4 lectures)

UNIT-IV: Energy: Renewable and non-renewable sources of energy 4 lectures Contemporary practices in resource management: EIA, GIS, Participatory Resource Appraisal, Ecological Footprint with emphasis on carbon footprint. (6 lectures)

UNIT-V: Resource Accounting; Waste management. National and international efforts in resource management and conservation (4 lectures)

PRACTICAL

1. Estimation of solid waste generated by a domestic system (biodegradable and nonbiodegradable) and its impact on land degradation.
2. Collection of data on forest cover of specific area.
3. Measurement of dominance of woody species by DBH (diameter at breast height) method.
4. Calculation and analysis of ecological footprint.
5. Ecological modeling.

Suggested Readings:

1. Vasudevan, N. (2006). Essentials of Environmental Science. Narosa Publishing House, New Delhi.
2. Singh, J. S., Singh, S.P. and Gupta, S. (2006). Ecology, Environment and Resource Conservation. Anamaya Publications, New Delhi.
3. Rogers, P.P., Jalal, K.F. and Boyd, J.A. (2008). An Introduction to Sustainable Development. Prentice Hall of India Private Limited, New Delhi.

DSE-2C: BIO-STATISTICS

(Credits-6: Theory-4, Practical-2)-Max. Marks: 100

THEORY (Each class 1 hr.): Marks-70 PRACTICAL

(Each class 2 hrs.): Marks-30 Lectures: 60 (40

Theory + 20 Practical classes)

UNIT-I: Biostatistics - definition - statistical methods - basic principles. Variables - measurements, functions, limitations and uses of statistics. (8 lectures)

Unit-II: Collection of data primary and secondary - types and methods of data collection procedures - merits and demerits. Classification - tabulation and presentation of data sampling methods. (8 lectures)

Unit-III: Measures of central tendency - mean, median, mode, geometric mean - merits & demerits. Measures of dispersion - range, standard deviation, mean deviation, quartile deviation - merits and demerits; Co-efficient of variations. (10 lectures)

Unit-IV: Correlation - types and methods of correlation, regression, simple regression equation, fitting prediction, similarities and dissimilarities of correlation and regression. (8 lectures)

Unit-V: Statistical inference - hypothesis - simple hypothesis - student 't' test - chi square test. (6 lectures)

PRACTICAL

1. Calculation of mean, standard deviation and standard error
2. Calculation of correlation coefficient values and finding out the probability
3. Calculation of F value and finding out the probability value for the Fvalue.

Suggested Readings:

1. Biostatistic, Danniell, W.W., 1987. New York, John Wiley Sons.
2. An introduction to Biostatistics, 3rd edition, Sundarrao, P.S.S and Richards, J. Christian Medical College, Vellore
3. Statistical Analysis of epidemiological data, Selvin, S., 1991. New York University Press.
4. Statistics for Biology, Boston, Bishop, O.N. Houghton, Mifflin.
5. The Principles of scientific research, Freedman, P. New York, Pergamon Press.
6. Statistics for Biologists, Campbell, R.C., 1998. Cambridge University Press.

DSE-3A: STRESS BIOLOGY

(Credits-6: Theory-4, Practical-2)-Max. Marks: 100
THEORY (Each class 1 hr.): Marks-70 PRACTICAL
(Each class 2 hrs.): Marks-30 Lectures: 60 (40
Theory + 20 Practical classes)

UNIT-I: Defining plant stress: Acclimation and adaptation. (2 lectures)

UNIT-II: Environmental factors: Water stress; Salinity stress, High light stress; Temperature stress; Hypersensitive reaction; Pathogenesis related (PR) proteins; Systemic acquired resistance; Mediation of insect and disease resistance by jasmonates. (12 lectures)

UNIT-III: Stress sensing mechanisms in plants: Role of nitric oxide. Calcium modulation, Phospholipid signaling (12 lectures)

UNIT-IV: Developmental and physiological mechanisms that protect plants against environmental stress: Adaptation in plants; Changes in root: shoot ratio; Aerenchyna development; Osmotic adjustment; Compatible solute production. (10 lectures)

UNIT-V: Reactive oxygen species Production and scavenging mechanisms. (4 lectures)

PRACTICAL

1. Quantitative estimation of peroxidase activity in the seedlings in the absence and presence of salt stress.
2. Superoxide activity in seedlings in the absence and presence of salt stress.
3. Assay of Ascorbate
4. Assay of peroxidase.

5. Assay of superoxide dismutase activity.
6. Quantitative estimation and analysis of catalase.

Suggested Readings:

1. Hopkins, W.G. and Huner, A. (2008). Introduction to Plant Physiology. John Wiley and Sons. U.S.A. 4th edition.
2. Taiz, L., Zeiger, E., Miller, I.M. and Murphy, A (2015). Plant Physiology and Development. Sinauer Associates Inc. USA. 6th edition.

DSE-3B: HORTICULTURAL PRACTICES & POST-HARVEST TECHNOLOGY

(Credits-6: Theory-4, Practical-2)-Max. Marks: 100

THEORY (Each class 1 hr.): Marks-70 PRACTICAL

(Each class 2 hrs.): Marks-30 Lectures: 60 (40

Theory + 20 Practical classes)

UNIT-I: Introduction: Scope and importance, Branches of horticulture; Role in rural economy and employment generation; Importance in food and nutritional security; Urban horticulture and ecotourism. (2 lectures)

Ornamental plants: Types, classification (annuals, perennials, climbers and trees); Identification and salient features of some ornamental plants [rose, marigold, gladiolus, carnations, orchids, poppies, gerberas, tuberose, sages, cacti and succulents (opuntia, agave and spurges)] Ornamental flowering trees (Indian laburnum, gulmohar, Jacaranda, Lagerstroemia, fishtail and areca palms, semul, Coral tree). (3 lectures)

UNIT-II: Fruit and vegetable crops: Production, origin and distribution; Description of plants and their economic products; Management and marketing of vegetable and fruit crops; Identification of some fruits and vegetable varieties (citrus, banana, mango, chillies and cucurbits). (4 lectures) Horticultural techniques: Application of manure, fertilizers, nutrients and PGRs; Weed control; Biofertilizers, biopesticides; Irrigation methods (drip irrigation, surface irrigation, furrow and border irrigation); Hydroponics; Propagation Methods: asexual (grafting, cutting, layering, budding), sexual (seed propagation), Scope and limitations. (6 lectures)

UNIT-III: Landscaping and garden design : Planning and layout (parks and avenues); gardening traditions - Ancient Indian, European, Mughal and Japanese Gardens; Urban forestry; policies and practices. (4 lectures)

Floriculture: Cut flowers, bonsai, commerce (market demand and supply); Importance of flower shows and exhibitions. (4 lectures)

UNIT-IV: Post-harvest technology: Importance of post harvest technology in horticultural crops; Evaluation of quality traits; Harvesting and handling of fruits, vegetables and cut flowers; Principles, methods of preservation and processing; Methods of minimizing losses during storage and transportation; Food irradiation - advantages and disadvantages; food safety. (6 lectures)

Disease control and management : Field and post-harvest diseases; Identification of deficiency symptoms; remedial measures and nutritional management practices; Crop sanitation; IPM strategies (genetic, biological and chemical methods for pest control); Quarantine practices; Identification of common diseases and pests of ornamentals, fruits and vegetable crops. (5 lectures)

UNIT-V: Horticultural crops - conservation and management: Documentation and conservation of germplasm; Role of micropropagation and tissue culture techniques; Varieties and cultivars of various horticultural crops; IPR issues; National, international and professional societies and sources of information on horticulture. (6 lectures)

Field Trip: Field visits to gardens, standing crop sites, nurseries, vegetable gardens and horticultural fields at IARI or other suitable locations.

PRACTICAL

Practical related to theory.

Suggested Readings:

1. Singh, D. & Manivannan, S. (2009). Genetic Resources of Horticultural Crops. Ridhi International, Delhi, India.
2. Swaminathan, M.S. and Kochhar, S.L. (2007). Groves of Beauty and Plenty: An Atlas of Major Flowering Trees in India. Macmillan Publishers, India.
3. NIIR Board (2005). Cultivation of Fruits, Vegetables and Floriculture. National Institute of Industrial Research Board, Delhi.
4. Kader, A.A. (2002). Post-Harvest Technology of Horticultural Crops. UCANR Publications, USA.
5. Capon, B. (2010). Botany for Gardeners. 3rd Edition. Timber Press, Portland, Oregon.

DSE-3C: RESEARCH METHODOLOGY

(Credits-6: Theory-4, Practical-2)-Max. Marks: 100

THEORY (Each class 1 hr.): Marks-70 PRACTICAL

(Each class 2 hrs.): Marks-30 Lectures: 60 (40

Theory + 20 Practical classes)

UNIT-I: Basic concepts of research :Research-definition and types of research (Descriptive vs analytical; applied vs fundamental; quantitative vs qualitative; conceptual vs empirical).Research methods vs methodology.Literature-review and its consolidation; Library research; field research; laboratory research. (6 lectures) General laboratory practices: Common calculations in botany laboratories. Understanding the details on the label of reagent bottles. Molarity and normality of common acids and bases.Preparation of solutions. Dilutions. Percentage solutions. Molar, molal and normal solutions.Technique of handling micropipettes; Knowledge about common toxic chemicals and safety measures in their handling. (8 lectures)

UNIT-II: Data collection and documentation of observations: Maintaining a laboratory record; Tabulation and generation of graphs. Imaging of tissuespecimens and application of scale bars. The art of field photography. (4 lectures)

Overview of Biological Problems : History; Key biology research areas, Model organisms in biology (A Brief overview): Genetics, Physiology, Biochemistry, Molecular Biology, Cell Biology,Genomics, Proteomics- Transcriptional regulatory network. (4 lectures)

UNIT-III: Methods to study plant cell/tissue structure: Whole mounts, peel mounts, squash preparations, clearing, maceration and sectioning; Tissue preparation: living vs fixed, physical vs chemical fixation, coagulating fixatives, noncoagulant fixatives; tissue dehydration using graded solvent series; Paraffin and plastic infiltration; Preparation of thin and ultrathin sections. (4 lectures)

UNIT-IV: Plant microtechniques : Staining procedures, classification and chemistry of stains. Staining equipment. Reactive dyes and fluorochromes (including genetically engineered protein labeling with GFP and other tags). Cytogenetic techniques with squashed plant materials. (8 lectures)

UNIT-V: The art of scientific writing and its presentation : Numbers, units, abbreviations and nomenclature used in scientific writing. Writing references. Power point presentation. Poster pre-

sentation. Scientific writing and ethics, Introduction to copyright-academic misconduct/plagiarism. (6 lectures)

PRACTICAL

1. Experiments based on chemical calculations.
2. Plant microtechnique experiments.
3. The art of imaging of samples through microphotography and field photography.
4. Poster presentation on defined topics.
5. Technical writing on topics assigned.

Suggested Readings:

1. Dawson, C. (2002). Practical research methods. UBS Publishers, New Delhi.
2. Stapleton, P., Yondeowei, A., Mukanyange, J., Houten, H. (1995). Scientific writing for agricultural research scientists a training reference manual. West Africa Rice Development Association, Hong Kong.
3. Ruzin, S.E. (1999). Plant microtechnique and microscopy. Oxford University Press, New York, U.S.

DSE-3D: INDUSTRIAL & ENVIRONMENTAL MICROBIOLOGY

(Credits-6: Theory-4, Practical-2)-Max. Marks: 100

THEORY (Each class 1 hr.): Marks-70 PRACTICAL

(Each class 2 hrs.): Marks-30 Lectures: 60 (40

Theory + 20 Practical classes)

UNIT-I: Scope of microbes in industry and environment: (2 lectures)

Bioreactors/Fermenters and fermentation processes: Solid-state and liquid-state (stationary and submerged) fermentations; Batch and continuous fermentations. Components of a typical bioreactor, Types of bioreactors laboratory, pilot scale and production fermenters; Constantly stirred tank fermenter, tower fermenter, fixed bed and fluidized bed bioreactors and airlift fermenter. A visit to any educational institute/ industry to see an industrial fermenter, and other downstream processing operations. (8 lectures)

UNIT-II: Microbial production of industrial products: Microorganisms involved, media, fermentation conditions, downstream processing and uses; Filtration, centrifugation, cell disruption, solvent extraction, precipitation and ultrafiltration, lyophilization, spray drying; Hands on microbial fermentations for the production and estimation (qualitative and quantitative) of Enzyme: amylase or lipase activity, Organic acid (citric acid or glutamic acid), alcohol (Ethanol) and antibiotic (Penicillin) (8 lectures)

Microbial enzymes of industrial interest and enzyme immobilization: Microorganisms for industrial applications and hands on screening microorganisms for casein hydrolysis; starch hydrolysis; cellulose hydrolysis. Methods of immobilization, advantages and applications of immobilization, large scale applications of immobilized enzymes (glucose isomerase and penicillin acylase). (6 lectures)

UNIT-III: Microbes and quality of environment: Distribution of microbes in air; Isolation of microorganisms from soil, air and water. (4 lectures)

UNIT-IV: Microbial flora of water: Water pollution, role of microbes in sewage and domestic waste

water treatment systems. Determination of BOD, COD, TDS and TOC of water samples; Microorganisms as indicators of water quality, check coliform and fecal coliform in water samples. (6 lectures)

UNIT-V: Microbes in agriculture and remediation of contaminated soils: Biological fixation; Mycorrhizae; Bioremediation of contaminated soils. Isolation of root nodulating bacteria, arbuscular mycorrhizal colonization in plant roots. (6 lectures)

PRACTICAL

1. Principles and functioning of instruments in microbiology laboratory
2. Hands on sterilization techniques and preparation of culture media.

Suggested Readings:

1. Pelzar, M.J. Jr., Chen E.C. S., Krieg, N.R. (2010). Microbiology: An application based approach. Tata McGraw Hill Education Pvt. Ltd., Delhi.
2. Tortora, G.J., Funke, B.R., Case. C.L. (2007). Microbiology. Pearson Benjamin Cummings, San Francisco, U.S.A. 9th edition.

GENERIC ELECTIVE COURSES

GE-1A: BIODIVERSITY

(Credits-6: Theory-4, Practical-2)-Max. Marks: 100
THEORY (Each class 1 hr.): Marks-70 PRACTICAL
(Each class 2 hrs.): Marks-30 Lectures: 60 (40
Theory + 20 Practical classes)

UNIT-I: Microbes : Viruses Discovery, general structure, replication (general account), DNA virus (T-phage); Lytic and lysogenic cycle, RNA virus (TMV); **Economic importance**; Bacteria Discovery, General characteristics and cell structure; Reproduction vegetative, asexual and recombination (conjugation, transformation and transduction); **Economic importance**. (8 lectures)

UNIT-II: Algae: General characteristics; Ecology and distribution; Range of thallus organization and reproduction; Classification of algae; Morphology and lifecycles of the following: *Nostoc*, *Chlamydomonas*, *Oedogonium*, *Vaucheria*, *Fucus*, *Polysiphonia*. **Economic importance of algae**. (10 lectures)

Fungi : Introduction- General characteristics, **ecology and significance**, range of thallus organization, cell wall composition, nutrition, reproduction and classification; True Fungi- General characteristics, **ecology and significance**, life cycle of *Rhizopus* (Zygomycota) *Penicillium*, *Alternaria* (Ascomycota), *Puccinia*, *Agaricus* (Basidiomycota); Symbiotic Associations-**Lichens**: (6 lectures)

UNIT-III: Introduction to Archegoniate : Unifying features of archegoniates, Transition to land habit, Alternation of generations. (2 lectures)

Bryophytes : General characteristics, adaptations to land habit, Classification, Range of thallus organization. Classification (up to family), morphology, anatomy and reproduction of *Marchantia* and *Funaria*. (Developmental details not to be included). **Ecology and economic importance of bryophytes with special mention of Sphagnum**. (6 lectures)

UNIT-IV: Pteridophytes : General characteristics, classification, Early land plants (*Cooksonia* and

Rhynia). Classification (up to family), morphology, anatomy and reproduction of Selaginella, Equisetum and Pteris. (Developmental details not to be included). Heterospory and seed habit, stellar evolution. **Ecological and economical importance of Pteridophytes**. (5 lectures)

UNIT-V: Gymnosperms: General characteristics, classification. Classification (up to family), morphology, anatomy and reproduction of Cycas and Pinus. (Developmental details not to be included). **Ecological and economical importance**. (6 lectures)

PRACTICAL

1. EMs/Models of viruses T-Phage and TMV, Line drawing/Photograph of Lytic and Lysogenic Cycle.
2. Types of Bacteria from temporary/permanent slides/photographs; EM bacterium; Binary Fission; Conjugation; Structure of root nodule.
3. Gram staining.
4. Study of vegetative and reproductive structures of Nostoc, Chlamydomonas (electron micrographs), Oedogonium, Vaucheria, Fucus* and Polysiphonia through temporary preparations and permanent slides. (*: Fucus - Specimen and permanent slides)
5. Rhizopus and Penicillium: Asexual stage from temporary mounts and sexual structures through permanent slides.
6. Alternaria: Specimens/photographs and tease mounts.
7. Puccinia: Herbarium specimens of Black Stem Rust of Wheat and infected Barberry leaves; section/tease mounts of spores on Wheat and permanent slides of both the hosts.
8. Agaricus: Specimens of button stage and full grown mushroom; Sectioning of gills of Agaricus.
9. Lichens: Study of growth forms of lichens (crustose, foliose and fruticose)
10. Mycorrhiza: ecto mycorrhiza and endo mycorrhiza (Photographs)
11. Marchantia- morphology of thallus, w.m. rhizoids and scales, v.s. thallus through gemma cup, w.m. gemmae (all temporary slides), v.s. antheridiophore, archegoniophore, l.s. sporophyte (all permanent slides).
12. Funaria- morphology, w.m. leaf, rhizoids, operculum, peristome, annulus, spores (temporary slides); permanent slides showing antheridial and archegonial heads, l.s. capsule and protonema.
13. Selaginella- morphology, w.m. leaf with ligule, t.s. stem, w.m. strobilus, w.m. microsporophyll and megasporophyll (temporary slides), l.s. strobilus (permanent slide).
14. Equisetum- morphology, t.s. internode, l.s. strobilus, t.s. strobilus, w.m. sporangiophore, w.m. spores (wet and dry) (temporary slides); t.s. rhizome (permanent slide).
15. Pteris- morphology, t.s. rachis, v.s. sporophyll, w.m. sporangium, w.m. spores (temporary slides), t.s. rhizome, w.m. prothallus with sex organs and young sporophyte (permanent slide).
16. Cycas- morphology (coralloid roots, bulbil, leaf), t.s. coralloid root, t.s. rachis, v.s. leaflet, v.s. microsporophyll, w.m. spores (temporary slides), l.s. ovule, t.s. root (permanent slide).
17. Pinus- morphology (long and dwarf shoots, w.m. dwarf shoot, male and female), w.m. dwarf

shoot, t.s. needle, t.s. stem, , l.s./t.s. male cone, w.m. microsporophyll, w.m. microspores (temporary slides), l.s. female cone, t.l.s. & r.l.s. stem (permanent slide).

Suggested Readings:

1. Kumar, H.D. (1999). Introductory Phycology. Affiliated East-West. Press Pvt. Ltd. Delhi. 2nd edition.
2. Tortora, G.J., Funke, B.R., Case, C.L. (2010). Microbiology: An Introduction, Pearson Benjamin Cummings, U.S.A. 10th edition.
3. . Sethi, I.K. and Walia, S.K. (2011). Text book of Fungi & Their Allies, MacMillan Publishers Pvt. Ltd., Delhi.
4. Alexopoulos, C.J., Mims, C.W., Blackwell, M. (1996). Introductory Mycology, John Wiley and Sons (Asia), Singapore. 4th edition.
5. Raven, P.H., Johnson, G.B., Losos, J.B., Singer, S.R., (2005). Biology. Tata McGraw Hill, Delhi, India.
6. Vashishta, P.C., Sinha, A.K., Kumar, A., (2010). Pteridophyta, S. Chand. Delhi, India.
7. Bhatnagar, S.P. and Moitra, A. (1996). Gymnosperms. New Age International (P) Ltd Publishers, New Delhi, India.
8. Parihar, N.S. (1991). An introduction to Embryophyta. Vol. I. Bryophyta. Central Book Depot, Allahabad.

GE-1B: PLANT ECOLOGY & TAXONOMY

(Credits-6: Theory-4, Practical-2)-Max. Marks: 100

THEORY (Each class 1 hr.): Marks-70 PRACTICAL

(Each class 2 hrs.): Marks-30 Lectures: 60 (40

Theory + 20 Practical classes)

UNIT-I: Introduction: (2 lectures)

Ecological factors : Soil: Origin, formation, composition, soil profile. Water: States of water in the environment, precipitation types. Light and temperature: Variation Optimal and limiting factors; Shelford law of tolerance. Adaptation of hydrophytes and xerophytes (6 lectures)

Plant communities : Characters; Ecotone and edge effect; Succession; Processes and types (3 lectures)

UNIT-II: Ecosystem : Structure; Biotic and abiotic components, energy flow trophic organisation; Food chains and food webs, Ecological pyramids production and productivity; Biogeochemical cycling; Cycling of carbon, nitrogen and Phosphorous (6 lectures)

Phytogeography : Principle biogeographical zones; Endemism (2 lectures)

UNIT-III: Introduction to plant taxonomy: Identification, Classification, Nomenclature. (2 lectures)

Identification : Functions of Herbarium, important herbaria and botanical gardens of the world and India; Documentation: Flora, Keys: single access and multi-access (3 lectures)

UNIT-IV: Taxonomic evidences from palynology, cytology, phytochemistry and molecular Data: (4 lectures)

Taxonomic hierarchy: Ranks, categories and taxonomic groups 2 lectures Biometrics, numerical taxonomy and cladistics: Characters; variations; OTUs, character weighting and coding; cluster analysis; phenograms, cladograms (definitions and differences). (5 lectures)

UNIT-V: Botanical nomenclature: Principles and rules (ICN); ranks and names; binominal system, typification, author citation, valid publication, rejection of names, principle of priority and its limitations. (4 lectures)

Classification: Types of classification-artificial, natural and phylogenetic. Bentham and Hooker (upto series), Engler and Prantl (upto series). (5 lectures)

PRACTICAL

1. Study of instruments used to measure microclimatic variables: Soil thermometer, maximum and minimum thermometer, anemometer, psychrometer/hygrometer, rain gauge and luxmeter.
2. Determination of pH, and analysis of two soil samples for carbonates, chlorides, nitrates, sulphates, organic matter and base deficiency by rapid field test.
3. Comparison of bulk density, porosity and rate of infiltration of water in soil of three habitats.
4. (a) Study of morphological adaptations of hydrophytes and xerophytes (four each). (b) Study of biotic interactions of the following: Stem parasite (*Cuscuta*), Root parasite (*Orobancha*), Epiphytes, Predation (Insectivorous plants).
5. Determination of minimal quadrat size for the study of herbaceous vegetation in the college campus by species area curve method. (species to be listed)
6. Quantitative analysis of herbaceous vegetation in the college campus for frequency and comparison with Raunkiaers frequency distribution law
7. Study of vegetative and floral characters of the following families (Description, V.S. flower, section of ovary, floral diagram/s, floral formula/e and systematic position according to Bentham & Hookers system of classification): Brassicaceae - Brassica, Alyssum / Iberis; Asteraceae - Sonchus/Launaea, Vernonia/Ageratum, Eclipta/Tridax; Solanaceae - Solanum nigrum, Withania; Lamiaceae - Salvia, Ocimum; Liliaceae - Asphodelus / Liliium / Allium.
8. Mounting of a properly dried and pressed specimen of any wild plant with herbarium label (to be submitted in the record book).

Suggested Readings:

1. Kormondy, E.J. (1996). Concepts of Ecology. Prentice Hall, U.S.A. 4th edition.
2. Sharma, P.D. (2010) Ecology and Environment. Rastogi Publications, Meerut, India. 8th edition.
3. Simpson, M.G. (2006). Plant Systematics. Elsevier Academic Press, San Diego, CA, U.S.A.

4. Singh, G. (2012). Plant Systematics: Theory and Practice. Oxford & IBH Pvt. Ltd., New Delhi. 3rd edition.

GE-2: ECONOMIC PLANT ANATOMY & EMBRYOLOGY

(Credits-6: Theory-4, Practical-2)-Max. Marks: 100

THEORY (Each class 1 hr.): Marks-70 PRACTICAL

(Each class 2 hrs.): Marks-30 Lectures: 60 (40

Theory + 20 Practical classes)

UNIT-I: Introduction: (2 lectures)

Meristematic and permanent tissues: Root and shoot apical meristems; Simple and complex tissues (5 lectures)

Organs: Structure of dicot and monocot root stem and leaf. (3 lectures)

UNIT-II: Secondary Growth: Vascular cambium structure and function, seasonal activity. Secondary growth in root and stem, Wood (heartwood and sapwood) (6 lectures)

Adaptive and protective systems: Epidermis, cuticle, stomata; General account of adaptations in xerophytes and hydrophytes. (5 lectures)

UNIT-III: Structural organization of flower: Structure of anther and pollen; Structure and types of ovules; Types of embryo sacs, organization and ultrastructure of mature embryo sac. (5 lectures)

Pollination and fertilization: Pollination mechanisms and adaptations; Double fertilization; Seed-structure appendages and dispersal mechanisms. (6 lectures)

UNIT-IV: Embryo and endosperm: Endosperm types, structure and functions; Dicot and monocot embryo; Embryo endosperm relationship (5 lectures)

UNIT-V: Apomixis and polyembryony: Definition, types and Practical applications. (5 lectures)

PRACTICAL

1. Study of meristems through permanent slides and photographs.
2. Tissues (parenchyma, collenchyma and sclerenchyma); Macerated xylary elements, Phloem (Permanent slides, photographs)
3. Stem: Monocot: Zea mays; Dicot: Helianthus; Secondary: Helianthus (only Permanent slides).
4. Root: Monocot: Zea mays; Dicot: Helianthus; Secondary: Helianthus (only Permanent slides).
5. Leaf: Dicot and Monocot leaf (only Permanent slides).
6. Adaptive anatomy: Xerophyte (Nerium leaf); Hydrophyte (Hydrilla stem).
7. Structure of anther (young and mature), tapetum (amoeboid and secretory) (Permanent slides).
8. Types of ovules: anatropous, orthotropous, circinotropous, amphitropous/ campylotropous.
9. Female gametophyte: Polygonum (monosporic) type of Embryo sac Development (Permanent slides/photographs).
10. Ultrastructure of mature egg apparatus cells through electron micrographs.
11. Pollination types and seed dispersal mechanisms (including appendages, aril, caruncle) (Photographs and specimens).
12. Dissection of embryo/endosperm from developing seeds.

13. Calculation of percentage of germinated pollen in a given medium.

Suggested Readings:

1. Bhojwani, S.S. & Bhatnagar, S.P. (2011). Embryology of Angiosperms. Vikas Publication House Pvt. Ltd. New Delhi. 5th edition.
2. Mauseth, J.D. (1988). Plant Anatomy. The Benjamin/Cummings Publisher, USA.

GE-4A: PLANT PHYSIOLOGY & METABOLISM

(Credits-6: Theory-4, Practical-2)-Max. Marks: 100

THEORY (Each class 1 hr.): Marks-70 PRACTICAL

(Each class 2 hrs.): Marks-30 Lectures: 60 (40

Theory + 20 Practical classes)

UNIT-I: Plant-water relations: Importance of water, water potential and its components; Transpiration and its significance; Factors affecting transpiration; Root pressure and guttation. (4 lectures)
Mineral nutrition: Essential elements, macro and micronutrients; Criteria of essentiality of elements; Role of essential elements; Transport of ions across cell membrane, active and passive transport, carriers, channels and pumps. (4 lectures)

Translocation in phloem.: Composition of phloem sap, girdling experiment; Pressure flow model; Phloem loading and unloading (4 lectures)

UNIT-II: Photosynthesis: Photosynthetic Pigments (Chl a, b, xanthophylls, carotene); Photo- system I and II, reaction center, antenna molecules; Electron transport and mechanism of ATP synthesis; C₃, C₄ and CAM pathways of carbon fixation; Photorespiration. (8 lectures)

UNIT-III: Respiration : Glycolysis, anaerobic respiration, TCA cycle; Oxidative phosphorylation, Glyoxylate, Oxidative Pentose Phosphate Pathway. (4 lectures)

UNIT-IV: Enzymes: Structure and properties; Mechanism of enzyme catalysis and enzyme inhibition. (3 lectures)

Nitrogen metabolism : Biological nitrogen fixation; Nitrate and ammonia assimilation. (3 lectures)

UNIT-V: Plant growth regulators : Discovery and physiological roles of auxins, gibberellins, cytokinins, ABA, ethylene. (5 lectures)

Plant response to light and temperature: Photoperiodism (SDP, LDP, Day neutral plants); **Phytochrome** (discovery and structure), red and far red light responses on photomorphogenesis; Vernalization. (5 lectures)

PRACTICAL

1. Determination of osmotic potential of plant cell sap by plasmolytic method.
2. To study the effect of two environmental factors (light and wind) on transpiration by excised twig.
3. Calculation of stomatal index and stomatal frequency of a mesophyte and a xerophyte.
4. Demonstration of Hill reaction.
5. Demonstrate the activity of catalase and study the effect of pH and enzyme concentration.
6. To study the effect of light intensity and bicarbonate concentration on O₂ evolution in photosynthesis.

7. Comparison of the rate of respiration in any two parts of a plant.
8. Separation of amino acids by paper chromatography.

Demonstration experiments (any four): (a) Bolting.

- (b) Effect of auxins on rooting.
- (c) Suction due to transpiration.
- (d) R.Q. (e) Respiration in roots.

Suggested Readings:

1. Taiz, L., Zeiger, E., Mller, I.M. and Murphy, A (2015). Plant Physiology and Development. Sinauer Associates Inc. USA. 6th edition.
2. Hopkins, W.G., Huner, N.P., (2009). Introduction to Plant Physiology. John Wiley & Sons, U.S.A. 4th Edition.
3. Bajracharya, D., (1999). Experiments in Plant Physiology- A Laboratory Manual. Narosa Publishing House, New Delhi.

GE-4B: BOTANY & PLANT BIO-TECHNOLOGY

(Credits-6: Theory-4, Practical-2)-Max. Marks: 100

THEORY (Each class 1 hr.): Marks-70 PRACTICAL

(Each class 2 hrs.): Marks-30 Lectures: 60 (40 Theory + 20 Practical classes)

UNIT-I: Origin of Cultivated Plants: Concept of centres of origin, their importance with reference to Vavilovs work. (3lectures)

UNIT-II: Cereals: Wheat -Origin, morphology, uses 3 lectures Legumes: General account with special reference to Gram and soybean (4 lectures)

UNIT-III: Spices: General account with special reference to clove and black pepper (Botanical name, family, part used, morphology and uses) (4 lectures)

Beverages: Tea (morphology, processing, uses) (3 lectures)

UNIT-IV: Oils and Fats: General description with special reference to groundnut 3 lectures Fibre Yielding Plants: General description with special reference to Cotton (Botanical name, family, part used, morphology and uses) (3 lectures)

UNIT-V: Introduction to biotechnology (2 lectures)

Plant tissue culture: Micropropagation; haploid production through androgenesis and gynogenesis; brief account of embryo and endosperm culture with their applications, Gene cloning by recombinant DNA technology, transgenic plants. (6 lectures)

Molecular Techniques: Blotting techniques: Northern, Southern and Western Blotting, DNA Fingerprinting; Molecular DNA markers i.e. RAPD, RFLP, SNPs; DNA sequencing, PCR and Reverse Transcriptase-PCR. Hybridoma and monoclonal antibodies, ELISA and Immunodetection. Molecular diagnosis of human disease, Human gene Therapy. (9lectures)

PRACTICAL

1. Study of economically important plants: Wheat, Gram, Soybean, Black pepper, Clove Tea, Cotton, Groundnut through specimens, sections and microchemical tests

2. Familiarization with basic equipments in tissue culture.
3. Study through photographs: Anther culture, somatic embryogenesis, endosperm and embryo culture; micropropagation.
4. Study of molecular techniques: PCR, Blotting techniques, AGE and PAGE.

Suggested Readings:

1. Kochhar, S.L. (2011). Economic Botany in the Tropics, MacMillan Publishers India Ltd., New Delhi. 4th edition.
2. Bhojwani, S.S. and Razdan, M.K., (1996). Plant Tissue Culture: Theory and Practice. Elsevier Science Amsterdam. The Netherlands.
3. Glick, B.R., Pasternak, J.J. (2003). Molecular Biotechnology- Principles and Applications of recombinant DNA. ASM Press, Washington.

GE-V: ENVIRONMENTAL BIO-TECHNOLOGY

(Credits-6: Theory-4, Practical-2)-Max. Marks: 100

THEORY (Each class 1 hr.): Marks-70 PRACTICAL

(Each class 2 hrs.): Marks-30 Lectures: 60 (40
Theory + 20 Practical classes)

UNIT-I: Environment - basic concepts and issues, global environmental problems ozone depletion, UV-B, greenhouse effect and acid rain due to anthropogenic activities, their impact and biotechnological approaches for management. (4 lectures)

An overview of atmosphere, hydrosphere, lithosphere and anthrosphere - environmental problems. Environmental pollution - types of pollution, sources of pollution, measurement of pollution, Bio-concentration, bio/geomagnification. (4 lectures)

UNIT-II: Microbiology of waste water treatment, aerobic process - activated sludge, oxidation ponds, trickling filter, towers, rotating discs, rotating drums, oxidation ditch. Anaerobic process - anaerobic digestion, anaerobic filters, up-flow anaerobic sludge blanket reactors. Treatment schemes for waste waters of dairy, distillery, tannery, sugar and antibiotic industries. (6 lectures)

UNIT-III: Xenobiotic compounds - organic (chlorinated hydrocarbons, substituted simple aromatic compounds, poly-aromatic hydrocarbons, pesticides, surfactants) and inorganic (metals, radionuclides, phosphates, nitrates). Bio-remediation of xenobiotics in environment - ecological consideration, decay behavior and degradative plasmids, molecular techniques in bio-remediation. (6 lectures)

Role of immobilized cells/enzymes in treatment of toxic compounds. Bio-pesticides, bio-reactors, bio-leaching, bio-mining, bio-sensors, bio-techniques for air pollution abatement and odour control. (4 lectures)

UNIT-IV: Sustainable Development: Economics and Environment: Economic growth, Gross National Productivity and the quality of life, Tragedy of Commons, Economics of Pollution control, Cost-benefit and cost effectiveness analysis, WTO and Environment, Corporate Social Responsibility, Environmental awareness and Education; Environmental Ethics. (6 lectures)

UNIT-V: International Legislations, Policies for Environmental Protection: Stockholm Conference (1972) and its declaration, WCED (1983) and Brundtland Report (1987), Rio Earth Summit-UNCED (1992) and its declaration, Montreal Protocol - 1987, Basel Convention (1989), Kyoto Protocol- 1997, Ramsar Convention 1971. (3 lectures)

National Legislations, Policies for Pollution Management: Salient features of Wild life protection act

1972, Water Pollution (Prevention and Control) Act- 1974, Forest conservation act 1980, Air Pollution (Prevention and Control) Act-1981, National Environmental Policy-2006, Central and State Pollution Control Boards: Constitution and power. (3 lectures)

Public Participation for Environmental Protection: Environmental movement and peoples participation with special references to Gandhamardan, Chilika and Narmada Bachao Andolan, Chipko and Silent valley Movement; Women and Environmental Protection, Role of NGO in bringing environmental awareness and education in the society. (4lectures)

PRACTICAL

1. Water/Soil analysis-DO, salinity, pH, chloride, total hardness, alkalinity, acidity, nitrate, calcium, Magnesium and phosphorus.
2. Gravimetric analysis-Total solid, dissolved solid, suspended solid in an effluent
3. Microbial assessment of air (open plate and air sample) and water.

Suggested Readings:

1. Waste water engineering-treatment, disposal and reuse, Metcalf and Eddy Inc., Tata McGraw Hill, New Delhi.
2. Environmental Chemistry, AK. De, Wiley Eastern Ltd, New Delhi.
3. Introduction to Bio-deterioration, D.Allsopp and K.J. Seal, ELBS / Edward Arnold.
4. Bioremediation, Baaker, KH and Herson D.S., 1994. Mc.GrawHill Inc, NewYork.
5. Industrial and Environmental Biotechnology - Nuzhat Ahmed, Fouad M. Qureshi and Obaid Y. Khan, 2006. Horizon Press.
6. Environmental Molecular Biology, Paul. A, Rochelle, 2001.Horizon Press.
7. Environmental Protection and Laws by Jadhav and Bhosale, V.M.Himalaya publ. House 13. Biodiversity Assessment and Conservation by PC Trivedi, Agrobios publ.

SKILL ENHANCEMENT COURSES (SEC)

SEC-I: BIO-FERTILIZERS

(Credits-2: Lectures: 30)

THEORY (Each class 1 hr.)-Marks: 50.

Unit-I: General account about the microbes used as biofertilizer Rhizobium isolation, identification, mass multiplication, carrier based inoculants, Actinorrhizal symbiosis. (4 lectures)

Unit-II: Azospirillum: isolation and mass multiplication carrier based inoculant, associative effect of different microorganisms. Azotobacter: classification, characteristics crop response to Azotobacter inoculum, maintenance and mass multiplication. (8 lectures)

Unit-III: Cyanobacteria (blue green algae), Azolla and Anabaena azollae association, nitrogen fixation, factors affecting growth, blue green algae and Azolla in rice cultivation. (4 lectures)

Unit-IV: Mycorrhizal association, types of mycorrhizal association, taxonomy, occurrence and distribution, phosphorus nutrition, growth and yield colonization of VAM isolation and inoculum production of VAM, and its influence on growth and yield of crop plants. (8 lectures)

Unit-V: Organic farming Green manuring and organic fertilizers, Recycling of biodegradable municipal, agricultural and Industrial wastes bio-compost making methods, types and method of vermicomposting field Application. (6 lectures)

Suggested Readings:

1. Dubey, R.C., 2005 A Text book of Biotechnology S.Chand & Co, New Delhi.
2. Kumaresan, V. 2005, Biotechnology, Saras Publications, New Delhi.
3. John Jothi Prakash, E. 2004. Outlines of Plant Biotechnology. Emkay, Publication, New Delhi.
4. Sathe, T.V. 2004 Vermiculture and Organic Farming. Daya publishers.
5. Subha Rao, N.S. 2000, Soil Microbiology, Oxford & IBH Publishers, New Delhi.
6. Vayas,S.C, Vayas, S. and Modi, H.A. 1998 Bio-fertilizers and organic, Farming Akta Prakashan, Nadiad

SEC-II: HERBAL TECHNOLOGY

(Credits-2: Lectures: 30)

THEORY (Each class 1 hr.)-Marks: 50.

Unit-I: Herbal medicines: history and scope - definition of medical terms - role of medicinal plants in Siddha systems of medicine; cultivation - harvesting - processing - storage - marketing and utilization of medicinal plants. (6 lectures)

Unit-II: Pharmacognosy - systematic position m edicinal uses of the following herbs in curing various ailments; Tulsi, Ginger, Fenugreek, Indian Goose berry and Ashoka. (6 lectures)

Unit-III:Phytochemistry - active principles and methods of their testing - identification and utilization of the medicinal herbs; Catharanthus roseus (cardiotonic), Withania somnifera (drugs acting on nervous system), Clerodendron phlomoides (anti-rheumatic) and Centella asiatica (memory booster). (6 lectures)

Unit-IV: Analytical pharmacognosy: Drug adulteration - types, methods of drug evaluation - Biological testing of herbal drugs - Phytochemical screening tests for secondary metabolites (alkaloids, flavonoids, steroids, triterpenoids, phenolic compounds) (8 lectures)

Unit-V: Medicinal plant banks micro propagation of important species (Withania somnifera, neem and tulsi- Herbal foods-future of pharmacognosy) (4 lectures)

Suggested Readings:

1. Glossary of Indian medicinal plants, R.N.Chopra, S.L.Nayar and I.C.Chopra, 1956. C.S.I.R, New Delhi.
2. The indigenous drugs of India, Kanny, Lall, Dey and Raj Bahadur, 1984. International Book Distributors.
3. Herbal plants and Drugs Agnes Arber, 1999. Mangal Deep Publications.
4. Ayurvedic drugs and their plant source. V.V. Sivarajan and Balachandran Indra 1994. Oxford IBH publishing Co.
5. Ayurveda and Aromatherapy. Miller, Light and Miller, Bryan, 1998. Banarsidass, Delhi.
6. Principles of Ayurveda, Anne Green, 2000. Thomsons, London.

7. Pharmacognosy, Dr.C.K.Kokate et al. 1999. Nirali Prakashan.

SEC-III: NURSERY & GARDENING

(Credits-2: Lectures: 30)

THEORY (Each class 1 hr.)-Marks: 50.

Unit-I: Nursery: definition, objectives and scope and building up of infrastructure for nursery, planning and seasonal activities - Planting - direct seeding and transplants. (4 lectures)

Unit-II: Seed: Structure and types - Seed dormancy; causes and methods of breaking dormancy - Seed storage: Seed banks, factors affecting seed viability, genetic erosion Seed production technology - seed testing and certification. (6 lectures)

Unit-III: Vegetative propagation: air-layering, cutting, selection of cutting, collecting season, treatment of cutting, rooting medium and planting of cuttings - Hardening of plants green house - mist chamber, shed root, shade house and glass house. (6 lectures)

Unit-IV: Gardening: definition, objectives and scope - different types of gardening landscape and home gardening - parks and its components - plant materials and design computer applications in landscaping - Gardening operations: soil laying, manuring, watering, management of pests and diseases and harvesting. (8 lectures)

Unit-V: Sowing/raising of seeds and seedlings - Transplanting of seedlings - Study of cultivation of different vegetables: cabbage, brinjal, lady's finger, onion, garlic, tomatoes, and carrots - Storage and marketing procedures. (6 lectures)

Suggested Readings:

1. Bose T.K. & Mukherjee, D., 1972, Gardening in India, Oxford & IBH Publishing Co., New Delhi.
2. Sandhu, M.K., 1989, Plant Propagation, Wile Eastern Ltd., Bangalore, Madras.
3. Kumar, N., 1997, Introduction to Horticulture, Rajalakshmi Publications, Nagercoil.
4. Edmond Musser & Andres, Fundamentals of Horticulture, McGraw Hill Book Co., New Delhi.
5. Agrawal, P.K. 1993, Hand Book of Seed Technology, Dept. of Agriculture and Cooperation, National Seed Corporation Ltd., New Delhi.
6. Janick Jules. 1979. Horticultural Science. (3rd Ed.), W.H. Freeman and Co., San Francisco, USA.

SEC-IV: FLORICULTURE

(Credits-2: Lectures: 30)

THEORY (Each class 1 hr.)-Marks: 50.

Unit-I: Introduction: History of gardening; Importance and scope of floriculture and landscape gardening. (2 lectures)

Unit-II: Nursery Management and Routine Garden Operations: Sexual and vegetative methods of propagation; Soil sterilization; Seed sowing; Pricking; Planting and transplanting; Shading; Stopping or pinching; Defoliation; Wintering; Mulching; Topiary; Role of plant growth regulators. (8 lectures)

Unit-III: Ornamental Plants: Flowering annuals; Herbaceous perennials; Divine vines; Shade and ornamental trees; Ornamental bulbous and foliage plants; Cacti and succulents; Palms and Cycads; Ferns and Selaginellas; Cultivation of plants in pots; Indoor gardening; Bonsai. (4 lectures)

Unit-IV: Principles of Garden Designs: English, Italian, French, Persian, Mughal and Japanese gardens; Features of a garden (Garden wall, Fencing, Steps, Hedge, Edging, Lawn, Flower beds,

Shrubbery, Borders, Water garden. Some Famous gardens of India (4 lectures)
Landscaping Places of Public Importance: Landscaping highways and Educational institutions. (4 lectures)

Unit-V: Commercial Floriculture: Factors affecting flower production; Production and packaging of cut flowers; Flower arrangements; Methods to prolong vase life; Cultivation of Important cut flowers (Carnation, Aster, Chrysanthemum, Dahlia, Gerbera, Gladiolous, Marigold, Rose, Liliium, Orchids). (6 lectures)

Diseases and Pests of Ornamental Plants. (2 lectures)

Suggested Readings:

Randhawa, G.S. and Mukhopadhyay, A. 1986. Floriculture in India. Allied Publishers.

SEC-V: MEDICAL BOTANY

(Credits-2: Lectures: 30)

THEORY (Each class 1 hr.)-Marks: 50.

Unit-I: History, Scope and Importance of Medicinal Plants. Indigenous Medicinal Sciences; Definition and Scope-Ayurveda: History, origin, panchamahabhutas, saptadhatu and tridosha concepts, Rasayana, plants used in ayurvedic treatments. (5 lectures)

Unit-II: Siddha: Origin of Siddha medicinal systems, Basis of Siddha system, plants used in Siddha medicine. Unani: History, concept: Umoor-e- tabiya, tumors treatments/ therapy, polyherbal formulations. (5 lectures)

Unit-III: Conservation of endangered and endemic medicinal plants. Definition: endemic and endangered medicinal plants, Red list criteria; In situ conservation: Biosphere reserves, sacred groves, National Parks; Ex situ conservation: Botanic Gardens, Ethno medicinal plant Gardens. (6 lectures)

Unit-IV: Propagation of Medicinal Plants: Objectives of the nursery, its classification, important components of a nursery, sowing, pricking, use of green house for nursery production, propagation through cuttings, layering, grafting and budding. (6 lectures)

Unit-V: Ethnobotany and Folk medicines. Definition; Ethnobotany in India: Methods to study ethnobotany; Applications of Ethnobotany: National interacts, Palaeo-ethnobotany. Folk medicines of ethnobotany, ethno medicine, ethno ecology, ethnic communities of India. Application of natural products to certain diseases- Jaundice, cardiac, infertility, diabetics, Blood pressure and skin diseases. (8 lectures)

Suggested Readings:

1. Trivedi P C, 2006. Medicinal Plants: Ethno botanical Approach, Agro-bios, India.
2. Purohit and Vyas, 2008. Medicinal Plant Cultivation: A Scientific Approach, 2nd Edn. Agro- bios, India.

SEC-VI: PLANT DIVERSITY & HUMAN WELFARE

(Credits-2: Lectures: 30)

THEORY (Each class 1 hr.)-Marks: 50.

Unit-I: Plant diversity and its scope- Genetic diversity, Species diversity, Plant diversity at the ecosystem level, Agro-bio-diversity and cultivated plant taxa, wild taxa. Values and uses of Biodiversity: Ethical and aesthetic values, Precautionary principle, Methodologies for valuation, Uses of plants, Uses of microbes. (6 lectures)

Unit-II: Loss of Bio-diversity: Loss of genetic diversity, Loss of species diversity, Loss of ecosystem diversity, Loss of agro-bio-diversity, Projected scenario for biodiversity loss, (6 lectures)

Unit-III: Management of Plant Bio-diversity: Organizations associated with bio-diversity management- Methodology for execution-IUCN, UNEP, UNESCO, WWF, NBPGR; Bio-diversity legislation and conservations, Bio-diversity information management and communication. (6 lectures)

Unit-IV: Conservation of Bio-diversity: Conservation of genetic diversity, species diversity and ecosystem diversity, In situ and ex situ conservation, Social approaches to conservation, Bio-diversity awareness programmes, Sustainable development. (6 lectures)

Unit-V: Role of plants in relation to Human Welfare: (a) Importance of forestry their utilization and commercial aspects (b) Avenue trees. (c) Ornamental plants of India. (d) Alcoholic beverages through ages. Fruits and nuts: Important fruit crops their commercial importance. Wood and its uses. (6 lectures)

Suggested Readings:

Krishnamurthy, K.V. (2004). An Advanced Text Book of Biodiversity - Principles and Practices. Oxford and IBH Publications Co. Pvt. Ltd. New Delhi

SEC-VII: ETHNOBOTANY

(Credits-2: Lectures: 30)

THEORY (Each class 1 hr.)-Marks: 50.

Unit-I: Introduction, concept, scope and objectives; Ethnobotany as an interdisciplinary science. The relevance of ethnobotany in the present context; Major and minor ethnic groups or Tribals of India, and their life styles. Plants used by the tribals: (a) Food plants. (b) intoxicants and beverages
c) Resins and oils and miscellaneous uses. (6 lectures)

Unit-II: Methodology of Ethnobotanical studies: (a) Field work. (b) Herbarium. (c) Ancient Literature. (d) Archaeological findings. (e) Temples and sacred places. (6 lectures)

Unit-III: Role of ethnobotany in modern Medicine Medico-ethnobotanical sources in India; Significance of the following plants in ethno botanical practices (along with their habitat and morphology) (a) Azadiractha indica. (b) Ocimum sanctum. (c) Vitex negundo. (d) Gloriosa superba e) Tribulus terrestris. (f) Pongamia pinnata. (g) Cassia auriculata. (h) Indigofera tinctoria. Role of ethnobotany in modern medicine with special example Rauwolfia serpentina, Trichopus zeylanicus, Artemisia, Withania. (8 lectures)

Unit-IV: Role of ethnic groups in conservation of plant genetic resources. Endangered taxa and forest management (participatory forest management). (4 lectures)

Unit-V: Ethnobotany and legal aspects Ethnobotany as a tool to protect interests of ethnic groups. Sharing of wealth concept with few examples from India. Biopiracy, Intellectual Property Rights and Traditional Knowledge. (6 lectures)

Suggested Readings:

1. S.K. Jain, Manual of Ethnobotany, Scientific Publishers, Jodhpur, 1995.
2. S.K. Jain (ed.) Glimpses of Indian. Ethnobotny, Oxford and I B H, New Delhi 1981
3. Lone et al., Palaeoethnobotany

4. S.K. Jain (ed.) 1989. Methods and approaches in ethnobotany. Society of ethnobotanists, Lucknow, India.
5. S.K. Jain, 1990. Contributions of Indian ethnobotny. Scientific publishers, Jodhpur.
6. Colton C.M. 1997. Ethnobotany Principles and applications. John Wiley and sons Chichester
7. Rama Ro, N and A.N. Henry (1996). The Ethnobotany of Eastern Ghats in Andhra Pradesh, India. Botanical Survey of India. Howrah.
8. Rajiv K. Sinha Ethnobotany The Renaissance of Traditional Herbal Medicine INA SHREE Publishers, Jaipur-1996
9. Faulks, P.J. 1958. An introduction to Ethnobotany, Moredale pub. Ltd.

SEC-VIII: MUSHROOM CULTURE TECHNOLOGY

(Credits-2: Lectures: 30)

THEORY (Each class 1 hr.)-Marks: 50.

Unit-I: Introduction, history. Nutritional and medicinal value of edible mushrooms; Poisonous mushrooms. Types of edible mushrooms available in India - *Volvariella volvacea*, *Pleurotus citrinopileatus*, *Agaricus bisporus*. (5 lectures)

Unit-II: Cultivation Technology : Infrastructure: substrates (locally available) Polythene bag, vessels, Inoculation hook, inoculation loop, low cost stove, sieves, culture rack, mushroom unit (Thatched house) water sprayer, tray, small polythene bag. (6 Lectures)

Unit-III: Pure culture: Medium, sterilization, preparation of spawn, multiplication. Mushroom bed preparation - paddy straw, sugarcane trash, maize straw, banana leaves. Factors affecting the mushroom bed preparation - Low cost technology, Composting technology in mushroom production. (6 lectures)

Unit-IV: Storage and nutrition : Short-term storage (Refrigeration - upto 24 hours) Long term Storage (canning, pickles, papads), drying, storage in salt solutions. Nutrition - Proteins - amino acids, mineral elements nutrition - Carbohydrates, Crude fibre content - Vitamins. (8 lectures)

Unit-V: Food Preparation: Types of foods prepared from mushroom. Research Centres - National level and Regional level. Cost benefit ratio - Marketing in India and abroad, Export Value. (5 lectures)

Suggested Readings:

1. Marimuthu, T. Krishnamoorthy, A.S. Sivaprakasam, K. and Jayarajan. R (1991) Oyster Mushrooms, Department of Plant Pathology, Tamil Nadu Agricultural University, Coimbatore.
2. Swaminathan, M. (1990) Food and Nutrition. Bappco, The Bangalore Printing and Publishing Co. Ltd., No. 88, Mysore Road, Bangalore - 560018.
3. Tewari, Pankaj Kapoor, S.C., (1988). Mushroom cultivation, Mittal Publications, Delhi.

4. Nita Bahl (1984-1988) Hand book of Mushrooms, II Edition, Vol. I & Vol. II.

SEC-IX: INTELLECTUAL PROPERTY RIGHTS

(Credits-2: Lectures: 30)

THEORY (Each class 1 hr.)-Marks: 50.

Unit-I: Introduction to intellectual property right (IPR) : Concept and kinds. Economic importance. IPR in India and world: Genesis and scope, some important examples. IPR and WTO (TRIPS, WIPO). (2 lectures)

Patents: Objectives, Rights, Patent Act 1970 and its amendments. Procedure of obtaining patents, Working of patents. Infringement. (3 Lectures)

Copyrights: Introduction, Works protected under copyright law, Rights, Transfer of Copyright, Infringement. (3 Lectures)

Unit-II: Trademarks: Objectives, Types, Rights, Protection of goodwill, Infringement, Passing off, Defences, Domain name. (3 Lectures)

Geographical Indications : Objectives, Justification, International Position, Multilateral Treaties, National Level, Indian Position. (3 Lectures)

Unit-III: Protection of Traditional Knowledge : Objective, Concept of Traditional Knowledge, Holders, Issues concerning, Bio-Prospecting and Bio-Piracy, Alternative ways, Protectability, need for a Sui-Generis regime, Traditional Knowledge on the International Arena, at WTO, at National level, Traditional Knowledge Digital Library. (4 Lectures)

Unit-IV: Protection of Plant Varieties : Plant Varieties Protection-Objectives, Justification, International Position, Plant varieties protection in India. Rights of farmers, Breeders and Researchers. National gene bank, Benefit sharing. Protection of Plant Varieties and Farmers Rights Act, 2001. (2 Lectures)

Unit-V: Industrial Designs: Objectives, Rights, Assignments, Infringements, Defences of Design Infringement (2 Lectures)

CHEMISTRY(HONOURS)

SEMESTER-I

C-1: INORGANIC CHEMISTRY-I

(Credits-6: Theory-4, Practical-2)-Max. Marks: 100

THEORY (Each class 1 hr.): Marks-70 PRACTICAL

(Each class 2 hrs.): Marks-30 Lectures: 60 (40 Theory
+ 20 Practical classes)

Unit-I: Atomic structure

Bohrs theory, its limitations and atomic spectrum of hydrogen atom. Wave mechanics: de Broglie equation, Heisenbergs Uncertainty Principle and its significance, Schrdingers wave equation, significance of ψ and ψ^2 . Quantum numbers and their significance. Normalized and orthogonal wave functions. Sign of wave functions. Radial and angular wave functions for hydrogen atom. Radial and angular distribution curves. Shapes of s, p, d and f orbitals. Paulis Exclusion Principle, Hunds rule of maximum multiplicity, Aufbaus principle and its limitations. (14 Lectures)

Unit-II: Periodicity of elements

Periodicity of elements Periodicity of Elements: s, p, d, f block elements, the long form of periodic table. Detailed discussion of the following properties of the elements, with reference to s & p-block. (a) Effective nuclear charge, shielding or screening effect, Slater rules, variation of effective nuclear charge in periodic table. (b) Atomic radii (van der Waals) (c) Ionic and crystal radii. (d) Covalent radii (octahedral and tetrahedral) (e) Ionization enthalpy, Successive ionization enthalpies and factors affecting ionization energy. Applications of ionization enthalpy. (f) Electron gain enthalpy, trends of electron gain enthalpy. (g) Electronegativity, Paulings/ Mullikens electronegativity scales. Variation of electronegativity with bond order, partial charge, hybridization, group electronegativity. Sandersons electron density ratio. (16 Lectures)

Unit-III: Chemical bonding-I

Ionic bond: General characteristics, types of ions, size effects, radius ratio rule and its limitations. Packing of ions in crystals. Born-Land equation with derivation. Madelung constant, Born-Haber cycle and its application, Solvation energy. (ii) Covalent bond: Lewis structure, Valence Bond theory (Heitler-London approach). Energetics of hybridization, equivalent and non-equivalent hybrid orbitals, Resonance and resonance energy, Molecular orbital theory. Molecular orbital diagrams of diatomic and simple polyatomic molecules N_2 , O_2 , C_2 , B_2 , F_2 , CO , NO , and their ions; Valence shell electron pair repulsion theory (VSEPR), shapes of simple molecules and ions containing lone pairs and bond pairs of electrons, multiple bonding (σ and π bond approach) and bond lengths. Covalent character in ionic compounds, polarizing power and polarizability. Fajans rules and consequences of polarization. Ionic character in covalent compounds: Bond moment and dipole moment. Percentage ionic character from dipole moment and electronegativity difference. (16 Lectures)

Unit-IV: Chemical Bonding-II

(i) Metallic Bond: Qualitative idea of valence bond and band theories. Semiconductors and insulators. (ii) Weak Chemical Forces: van der Waals forces, ion-dipole forces, dipole-dipole interactions,

induced dipole interactions, Instantaneous dipole-induced dipole interactions. Repulsive forces, Hydrogen bonding (theories of hydrogen bonding, valence bond treatment) Effects of chemical force, melting and boiling points, solubility energetics of dissolution process. (10 Lectures)

Oxidation-reduction Redox equations, standard electrode potential and its application to inorganic reactions. Principles involved in some volumetric analyses (iron, copper and manganese). (4 Lectures)

Reference Books:

- Lee, J.D. Concise Inorganic Chemistry, ELBS, 1991.
- Douglas, B.E. and Mc Daniel, D.H., Concepts & Models of Inorganic Chemistry, Oxford, 1970.
- Atkins, P.W. & Paula, J. Physical Chemistry, Oxford Press, 2006.
- Day, M.C. and Selbin, J. Theoretical Inorganic Chemistry, ACS Publications 1962.

PRACTICAL: C-1 LAB.

(A) Titrimetric Analysis:

(i) Calibration and use of apparatus. (ii) Preparation of solutions of different Molarity/Normality of titrants.

(B) Acid-Base Titrations:

(i) Estimation of carbonate and hydroxide present together in mixture. (ii) Estimation of carbonate and bicarbonate present together in a mixture. (iii) Estimation of free alkali present in different soaps/detergents.

(C) Oxidation-Reduction Titrimetry:

(i) Estimation of Fe(II) and oxalic acid using standardized KMnO_4 solution. (ii) Estimation of oxalic acid and sodium oxalate in a given mixture. (iii) Estimation of Fe(II) with $\text{K}_2\text{Cr}_2\text{O}_7$ using internal (diphenylamine, anthranilic acid) and external indicator.

Reference text:

Vogel, A.I. A Textbook of Quantitative Inorganic Analysis, ELBS.

C-2: PHYSICAL CHEMISTRY

(Credits-6: Theory-4, Practical-2)-Max. Marks: 100
THEORY (Each class 1 hr.): Marks-70 PRACTICAL
(Each class 2 hrs.): Marks-30 Lectures: 60 (40 Theory
+ 20 Practical classes)

Unit-I: Gaseous state

Kinetic molecular model of a gas: postulates and derivation of the kinetic gas equation; collision frequency; collision diameter; mean free path and viscosity of gases, including their temperature and pressure dependence, relation between mean free path and coefficient of viscosity, calculation of σ from η ; variation of viscosity with temperature and pressure. Maxwell distribution and its use in evaluating molecular velocities (average, root mean square and most probable) and average kinetic energy, law of equipartition of energy, degrees of freedom and molecular basis of heat capacities. Behaviour of real gases: Deviations from ideal gas behaviour, compressibility factor, Z, and its variation with pressure for different gases. Causes of deviation from ideal behaviour. van der Waals

equation of state, its derivation and application in explaining real gas behaviour. Isotherms of real gases and their comparison with van der Waals isotherms, continuity of states, critical state, relation between critical constants and van der Waals constants, law of corresponding states. (18 Lectures)

Unit-II: Liquid state

(i) Qualitative treatment of the structure of the liquid state; physical properties of liquids; vapour pressure, surface tension and coefficient of viscosity, and their determination. Effect of addition of various solutes on surface tension and viscosity. Explanation of cleansing action of detergents. Temperature variation of viscosity of liquids and comparison with that of gases. Qualitative discussion of structure of water. (6 Lectures)

Ionic equilibria- I

(ii) Strong, moderate and weak electrolytes, degree of ionization, factors affecting degree of ionization, ionization constant and ionic product of water. Ionization of weak acids and bases, pH scale, common ion effect; dissociation constants of mono- and diprotic acids. (6 Lectures)

Unit- III: Solid state

Nature of the solid state, law of constancy of interfacial angles, law of rational indices, Miller indices, elementary ideas of symmetry, symmetry elements and symmetry operations, seven crystal systems and fourteen Bravais lattices; X-ray diffraction, Bragg's law, a simple account of rotating crystal method and powder pattern method. Analysis of powder diffraction patterns of NaCl, CsCl and KCl. Defects in crystals. Glasses and liquid crystals. (16 Lectures)

Unit-IV: Ionic equilibria - II

Salt hydrolysis-calculation of hydrolysis constant, degree of hydrolysis and pH for different salts. Buffer solutions; derivation of Henderson equation and its applications; buffer capacity, buffer range, buffer action and applications of buffers in analytical chemistry and biochemical processes in the human body. Solubility and solubility product of sparingly soluble salts applications of solubility product principle. Qualitative treatment of acid base titration curves (calculation of pH at various stages). Theory of acidbase indicators; selection of indicators and their limitations. Multistage equilibria in polyelectrolyte systems; hydrolysis and hydrolysis constants. (14 Lectures)

Reference Books:

- Atkins, P. W. & Paula, J. de Atkins Physical Chemistry Ed., Oxford University Press (2006).
- Ball, D. W. Physical Chemistry Thomson Press, India (2007).
- Castellan, G. W. Physical Chemistry 4th Ed. Narosa (2004).
- Mortimer, R. G. Physical Chemistry 3rd Ed. Elsevier: NOIDA, UP (2009).
- Principles of Physical Chemistry, Puri, Sharma, Pathania, Vishal Pub. Co.

PRACTICAL: C-2 LAB.

Surface tension measurements.

- (a) Determine the surface tension by (i) drop number (ii) drop weight method.
- (b) Study the variation of surface tension of detergent solutions with concentration.

Viscosity measurement using Ostwalds viscometer.

- (a) Determination of viscosity of aqueous solutions of (i) polymer, (ii) ethanol, and (iii) sugar at room temperature.

(b) Study the variation of viscosity of sucrose solution with the concentration of solute.

pH metry.

(a) Study the effect on pH of addition of HCl/NaOH to solutions of acetic acid, sodium acetate and their mixtures.

(b) Preparation of buffer solutions of different pH (i) Sodium acetate-acetic acid, (ii) Ammonium chloride-ammonium hydroxide.

(c) pH metric titration of (i) strong acid vs. strong base, (ii) weak acid vs. strong base.

(d) Determination of dissociation constant of a weak acid.

Reference Books:

- Khosla, B. D.; Garg, V. C. & Gulati, A. Senior Practical Physical Chemistry, R. Chand & Co., New Delhi (2011).
- Garland, C. W., Nibler, J. W. & Shoemaker, D. P. Experiments in Physical Chemistry 8th Ed.; McGraw-Hill, New York (2003).
- Halpern, A. M. & McBane, G. C. Experimental Physical Chemistry 3rd Ed.; W.H. Freeman & Co., New York (2003).

SEMESTER-II

C-3: ORGANIC CHEMISTRY I

(Credits-6: Theory-4, Practical-2)-Max. Marks: 100

THEORY (Each class 1 hr.): Marks-70 PRACTICAL

(Each class 2 hrs.): Marks-30 Lectures: 60 (40 Theory
+ 20 Practical classes)

Unit-I: BASICS OF ORGANIC CHEMISTRY

Electronic Displacements: Inductive, electromeric, resonance and mesomeric effects, hyperconjugation and their applications; Dipole moment; Organic acids and bases; their relative strength. Homolytic and Heterolytic fission with suitable examples. Curly arrow rules; Electrophiles and Nucleophiles; Nucleophilicity and basicity; Types, shape and their relative stability of carbocations, carbanions, free radicals and carbenes. Introduction to types of organic reactions and their mechanism: Addition, Elimination and Substitution reactions.

CARBON-CARBON SIGMA BONDS

Chemistry of alkanes: Formation of alkanes, Wurtz Reaction, Wurtz-Fittig Reactions, Free radical substitutions: Halogenation -relative reactivity and selectivity. (12 Lectures)

Unit-II: STEREOCHEMISTRY

Fischer Projection, Newmann and Sawhorse Projection formulae; Geometrical isomerism: cis-trans and, syn-anti isomerism E/Z notations with C.I.P rules. Optical Isomerism: Optical Activity, Specific Rotation, Chirality/Asymmetry, Enantiomers, Molecules with one and two chiral-centres, Diastereoisomers, meso structures, Racemic mixture and resolution. Relative and absolute configuration: D/L and R/S designations. (18 Lectures)

Unit-III: CHEMISTRY OF ALIPHATIC HYDROCARBONS

A. Carbon-Carbon pi bonds:

Formation of alkenes and alkynes by elimination reactions, Mechanism of E1, E2, E1cb reactions. Saytzeff and Hofmann eliminations. Reactions of alkenes: Electrophilic additions their mechanisms (Markownikoff/ Anti Markownikoff addition), mechanism of oxymercuration-demercuration, hydroborationoxidation, ozonolysis, reduction (catalytic and chemical), syn and anti-hydroxylation(oxidation). 1,2- and 1,4-addition reactions in conjugated dienes and, Diels-Alder reaction; Allylic and benzylic bromination and mechanism, e.g. propene, 1-butene, toluene, ethyl benzene. Reactions of alkynes: Acidity, Electrophilic and Nucleophilic additions. Hydration to form carbonyl compounds, Alkylation of terminal alkynes. **B. Cycloalkanes and Conformational Analysis**

Types of cycloalkanes and their relative stability, Baeyer strain theory, Conformation analysis of alkanes (ethane and n-butane): Relative stability with energy diagrams. Energy diagrams of cyclohexane: Chair, Boat and Twist boat forms. (18 Lectures)

Unit-IV: AROMATIC HYDROCARBONS

Aromaticity: Hckels rule, aromatic character of arenes, cyclic carbocations/carbanions and heterocyclic compounds with suitable examples. Electrophilic aromatic substitution: halogenation, nitration, sulphonation and Friedel-Crafts alkylation/acylation with their mechanism. Directing effects of the groups. (12 Lectures)

Reference Books:

- Morrison, R. N. & Boyd, R. N. Organic Chemistry, Dorling Kindersley (India) Pvt. Ltd. (Pearson Education).
- Finar, I. L. Organic Chemistry (Volume 1), Dorling Kindersley (India) Pvt. Ltd. (Pearson Education).
- Finar, I. L. Organic Chemistry (Volume 2): Stereochemistry and the Chemistry of Natural Products, Dorling Kindersley (India) Pvt. Ltd. (Pearson Education).
- Eliel, E. L. & Wilen, S. H. Stereochemistry of Organic Compounds; Wiley: London, 1994.
- Kalsi, P. S. Stereochemistry Conformation and Mechanism; New Age International, 2005.

PRACTICAL: C-3 LAB.

1. Checking the calibration of the thermometer.
2. Purification of organic compounds by crystallization using the following solvents:
 - Water
 - Alcohol
 - Alcohol-Water
3. Determination of the melting points of above compounds and unknown organic compounds (Kjeldahl method and electrically heated melting point apparatus).
4. Effect of impurities on the melting point mixed melting point of two unknown organic compounds.
5. Determination of boiling point of liquid compounds. (boiling point lower than and more than 100C by distillation and capillary method)

6. Chromatography

- Separation of a mixture of two amino acids by ascending and horizontal paper chromatography.
- Separation of a mixture of two sugars by ascending paper chromatography.
- Separation of a mixture of o-and p-nitrophenol or o-and p-aminophenol by thin layer chromatography (TLC).

Reference Books:

- Mann, F.G. & Saunders, B.C. Practical Organic Chemistry, Pearson Education (2009).
- Furniss, B.S., Hannaford, A.J.; Smith, P.W.G.; Tatchell, A.R. Practical Organic Chemistry, 5th Ed., Pearson (2012).

C-4: PHYSICAL CHEMISTRY-II

(Credits-6: Theory-4, Practical-2)-Max. Marks: 100
THEORY (Each class 1 hr.): Marks-70 PRACTICAL
(Each class 2 hrs.): Marks-30 Lectures: 60 (40 Theory
+ 20 Practical classes)

Unit-I: Chemical thermodynamics

Intensive and extensive variables; state and path functions; isolated, closed and open systems; zeroth law of thermodynamics. First law: Concept of heat, q , work, w , internal energy, U , and statement of first law; enthalpy, H , relation between heat capacities, calculations of q , w , U and H for reversible, irreversible and free expansion of gases (ideal and van der Waals) under isothermal and adiabatic conditions. Thermochemistry: Heats of reactions: standard states; enthalpy of formation of molecules and ions and enthalpy of combustion and its applications; calculation of bond energy, bond dissociation energy and resonance energy from thermochemical data, effect of temperature (Kirchhoffs equations) and pressure on enthalpy of reactions. (14 Lectures)

Unit-II: Second Law: Concept of entropy; thermodynamic scale of temperature, statement of the second law of thermodynamics; molecular and statistical interpretation of entropy. Calculation of entropy change for reversible and irreversible processes. Third Law: Statement of third law, concept of residual entropy, calculation of absolute entropy of molecules. Free Energy Functions: Gibbs and Helmholtz energy; variation of S , G , A with T , V , P ; Free energy change and spontaneity. Relation between Joule-Thomson coefficient and other thermodynamic parameters; inversion temperature; Gibbs-Helmholtz equation; Maxwell 17 relations; thermodynamic equation of state. (14 Lectures)

Unit-III: Systems of variable composition

Partial molar quantities, dependence of thermodynamic parameters on composition; Gibbs Duhem equation, chemical potential of ideal mixtures, change in thermodynamic functions in mixing of ideal gases. Chemical equilibrium, Criteria of thermodynamic equilibrium, degree of advancement of reaction, chemical equilibria in ideal gases, concept of fugacity. Thermodynamic derivation of relation between Gibbs free energy of reaction and reaction quotient (van Hoff's reaction). Equilibrium constants and their quantitative dependence on temperature, pressure and concentration. Free energy of mixing and spontaneity; thermodynamic derivation of relations between the various equilibrium

constants K_p , K_c and K_x . Le Chatelier principle (quantitative treatment) and its applications. (18 Lectures)

Unit-IV: Solutions and Colligative Properties

Dilute solutions; lowering of vapour pressure, Raoult's and Henry's Laws and their applications. Thermodynamic derivation using chemical potential to derive relations between the four colligative properties [(i) relative lowering of vapour pressure, (ii) elevation of boiling point, (iii) Depression of freezing point, (iv) osmotic pressure] and amount of solute. Applications in calculating molar masses of normal, dissociated and associated solutes in solution. (14 Lectures)

Reference Books:

- Peter, A. & Paula, J. de. Physical Chemistry 9th Ed., Oxford University Press (2011).
- Castellan, G. W. Physical Chemistry 4th Ed., Narosa (2004).
- Engel, T. & Reid, P. Physical Chemistry 3rd Ed., Prentice-Hall (2012).
- McQuarrie, D. A. & Simon, J. D. Molecular Thermodynamics Viva Books Pvt. Ltd.: New Delhi (2004).
- Assael, M. J.; Goodwin, A. R. H.; Stamatoudis, M.; Wakeham, W. A. & Will, S. Commonly Asked Questions in Thermodynamics. CRC Press: NY (2011).
- Levine, I. N. Physical Chemistry 6th Ed., Tata Mc Graw Hill (2010).
- Metz, C.R. 2000 solved problems in chemistry, Schaum Series (2006).

PRACTICAL: C-4 LAB.

THERMOCHEMISTRY

- (a) Determination of heat capacity of a calorimeter for different volumes using change of enthalpy data of a known system (method of back calculation of heat capacity of calorimeter from known enthalpy of solution or enthalpy of neutralization).
- (b) Determination of heat capacity of the calorimeter and enthalpy of neutralization of hydrochloric acid with sodium hydroxide.
- (c) Calculation of the enthalpy of ionization of ethanoic acid.
- (d) Determination of heat capacity of the calorimeter and integral enthalpy (endothermic and exothermic) solution of salts.
- (e) Determination of basicity/proticity of a polyprotic acid by the thermochemical method in terms of the changes of temperatures observed in the graph of temperature versus time for different additions of a base. Also calculate the enthalpy of neutralization of the first step.
- (f) Determination of enthalpy of hydration of copper sulphate.
- (g) Study of the solubility of benzoic acid in water and determination of H.

Reference Books;

- Khosla, B. D.; Garg, V. C. & Gulati, A., Senior Practical Physical Chemistry, R. Chand & Co.: New Delhi (2011).
- Athawale, V. D. & Mathur, P. Experimental Physical Chemistry New Age International: New Delhi (2001).

SEMESTER-III

C-5: INORGANIC CHEMISTRY-II

(Credits-6: Theory-4, Practical-2)-Max. Marks: 100
THEORY (Each class 1 hr.): Marks-70 PRACTICAL
(Each class 2 hrs.): Marks-30 Lectures: 60 (40 Theory
+ 20 Practical classes)

UNIT-I: General Principles of Metallurgy

Chief modes of occurrence of metals based on standard electrode potentials. Ellingham diagrams for reduction of metal oxides using carbon and carbon monoxide as reducing agent. Electrolytic Reduction, Hydrometallurgy. Methods of purification of metals: Electrolytic process, Parting process, van Arkel-de Boer process and Mond's process, Zone refining. (8 Lectures)

Acids and Bases

Bronsted-Lowry concept of acid-base reactions, solvated proton, relative strength of acids, types of acid-base reactions, Lewis acid-base concept, Classification of Lewis acids, Hard and Soft Acids and Bases (HSAB) Application of HSAB principle. (8 Lectures)

UNIT-II: Chemistry of s and p Block Elements-I

Inert pair effect, Relative stability of different oxidation states, diagonal relationship and anomalous behaviour of first member of each group. Allotropy and catenation. Complex formation tendency of s and p block elements. Hydrides and their classification ionic, covalent and interstitial. Basic beryllium acetate and nitrate. (14 Lectures)

UNIT-III: Chemistry of s and p Block Elements-II

Study of the following compounds with emphasis on structure, bonding, preparation, properties and uses. Boric acid and borates, boron nitrides, borohydrides (diborane) carboranes and graphitic compounds, silanes. Oxides and oxoacids of nitrogen, Phosphorus and chlorine. Peroxo acids of sulphur, interhalogen compounds, polyhalide ions, pseudohalogens and basic properties of halogens. (14 Lectures)

UNIT-IV: Noble Gases

Occurrence and uses, rationalization of inertness of noble gases, Clathrates; preparation and properties of XeF_2 , XeF_4 and XeF_6 ; Nature of bonding in noble gas compounds (Valence bond treatment and MO treatment for XeF_2). Molecular shapes of noble gas compounds (VSEPR theory). (8 Lectures)

Inorganic Polymers:

Types of inorganic polymers, comparison with organic polymers, synthesis, structural aspects and applications of silicones and siloxanes. Borazines, silicates and phosphazenes, and polysulphates. (8 Lectures)

Reference Books:

- Lee, J.D. Concise Inorganic Chemistry, ELBS, 1991.
- Douglas, B.E; Mc Daniel, D.H. & Alexander, J.J. Concepts & Models of Inorganic Chemistry 3rd Ed., John Wiley Sons, N.Y. 1994.
- Greenwood, N.N. & Earnshaw. Chemistry of the Elements, Butterworth-Heinemann. 1997.

- Cotton, F.A. & Wilkinson, G. Advanced Inorganic Chemistry, Wiley, VCH, 1999.
- Miessler, G. L. & Donald, A. Tarr. Inorganic Chemistry 4th Ed., Pearson, 2010.
- Shriver & Atkins, Inorganic Chemistry 5th Ed.

PRACTICAL: C-5 LAB.

(A) Iodo / Iodimetric Titrations

- Estimation of Cu(II) and $K_2Cr_2O_7$ using sodium thiosulphate solution (Iodimetrically).
- Estimation of available chlorine in bleaching powder iodometrically.

(B) Inorganic preparations

- Cuprous chloride, Cu_2Cl_2 .
- Preparation of manganese(III) phosphate, $MnPO_4.H_2O$.
- Preparation of aluminium potassium sulphate $K_2SO_4.Al_2(SO_4)_3.24H_2O$ (Potashalum).

Reference Books:

- Vogel, A.I. A Textbook of Quantitative Inorganic Analysis, ELBS. 1978

C-6: ORGANIC CHEMISTRY-II

(Credits-6: Theory-4, Practical-2)-Max. Marks: 100
 THEORY (Each class 1 hr.): Marks-70 PRACTICAL
 (Each class 2 hrs.): Marks-30 Lectures: 60 (40 Theory
 + 20 Practical classes)

UNIT-I: Chemistry of Halogenated Hydrocarbons

Alkyl halides: Methods of preparation, nucleophilic substitution reactions SN_1 , SN_2 and SN_i mechanisms with stereochemical aspects and effect of solvent etc.; nucleophilic substitution vs. elimination. Aryl halides: Preparation, including preparation from diazonium salts, nucleophilic aromatic substitution; SN_{Ar} , Benzyne mechanism. Relative reactivity of alkyl, allyl/benzyl, vinyl and aryl halides towards nucleophilic substitution reactions. Organometallic compounds of Mg and Li Use in synthesis of organic compounds. (16 Lectures)

UNIT-II: Alcohols, Phenols, Ethers and Epoxides

Alcohols: preparation, properties and relative reactivity of 1, 2, 3 alcohols, Bouvaelt-Blanc Reduction; Preparation and properties of glycols: Oxidation by periodic acid and lead tetraacetate, Pinacol-Pinacolone rearrangement; Phenols: Preparation and properties; Acidity and factors affecting it, Ring substitution reactions, ReimerTiemann and KolbesSchmidt Reactions, Fries and Claisen rearrangements with mechanism; Ethers and Epoxides: Preparation and reactions with acids. Reactions of epoxides with alcohols, ammonia derivatives and $LiAlH_4$ (16 Lectures)

UNIT-III: Carbonyl Compounds

Structure, reactivity and preparation: Nucleophilic additions, Nucleophilic addition-elimination reactions with ammonia derivatives with mechanism; Mechanisms of Aldol and Benzoin condensation, Knoevenagel condensation, Perkin, Cannizzaro and Wittig reaction, Beckmann rearrangements, haloform reaction and Baeyer Villiger oxidation, - substitution reactions, oxidations and reductions (Clemmensen, Wolff-Kishner, $LiAlH_4$, $NaBH_4$, MPV.; Addition reactions of unsaturated carbonyl compounds: Michael addition. Active methylene compounds: Keto-enol tautomerism. Preparation and synthetic applications of diethyl malonate and ethyl acetoacetate. (14 Lectures)

UNIT-IV: Carboxylic Acids and their Derivatives

Preparation, physical properties and reactions of monocarboxylic acids: Typical reactions of dicar-

boxylic acids, hydroxy acids and unsaturated acids: succinic, lactic, malic, tartaric, citric, maleic and fumaric acids; Preparation and reactions of acid chlorides, anhydrides, esters and amides; Comparative study of nucleophilic substitution at acyl group -Mechanism of acidic and alkaline hydrolysis of esters, Claisen condensation, Dieckmann and Reformatsky reactions, Hofmann-bromamide degradation and Curtius rearrangement. (10 Lectures)

Sulphur containing compounds

Preparation and reactions of thiols, thioethers. (4 Lectures)

Reference Books:

- Morrison, R. T. & Boyd, R. N. Organic Chemistry, Dorling Kindersley (India) Pvt. Ltd. (Pearson Education).
- Graham Solomons, T.W. Organic Chemistry, John Wiley & Sons, Inc.

PRACTICAL: C-6 LAB.

1. Functional group tests for alcohols, phenols, carbonyl and carboxylic acid group.
2. Organic preparations:
 - (i) Acetylation of one of the following compounds: amines (aniline, o-, m-, p-toluidines and o-, m-, p-anisidine) and phenols (-naphthol, vanillin, salicylic acid) by any one method:
 - (a) Using conventional method.
 - (b) Using green approach.
 - (ii) Benzoylation of one of the following amines (aniline, o-, m-, p-toluidines and o-, m-, p-anisidine) and one of the following phenols (-naphthol, resorcinol, p-cresol) by Schotten-Baumann reaction.
 - (iii) Bromination of any one of the following:
 - (a) Acetanilide by conventional methods.
 - (b) Acetanilide using green approach (Bromate-bromide method).
 - (iv) Nitration of any one of the following:
 - (a) Acetanilide/nitrobenzene by conventional method.
 - (b) Salicylic acid by green approach (using ceric ammonium nitrate).

The above derivatives should be prepared using 0.5-1gm. of the organic compound. The solid samples must be collected and may be used for recrystallization, melting point and TLC. **Reference**

Books:

- Mann, F.G. & Saunders, B.C. Practical Organic Chemistry, Pearson Education (2009).
- Furniss, B.S.; Hannaford, A.J.; Smith, P.W.G.; Tatchell, A.R. Practical Organic Chemistry, 5th Ed., Pearson (2012).
- Ahluwalia, V.K. & Aggarwal, R. Comprehensive Practical Organic Chemistry: Preparation and Quantitative Analysis, University Press (2000).
- Ahluwalia, V.K. & Dhingra, S. Comprehensive Practical Organic Chemistry: Qualitative Analysis, University Press (2000).

C-7: PHYSICAL CHEMISTRY-III

(Credits-6: Theory-4, Practical-2)-Max. Marks: 100
THEORY (Each class 1 hr.): Marks-70 PRACTICAL
(Each class 2 hrs.): Marks-30 Lectures: 60 (40 Theory
+ 20 Practical classes))

UNIT-I: Phase Equilibria-I

Concept of phases, components and degrees of freedom, derivation of Gibbs Phase Rule for non-reactive and reactive systems; Clausius-Clapeyron equation and its applications to solid-liquid, liquid-vapour and solid-vapour equilibria, phase diagram for one component systems, with applications

(H_2O and sulphur system). Phase diagrams for systems of solid-liquid equilibria involving eutectic, congruent and incongruent melting points, solid solutions (Pb-Ag system, desilverisation of lead) (14 Lectures)

UNIT-II: Phase Equilibria-II

Three component systems, water-chloroform-acetic acid system, triangular plots. Binary solutions: Gibbs-Duhem-Margules equation, its derivation and applications to fractional distillation of binary miscible liquids (ideal and non-ideal), azeotropes, partial miscibility of liquids, CST, miscible pairs, steam distillation. Nernst distribution law: its derivation and applications. (14 Lectures)

UNIT-III: Chemical Kinetics

Order and molecularity of a reaction, rate laws in terms of the advancement of a reaction, differential and integrated form of rate expressions up to second order reactions, experimental methods of the determination of orders, kinetics of complex reactions (integrated rate expressions up to first order only): (i) Opposing reactions (ii) parallel reactions and (iii) consecutive reactions and their differential rate equations (steady-state approximation in reaction mechanisms) (iv) chain reactions. Temperature dependence of reaction rates; Arrhenius equation; activation energy. Collision theory of reaction rates, qualitative treatment of the theory of absolute reaction rates. (18 Lectures)

UNIT-IV: Catalysis

Types of catalyst, specificity and selectivity, mechanisms of catalyzed reactions at solid surfaces; effect of particle size and efficiency of nanoparticles as catalysts. Enzyme catalysis, Michaelis-Menten mechanism, acid-base catalysis. (8 Lectures)

Surface chemistry

Physical adsorption, chemisorption, adsorption isotherms (Langmuir, Freundlich and Gibbs isotherms), nature of adsorbed state. (6 Lectures)

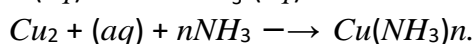
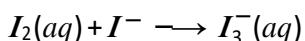
Reference Books:

- Peter Atkins & Julio De Paula, Physical Chemistry 9th Ed., Oxford University Press(2010).
- Castellan, G. W. Physical Chemistry, 4th Ed., Narosa (2004).
- McQuarrie, D. A. & Simon, J. D., Molecular Thermodynamics, Viva Books Pvt. Ltd.: New Delhi (2004).
- Engel, T. & Reid, P. Physical Chemistry 3rd Ed., Prentice-Hall (2012).
- Assael, M. J.; Goodwin, A. R. H.; Stamatoudis, M.; Wakeham, W. A. & Will, S.
- Commonly Asked Questions in Thermodynamics. CRC Press: NY (2011).
- Zundhal, S.S. Chemistry concepts and applications Cengage India(2011).
- Ball, D. W. Physical Chemistry Cengage India (2012).
- Mortimer, R. G. Physical Chemistry 3rd Ed., Elsevier: NOIDA, UP (2009).
- Levine, I. N. Physical Chemistry 6th Ed., Tata McGraw-Hill(2011).
- Metz, C. R. Physical Chemistry 2nd Ed., Tata McGraw-Hill(2009).

PRACTICAL: C-7 LAB.

I. Distribution of acetic/ benzoic acid between water and cyclohexane.

II. Study the equilibrium of at least one of the following reactions by the distribution method:



III. Study the kinetics of the following reactions.

(1) Integrated rate method:

- a. Acid hydrolysis of methyl acetate with hydrochloric acid.
- b. Saponification of ethyl acetate.

(2) Compare the strengths of HCl and H₂SO₄ by studying kinetics of hydrolysis of methylacetate.

Adsorption

Verify the Freundlich and Langmuir isotherms for adsorption of acetic acid on activated charcoal.

Reference Books:

- Khosla, B. D.; Garg, V. C. & Gulati, A. Senior Practical Physical Chemistry, R. Chand & Co.: New Delhi (2011).
- Garland, C. W.; Nibler, J. W. & Shoemaker, D. P. Experiments in Physical Chemistry 8th Ed.; McGraw-Hill: New York (2003).
- Halpern, A. M. & McBane, G. C. Experimental Physical Chemistry 3rd Ed.; W.H. Freeman & Co.: New York (2003).

SEMESTER- IV

C-8: INORGANIC CHEMISTRY-III

(Credits-6: Theory-4, Practical-2)-Max. Marks: 100
THEORY (Each class 1 hr.): Marks-70 PRACTICAL
(Each class 2 hrs.): Marks-30 Lectures: 60 (40 Theory
+ 20 Practical classes)

UNIT-I: Coordination Chemistry

Werners theory, valence bond theory (inner and outer orbital complexes), electroneutrality principle and back bonding. Crystal field theory, measurement of CFSE weak and strong fields, pairing energies, factors affecting the magnitude of $10 Dq$ in octahedral vs. tetrahedral coordination, tetragonal distortions from octahedral geometry, Jahn-Teller theorem, square planar geometry. Qualitative aspect of ligand field and MO Theory. IUPAC nomenclature of coordination compounds, isomerism in coordination compounds. Stereochemistry of complexes with 4 and 6 coordination numbers. Chelate effect, Labile and inert complexes. (20 Lectures)

UNIT-II: Transition Elements-I

General group trends with special reference to electronic configuration, colour, variable valency, magnetic and catalytic properties, ability to form complexes. Stability of various oxidation states and e.m.f. (Latimer & Bsworth diagrams). Difference between the first, second and third transition series. (12 Lectures)

UNIT-III: Transition Elements-II

Chemistry of Ti, V, Cr Mn, Fe and Co in various oxidation states (excluding their metallurgy). (12 Lectures)

UNIT-IV: Lanthanoids and Actinoids

Electronic configuration, oxidation states, colour, spectral and magnetic properties, lanthanide contraction, separation of lanthanides (ion-exchange method only). General features of actinoids, separation of Np, Pm, Am from U. (6 Lectures)

Bioinorganic Chemistry

Metal ions present in biological systems, classification of elements according to their action in biological system. Na/K-pump, carbonic anhydrase and carboxypeptidase. Excess and deficiency of some trace metals. Toxicity of metal ions (Hg, Pb, Cd and As), reasons for toxicity, Use of chelating agents in medicine. Iron and its application in bio-systems, Haemoglobin; Storage and transfer of iron. (10 Lectures)

Reference Books:

- Purcell, K.F & Kotz, J.C. Inorganic Chemistry W.B. Saunders Co, 1977.
- Huheey, J.E., Inorganic Chemistry, Prentice Hall, 1993.
- Lippard, S.J. & Berg, J.M. Principles of Bioinorganic Chemistry Panima Publishing Company 1994.
- Cotton, F.A. & Wilkinson, G, Advanced Inorganic Chemistry. Wiley-VCH, 1999.
- Basolo, F, and Pearson, R.C., Mechanisms of Inorganic Chemistry, John Wiley & Sons, NY, 1967.
- Greenwood, N.N. & Earnshaw A., Chemistry of the Elements, Butterworth-Heinemann, 1997.

PRACTICAL: C-8 LAB.

Gravimetric Analysis:

- i. Estimation of nickel(II) using Dimethylglyoxime (DMG).
- ii. Estimation of copper as CuSCN.
- iii. Estimation of iron as Fe_2O_3 by precipitating iron as $Fe(OH)_3$.
- iv. Estimation of Al(III) by precipitating with oxine and weighing as Al(oxine)₃ (aluminium oxinate).

Chromatography of metal ions

Principles involved in chromatographic separations. Paper chromatographic separation of following metal ions:

- i. Ni(II) and Co(II)
- ii. Fe(III) and Al(III)

Reference Book:

- Vogel, A.I. A text book of Quantitative Analysis, ELBS 1986.

C-9: ORGANIC CHEMISTRY-III

(Credits-6: Theory-4, Practical-2)-Max. Marks: 100

THEORY (Each class 1 hr.): Marks-70 PRACTICAL

(Each class 2 hrs.): Marks-30 Lectures: 60 (40 Theory

+ 20 Practical classes)

UNIT-I: Nitrogen Containing Functional Groups

Preparation and important reactions of nitro and compounds, nitriles. Amines: Effect of substituent and solvent on basicity; Preparation and properties: Gabriel phthalimide synthesis, Carbylamine reaction, Mannich reaction, Hoffmanns exhaustive methylation, Hofmann-elimination reaction; Distinction between 1, 2 and 3 amines with Hinsberg reagent and nitrous acid. (14 Lectures)

UNIT-II: Diazonium Salts

Preparation and their synthetic applications.

Polynuclear Hydrocarbons

Reactions of naphthalene and anthracene Structure, Preparation and structure elucidation and important derivatives of naphthalene and anthracene. Polynuclear hydrocarbons. (12 Lectures)

UNIT-III: Heterocyclic Compounds

Classification and nomenclature, Structure, aromaticity in 5-numbered and 6-membered rings containing one heteroatom; Synthesis, reactions and mechanism of substitution reactions of: Furan,

Pyrrrole (Paal-Knorr synthesis, Knorr pyrrole synthesis, Hantzsch synthesis), Thiophene, Pyridine (Hantzsch synthesis), Pyrimidine. Fischer indole synthesis and Madelung synthesis, structure of quinoline and isoquinoline. Derivatives of furan: Furfural and furoic acid (preparation only). (18 Lectures)

UNIT-IV: Alkaloids

Natural occurrence, General structural features, Isolation and their physiological action Hoffmann's exhaustive methylation, Emde's modification, Structure elucidation and synthesis of Hygrine and Nicotine. Medicinal importance of Nicotine, Hygrine, Quinine, Morphine, Cocaine, and Reserpine. (8 Lectures) Terpenes Occurrence, classification, isoprene rule; Elucidation of structure and synthesis of Citral, Neral and -terpineol. (8 Lectures)

Reference Books:

- Morrison, R. T. & Boyd, R. N. Organic Chemistry, Dorling Kindersley (India) Pvt. Ltd. (Pearson Education).
- Finar, I. L. Organic Chemistry (Volume 1), Dorling Kindersley (India) Pvt. Ltd. (Pearson Education).
- Finar, I. L. Organic Chemistry (Volume 2: Stereochemistry and the Chemistry of Natural Products), Dorling Kindersley (India) Pvt. Ltd. (Pearson Education).
- Acheson, R.M. Introduction to the Chemistry of Heterocyclic compounds, John Wiley & Sons (1976).
- Graham Solomons, T.W. Organic Chemistry, John Wiley & Sons, Inc.
- Kalsi, P. S. Textbook of Organic Chemistry 1st Ed., New Age International (P) Ltd. Pub.
- Clayden, J.; Greeves, N.; Warren, S.; Wothers, P.; Organic Chemistry, Oxford University Press.
- Singh, J.; Ali, S.M. & Singh, J. Natural Product Chemistry, Prajati Parakashan (2010).

PRACTICAL: C-9 LAB.

1. Detection of extra elements (N, X, S).
2. Functional group test for nitro, amine and amide groups.
3. Qualitative analysis of unknown organic compounds containing simple functional groups (alcohols, carboxylic acids, phenols and carbonyl compounds).

Reference Books:

- Mann, F.G. & Saunders, B.C. Practical Organic Chemistry, Pearson Education (2009).
- Furniss, B.S.; Hannaford, A.J.; Smith, P.W.G.; Tatchell, A.R. Practical Organic Chemistry, 5th Ed., Pearson (2012).
- Ahluwalia, V.K. & Aggarwal, R. Comprehensive Practical Organic Chemistry: Preparation and Quantitative Analysis, University Press (2000).
- Ahluwalia, V.K. & Dhingra, S. Comprehensive Practical Organic Chemistry: Qualitative Analysis, University Press (2000).

C-10: PHYSICAL CHEMISTRY-IV

(Credits-6: Theory-4, Practical-2)-Max. Marks: 100

THEORY (Each class 1 hr.): Marks-70 PRACTICAL

(Each class 2 hrs.): Marks-30 Lectures: 60 (40

Theory + 20 Practical classes)

UNIT-I: Conductance-I

Arrhenius theory of electrolytic dissociation. Conductivity, equivalent and molar conductivity and their variation with dilution for weak and strong electrolytes. Molar conductivity at infinite dilution. Kohlrausch law of independent migration of ions. Debye-Hckel-Onsager equation, Wien effect, Debye-Falkenhagen effect, Waldens rules. (12 Lectures)

UNIT-II: Conductance-II

Ionic velocities, mobilities and their determinations, transference numbers and their relation to ionic mobilities, determination of transference numbers using Hittorf and Moving Boundary methods. Applications of conductance measurement: (i) degree of dissociation of weak electrolytes, (ii) ionic product of water (iii) solubility and solubility product of sparingly soluble salts, (iv) conductometric titrations, and (v) hydrolysis constants of salts. (16 Lectures)

UNIT-III: Electrochemistry-I

Quantitative aspects of Faradays laws of electrolysis, rules of oxidation/reduction of ions based on half-cell potentials, applications of electrolysis in metallurgy and industry. Chemical cells, reversible and irreversible cells with examples. Electromotive force of a cell and its measurement, Nernst equation; Standard electrode (reduction) potential and its application to different kinds of half-cells. Application of EMF measurements in determining free energy, enthalpy and entropy of a cell reaction, (ii) equilibrium constants, and (iii) pH values, using hydrogen, quinone-hydroquinone, glass electrodes. (18 Lectures)

UNIT-IV: Electrochemistry-II

Concentration cells with and without transference, liquid junction potential; determination of activity coefficients and transference numbers. Qualitative discussion of potentiometric titrations (acid-base, redox, precipitation). Electrical properties of atoms and molecules Basic ideas of electrostatics, Electrostatics of dielectric media. Clausius-Mosotti equation and Lorenz-Laurentz equation (no derivation), Dipole moment and molecular polarizabilities and their measurements. (14 Lectures)

Reference Books:

- Atkins, P.W & Paula, J.D. Physical Chemistry, 9th Ed., Oxford University Press (2011).
- Castellan, G. W. Physical Chemistry 4th Ed., Narosa (2004).
- Mortimer, R. G. Physical Chemistry 3rd Ed., Elsevier: NOIDA, UP (2009).
- Barrow, G. M., Physical Chemistry 5th Ed., Tata McGraw Hill: New Delhi (2006).
- Engel, T. & Reid, P. Physical Chemistry 3rd Ed., Prentice-Hall (2012).
- Rogers, D. W. Concise Physical Chemistry Wiley (2010).
- Silbey, R. J.; Alberty, R. A. & Bawendi, M. G. Physical Chemistry 4th Ed., John Wiley & Sons, Inc. (2005).

PRACTICAL: C-10 LAB.

Conductometry

- I. Determination of cell constant.
- II. Determination of equivalent conductance, degree of dissociation and dissociation constant of a weak acid.
- III. Perform the following conductometric titrations:
 - i. Strong acid vs. strong base
 - ii. Weak acid vs. strong base
 - iii. Strong acid vs. weak base

Potentiometry

- I. Perform the following potentiometric titrations:
 - i. Strong acid vs. strong base
 - ii. Weak acid vs. strong base
 - iii. Dibasic acid vs. strong base

Reference Books:

- Khosla, B. D.; Garg, V. C. & Gulati, A. Senior Practical Physical Chemistry, R. Chand & Co.: New Delhi (2011).
- Garland, C. W.; Nibler, J. W. & Shoemaker, D. P. Experiments in Physical Chemistry 8th Ed.; McGraw-Hill: New York (2003).
- Halpern, A. M. & McBane, G. C. Experimental Physical Chemistry 3rd Ed.; W.H. Freeman & Co.: New York (2003).

SEMESTER- V

C-11: ORGANIC CHEMISTRY-IV

(Credits-6: Theory-4, Practical-2)-Max. Marks: 100
THEORY (Each class 1 hr.): Marks-70 PRACTICAL
(Each class 2 hrs.): Marks-30 Lectures: 60 (40 Theory
+ 20 Practical classes)

UNIT-I: Nucleic Acids

Components of nucleic acids, Nucleosides and nucleotides; Structure, synthesis and reactions of: Adenine, Guanine, Cytosine, Uracil and Thymine; Structure of polynucleotides. (9 Lectures) **Enzymes** Introduction, classification and characteristics of enzymes. Salient features of active site of enzymes. Mechanism of enzyme action (taking trypsin as example), factors affecting enzyme action, coenzymes and cofactors and their role in biological reactions, specificity of enzyme action (including stereospecificity), enzyme inhibitors and their importance, phenomenon of inhibition (competitive, uncompetitive and non-competitive inhibition including allosteric inhibition). (8 Lectures)

UNIT-II: Amino Acids, Peptides and Proteins

Amino acids, peptides and their classification. -Amino acids - Synthesis, ionic properties and reactions. Zwitterions, pKa values, isoelectric point and electrophoresis. Study of peptides: determination of their primary structures-end group analysis, methods of peptide synthesis. Synthesis

of peptides using N-protecting, C-protecting and C-activating groups -Solid-phase synthesis (16 Lectures)

UNIT-III: Lipids

Introduction to oils and fats; common fatty acids present in oils and fats, Hydrogenation of fats and oils, Saponification value, acid value, iodine number. Reversion and rancidity. (8 Lectures) **Concept of Energy in Biosystems**

Cells obtain energy by the oxidation of foodstuff (organic molecules). Introduction to metabolism (catabolism and anabolism). Overview of catabolic pathways of fat and protein. Interrelationship in the metabolic pathways of protein, fat and carbohydrate. Caloric value of food, standard caloric content of food types. (7 Lectures)

UNIT-IV: Pharmaceutical Compounds: Structure and Importance

Classification, structure and therapeutic uses of antipyretics: Paracetamol (with synthesis), Analgesics: Ibuprofen (with synthesis), Antimalarials: Chloroquine (with synthesis). An elementary treatment of Antibiotics and detailed study of chloramphenicol, Medicinal values of curcumin (haldi), azadirachtin (neem), vitamin C and antacid (ranitidine). (12 Lectures)

Reference Books:

- Berg, J.M., Tymoczko, J.L. and Stryer, L. (2006) Biochemistry. VIth Edition. W.H. Freeman and Co.
- Nelson, D.L., Cox, M.M. and Lehninger, A.L. (2009) Principles of Biochemistry. IV Edition. W.H. Freeman and Co.
- Murray, R.K., Granner, D.K., Mayes, P.A. and Rodwell, V.W. (2009) Harpers Illustrated Biochemistry. XXVIII edition. Lange Medical Books/McGraw-Hill.

PRACTICAL: C-11 LAB.

1. Preparations of the following compounds:
 - i. Aspirine, ii. Phenacetin, iii. Milk of magnesia, iv. Aluminium hydroxide gel, v. Divol.
2. Saponification value of an oil or a fat.
3. Determination of Iodine number of an oil/ fat.

Reference Books:

- Manual of Biochemistry Workshop, 2012, Department of Chemistry, University of Delhi.
- Arthur, I. Vogel, Quantitative Organic Analysis, Pearson.

C-12: PHYSICAL CHEMISTRY-V

(Credits-6: Theory-4, Practical-2)-Max. Marks: 100
THEORY (Each class 1 hr.): Marks-70 PRACTICAL
(Each class 2 hrs.): Marks-30 Lectures: 60 (40 Theory
+ 20 Practical classes)

UNIT-I: Quantum Chemistry

Postulates of quantum mechanics, quantum mechanical operators, Schrödinger equation and its application to free particle and particle-in-a-box (rigorous treatment), quantization of energy levels,

zero-point energy and Heisenberg Uncertainty principle; wave functions, probability distribution functions, nodal properties. Extension to three dimensional boxes, separation of variables, degeneracy. Qualitative treatment of simple harmonic oscillator model of vibrational motion: Setting up of Schrödinger equation and discussion of solution and wave functions. Vibrational energy of diatomic molecules and zero-point energy. Angular momentum: Commutation rules, quantization of square of total angular momentum and z-component. Rigid rotator model of rotation of diatomic molecule. Schrödinger equation, transformation to spherical polar coordinates. Separation of variables (Preliminary treatment). Qualitative treatment of hydrogen atom and hydrogen-like ions: setting up of Schrödinger equation in spherical polar coordinates, radial part, quantization of energy (only final energy expression). Average and most probable distances of electron from nucleus. (18 Lectures)

UNIT-II: Chemical Bonding

Chemical bonding: Covalent bonding, valence bond and molecular orbital approaches, LCAO-MO treatment of H^+ . Bonding and antibonding orbitals. Qualitative extension to H_2 . Comparison of LCAO-MO and VB treatments of H_2 (only wavefunctions, detailed solution not required) and their limitations. Qualitative description of LCAO-MO treatment of homonuclear and heteronuclear diatomic molecules (HF, LiH). Localised and non-localised molecular orbitals treatment of triatomic (BeH_2 , H_2O) molecules. Qualitative MO theory and its application to AH_2 type molecules. (12 Lectures)

UNIT-III: Molecular Spectroscopy-I

Interaction of electromagnetic radiation with molecules and various types of spectra; Born-Oppenheimer approximation. Rotation spectroscopy: Selection rules, intensities of spectral lines, determination of bond lengths of diatomic and linear triatomic molecules, isotopic substitution.

Vibrational spectroscopy: Classical equation of vibration, computation of force constant, amplitude of diatomic molecular vibrations, anharmonicity, Morse potential, dissociation energies, fundamental frequencies, overtones, hot bands, degrees of freedom for polyatomic molecules, modes of vibration. Vibration-rotation spectroscopy: diatomic vibrating rotator, P, Q, R branches.

Raman spectroscopy: Qualitative treatment of Rotational Raman effect; Effect of nuclear spin, Vibrational Raman spectra, Stokes and anti-Stokes lines; their intensity difference, rule of mutual exclusion. (16 Lectures)

UNIT-IV: Molecular Spectroscopy-II

Electronic spectroscopy: Franck-Condon principle, electronic transitions, singlet and triplet states, fluorescence and phosphorescence, dissociation and predissociation. (6 Lectures) **Photochemistry**

Characteristics of electromagnetic radiation, Lambert-Beers law and its limitations, physical significance of absorption coefficients. Laws of photochemistry, quantum yield, actinometry, examples of low and high quantum yields, photochemical equilibrium and the differential rate of photochemical reactions, photosensitised reactions, quenching. Role of photochemical reactions in biochemical processes, photostationary states, chemiluminescence. (8 Lectures)

Reference Books:

- Banwell, C. N. & McCash, E. M. Fundamentals of Molecular Spectroscopy 4th Ed. Tata McGraw-

Hill: New Delhi (2006).

- Chandra, A. K. Introductory Quantum Chemistry Tata McGraw-Hill (2001).
- House, J. E. Fundamentals of Quantum Chemistry 2nd Ed. Elsevier: USA (2004).
- Lowe, J. P. & Peterson, K. Quantum Chemistry, Academic Press (2005).
- Kakkar, R. Atomic & Molecular Spectroscopy, Cambridge University Press (2015).

PRACTICAL: C-12 LAB.

Colourimetry

1. Determine the concentration of HCl against 0.1 N NaOH spectrophotometrically.
2. To find the strength of given ferric ammonium sulfate solution of (0.05 M) by using EDTA spectrophotometrically.
3. To find out the strength of CuSO₄ solution by titrating with EDTA spectrophotometrically.
4. To determine the concentration of Cu(II) and Fe(III) solution photometrically by titrating with EDTA.

Reference Books:

- Khosla, B. D.; Garg, V. C. & Gulati, A., Senior Practical Physical Chemistry, R. Chand & Co.: New Delhi (2011).
- Garland, C. W.; Nibler, J. W. & Shoemaker, D. P. Experiments in Physical Chemistry 8th Ed.; McGraw-Hill: New York (2003).
- Halpern, A. M. & McBane, G. C. Experimental Physical Chemistry 3rd Ed.; W.H. Freeman & Co.: New York (2003).
- Experimental Physical Chemistry by J. N. Gurtu, R. Kapoor.

SEMESTER- VI

C-13: INORGANIC CHEMISTRY-IV

(Credits-6: Theory-4, Practical-2)-Max. Marks: 100
THEORY (Each class 1 hr.): Marks-70 PRACTICAL
(Each class 2 hrs.): Marks-30 Lectures: 60 (40 Theory
+ 20 Practical classes)

UNIT-I: Organometallic Compounds-I

Definition and classification of organometallic compounds on the basis of bond type. Concept of hapticity of organic ligands. Metal carbonyls: 18 electron rule, electron count of mononuclear, polynuclear and substituted metal carbonyls of 3d series. General methods of preparation (direct combination, reductive carbonylation, thermal and photochemical decomposition) of mono and binuclear carbonyls of 3d series. Structures of mononuclear and binuclear carbonyls of Cr, Mn, Fe, Co and Ni using VBT. -acceptor behaviour of CO (MO diagram of CO to be discussed), synergic effect and use of IR data to explain extent of back bonding. Zeises salt: Preparation and structure, evidences of synergic effect and comparison of synergic effect with that in carbonyls. (14 Lectures)

UNIT-II: Organometallic Compounds-II

Metal Alkyls: Important structural features of methyl lithium (tetramer) and trialkyl aluminium

(dimer), concept of multicentre bonding in these compounds. Role of triethylaluminium in polymerisation of ethene (Ziegler Natta Catalyst). Species present in ether solution of Grignard reagent and their structures. Ferrocene: Preparation and reactions (acetylation, alkylation, metallation, Mannich Condensation), structure and aromaticity, comparison of aromaticity and reactivity with that of benzene. (14 Lectures)

UNIT-III: Theoretical Principles in Qualitative Analysis (H_2S Scheme)

Basic principles involved in analysis of cations and anions and solubility products, common ion effect. Principles involved in separation of cations into groups and choice of group reagents. Interfering anions (fluoride, borate, oxalate and phosphate) and need to remove them after Group II. (10 Lectures)

Catalysis by Organometallic Compounds

Study of the following industrial processes and their mechanism:

1. Alkene hydrogenation (Wilkinson's Catalyst).
2. Hydroformylation (Co salts).
3. Wacker Process.
4. Synthetic gasoline (Fischer Tropsch reaction). (8 Lectures)

UNIT-IV: Reaction Kinetics and Mechanism

Introduction to inorganic reaction mechanisms. Substitution reactions in square planar complexes, Trans-effect and its applications, theories of trans effect, Mechanism of nucleophilic substitution in square planar complexes. Thermodynamic and kinetic stability, Kinetics of octahedral substitution (classification of metal ions based on water exchange rate), General mechanism of substitution in octahedral complexes (D, I, Id, Ia). (14 Lectures)

Reference Books:

- Vogel, A.I. Qualitative Inorganic Analysis, Longman, 1972.
- Svehla, G. Vogel's Qualitative Inorganic Analysis, 7th Edition, Prentice Hall, 1996-03-07.
- Huheey, J. E.; Keiter, E.A. & Keiter, R.L. Inorganic Chemistry, Principles of Structure and Reactivity 4th Ed., Harper Collins 1993, Pearson, 2006.
- Sharpe, A.G. Inorganic Chemistry, 4th Indian Reprint (Pearson Education) 2005.
- Douglas, B. E.; McDaniel, D.H. & Alexander, J.J. Concepts and Models in Inorganic Chemistry, 3rd Ed., John Wiley and Sons, NY, 1994.
- Greenwood, N.N. & Earnshaw, A. Chemistry of the Elements, Elsevier 2nd Ed, 1997 (Ziegler Natta Catalyst and Equilibria in Grignard Solution).
- Lee, J.D. Concise Inorganic Chemistry 5th Ed., John Wiley and sons 2008.
- Powell, P. Principles of Organometallic Chemistry, Chapman and Hall, 1988.
- Shriver, D.D. & P. Atkins, Inorganic Chemistry 2nd Ed., Oxford University Press, 1994.
- Basolo, F. & Person, R. Mechanisms of Inorganic Reactions: Study of Metal Complexes in Solution 2nd Ed., John Wiley & Sons Inc; NY.
- Purcell, K.F. & Kotz, J.C., Inorganic Chemistry, W.B. Saunders Co. 1977.
- Miessler, G. L. & Donald, A. Tarr, Inorganic Chemistry 4th Ed., Pearson, 2010.
- Collman, James P. et al. Principles and Applications of Organotransition Metal Chemistry. Mill Valley, CA: University Science Books, 1987.

- Crabtree, Robert H. The Organometallic Chemistry of the Transition Metals, New York, NY: John Wiley, 2000.
- Spessard, Gary O., & Gary L. Miessler. Organometallic Chemistry. Upper Saddle River, NJ: Prentice-Hall, 1996.
- Mehrotra R.C. and Singh, A. Organometallic Chemistry, New Age International Publishers, 2nd Edn, 2000.

PRACTICAL: C-13 LAB.

Qualitative semimicro analysis of mixtures containing 3 anions and 3 cations. Emphasis should be given to the understanding of the chemistry of different reactions. The following radicals are suggested:

CO_3^{2-} , NO_2^- , S^{2-} , SO_3^{2-} , $S_2O_3^{2-}$, CH_3COO^- , F^- , Cl^- , Br^- , I^- , NO_3^- , BO_3^{3-} , $C_2O_4^{2-}$, PO_4^{3-} , NH_4^+ , K^+ , Pb^{2+} , Cu^{2+} , Cd^{2+} , Bi^{3+} , Sn^{2+} , Sb^{3+} , Fe^{3+} , Al^{3+} , Cr^{3+} , Zn^{2+} , Mn^{2+} , Co^{2+} , Ni^{2+} , Ba^{2+} , Sr^{2+} , Ca^{2+} , Mg^{2+} .

Mixtures should preferably contain one interfering anion, or insoluble component ($BaSO_4$, $SrSO_4$, $PbSO_4$, CaF_2 or Al_2O_3) or combination of anions e.g. CO_3^{2-} and SO_3^{2-} , NO_2^- and NO_3^- , Cl^- and Br^- , Cl^- and I^- , Br^- and I^- , NO_3^- and Br^- , NO_3^- and I^- .

Spot tests should be done whenever possible.

Reference Books:

- Vogel's Qualitative Inorganic Analysis, Revised by G.Svehla.
- Marr & Rockett Inorganic Preparations.

C-14: ORGANIC CHEMISTRY-IV

(Credits-6: Theory-4, Practical-2)-Max. Marks: 100

THEORY (Each class 1 hr.): Marks-70 PRACTICAL

(Each class 2 hrs.): Marks-30

Lectures: 60 (40 Theory + 20 Practical classes)

UNIT-I: Organic Spectroscopy-I

UV Spectroscopy: Types of electronic transitions, max, Chromophores and Auxochromes, Bathochromic and Hypsochromic shifts, Intensity of absorption; Application of Woodward rules for calculation of max for the following systems: the unsaturated aldehydes: ketones, carboxylic acids and esters; Conjugated dienes: alicyclic, homoannular and heteroannular; Extended conjugated systems (aldehydes, ketones and dienes); distinction between cis and trans isomers.

IR Spectroscopy: Fundamental and non-fundamental molecular vibrations; IR absorption positions of O, N and S containing functional groups; Effect of H-bonding, conjugation, resonance and ring size on IR absorptions; Fingerprint region and its significance; application in functional group analysis. (18 Lectures)

UNIT-II: Organic Spectroscopy-II

NMR Spectroscopy: Basic principles of Proton Magnetic Resonance, chemical shift and factors influencing it; Spin-spin coupling and coupling constant; Anisotropic effects in alkene, alkyne, aldehydes and aromatics; Interpretation of NMR spectra of simple compounds. Mass Spectroscopy-Basic principle, Fragmentation pattern, Instrumentation, Determination of m/e ratio. Application of Mass Spectroscopy on CH₄, C₂H₆, n-butane and neo-pentane. Applications of IR, UV and NMR for identification of simple organic molecules. (12 Lectures)

UNIT-III: Carbohydrates

Occurrence, classification and their biological importance. Monosaccharides: Constitution and absolute configuration of glucose and fructose, epimers and anomers, mutarotation, determination of ring size of glucose and fructose, Haworth projections and conformational structures; Interconversions of aldoses and ketoses; Killiani-Fischer synthesis and Ruff degradation; Disaccharides Structure elucidation of maltose. Polysaccharides Elementary treatment of starch, cellulose. (8 Lectures) **Dyes** Classification, colour and constitution; Mordant and Vat dyes; Chemistry of dyeing. Synthesis and applications of: Azo dyes Methyl orange and Congo red (mechanism of Diazo Coupling); Triphenyl methane dyes - Malachite Green, and crystal violet; Phthalein dyes Phenolphthalein and Fluorescein; Natural dyes Alizarin and Indigo; Edible dyes with examples. (8 Lectures)

UNIT-IV: Polymers

Introduction and classification including di-block, tri-block and amphiphilic polymers; Number average molecular weight, Weight average molecular weight, Degree of polymerization, Polydispersity Index. Polymerisation reactions -Addition and condensation -Mechanism of cationic, anionic and free radical addition polymerization; Metallocene-based Ziegler-Natta polymerisation of alkenes; Preparation and applications of plastics thermosetting (phenol-formaldehyde, Polyurethanes) and thermosoftening (PVC, polythene); Fabrics natural and synthetic (acrylic, polyamido, polyester); Rubbers natural and synthetic: Buna-S and Neoprene; Vulcanization; Polymer additives; Biodegradable and conducting polymers with examples. (14 Lectures)

Reference Books:

- Kalsi, P. S. Textbook of Organic Chemistry 1st Ed., New Age International (P) Ltd. Pub.
- Morrison, R. T. & Boyd, R. N. Organic Chemistry, Dorling Kindersley (India) Pvt. Ltd. (Pearson Education).
- Billmeyer, F. W. Textbook of Polymer Science, John Wiley & Sons, Inc.
- Gowariker, V. R.; Viswanathan, N. V. & Sreedhar, J. Polymer Science, New Age International (P) Ltd.

Pub.

- Finar, I. L. Organic Chemistry (Volume 2: Stereochemistry and the Chemistry of Natural Products), Dorling Kindersley (India) Pvt. Ltd. (Pearson Education).
- Graham Solomons, T.W. Organic Chemistry, John Wiley & Sons, Inc.
- Clayden, J.; Greeves, N.; Warren, S.; Wothers, P.; Organic Chemistry, Oxford University Press.
- Singh, J.; Ali, S.M. & Singh, J. Natural Product Chemistry, Pragati Prakashan (2010).
- Kemp, W. Organic Spectroscopy, Palgrave.

PRACTICAL: C-14 LAB.

1. Extraction of caffeine from tea leaves.
2. Preparation of sodium polyacrylate.
3. Preparation of urea formaldehyde.
4. Analysis of Carbohydrate: aldoses and ketoses, reducing and non-reducing sugars.
5. Qualitative analysis of unknown organic compounds containing mono-functional groups (carbohydrates, aryl halides, aromatic hydrocarbons, nitro compounds, amines and amides) and simple bifunctional groups, for e.g. salicylic acid, cinnamic acid, nitrophenols etc.

Reference Books:

- Vogel, A.I. Quantitative Organic Analysis, Part 3, Pearson (2012).
- Mann, F.G. & Saunders, B.C. Practical Organic Chemistry, Pearson Education (2009).
- Furniss, B.S., Hannaford, A.J.; Smith, P.W.G.; Tatchell, A.R. Practical Organic Chemistry, 5th Ed., Pearson (2012).
- Ahluwalia, V.K. & Aggarwal, R. Comprehensive Practical Organic Chemistry: Preparation and Quantitative Analysis, University Press (2000).
- Ahluwalia, V.K. & Dhingra, S. Comprehensive Practical Organic Chemistry: Qualitative Analysis, University Press (2000).

DISCIPLINE SPECIFIC ELECTIVE(DSE)

SEMESTER-V

DSE-1: POLYMER CHEMISTRY

(Credits-6: Theory-4, Practical-2)-Max. Marks: 100
THEORY (Each class 1 hr.): Marks-70 PRACTICAL
(Each class 2 hrs.): Marks-30 Lectures: 60 (40 Theory
+ 20 Practical classes)

UNIT-I: Introduction and history of polymeric materials:

Different schemes of classification of polymers, Polymer nomenclature, Molecular forces and chemical bonding in polymers, Texture of Polymers. (4 Lectures)

Functionality and its importance:

Criteria for synthetic polymer formation, classification of polymerization processes, Relationships between functionality, extent of reaction and degree of polymerization. Bi-functional systems, Poly-functional systems. (8 Lectures)

UNIT-II: Kinetics of Polymerization:

Mechanism and kinetics of step growth, radical chain growth, ionic chain (both cationic and anionic) and coordination polymerizations, Mechanism and kinetics of copolymerization, polymerization techniques. (8 lectures)

Crystallization and crystallinity:

Determination of crystalline melting point and degree of crystallinity, Morphology of crystalline polymers, Factors affecting crystalline melting point. (4 Lectures)

Nature and structure of polymers-Structure property relationships. (2 Lectures)

UNIT-III: Determination of molecular weight of polymers

(Mn, Mw, etc.) by end group analysis, viscometry, light scattering and osmotic pressure methods. Molecular weight distribution and its significance. Polydispersity index. (8 Lectures)

Glass transition temperature (T_g) and determination of T_g

WLF equation, Factors affecting glass transition temperature (T_g). (8 Lectures)

UNIT-IV: Polymer Solution

Criteria for polymer solubility, Solubility parameter, Thermodynamics of polymer solutions, entropy, enthalpy, and free energy change of mixing of polymers solutions. (8 Lectures)

Properties of Polymers

(Physical, thermal & mechanical properties). Brief introduction to preparation, structure, properties and application of the following polymers: polyolefins, polystyrene and styrene copolymers, poly(vinyl chloride) poly(vinyl acetate), polyacrylamide, fluoro polymers (Teflon), polyamides (nylon- 6 and nylon 6,6). Phenol formaldehyde resins (Bakelite, Novalac), polyurethanes, silicone polymers (polysiloxane), Polycarbonates, Conducting Polymers, (polyacetylene, polyaniline). (10 Lectures)

Reference Books:

- Seymours Polymer Chemistry, Marcel Dekker, Inc.

- G. Odian: Principles of Polymerization, John Wiley.
- F.W. Billmeyer: Text Book of Polymer Science, John Wiley.
- P. Ghosh: Polymer Science & Technology, Tata Mcgraw-Hill.
- R.W. Lenz: Organic Chemistry of Synthetic High Polymers.

PRACTICAL: DSE-1 LAB.

Polymer synthesis

1. Free radical solution polymerization of styrene (St) / Methyl Methacrylate (MMA) / Methyl Acrylate (MA) / Acrylic acid (AA).
 - (a) Purification of monomer.
 - (b) Polymerization using benzoyl peroxide (BPO) / 2,2-azo-bis-isobutyronitrile (AIBN).
2. Preparation of nylon 66/6.
3. Interfacial polymerization, preparation of polyester from isophthaloyl chloride (IPC) and phenolphthalein.
 - (a) Preparation of IPC.
 - (b) Purification of IPC.
 - (c) Interfacial polymerization.
4. Redox polymerization of acrylamide.
5. Precipitation polymerization of acrylonitrile.
6. Preparation of urea-formaldehyde resin.
7. Preparations of novalac resin/resold resin.
8. Microscale Emulsion Polymerization of poly(methylacrylate).

Polymer characterization

1. Determination of molecular weight by viscometry:
 - (a) Polyacrylamide-aq. NaNO₂ solution
 - (b) (Poly vinyl propylidene (PVP) in water
2. Determination of the viscosity-average molecular weight of poly(vinyl alcohol) (PVOH) and the fraction of head-to-head monomer linkages in the polymer.
3. Determination of molecular wt. by end group analysis: Polyethylene glycol (PEG) (OH group).
4. Determination of hydroxyl number of a polymer using colorimetric method.

Polymer analysis

1. Estimation of the amount of HCHO in the given solution by sodium sulphite method
2. Instrumental Techniques
3. IR studies of polymers

*at least 5 experiments to be carried out.

Reference Books:

- Malcolm P. Stevens, Polymer Chemistry: An Introduction, 3rd Ed.
- Harry R. Allcock, Frederick W. Lampe and James E. Mark, Contemporary Polymer Chemistry, 3rd ed. Prentice-Hall (2003).
- Fred W. Billmeyer, Textbook of Polymer Science, 3rd ed. Wiley-Interscience (1984).
- Joel R. Fried, Polymer Science and Technology, 2nd ed. Prentice-Hall (2003).
- Petr Munk and Tejraj M. Aminabhavi, Introduction to Macromolecular Science, 2nd ed. John

Wiley & Sons (2002).

- L.H. Sperling, Introduction to Physical Polymer Science, 4th ed. John Wiley & Sons (2005).
- Malcolm P. Stevens, Polymer Chemistry: An Introduction, 3rd ed. Oxford University Press (2005).
- Seymour/ Carrahers Polymer Chemistry, 9th ed. by Charles E. Carraher, Jr. (2013).

DSE-2: GREEN CHEMISTRY

(Credits-6: Theory-4, Practical-2)-Max. Marks: 100
THEORY (Each class 1 hr.): Marks-70 PRACTICAL
(Each class 2 hrs.): Marks-30 Lectures: 60 (40 Theory
+ 20 Practical classes)

UNIT-I: Introduction to Green Chemistry

What is Green Chemistry? Need for Green Chemistry. Goals of Green Chemistry. Limitations/Obstacles in the pursuit of the goals of Green Chemistry. (4 Lectures)

Principles of Green Chemistry and Designing a Chemical synthesis-I

Twelve principles of Green Chemistry with their explanations and examples with special emphasis on: Designing a Green Synthesis using these principles; Prevention of Waste/ byproducts; maximum incorporation of the materials used in the process into the final products, Atom Economy, calculation of atom economy of the rearrangement, addition, substitution and elimination reactions. Prevention/ minimization of hazardous/ toxic products reducing toxicity. risk = (function) hazard exposure; waste or pollution prevention hierarchy. Green solvents supercritical fluids, water as a solvent for organic reactions, ionic liquids, fluoruous biphasic solvent, PEG, solventless processes, immobilized solvents and how to compare greenness of solvents. (12 Lectures)

UNIT-II: Principles of Green Chemistry and Designing a Chemical synthesis-II

Explanation of principles with special emphasis on: Energy requirements for reactions alternative sources of energy: use of microwaves and ultrasonic energy. Selection of starting materials; avoidance of unnecessary derivatization careful use of blocking/protecting groups. Use of catalytic reagents (wherever possible) in preference to stoichiometric reagents; catalysis and green chemistry, comparison of heterogeneous and homogeneous catalysis, biocatalysis, asymmetric catalysis and photocatalysis. Prevention of chemical accidents designing greener processes, inherent safer design, principle of ISD What you dont have cannot harm you, greener alternative to Bhopal Gas Tragedy (safer route to carcarbaryl) and Flixiborough accident (safer route to cyclohexanol) subdivision of ISD, minimization, simplification, substitution, moderation and limitation. Strengthening/ development of analytical techniques to prevent and minimize the generation of hazardous substances in chemical processes. (14 Lectures)

UNIT-III: Examples of Green Synthesis/ Reactions and some real world cases-I Green Synthesis of the following compounds: adipic acid, catechol, disodium iminodiacetate (alternative to Strecker synthesis) Microwave assisted reactions in water: Hofmann Elimination, methyl benzoate to benzoic acid, oxidation of toluene and alcohols; microwave assisted reactions in organic solvents: Diels-Alder reaction and Decarboxylation reaction. Ultrasound assisted reactions: sonochemical Simmons-Smith Reaction (Ultrasonic alternative to Iodine). Surfactants for carbon dioxide replacing smog producing and ozone depleting solvents with CO₂ for precision cleaning and dry cleaning of garments. Designing of Environmentally safe marine antifoulant. (14 Lectures)

UNIT-IV: Examples of Green Synthesis/ Reactions and some real world cases-II Rightfit pigment: synthetic azopigments to replace toxic organic and inorganic pigments. An efficient, green synthesis of a compostable and widely applicable plastic (poly lactic acid) made from corn. Healthier Fats and oil by Green Chemistry: Enzymatic Inter esterification for production of

no Trans-Fats and Oils Development of Fully Recyclable Carpet: Cradle to Cradle Carpeting (6 Lectures)

Future Trends in Green Chemistry

Oxidation reagents and catalysts; Biomimetic, multifunctional reagents; Combinatorial green chemistry; Proliferation of solventless reactions; co crystal controlled solid state synthesis (C2S3); Green chemistry in sustainable development. (10 Lectures)

Reference Books:

- V.K. Ahluwalia & M.R. Kidwai: New Trends in Green Chemistry, • Anamalaya Publishers (2005).
- P.T. Anastas & J.K. Warner: Oxford Green Chemistry- Theory and Practical, University Press (1998).
- A.S. Matlack: Introduction to Green Chemistry, Marcel Dekker (2001).
- M.C. Cann & M.E. Connely: Real-World cases in Green Chemistry, American Chemical Society, Washington (2000).
- M.A. Ryan & M. Tinneland, Introduction to Green Chemistry, American Chemical Society, Washington (2002).

PRACTICAL: DSE-2

1. Safer starting materials.

- The Vitamin C clock reaction using Vitamin C tablets, tincture of iodine, hydrogen peroxide and liquid laundry starch.
- Effect of concentration on clock reaction.
- Preparation and characterization of nanoparticles (Ag, Au) using plant extract.

2. Using renewable resources

- Preparation of biodiesel from vegetable oil.

3. Avoiding waste

- Principle of atom economy.
- Use of molecular model kit to simulate the reaction to investigate how the atom economy can illustrate Green Chemistry.
- Preparation of propene by two methods can be studied.

(I) Triethylamine ion + OH⁻ $\xrightarrow{H_2SO_4/O}$ propene + trimethylpropene + water

(II) 1-propanol $\xrightarrow{\text{water}}$ propene + water

- The other types of reactions, like addition, elimination, substitution and rearrangement should also be studied for the calculation of atom economy.

4. Use of enzymes as catalysts

- Benzoin condensation using Thiamine Hydrochloride as a catalyst instead of cyanide

5. Alternative Green solvents

Diels Alder reaction in water

- Reaction between furan and maleic acid in water and at room temperature rather than in benzene and reflux.
- Extraction of D-limonene from orange peel using liquid CO₂ prepared from dry ice.
- Mechanochemical solvent free synthesis of azomethines

4. Alternative sources of energy

- Solvent free, microwave assisted one pot synthesis of phthalocyanine complex of Cu(II).

- Photoreduction of benzophenone to benzopinacol in the presence of sunlight.

Reference Books:

- Anastas, P.T & Warner, J.C. Green Chemistry: Theory and Practice, Oxford University Press (1998).
- Kirchoff, M. & Ryan, M.A. Greener approaches to undergraduate chemistry experiment. American Chemical Society, Washington DC (2002).
- Ryan, M.A. Introduction to Green Chemistry, Tinnesand; (Ed), American Chemical Society, Washington DC (2002).
- Sharma, R.K.; Sidhwani, I.T. & Chaudhari, M.K. I.K. Green Chemistry Experiment: A monograph International Publishing House Pvt Ltd. New Delhi. Bangalore CISBN 978-93-81141-55-7 (2013).
- Cann, M.C. & Connelly, M. E. Real world cases in Green Chemistry, American Chemical Society (2008).
- Cann, M. C. & Thomas, P. Real world cases in Green Chemistry, American Chemical Society (2008).

DSE-3: INDUSTRIAL CHEMICALS AND ENVIRONMENT

(Credits-6: Theory-4, Practical-2)-Max. Marks: 100

THEORY (Each class 1 hr.): Marks-70 PRACTICAL

(Each class 2 hrs.): Marks-30 Lectures: 60 (40 Theory + 20 Practical classes)

UNIT-I: Industrial Gases and Inorganic Chemicals

Industrial Gases: Large scale production, uses, storage and hazards in handling of the following gases: oxygen, nitrogen, argon, neon, helium, hydrogen, acetylene, carbon monoxide, chlorine, sulphur dioxide. Inorganic Chemicals: Manufacture, application and hazards in handling the following chemicals: hydrochloric acid, nitric acid, sulphuric acid, caustic soda, common salt, bleaching powder, sodium thiosulphate, hydrogen peroxide, potash alum, potassium dichromate and potassium permanganate. (10 Lectures)

Industrial Metallurgy

Preparation of metals (ferrous and nonferrous) and ultrapure metals for semiconductor technology. (4 Lectures)

UNIT-II: Environment and its segments

Ecosystems. Biogeochemical cycles of carbon, nitrogen and sulphur. Air Pollution: Major regions of atmosphere. Chemical and photochemical reactions in atmosphere. Air pollutants: types, sources, particle size and chemical nature; Photochemical smog: its constituents and photochemistry. Environmental effects of ozone. Major sources of air pollution. Pollution by SO_2 , CO_2 , CO , NO_x , and H_2S and control procedures. Effects of air pollution on living organisms and vegetation. Greenhouse effect and global warming, Ozone depletion by oxides of nitrogen, chlorofluorocarbons and halogens, removal of sulphur from coal. (14 Lectures)

UNIT-III: Water Pollution: Hydrological cycle, water resources, aquatic ecosystems, Sources and nature of water pollutants, Techniques for measuring water pollution, Impacts of water pollution on hydrological and ecosystems. Water purification methods. Effluent treatment plants (primary, sec-

ondary and tertiary treatment). Industrial effluents from the following industries and their treatment: electroplating, textile, tannery, dairy, petroleum and petrochemicals, fertilizer. Sludge disposal. Industrial waste management, incineration of waste. Water treatment and purification (reverse osmosis, ion exchange). Water quality parameters for waste water, industrial water and domestic water. (16 Lectures)

UNIT-IV: Energy & Environment

Sources of energy: Coal, petrol and natural gas. Nuclear fusion/fission, solar energy, hydrogen, geothermal, tidal and hydel. Nuclear Pollution: Disposal of nuclear waste, nuclear disaster and its management. (10 Lectures)

Biocatalysis: Introduction to biocatalysis: Importance in green chemistry and chemical industry. (6 Lectures)

Reference Books:

- E. Stocchi: Industrial Chemistry, Vol-I, Ellis Horwood Ltd. UK.
- R.M. Felder, R.W. Rousseau: Elementary Principles of Chemical Processes, Wiley Publishers, New Delhi.
- A. Kent: Riegels Handbook of Industrial Chemistry, CBS Publishers, New Delhi.
- S. S. Dara: A Textbook of Engineering Chemistry, S. Chand & Company Ltd. New Delhi.
- De, Environmental Chemistry: New Age International Pvt., Ltd, New Delhi.
- S. M. Khopkar, Environmental Pollution Analysis: Wiley Eastern Ltd, New Delhi.
- S.E. Manahan, Environmental Chemistry, CRC Press (2005).
- G.T. Miller, Environmental Science 11th edition. Brooks/ Cole (2006).
- Mishra, Environmental Studies. Selective and Scientific Books, New Delhi (2005).

PRACTICAL: DSE-3

1. Determination of dissolved oxygen in water.
2. Determination of Chemical Oxygen Demand (COD).
3. Determination of Biological Oxygen Demand (BOD).
4. Percentage of available chlorine in bleaching powder.
5. Measurement of chloride, sulphate and salinity of water samples by simple titration method ($AgNO_3$ and potassium chromate).
6. Estimation of total alkalinity of water samples (CO_3^{2-} , HCO_3^-) using double titration method.
7. Measurement of dissolved CO_2 .
8. Study of some of the common bio-indicators of pollution.
9. Estimation of SPM in air samples.
10. Preparation of borax/ boric acid.

Reference Books:

- E. Stocchi: Industrial Chemistry, Vol-I, Ellis Horwood Ltd. UK.
- R.M. Felder, R.W. Rousseau: Elementary Principles of Chemical Processes, Wiley Publishers, New Delhi.
- A. Kent: Riegels Handbook of Industrial Chemistry, CBS Publishers, New Delhi.
- S. S. Dara: A Textbook of Engineering Chemistry, S. Chand & Company Ltd. New Delhi.
- De, Environmental Chemistry: New Age International Pvt., Ltd, New Delhi.
- S. M. Khopkar, Environmental Pollution Analysis: Wiley Eastern Ltd, New Delhi.

DSE-4: DISSERTATION/PROJECT WORK

Marks:100

SKILL ENHANCEMENT COURSES (SEC)

SEMESTER- III

SEC-I: PESTICIDE CHEMISTRY

(Credits: 02)- Max. Marks: 50

30 Lectures(Each Lecture 1 hr.)

General introduction to pesticides (natural and synthetic), benefits and adverse effects, changing concepts of pesticides, structure activity relationship, synthesis and technical manufacture and uses of representative pesticides in the following classes: Organochlorines (DDT, Gammexene,); Organophosphates (Malathion, Parathion); Carbamates (Carbofuran and carbaryl); Quinones (Chloranil), Anilides (Alachlor and Butachlor).

Practical

- To calculate acidity/alkalinity in given sample of pesticide formulations as per BIS specifications.
- Preparation of simple organophosphates, phosphonates and thiophosphates.

Reference Book:

- R. Cremlyn: Pesticides, John Wiley.

SEMESTER- IV

SEC-II: FUEL CHEMISTRY

(Credits: 02)- Max. Marks: 50

30 Lectures(Each Lecture 1 hr.)

Review of energy sources (renewable and non-renewable). Classification of fuels and their calorific value Coal: Uses of coal (fuel and non-fuel) in various industries, its composition, carbonization of coal. Coal gas, producer gas and water gas composition and uses. Fractionation of coal tar, uses of coal tar bases chemicals, requisites of a good metallurgical coke, Coal gasification (Hydro gasification and Catalytic gasification), Coal liquefaction and Solvent Refining.

Petroleum and Petrochemical Industry: Composition of crude petroleum, Refining and different types of petroleum products and their applications. Fractional Distillation (Principle and process), Cracking (Thermal and catalytic cracking), Reforming Petroleum and non-petroleum fuels (LPG, CNG, LNG, bio-gas, fuels derived from biomass), fuel from waste, synthetic fuels (gaseous and liquids), clean fuels. Petrochemicals: Vinyl acetate, Propylene oxide, Isoprene, Butadiene, Toluene and its derivatives Xylene.

Lubricants: Classification of lubricants, lubricating oils (conducting and non-conducting) Solid and semisolid lubricants, synthetic lubricants. Properties of lubricants (viscosity index, cloud point, pore point) and their determination.

large Reference Books:

- E. Stocchi: Industrial Chemistry, Vol -I, Ellis Horwood Ltd. UK.
- P.C. Jain, M. Jain: Engineering Chemistry, Dhanpat Rai & Sons, Delhi.
- B.K. Sharma: Industrial Chemistry, Goel Publishing House, Meerut.

GENERIC ELECTIVE(GE)

B. Sc.(Hons.) Students other than Chemistry Honours will opt four Chemistry GE Papers.

SEMESTER-I

GE-I: ATOMIC STRUCTURE, BONDING, GENERAL ORGANIC CHEMISTRY & ALIPHATIC HYDROCARBONS

(Credits-6: Theory-4, Practical-2)-Max. Marks: 100
THEORY (Each class 1 hr.): Marks-70 PRACTICAL
(Each class 2 hrs.): Marks-30 Lectures: 60 (40 Theory
+ 20 Practical classes)

SECTION A: INORGANIC CHEMISTRY-1 (30 Periods)

Unit-I: Atomic Structure

Review of: Bohrs theory and its limitations, dual behaviour of matter and radiation, de-Broglies relation, Heisenberg Uncertainty principle. Hydrogen atom spectra.

What is Quantum mechanics ? Time independent Schrodinger equation and meaning of various terms in it. Significance of ψ and ψ^2 , Schrodinger equation for hydrogen atom. Radial and angular parts of the hydrogenic wave functions (atomic orbitals) and their variations for 1s, 2s, 2p, 3s, 3p and 3d orbitals (Only graphical representation). Significance of quantum numbers, orbital angular momentum and quantum numbers m_l and m_s . Shapes of s, p and d atomic orbitals, nodal planes. Discovery of spin, spin quantum number (s) and magnetic spin quantum number (m_s). Rules for filling electrons in various orbitals, Electronic configurations of the atoms. Stability of half-filled and completely filled orbitals, concept of exchange energy. Relative energies of atomic orbitals, Anomalous electronic configurations. (14 Lectures)

Unit-II: Chemical Bonding and Molecular Structure

Ionic Bonding: General characteristics of ionic bonding. Energy considerations in ionic bonding, lattice energy and solvation energy and their importance in the context of stability and solubility of ionic compounds. Statement of Born-Land equation for calculation of lattice energy, Born-Haber cycle and its applications, polarizing power and polarizability. Fajans rules, ionic character in covalent compounds, bond moment, dipole moment and percentage ionic character.

Covalent bonding: VB Approach: Shapes of some inorganic molecules and ions on the basis of VSEPR and hybridization with suitable examples of linear, trigonal planar, square planar, tetrahedral, trigonal bipyramidal and octahedral arrangements. Concept of resonance and resonating structures in various inorganic and organic compounds.

MO Approach: Rules for the LCAO method, bonding and antibonding MOs and their characteristics for s-s, s-p and p-p combinations of atomic orbitals, nonbonding combination of orbitals, MO treatment of homonuclear diatomic molecules (N_2 , O_2) and heteronuclear diatomic molecules (CO, NO). Comparison of VB and MO approaches. (16 Lectures)

Section B: Organic Chemistry-1 (30 Periods) Unit- III: Fundamentals of Organic Chemistry

Physical Effects, Electronic Displacements: Inductive Effect, Electromeric Effect, Resonance and Hyperconjugation. Cleavage of Bonds: Homolysis and Heterolysis.

Structure, shape and reactivity of organic molecules: Nucleophiles and electrophiles. Reactive Intermediates: Carbocations, Carbanions and free radicals. Strength of organic acids and bases: Comparative study with emphasis on factors affecting pK values. Aromaticity: Hckels rule. (8 Lectures)

Stereochemistry

Conformations with respect to ethane, butane and cyclohexane. Interconversion of Wedge Formula, Newmann, Sawhorse and Fischer representations. Concept of chirality (upto two carbon atoms). Configuration: Geometrical and Optical isomerism; Enantiomerism, Diastereomerism and Meso compounds). D and L; cis-trans nomenclature; CIP Rules: R/S (for one chiral carbon atoms) and E/Z Nomenclature (for up to two C=C systems). (10 Lectures)

Unit- IV: Aliphatic Hydrocarbons

Functional group approach for the following reactions (preparations & reactions) to be studied in context to their structure. Alkanes: (Upto 5 Carbons). Preparation: Catalytic hydrogenation, Wurtz reaction, Kolbes synthesis, from Grignard reagent. Reactions: Free radical Substitution: Halogenation.

Alkenes: (Upto 5 Carbons) Preparation: Elimination reactions: Dehydration of alkenes and dehydrohalogenation of alkyl halides (Saytzeffs rule); cis alkenes (Partial catalytic hydrogenation) and trans alkenes (Birch reduction). Reactions: cis-addition (alk. $KMnO_4$) and trans-addition (bromine), Addition of HX (Markownikoffs and anti-Markownikoffs addition), Hydration, Ozonolysis, Alkynes: (Upto 5 Carbons) Preparation: Acetylene from CaC_2 and conversion into higher alkynes; by dehalogenation of tetra halides and dehydrohalogenation of vicinal-dihalides.

Reactions: formation of metal acetylides, addition of bromine and alkaline $KMnO_4$, ozonolysis. (12 Lectures)

Reference Books:

- J. D. Lee: A new Concise Inorganic Chemistry, E L. B. S.
- F. A. Cotton & G. Wilkinson: Basic Inorganic Chemistry, John Wiley.
- Douglas, McDaniel and Alexander: Concepts and Models in Inorganic Chemistry, John Wiley.
- T. W. Graham Solomon: Organic Chemistry, John Wiley and Sons.
- Peter Sykes: A Guide Book to Mechanism in Organic Chemistry, Orient Longman.
- E. L. Eliel: Stereochemistry of Carbon Compounds, Tata McGraw Hill. I. L. Finar: Organic Chemistry (Vol. I & II), E. L. B. S.
- R. T. Morrison & R. N. Boyd: Organic Chemistry, Prentice Hall.
- Arun Bahl and B. S. Bahl: Advanced Organic Chemistry, S. Chand.

PRACTICAL: GE-I LAB.

Section A: Inorganic Chemistry-Volumetric Analysis

1. Estimation of sodium carbonate and sodium hydrogen carbonate present in a mixture.
2. Estimation of oxalic acid by titrating it with $KMnO_4$.
3. Estimation of water of crystallization in Mohrs salt by titrating with $KMnO_4$.

4. Estimation of Fe (II) ions by titrating it with $K_2Cr_2O_7$ using internal indicator.
5. Estimation of Cu (II) ions iodometrically using $Na_2S_2O_3$.

Section B: Organic Chemistry

1. Detection of extra elements (N, S, Cl, Br, I) in organic compounds (containing upto two extra elements).
2. Separation of mixtures by Chromatography: Measure the Rf value in each case (combination of two compounds to be given).
 - (a) Identify and separate the components of a given mixture of 2 amino acids (glycine, aspartic acid, glutamic acid, tyrosine or any other amino acid) by paper chromatography.
 - (b) Identify and separate the sugars present in the given mixture by paper chromatography.

large Reference Books:

- Vogels Qualitative Inorganic Analysis, A.I. Vogel, Prentice Hall, 7th Edition.
- Vogels Quantitative Chemical Analysis, A.I. Vogel, Prentice Hall, 6th Edition.
- Textbook of Practical Organic Chemistry, A.I. Vogel, Prentice Hall, 5th edition.
- Practical Organic Chemistry, F. G. Mann. & B. C. Saunders, Orient Longman, 1960.

SEMESTER-II

GE-II: CHEMICAL ENERGETICS, EQUILIBRIA & FUNCTIONAL ORGANIC CHEMISTRY-I

(Credits-6: Theory-4, Practical-2)-Max. Marks: 100
THEORY (Each class 1 hr.): Marks-70 PRACTICAL
(Each class 2 hrs.): Marks-30 Lectures: 60 (40 Theory
+ 20 Practical classes)

Section A: Physical Chemistry-1 (30 Lectures) Unit-I:

Chemical Energetics

Review of thermodynamics and the Laws of Thermodynamics. Important principles and definitions of thermochemistry. Concept of standard state and standard enthalpies of formations, integral and differential enthalpies of solution and dilution. Calculation of bond energy, bond dissociation energy and resonance energy from thermochemical data. Variation of enthalpy of a reaction with temperature Kirchhoffs equation. Statement of Third Law of thermodynamics (10 Lectures)

Chemical Equilibrium:

Free energy change in a chemical reaction. Thermodynamic derivation of the law of chemical equilibrium. Distinction between G and G_0 , Le Chateliers principle. Relationships between K_p , K_c and K_x for reactions involving ideal gases. (8 Lectures)

Unit- II: Ionic Equilibria

Strong, moderate and weak electrolytes, degree of ionization, factors affecting degree of ionization, ionization constant and ionic product of water. Ionization of weak acids and bases, pH scale, common ion effect. Salt hydrolysis-calculation of hydrolysis constant, degree of hydrolysis and pH for different

salts. Buffer solutions. Solubility and solubility product of sparingly soluble salts applications of solubility product principle. (12 Lectures)

Section B: Organic Chemistry-2 (30 Lectures) Unit- III:

Functional group approach for the following reactions (preparations & reactions) to be studied in context to their structure. Aromatic hydrocarbons: Preparation (Case benzene): from phenol, by decarboxylation, from acetylene, from benzene sulphonic acid. Reactions: (Case benzene): Electrophilic substitution: nitration, halogenation and sulphonation. Friedel-Crafts reaction (alkylation and acylation) (upto 4 carbons on benzene). Side chain oxidation of alkyl benzenes (up to 4 carbons on benzene). (8 Lectures)

Alkyl and Aryl Halides

Alkyl Halides (Up to 5 Carbons) Types of Nucleophilic Substitution (SN_1 , SN_2 and SN_i) reactions. Preparation: from alkenes and alcohols.

Reactions: hydrolysis, nitrite & nitro formation, nitrile & isonitrile formation. Williamsons ether synthesis: Elimination vs substitution.

Aryl Halides Preparation: (Chloro, bromo and iodo-benzene case): from phenol, Sandmeyer & Gattermann reactions. Reactions (Chlorobenzene): Aromatic nucleophilic substitution (replacement by OH group) and effect of nitro substituent. Benzyne Mechanism: KNH_2/NH_3 (or $NaNH_2/NH_3$). (8 Lectures)

Unit- IV: Alcohols, Phenols and Ethers (Upto 5 Carbons)

Alcohols: Preparation: Preparation of 1, 2 and 3 alcohols: using Grignard reagent, Esterhydrolysis, Reduction of aldehydes and ketones, carboxylic acid and esters.

Reactions: With sodium, HX (Lucas test), esterification, oxidation (with PCC, alk. $KMnO_4$, acidic dichromate, conc. HNO_3). Oppeneauer oxidation Diols: (Upto 6 Carbons) oxidation of diols. Pinacol-Pinacolone rearrangement.

Phenols: (Phenol case) Preparation: Cumene hydroperoxide method, from diazonium salts. Reactions: Electrophilic substitution: Nitration, halogenation and sulphonation. ReimerTiemann Reaction, Gattermann-Koch Reaction,

Ethers (aliphatic and aromatic): Cleavage of ethers with HI.

Aldehydes and ketones (aliphatic and aromatic): Formaldehyde, acetaldehyde, acetone and benzaldehyde

Preparation: from acid chlorides and from nitriles.

Reactions Reaction with HCN, ROH, $NaHSO_3$, $NH_2 - G$ derivatives. Iodoform test. Aldol Condensation, Cannizzaros reaction, Benzoin condensation. Clemensen reduction and Wolff Kishner reduction. (14 Lectures)

Reference Books:

- T. W. Graham Solomons: Organic Chemistry, John Wiley and Sons.
- Peter Sykes: A Guide Book to Mechanism in Organic Chemistry, Orient Longman.
- I.L. Finar: Organic Chemistry (Vol. I & II), E. L. B. S.
- R. T. Morrison & R. N. Boyd: Organic Chemistry, Prentice Hall.
- Arun Bahl and B. S. Bahl: Advanced Organic Chemistry, S. Chand.

- G. M. Barrow: Physical Chemistry Tata McGraw-Hill(2007).
- G. W. Castellan: Physical Chemistry 4th Edn. Narosa (2004).
- C. Kotz, P. M. Treichel & J. R. Townsend: General Chemistry Cengage Lening India Pvt. Ltd., New Delhi (2009).
- H. Mahan: University Chemistry 3rd Ed. Narosa (1998).
- R. H. Petrucci: General Chemistry 5th Ed. Macmillan Publishing Co.: New York (1985).

PRACTICAL: GE-II LAB.

Section A: Physical Chemistry Thermochemistry

1. Determination of heat capacity of calorimeter for different volumes.
2. Determination of enthalpy of neutralization of hydrochloric acid with sodium hydroxide.
3. Determination of enthalpy of ionization of acetic acid.
4. Determination of integral enthalpy of solution of salts (KNO₃, NH₄Cl).
5. Determination of enthalpy of hydration of copper sulphate.
6. Study of the solubility of benzoic acid in water and determination of H. **Ionic equilibria**
pH measurements a) Measurement of pH of different solutions like aerated drinks, fruit juices, shampoos and soaps (use dilute solutions of soaps and shampoos to prevent damage to the glass electrode) using pH-meter.
b) Preparation of buffer solutions:
(i) Sodium acetate-acetic acid.
(ii) Ammonium chloride-ammonium hydroxide.
Measurement of the pH of buffer solutions and comparison of the values with theoretical values.

Section B: Organic Chemistry

1. Purification of organic compounds by crystallization (from water and alcohol) and distillation.
2. Criteria of Purity: Determination of melting and boiling points.
3. Preparations: Mechanism of various reactions involved to be discussed. Recrystallisation, determination of melting point and calculation of quantitative yields to be done.
(a) Bromination of Phenol/Aniline.
(b) Benzoylation of amines/phenols.
(c) Oxime and 2,4 dinitrophenylhydrazone of aldehyde/ketone.

Reference Books:

- A.I. Vogel: Textbook of Practical Organic Chemistry, 5th edition, Prentice-Hall.
- F. G. Mann & B. C. Saunders, Practical Organic Chemistry, Orient Longman (1960).
- B.D. Khosla, Senior Practical Physical Chemistry, R. Chand & Co.

SEMESTER-III

GE-III: CHEMISTRY OF S- AND P-BLOCK ELEMENTS, STATES OF MATTER & CHEMICAL KINETICS

(Credits-6: Theory-4, Practical-2)-Max. Marks: 100

THEORY (Each class 1 hr.): Marks-70

PRACTICAL (Each class 2 hrs.): Marks-30

Lectures: 60 (40 Theory + 20 Practical classes)

UNIT-I: General Principles of Metallurgy

Chief modes of occurrence of metals based on standard electrode potentials. Ellingham diagrams for reduction of metal oxides using carbon as reducing agent. Hydrometallurgy, Methods of purification of metals (Al, Pb, Fe, Cu, Ni, Zn): electrolytic, oxidative refining, Parting process, van Arkel-de Boer process and Mond's process. (4 Lectures)

s- and p-Block Elements

Periodicity in s- and p-block elements with respect to electronic configuration, atomic and ionic size, ionization enthalpy, electronegativity (Pauling & Mulliken scales). Allotropy in C, S, and P. Oxidation states with reference to elements in unusual and rare oxidation states like carbides and nitrides), inert pair effect, diagonal relationship and anomalous behaviour of first member of each group. (11 Lectures)

UNIT-II: Compounds of s- and p-Block Elements

Hydrides and their classification (ionic, covalent and interstitial), structure and properties with respect to stability of hydrides of p- block elements. Concept of multicentre bonding (diborane).

Structure, bonding and their important properties like oxidation/reduction, acidic/basic nature of the following compounds and their applications in industrial, organic and environmental chemistry.

Hydrides of nitrogen (NH_3 , N_2H_4 , N_3H , NH_2OH)

Oxoacids of P, S and Cl.

Halides and oxohalides: PCl_3 , PCl_5 , $SOCl_2$. (15 Lectures)

Section B: Physical Chemistry-3 (30 Lectures) UNIT-III:

Kinetic Theory of Gases

Postulates of Kinetic Theory of Gases and derivation of the kinetic gas equation. Deviation of real gases from ideal behaviour, compressibility factor, causes of deviation. van der Waals equation of state for real gases. Boyle temperature (derivation not required). Critical phenomena, critical constants and their calculation from van der Waals equation. Maxwell Boltzmann distribution laws of molecular velocities and molecular energies (graphic representation derivation not required) and their importance.

Temperature dependence of these distributions. Most probable, average and root mean square velocities (no derivation). Collision cross section, collision number, collision frequency, collision diameter and mean free path of molecules. Viscosity of gases and effect of temperature and pressure on coefficient of viscosity (qualitative treatment only). (10 Lectures)

Liquids

Surface tension and its determination using stalagmometer. Viscosity of a liquid and determination of coefficient of viscosity using Ostwald viscometer. Effect of temperature on surface tension and coefficient of viscosity of a liquid (qualitative treatment only). (5 Lectures)

UNIT-IV: Solids

Forms of solids. Symmetry elements, unit cells, crystal systems, Bravais lattice types and identification of lattice planes. Laws of Crystallography - Law of constancy of interfacial angles, Law of

rational indices. Miller indices. XRay diffraction by crystals, Braggs law. Structures of NaCl, and CsCl (qualitative treatment only). Defects in crystals. (7 Lectures)

Chemical Kinetics

The concept of reaction rates. Effect of temperature, pressure, catalyst and other factors on reaction rates. Order and molecularity of a reaction. Derivation of integrated rate equations for zero, first and second order reactions (both for equal and unequal concentrations of reactants). Half-life of a reaction. General methods for determination of order of a reaction. Concept of activation energy and its calculation from Arrhenius equation. Theories of Reaction Rates: Collision theory and Activated Complex theory of bimolecular reactions. Comparison of the two theories (qualitative treatment only). (8 Lectures)

Reference Books:

- G. M. Barrow: Physical Chemistry Tata McGraw-Hill(2007).
- G. W. Castellan: Physical Chemistry 4th Edn. Narosa (2004).
- C. Kotz, P. M. Treichel & J. R. Townsend: General Chemistry Cengage Lening India Pvt. Ltd., New Delhi (2009).
- H. Mahan: University Chemistry 3rd Ed. Narosa (1998).
- R. H. Petrucci: General Chemistry 5th Ed. Macmillan Publishing Co.: New York (1985).
- D. Lee: A New Concise Inorganic Chemistry, E.L.B.S.
- F.A. Cotton & G. Wilkinson: Basic Inorganic Chemistry, John Wiley.
- F. Shriver and P. W. Atkins: Inorganic Chemistry, Oxford University Press.
- Gary Wulfsberg: Inorganic Chemistry, Viva Books Pvt. Ltd.

PRACTICAL: GE-III LAB.

Section A: Inorganic Chemistry

Semi-micro qualitative analysis using H_2S of mixtures- not more than four ionic species (two anions and two cations and excluding insoluble salts) out of the following:

Cations : NH_4^+ , Pb^{2+} , Ag^+ , Bi^{3+} , Cu^{2+} , Cd^{2+} , Sn^{2+} , Fe^{3+} , Al^{3+} , Co , Cr^{3+} ,

Ni^{2+} , Mn^{2+} , Zn^{2+} , Ba^{2+} , Sr^{2+} , Ca^{2+} , K^+

Anions: CO_3^{2-} , S^{2-} , SO_3^{2-} , NO_3^- , Cl^- , Br^- , I^- , NO_2^- , PO_4^{3-} , F^- (Spot tests should be carried out

wherever feasible)

Section B: Physical Chemistry Chemical Kinetics

Study the kinetics of the following reactions.

3. Initial rate method: Iodide-persulphate reaction.
4. Integrated rate method:
 - a) Acid hydrolysis of methyl acetate with hydrochloric acid.
 - b) Saponification of ethyl acetate.
 - c) Compare the strengths of HCl and H_2SO_4 by studying kinetics of hydrolysis of methyl acetate.

Reference Books:

- A.I. Vogel, Qualitative Inorganic Analysis, Prentice Hall, 7th Edn
- A.I. Vogel, Quantitative Chemical Analysis, Prentice Hall, 6th Edn.
- B.D. Khosla, Senior Practical Physical Chemistry, R. Chand & Co.

SEMESTER- IV

GE:IV ORGANOMETALLICS, BIOINORGANIC CHEMISTRY, POLYNUCLEAR HYDROCARBONS AND UV, IR SPECTROSCOPY

(Credits-6: Theory-4, Practical-2)-Max. Marks: 100
THEORY (Each class 1 hr.): Marks-70 PRACTICAL
(Each class 2 hrs.): Marks-30 Lectures: 60 (40 Theory
+ 20 Practical classes)

Section A: Inorganic Chemistry-4 (30 Lectures) UNIT-

I: Chemistry of 3d metals

Oxidation states displayed by Cr, Fe, Co, Ni and Cu. A study of the following compounds (including preparation and important properties); Peroxo compounds of Cr, $K_2Cr_2O_7$, $KMnO_4$, $K_4[Fe(CN)_6]$, sodium nitroprusside, $[Co(NH_3)_6]Cl_3$, $Na_3[Co(NO_2)_6]$. (6 Lectures)

Organometallic Compounds Definition and Classification with appropriate examples based on nature of metal-carbon bond (ionic, s, p and multicentre bonds). Structures of methyl lithium, Zeiss salt and ferrocene. EAN rule as applied to carbonyls. Preparation, structure, bonding and properties of mononuclear and polynuclear carbonyls of 3d metals. π -acceptor behaviour of carbon monoxide. Synergic effects (VB approach). (12 Lectures)

UNIT-II: Bio-Inorganic Chemistry

A brief introduction to bio-inorganic chemistry. Role of metal ions present in biological systems with special reference to Na^+ , K^+ and Mg^{2+} ions: Na/K pump; Role of Mg^{2+} ions in energy production and chlorophyll. Role of Ca^{2+} in blood clotting, stabilization of protein structures and structural role (bones). (12 Lectures)

Section B: Organic Chemistry-4 (30 Lectures)

UNIT-III: Polynuclear and heteronuclear aromatic compounds

Properties of the following compounds with reference to electrophilic and nucleophilic substitution: Naphthalene, Anthracene, Furan, Pyrrole, Thiophene, and Pyridine. (6 Lectures)

Active methylene compounds

Preparation: Claisen ester condensation. Keto-enol tautomerism. Reactions: Synthetic uses of ethylacetoacetate (preparation of non-heteromolecules having upto 6 carbon). (6 Lectures)

UNIT-IV: Application of Spectroscopy to Simple Organic Molecules

Applications of visible, ultraviolet and Infrared spectroscopy in organic molecules. Electromagnetic radiations, electronic transitions, λ_{max} and ν_{max} , chromophore, auxochrome, bathochromic and hypsochromic shifts. Application of electronic spectroscopy and Woodward rules for calculating λ_{max} of conjugated dienes and α , β -unsaturated compounds. Infrared radiation and types of molecular vibrations, functional group and fingerprint region. IR spectra of alkanes, alkenes and simple alcohols (inter and intramolecular hydrogen bonding), aldehydes, ketones, carboxylic acids and their derivatives (effect of substitution on $>C=O$ stretching absorptions). (18 Lectures)

Reference Books:

- James E. Huheey, Ellen Keiter & Richard Keiter: Inorganic Chemistry: Principles of Structure and

Reactivity, Pearson Publication.

- G.L. Miessler & Donald A. Tarr: Inorganic Chemistry, Pearson Publication.
- J.D. Lee: A New Concise Inorganic Chemistry, E.L.B.S.
- F.A. Cotton & G. Wilkinson: Basic Inorganic Chemistry, John Wiley & Sons.
- I.L. Finar: Organic Chemistry (Vol. I & II), E.L.B.S.
- John R. Dyer: Applications of Absorption Spectroscopy of Organic Compounds, • Prentice Hall.
- R.M. Silverstein, G.C. Bassler & T.C. Morrill: Spectroscopic Identification of Organic Compounds, John Wiley & Sons.
- R.T. Morrison & R.N. Boyd: Organic Chemistry, Prentice Hall.
- Peter Sykes: A Guide Book to Mechanism in Organic Chemistry, Orient Longman.
- Arun Bahl and B. S. Bahl: Advanced Organic Chemistry, S. Chand.

PRACTICAL: GE-IV LAB.

Section A: Inorganic Chemistry

1. Separation of mixtures by chromatography: Measure the R_f value in each case. (Combination of two ions to be given).

Paper chromatographic separation of Fe^{3+} , Al^{3+} and Cr^{3+} or Paper chromatographic separation of Ni^{2+} , Co^{2+} , Mn^{2+} and Zn^{2+}

Section B: Organic Chemistry

Systematic Qualitative Organic Analysis of Organic Compounds possessing mono-functional groups (-COOH, phenolic, aldehydic, ketonic, amide, nitro, amines) and preparation of one derivative.

Reference Books:

- A.I. Vogel: Qualitative Inorganic Analysis, Prentice Hall, 7th Edn.
- A.I. Vogel: Quantitative Chemical Analysis, Prentice Hall, 6th Edn.
- A.I. Vogel: Textbook of Practical Organic Chemistry, Prentice Hall, 5th Edn.
- F. G. Mann & B. C. Saunders: Practical Organic Chemistry, Orient Longman (1960).

SEMESTER- IV (CBZ Students)

GE:IV- MOLECULES OF LIFE

(Credits-6: Theory-4, Practical-2)-Max. Marks: 100
THEORY (Each class 1 hr.): Marks-70 PRACTICAL
(Each class 2 hrs.): Marks-30 Lectures: 60 (40 Theory
+ 20 Practical classes)

UNIT-I: Carbohydrates

Classification of carbohydrates, reducing and non reducing sugars, General Properties of Glucose and Fructose, their open chain structure. Epimers, mutarotation and anomers. Determination of configuration of Glucose (Fischer proof). Cyclic structure of glucose. Haworth projections. Cyclic structure of fructose. Linkage between monosachharides, structure of disacharrides (sucrose, maltose, lactose) and polysacharrides (starch and cellulose) excluding their structure elucidation. (12 Periods)

UNIT-II Amino Acids, Peptides and Proteins

Classification of Amino Acids, Zwitterion structure and Isoelectric point. Overview of Primary, Secondary, Tertiary and Quaternary structure of proteins. Determination of primary structure of peptides, determination of N-terminal amino acid (by DNFB and Edman method) and C-terminal amino acid (by thiohydantoin and with carboxypeptidase enzyme). Synthesis of simple peptides (upto dipeptides) by N-protection (t-butyloxycarbonyl and phthaloyl) & C-activating groups and Merrifield solid phase synthesis. (12 Periods)

UNIT-III: Enzymes and correlation with drug action

Mechanism of enzyme action, factors affecting enzyme action, Coenzymes and cofactors and their role in biological reactions, Specificity of enzyme action (Including stereospecificity), Enzyme inhibitors and their importance, phenomenon of inhibition (Competitive and Non competitive inhibition including allosteric inhibition). Drug action-receptor theory. Structure activity relationships of drug molecules, binding role of OH group, $-NH_2$ group, double bond and aromatic ring, (10 Periods)

Nucleic Acids

Components of Nucleic acids: Adenine, guanine, thymine and Cytosine (Structure only), other components of nucleic acids, Nucleosides and nucleotides (nomenclature), Structure of polynucleotides; Structure of DNA (Watson-Crick model) and RNA (types of RNA), Genetic Code, Biological roles of DNA and RNA: Replication, Transcription and Translation. (8 Periods)

UNIT-IV: Lipids

Introduction to lipids, classification. Oils and fats: Common fatty acids present in oils and fats, Omega fatty acids, Trans fats, Hydrogenation, Saponification value, Iodine number. Biological importance of triglycerides, phospholipids, glycolipids, and steroids (cholesterol). (8 Periods) **Concept**

of Energy in Biosystems

Calorific value of food. Standard caloric content of carbohydrates, proteins and fats. Oxidation of foodstuff (organic molecules) as a source of energy for cells. Introduction to Metabolism (catabolism, anabolism), ATP: the universal currency of cellular energy, ATP hydrolysis and free energy change. Conversion of food into energy. Outline of catabolic pathways of Carbohydrate- Glycolysis, Fermentation, Krebs Cycle. Overview of catabolic pathways of Fats and Proteins. Interrelationships in the metabolic pathways of Proteins, Fats and Carbohydrates. (10 Lectures)

Recommended Texts:

- Morrison, R. T. & Boyd, R. N. Organic Chemistry, Dorling Kindersley (India) Pvt. Ltd. (Pearson Education).
- Finar, I. L. Organic Chemistry (Volume 1), Dorling Kindersley (India) Pvt. Ltd. (Pearson Education).
- Finar, I. L. Organic Chemistry (Volume 2), Dorling Kindersley (India) Pvt. Ltd. (Pearson Education).
- Nelson, D. L. & Cox, M. M. Lehningers Principles of Biochemistry 7th Ed., W. H. Freeman.
- Berg, J. M., Tymoczko, J. L. & Stryer, L. Biochemistry 7th Ed., W. H. Freeman.

PRACTICAL: GE-IV(CBZ) LAB.

1. Separation of amino acids by paper chromatography.

2. To determine the concentration of glycine solution by formylation method.
3. Study of titration curve of glycine.
4. Action of salivary amylase on starch.
5. Effect of temperature on the action of salivary amylase on starch.
6. To determine the saponification value of an oil/fat.
7. To determine the iodine value of an oil/fat.
8. Differentiate between a reducing/ nonreducing sugar.
9. Extraction of DNA from onion/cauliflower.
10. To synthesise aspirin by acetylation of salicylic acid and compare it with the ingredient of an aspirin tablet by TLC.

Recommended Texts:

- Furniss, B.S.; Hannaford, A.J.; Rogers, V.; Smith, P.W.G.; Tatchell, A.R. *Vogels Textbook of Practical Organic Chemistry*, ELBS.
- Ahluwalia, V.K. & Aggarwal, R. *Comprehensive Practical Organic Chemistry*, Universities Press.

COMPUTER SCIENCE(HONOURS)

SEMESTER-I

C:1-PROGRAMMING USING C (Credit:6, Theory:4, Practical: 2)

UNIT- I

Introduction to Programming Language, Introduction to C Programming , Character Set, C Tokens, Keywords & Identifiers, Constants, Variables, Data Types, Variables , Storage Classes, Operators (Arithmetic, Relational, Logical , Assignment, Increment & Decrement, Conditional , Bitwise), Expressions , Input and Output Operations.

UNIT- II

Decision Making and Branching: Simple IF Statement, IF.. ELSE Statement, Nesting IF. ELSE Statement, ELSE IF Ladder, Switch Statement, Operator, GOTO Statement. Decision Making and Looping: The WHILE Statement, The DO Statement, The FOR Statement, Jumps in LOOPS. Arrays, Character Arrays and Strings.

UNIT- III

User-defined Functions: Need, Elements & Definition, Function Calls, Function Definition, Category of Functions, Recursion. Structures and Unions: Defining, Declaring, Accessing, Initialization Structure, Arrays of Structures, Arrays within Structures, Structures and Functions, Unions.

UNIT- IV

Pointers: Accessing the Address of a Variable, Declaring Pointer Variables, Initializations of Pointer Variable, Accessing a Variable through its Pointer, Chain of Pointers, Pointer Expressions, Pointer Increments and Scale Factor, Pointers and Arrays,, Pointers and Character Strings, Array of Pointers, Pointers as Function Arguments, Functions Returning Pointers, Pointers to Functions, Pointers to Structures, Troubles with Pointers.

UNIT- V

File Management in C: Defining and Opening a File, Closing a File, Input/ Output Operations on Files, Error Handling During I/O Operations, Random Access to Files, Command Line Arguments, Dynamic Memory Allocation.

Recommended Books:

1. E. Balaguruswamy, Programming in ANSI C,4/e, (TMH).
2. Paul Deitel, Harvey Deitel, C: How to Program, 8/e, Prentice Hall.
3. J. R. Hanly, Problem Solving & Program Design in C, 7/e, Pearson.
4. B. Kernighan & D.M. Ritchie, The C Programming Language, 2/e PHI.

C: 2-COMPUTER ORGANIZATION

(Credit:6, Theory:4, Practical: 2)

UNIT-I

Character Codes, Decimal System, Binary System, Decimal to Binary Conversion, Hexadecimal Notation, Boolean Algebra, Basic Logic Functions: Electronic Logic Gates, Synthesis of Logic Functions, Minimization of Logic Expressions, Minimization using Karnaugh Maps, Synthesis with NAND and NOR Gates.

UNIT-II

Flip-Flops, Gated Latches, Master-Slave Flip-Flops, Edge-Triggering, T Flip-Flops, JK Flip-Flops. Registers and Shift Registers, Counters, Decoders, Multiplexers, Programmable Logic Devices (PLDs), Programmable Array Logic (PAL), Complex Programmable Logic Devices (CPLDs), Field-Programmable Gate Array (FPGA), Sequential Circuits, Timing Diagrams, The Finite State Machine Model, Synthesis of Finite State Machines.

UNIT-III

Basic Structure of Computers: Computer Types, Functional Units, Input Unit, Memory Unit, Arithmetic and Logic Unit, Output Unit, Control Unit, Basic Operational Concepts, Bus Structures, Software. Machine Instructions and Programs: Numbers, Arithmetic Operations, and Characters: Number Representation, Addition of Positive Numbers, Addition and Subtraction of Signed Numbers, Overflow of Integer Arithmetic, Characters, Memory Locations and Addresses, Byte Addressability, Word Alignment, Accessing Numbers, Characters, and Character Strings, Memory Operations, Instructions and Instruction Sequencing, Register Transfer Notation, Basic Instruction Types, Instruction Execution and Straight-Line Sequencing, Branching, Condition Codes, Generating Memory Addresses, Addressing Modes, Implementation of Variables and Constants, Indirection and Pointers, Indexing and Arrays, Relative Addressing.

UNIT-IV

THE ARM EXAMPLE: Registers, Memory Access, and Data Transfer, Register Structure, Memory Access Instructions and Addressing Modes, Register Move Instructions, Arithmetic and Logic Instructions: Arithmetic Instructions, Logic Instructions, Branch Instructions, Setting Condition Codes, Assembly Language, Pseudo-Instructions, I/O Operations, Subroutines, Vector Dot Product Program, Byte-Sorting Program, Linked-List Insertion and Deletion Subroutines. Basic Input-Output Operations, Stacks and Queues, Subroutines. PowerPC Example: Basic PowerPC Processor Organization, Load and Store Instructions, Arithmetic and Logic Instructions, Flow Control Instructions, Compare Instructions, Logic Instructions, Subroutines.

UNIT-V

Memory System: Semiconductor RAM Memories, Internal Organization of Memory Chips, Static Memories, Asynchronous DRAMS, Synchronous DRAMS, Structure of Large Memories, Memory System Considerations, RAMBUS Memory. Read-Only Memories: ROM, PROM, EPROM, EEPROM, Flash Memory, Speed, Size, and Cost of Memory. Secondary Storage: Magnetic Hard Disks, Optical Disks, Magnetic Tape Systems.

Recommended Books:

1. Carl Hamacher, Z. Vranesic, S. Zaky: Computer Organization, 5/e (TMH)
2. William Stallings: Computer Organization and Architecture (Design for Performance), 9/e
3. S. Brown, & Z. Vranesic, Fundamentals of Digital Logic Design with VHDL, 2/e, McGraw-Hill
4. J. P. Uyemura, A First Course in Digital System Design, An Integrated Approach, Cengage Learning.

GE:1-PROBABILITY AND STATISTICS

Credits;4

UNIT-I

Probability and Probability Distribution: Events and the Sample Space, Calculating Probabilities using Simple events, Useful counting rules, Probability rules: Addition rule, Conditional probability and multiplication rule, Bayes rule.

UNIT-II

Probability Distributions: Random Variable, Discrete random variable, Mean and Standard deviation of discrete random variable, Discrete Probability Distributions: Binomial, Poisson and Hypergeometric probability distribution, Continuous Probability distribution: Normal distribution.

UNIT-III

Sampling Distribution: sampling plans and experimental designs, Sampling distribution of a statistic, Central Limit theorem, Sampling distribution of the Sample mean and Proportion. Large Sample Estimation: Point estimation, Interval estimation, Confidence interval of population mean, Population proportion, difference between two population means, difference between two population proportions.

UNIT-IV

Large Sample Tests of Hypothesis: Test of a Population mean, Test of difference of two population means, Test of hypothesis for a binomial proportion, Test of hypothesis for the difference between two binomial proportions. Inference from Small Samples: Students t Distribution, Small Sample inferences concerning a population mean and difference between two population means, Inferences concerning a population variance and difference between two population variances.

UNIT-V

Analysis of Variance: One-way classification, Two-way classification. Linear regression and Correlation: Method of least squares, Analysis of variance for linear regression, Testing the usefulness of the linear regression model, Estimation and Prediction using the fitted line. Carl Pearsons coefficient of Correlation, Test of hypothesis concerning the Correlation coefficient.

Recommended Books: 1. William Mendenhall, Robert J. Beaver, Barbara M. Beaver, Probability and Statistics 14/e, CENGAGE Learning. 2. W. W. Hines, D.C. Montgomery, D.M. Goldsman, & C.M. Borror, Probability & Statistics in Engineering”.

C: 3-PROGRAMMING USING C++

(Credit:6, Theory:4, Practical: 2)

UNIT-I

Principles of Object-Oriented Programming: Object-Oriented Programming (OOP) Paradigm, Basic Concepts of OOP, Benefits of OOP, Object Oriented Languages, Applications of OOP. Beginning with C++: Applications of C++, C++ statements, Example with Class, Structure of C++ Program, Creating the Source File, Compiling and Linking. Tokens, Expressions and Control Structures: Tokens, Keywords, Identifiers & Constants, Basic Data Types, User-Defined Data Types, Derived Data Types, Symbolic Constants, Type Compatibility, Declaration of Variables, Dynamic Initialization of Variables, Reference Variables, Operators in C++, Scope Resolution Operator, Member Deferencing Operators, Memory Management Operators, Manipulators, Type Cast Operators, Expressions and

their Types, Special Assignment Expressions, Implicit Conversions, Operator Overloading, Operator Precedence, Control Structures.

UNIT- II

Functions in C++: The Main Function, Function Prototyping, Call By Reference, Return by Reference, Inline Functions, Default Arguments, Const. Arguments, Function Overloading, Friend & Virtual Functions, Math. Library Functions. **Classes and Objects**: Specifying a Class, Defining Member Functions, Making an outside Function Inline, Nested Member Functions, Private Member Functions, Arrays within a Class, Memory Allocation for Objects, Static Data Members, Static Member Functions, Arrays of Objects, Objects as Function Arguments, Friendly Functions, Returning Objects, Const. Member Functions, Pointer to Members, Local Classes.

UNIT- III

Constructors & Destructors: Constructors, Parameterized Constructors, Multiple Constructors in a Class, Constructors with Default Arguments, Dynamic Initialization of Objects, Copy Constructor, Dynamic Constructors, Constructing Two-Dimensional Arrays, Const. Objects, Destructors. **Operator Overloading and Type Conversions**: Defining Operator Overloading, Overloading Unary Operators, Overloading Binary Operators, Overloading Binary Operators using Friends, Manipulation of Strings using Operators, Rules for Overloading Operators, Type Conversions.

UNIT- IV

Inheritance : Defining Derived Classes, Single Inheritance, Making a Private Member Inheritance, Multilevel Inheritance, Multiple Inheritance, Hierarchical Inheritance, Hybrid Inheritance, Virtual Base Classes, Abstract Classes, Constructors in Derived Classes, Member Classes, Nesting of Classes. Pointers, Virtual Functions and Polymorphism: Pointers, Pointers to Objects, this Pointer, Pointers to Derived Classes, Virtual Functions, Pure Virtual Functions.

UNIT- V

Managing Console I/O Operations: **C++ Streams**, C++ Stream Classes, Unformatted I/O Operations, Formatted Console I/O Operations, Managing Output with Manipulators. **Files**: Classes for File Stream Operations, Opening and Closing a File, Detecting end-of-file, File Modes, File Pointers and their Manipulations, Sequential Input and Output Operations, Updating a File: Random Access, Error Handling During File Operations, Command-line Arguments.

Recommended Books:

1. E. Balgurusamy, Object Oriented Programming with C++ :, 4/e (TMH).
2. Paul Deitel, Harvey Deitel, "C++: How to Program",9/e. Prentice Hall.
3. J. Farrell, Object-Oriented Programming, Cengage Learning.
4. Bjarne Stroustrup, "Programming – Principles and Practice using C++", 2/e, Addison-Wesley 2014.

C: 4-DATA STRUCTURES (Credit:6, Theory:4, Practical: 2)

UNIT-I

Introduction and Overview: Definitions, Concept of Data Structures, Overview of Data Structures, Implementation of Data Structures. Arrays: Terminology, One-Dimensional Array, Multi-Dimensional Arrays, Pointer Arrays.

UNIT-II

Linked Lists: Single Linked List, Circular Linked List, Double Linked List, Circular Double Linked List, Application of Linked Lists, Memory Representation, Boundary Tag System, De-allocation Strategy, Buddy System, Compaction.

UNIT-III

Stacks: Definition, Representation of Stack (Array, Linked List), Operations on Stacks, Applications of Stack (Evaluation of Arithmetic Expressions, Code Generation, Implementation of Recursion, Factorial Calculation, Quick Sort, Tower of Hanoi, Activation Record Management).

UNITIV

Queues: Definition, Representation of Queues (Array, Linked List), Circular Queue, Deque, Priority Queue, Application of Queues (Simulation, CPU Scheduling in Multiprogramming Environment, Round Robin Algorithm).

UNITV

Tree: Binary Trees, Properties of Binary Tree, Linear Representation of Binary a Binary Tree, Linked Representation of a Binary Tree, Physical Implementation of Binary Tree in Memory, Operations on Binary Tree (Insertion, Deletion, Traversal, Merging of two Binary Trees), Types of Binary Trees (Expression Tree, Binary Search Tree, Heap Tree, Threaded Binary Trees, Height Balanced Binary Tree, Weighted Binary Tree, Decision Trees).

Recommended Books:

1. D. Samanta, Classic Data Structures:, 2/e (PHI).
2. D.S Malik, Data Structure using C++, 2/e, Cengage Learning, 2010.
3. Adam Drozdek, "Data Structures and algorithm in C++", 3/e, Cengage Learning, 2012.
4. Robert L. Kruse, "Data Structures and Program Design in C++", Pearson.

GE: 2-NUMERICAL TECHNIQUES

Credits;4

UNIT-I

Introduction: Numbers and their accuracy, Chopping and Rounding off, Errors: Absolute and Relative errors, Floating point representations of numbers, Loss of significance. Solution of Algebraic and Transcendental Equations: Bisection Method, Newton-Raphson Method, Secant Method, Method of false position, Rate of convergence and comparison of iterative methods.

UNIT-II

Interpolation and Numerical Differentiation: Polynomial Interpolation, Interpolating polynomial: Lagrange form, Newton form, Nested form, Divided difference Interpolation, Inverse Interpolation, Errors in polynomial Interpolation. First derivative and second derivative via Taylor Series, Richardson Extrapolation.

UNIT-III

Numerical Integration: Trapezoidal Rule, Composite Trapezoidal rule, Simpsons 1/3 rule, Simpsons 3/8 rule, Gaussian Quadrature formulae (1-point, 2-point, 3-point)

UNIT-IV

Solution of System of Linear Equations: Gaussian Elimination method and Pivoting, LU factorization method, ill Conditioning, Iterative Methods: Jacobi iterative method, Gauss Seidel iterative method. Eigen Values and Eigen Vectors: Eigen value properties, Computation Eigen values by Power method.

UNIT-V

Solution of Ordinary Differential Equations: Taylor Series method, Runge-Kutta method of order 2 and order 4, Predictor-Corrector method: Adams-Bashforth-Moulton method. Smoothing of Data and the Method of Least Squares: Linear and non-linear least square method.

Recommended Books:

1. E. Ward Cheney and David R. Kincaid, Numerical Methods and Applications CENGAGE Learning India Private Ltd., New Delhi.
2. S.R.K. Iyengar, R.K. Jain, & M.K. Jain, Numerical Methods for Scientific & Engineering Computation, 6/e, New Age Int. Pub.
3. S.S. Sastry, Introductory Methods of Numerical Analysis, 5/e, EEE
4. Steven C. Chapra, Applied Numerical Methods with MATLAB, 2/e, McGraw-Hill.

SEMESTER-III

C: 5-OPERATING SYSTEMS (Credit:6, Theory:4, Practical: 2)

UNIT-I

Operating System, Computer-System Organization, Computer-System Architecture, Operating-System Structure, Operating-System Operations, Process Management, Memory Management, Storage Management, Protection and Security, Distributed Systems, Special Purpose Systems, Computing Environments, Open-Source Operating Systems. Operating System Services, User Operating System Interface, System Calls, Types of System Calls, System Programs, Operating-System Design and Implementation, Operating System Structure, Virtual Machines, Operating System Debugging, Operating System Generations. System Boot.

UNIT-II

Process: Process Concept, Process Scheduling, Operations on Processes, Inter-Process Communication, Examples of IPC Systems, Communication in Client-Server Systems. Multithreaded Programming: Multithreading Models, Thread Libraries, Threading Issues, Operating-System Examples.

UNIT-III

Process Scheduling: Basic Concepts, Scheduling Criteria, Scheduling Algorithms, Thread Scheduling. Multiple Process Scheduling. Synchronization: The Critical Section Problem, Petersons Solution, Synchronization Hardware, Semaphores, Classical Problems of Synchronization, Monitors, Synchronization Examples, Atomic Transactions.

UNIT-IV

Deadlocks: System Model, Deadlock Characterization, Methods of Handling Deadlocks, Deadlock Prevention, Deadlock avoidance, Deadlock Detection, Recovery from Deadlock. Memory Management Strategies: Swapping, Contiguous Memory Allocation, Paging, Structure of the Page Table, Segmentation, Example: The Intel Pentium.

UNIT-V

Virtual-Memory Management: Demand Paging, Copy-on-Write, Page Replacement, Allocation of Frames, Thrashing, Memory-Mapped Files, Allocating Kernel Memory. File System: File Concept, Access Methods, Directory and Disk Structure, File-System Mounting, File Sharing, Protection.

Recommended Books:

1. A Silberschatz, P.B. Galvin, G. Gagne, Operating Systems Concepts, 8/e, John Wiley Publications 2008.
2. A.S. Tanenbaum, Modern Operating Systems, 3/e, Pearson Education 2007.
3. W. Stallings, Operating Systems, Internals & Design Principles, 5/e, Prentice Hall of India. 2008.
4. G. Nutt, Operating Systems: A Modern Perspective, 2/e, Pearson Education 1997.

C: 6-DATABASE MANAGEMENT SYSTEM**(Credit:6, Theory:4, Practical: 2)****UNIT-I**

Databases and Database Users, Database System Concepts and Architecture, Data Modelling using the Entity-Relationship (ER) Model, The Enhanced Entity-Relationship (EER) Model.

UNIT-II

Relational Model: The Relational Data Model and Relational Database Constraints, The Relational Algebra and Relational Calculus.

UNIT-III

Relational Database Design by ER- and EER-to-Relational Mapping, SQL-99: Schema Definition, Constraints, Queries, and Views, Introduction to SQL Programming Techniques.

UNIT-IV

Functional Dependencies and Normalization for Relational Databases, Relational Database Algorithms and Further Dependencies, Practical Database Design Methodology and use of UML Diagrams.

UNIT-V

Disk Storage, Basic File Structures, and Hashing, Indexing Structures for Files, Algorithms for Query Processing and Optimization, Physical Database Design and Tuning.

Recommended Books:

1. R. Elmasri, S.B. Navathe, Fundamentals of Database Systems, 6/e, Pearson Education, 2010.
2. A. Silberschatz, H.F. Korth, S. Sudarshan, Database System Concepts 6/e, McGraw Hill, 2010.
3. R. Ramakrishanan, J. Gehrke, Database Management Systems, McGraw-Hill.
4. C. Coronel, S. Morris, & P. Rob, Database Principles (Fundamentals of Design, Implementation, and Management), 9/e, Cengage Learning.

C: 7-DISCRETE STRUCTURES**(Credit:6, Theory:4, Practical: 2)**

UNIT-I Logic and Proofs: Propositional Logic, Propositional Equivalences, Predicates and Quantifiers, Nested Quantifiers, Rules of Inference, Introduction to Proofs, Normal Forms, Proof Methods and Strategy, Mathematical Induction, Strong Induction and Well-Ordering, Recursive Definitions and Structural Induction, Recursive Algorithms.

UNIT-II

Basic Structures: Sets, Set Operations, Functions, Recursive Functions, Sequences and Summations. **Relations:** Relations and their Properties, n-ary Relations and their Applications, Representing Relations, Closures of Relations, Equivalence Relations, Partial Ordering. Boolean.

UNIT-III

Algebra: Boolean Functions, Representing Boolean Functions, Logic Gates, Minimization of Circuits. Algebraic Structures & Coding Theory: The Structure of Algebras, Semi-groups, Monoids and Groups, Homomorphism, Normal Subgroups, and Congruence Relations, Rings, Integral Domains and Fields, Quotient and Product Algebras, Coding Theory. Polynomial Rings and Polynomial Codes.

UNIT-IV

Counting: Basics of Counting, The Pigeonhole Principle, Permutations and Combinations, Binomial Coefficients, Generalized Permutations and Combinations, Generating Permutations and Combinations. Advanced Counting Techniques, Applications of Inclusion-Exclusion, Discrete probability, Conditional probability, Bayes Theorem.

UNIT-V

Graphs: Graphs and Graph Models, Graph Terminology and Special Types of Graphs, Havel-Hakimi Theorem, Representing Graphs and Graph Isomorphism, Connectivity, Cut-Sets, Euler and Hamiltonian Paths, Shortest-Path Problem, Planar Graphs, Graph Coloring, Network Flows.

Recommended Books:

1. Kenneth H Rosen, Discrete Mathematics & Its Applications, McGraw-Hill. 7/e.
2. J. L. Hein, Discrete Structures, Logic, and Computability, 3rd Edition, Jones and Bartlett Publishers, 2009
3. C.L. Liu, D.P. Mahopatra, Elements of Discrete mathematics, 2nd Edition, Tata McGraw Hill, 1985
4. M. O. Albertson and J. P. Hutchinson, Discrete Mathematics with Algorithms, John Wiley Publication, 1988

GE:3-ELECTRICITY & MAGNETISM

(Credit: 06, Theory:04, Practical:02)

UNIT-I

Electric Field and Electric Potential: Electric field: Electric field lines. Electric flux. Gauss Law with applications to charge distributions with spherical, cylindrical and planar symmetry. Conservative nature of Electrostatic Field. Electrostatic Potential. Laplace and Poisson, equations. The Uniqueness Theorem. Potential and Electric Field of a dipole. Force and Torque on a dipole.

UNIT-II

Electrostatic energy of system of charges. Electrostatic energy of a charged sphere. Conductors in an electrostatic Field. Surface charge and force on a conductor. Capacitance of a system of charged conductors. Parallel-plate capacitor. Capacitance of an isolated conductor. Method of Images and its application to: (1) Plane Infinite Sheet, and (2) Sphere.

UNIT-III

Dielectric Properties of Matter: Electric Field in matter. Polarization, Polarization Charges. Electrical Susceptibility and Dielectric Constant. Capacitor (parallel plate, spherical, cylindrical) filled with dielectric. Displacement vector D . Relations between E , P and D . Gauss Law in dielectrics.

UNIT-IV

Magnetic Field: Magnetic force between current elements and definition of Magnetic Field B . Biot-Savart's Law and its simple applications: straight wire and circular loop. Current Loop as a Magnetic

Dipole and its Dipole Moment (Analogy with Electric Dipole). Amperes Circuital Law and its application to (1) Solenoid and (2) Toroid. Properties of B: curl and divergence. Vector Potential. Magnetic Force on (1) point charge (2) current carrying wire (3) between current elements. Torque on a current loop in a uniform Magnetic Field.

UNIT-V

Magnetic Properties of Matter: Magnetization vector (M). Magnetic Intensity(H). Magnetic Susceptibility and permeability. Relation between B, H, M. Ferromagnetism. B-H curve and hysteresis. Electromagnetic Induction: Faradays Law. Lenzs Law. Self Inductance and Mutual Inductance. Reciprocity Theorem. Energy stored in a Magnetic Field. Introduction to Maxwells Equations. Charge Conservation and Displacement current. Electrical Circuits: AC Circuits: Kirchhoffs laws for AC circuits. Complex Reactance and Impedance. Series LCR Circuit: (1) Resonance, (2) Power Dissipation and (3) Quality Factor, and (4) Band Width. Parallel LCR Circuit. Network theorems: Ideal Constant-voltage and Constant-current Sources. Network Theorems: Thevenin theorem, Norton theorem, Superposition theorem, Reciprocity theorem, Maximum Power Transfer theorem. Applications to dc circuits.

Recommended Books:

1. S. Mahajan & Choudhury, Electricity, Magnetism & Electromagnetic Theory, 2012, Tata McGraw Hill
2. Edward M. Purcell, Electricity and Magnetism, 1986 McGraw-Hill Education
3. M.N.O. Sadiku, Elements of Electromagnetics, 2010, Oxford University Press.
4. J.H.Fewkes & J.Yarwood , Electricity and Magnetism,. Vol. I, 1991, Oxford Univ. Press

SEMESTER-IV

C: 8-JAVA PROGRAMMING

(Credit:6, Theory:4, Practical: 2)

UNIT-I

Introduction to Java: Java Architecture and Features, Understanding the semantic and syntax differences between C++ and Java, Compiling and Executing a Java Program, Variables, Constants, Keywords **Data Types**, Operators (Arithmetic, Logical and Bitwise) and Expressions, Comments, Doing Basic Program Output, Decision Making Constructs (conditional statements and loops)and Nesting, Java Methods (Defining, Scope, Passing and Returning Arguments, Type Conversion and Type and Checking, Built-in Java Class Methods).

UNIT-II

Arrays, Strings and I/O: Creating & Using Arrays (One Dimension and Multi-dimensional), Referencing Arrays Dynamically, Java Strings: The Java String class, Creating & Using String Objects, Manipulating Strings, String Immutability & Equality, Passing Strings To & From Methods, String Buffer Classes. Simple I/O using System.out and the Scanner class, Byte and Character streams, Reading/Writing from console and files. Object-Oriented Programming Overview: Principles of Object-Oriented Programming, Defining & Using Classes, Controlling Access to Class Members, Class Constructors, Method Overloading, Class Variables & Methods, Objects as parameters, final classes, Object class, Garbage Collection.

UNIT-III

Inheritance, Interfaces, Packages, Enumerations, Autoboxing and Metadata: Inheritance: (Single Level and Multilevel, Method Overriding, Dynamic Method Dispatch, Abstract Classes), Interfaces and Packages, Extending interfaces and packages, Package and Class Visibility, Using Standard Java Packages (util, lang, io, net), **Wrapper Classes**, Autoboxing/Unboxing, Enumerations and Metadata.

UNIT-IV

Exception Handling, Threading, Networking and Database Connectivity: Exception types, uncaught exceptions, throw, built-in exceptions, Creating your own exceptions; Multi-threading: The Thread class and Runnable interface, creating single and multiple threads, Thread prioritization, synchronization and communication, suspending/resuming threads. Using java.net package, Overview of TCP/IP and Datagram programming. Accessing and manipulating databases using JDBC.

UNIT-V

Applets and Event Handling: Java Applets: Introduction to Applets, Writing Java Applets, Working with Graphics, Incorporating Images & Sounds. Event Handling Mechanisms, Listener Interfaces, Adapter and Inner Classes. The design and Implementation of GUIs using the AWT controls, Swing components of Java Foundation Classes such as labels, buttons, text fields, layout managers, menus, events and listeners; Graphic objects for drawing figures such as lines, rectangles, ovals, using different fonts. Overview of servlets.

Recommended Books:

1. E. Balagurusamy, Programming with Java, 4/e, TMH
2. Bruce Eckel, "Thinking Java", 8/e, Pearson India, 2010.
3. John R. Hubbard, "Programming with JAVA", Schaum's Series, 2/e, 2004.
4. Cay S. Horstmann, Gary Cornell, "Core Java 2 Volume 1", 9/e, Prentice Hall, 2012.

C: 9-COMPUTER NETWORK (Credit:6, Theory:4, Practical: 2)

UNIT-I

Introduction: Data Communications, Networks, The Internet, Protocols and Standards. Network Models: Layered Tasks, The OSI Model, **Layers in the OSI Model**, **TCP/ IP Protocol Suite**, **Ad- dressing**.

UNIT-II

Data and Signals: Analog and Digital, Periodic Analog Signals, Digital Signals, Transmission Impairment, Data Rate Limits, Performance. **Digital Transmission: Digital-To-Digital Conversion, Analog-To-Digital Conversion, Transmission Modes. Analog Transmission: Digital-To-Analog Conversion, Analog-To-Analog Conversion.**

UNIT-III

Multiplexing and Spreading: Multiplexing, Spread Spectrum. **Transmission Media: Guided Media, Unguided Media (Wireless).** Switching: Circuit Switched, Datagrams, Virtual Circuit Networks, Structure of a Switch. Telephone Network, Dial-Up MODEMS, Digital Subscriber Line (DSL), Cable TV Networks, Cable TV for Data Transfer.

UNIT-IV

Error Detection and Correction: Introduction, Block Coding, Linear Block Codes, Cyclic Codes,

Checksum. Data Link Control: Framing, Flow and Error Control, Protocols, Noiseless Channels, Noisy Channels, HDLC, Point-To-Point Protocol. Multiple Access: Random Access, Controlled Access, Channelization. Wired LANs: IEEE Standards, Standard Ethernet, Changes in the Standard, Fast Ethernet, Gigabit Ethernet: Wireless LANs: IEEE 802.11, Bluetooth.

UNIT-V

Connecting LANs: Connecting Devices, Backbone Networks, Virtual LANs. Wireless LANs: Cellular Telephony, Satellite Networks. SONET: Architecture, SONET Layers, SONET Frames, STS Multiplexing, SONET Networks, Virtual Tributaries. Virtual-Circuit Networks. Frame Relay, ATM, ATM LANs,

Recommended Books:

1. B. A. Forouzan, Data Communications and Networking, 4/e, THM, 2007
2. A. S. Tanenbaum, & David J. Wetherall, Computer Networks, 5/e, Pearson

C: 10-COMPUTER GRAPHICS

(Credit:6, Theory:4, Practical: 2)

UNIT-I

Computer Graphics: A Survey of Computer graphics, Overview of Graphics System: Video Display Devices, Raster-Scan Systems, Input Devices, Hard-Copy Devices, Graphics Software, Introduction to OpenGL. Graphics Output Primitives: Point and Lines, Algorithms for line, circle & ellipse generation, Filled-Area Primitives. Attributes of Graphics Primitives: Point, line, curve attributes, fill area attributes, fill methods for areas with irregular boundaries, Antialiasing.

UNIT-II

Geometric Transformations (both 2-D & 3-D): Basic Geometric Transformations, Matrix Representation and Homogeneous Coordinates, Composite Transformations, Inverse Transformations, Other Transformations (Reflection, shear), Transformation between coordinate systems, Affine Transformations. Two Dimensional Viewing: Viewing pipeline, Clipping Window, Normalization & Viewport coordinate Transformations, Clipping Algorithms: Point clipping, Line clipping and Polygon clipping. Three Dimensional Viewing: 3-dimensional Viewing Concepts, Viewing pipeline, Projection Transformations (Orthogonal, Oblique parallel, Perspective), Clipping Algorithms.

UNIT-III

Three Dimensional Object Representations: Curved Surfaces, Quadratic Surfaces, Spline Representations, Bezier Spline Curves and Surfaces, B-Spline Curves and Surfaces, Octrees, BSP Trees, Fractal Geometry Methods, Gamma correction.

UNIT-IV

Visible Surface Detection Methods: Classification of Visible-Surface Detection Algorithms, Back-Face Detection, Depth-Buffer method, A-Buffer Method, Scan line and Depth Sorting, Area subdivision Method, Ray Casting Method.

UNIT-V

Illumination Models: Basic Illumination Models, Displaying light Intensities, Halftone Patterns and Dithering techniques, Polygon-Rendering Methods (Gouraud Shading, Phong Shading), Ray-Tracing Methods (Basic Ray-Tracing Algorithm, Ray-Surface Intersection Calculations). Computer Animation, Hierarchical Modeling (introductory idea only).

Recommended Books:

1. Donald Hearn & M. Pauline Baker, Computer Graphics with OpenGL, Pearson Education.
2. A.V. Dan, F.H. Jones, J.D. Foley, S.K. Feiner, Computer Graphics Principles & Practices in C, 2/e, Pearson.
3. D. F. Rogers, Procedural Elements for Computer Graphics, McGraw Hill.
4. D. F. Rogers, & J. A. Adams, Mathematical Elements for Computer Graphics, 2/e, McGraw Hill.

SEC: II-ANDROID PROGRAMMING**(Credit:02)****UNIT-I**

Introduction: History of Android, Introduction to Android Operating Systems, Android Development Tools, Android Architecture. Overview of object oriented programming using Java: OOPs Concepts: Inheritance, Polymorphism, Interfaces, Abstract class, Threads, Overloading and Overriding, Java Virtual Machine.

UNIT-II

Development Tools: Installing and using Eclipse with ADT plug-in, Installing Virtual machine for Android sandwich/Jelly bean (Emulator), configuring the installed tools, creating a androidproject , Hello Word, run on emulator, Deploy it on USB-connected Android device.

UNIT-III

User Interface Architecture: Application context, intents, Activity life cycle, multiple screen sizes.

UNIT-IV

User Interface Design: Form widgets, Text Fields, Layouts, Button control, toggle buttons, Spinners (Combo boxes), Images, Menu, Dialog.

UNIT-V

Database: Understanding of SQLite database, connecting with the database.

Recommended Books:

1. James C. Sheusi, Android application Development for Java Programmers, Cengage Learning, 2013.
2. M. Burton, & D. Felker, Android Application Development for Dummies, 2/e, Wiley India.

GE:IV-ELECTRONICS**(Credit: 06, Theory:04, Practical:02)****UNIT-I**

Semiconductor Diodes: P and N type semiconductors. Energy Level Diagram. Conductivity and Mobility, Concept of Drift velocity. PN Junction Fabrication (Simple Idea). Barrier Formation in PN Junction Diode. Static and Dynamic Resistance. Current. Flow Mechanism in Forward and Reverse Biased Diode. Drift Velocity. Derivation for Barrier Potential, Barrier Width and Current for Step Junction. Current Flow Mechanism in Forward and Reverse Biased Diode.

UNIT-II

Two-terminal Devices and their Applications: (1) Rectifier Diode: Half-wave Rectifiers. Centre-tapped and Bridge Full-wave Rectifiers, Calculation of Ripple Factor and Rectification Efficiency, C-filter (2) Zener Diode and Voltage Regulation. Principle and structure of (1) LEDs, (2) Photodiode

and (3) Solar Cell. Bipolar Junction Transistors: n-p-n and p-n-p Transistors. Characteristics of CB, CE and CC Configurations. Current gains α and β Relations between α and β . Load Line analysis of Transistors. DC Load line and Q-point. Physical Mechanism of Current Flow. Active, Cutoff and Saturation Regions.

UNIT-III

Amplifiers: Transistor Biasing and Stabilization Circuits. Fixed Bias and Voltage Divider Bias. Transistor as 2-port Network. h-parameter Equivalent Circuit. Analysis of a single-stage CE amplifier using Hybrid Model. Input and Output Impedance. Current, Voltage and Power Gains. Classification of Class A, B & C Amplifiers.

UNIT-IV

Coupled Amplifier: Two stage RC-coupled amplifier and its frequency response. Feedback in Amplifiers: Effects of Positive and Negative Feedback on Input Impedance, Output Impedance, Gain, Stability, Distortion and Noise. Sinusoidal Oscillators: Barkhausen's Criterion for self-sustained oscillations. RC Phase shift oscillator, determination of Frequency. Hartley & Colpitts oscillators. Operational Amplifiers (Black Box approach): Characteristics of an Ideal and Practical Op-Amp. (IC 741) Open-loop and Closed-loop Gain. Frequency Response. CMRR. Slew Rate and concept of Virtual ground.

UNIT-V

Applications of Op-Amps: (1) Inverting and non-inverting amplifiers, (2) Adder, (3) Subtractor, (4) Differentiator, (5) Integrator, (6) Log amplifier, (7) Zero crossing detector (8) Wein bridge oscillator. Conversion: Resistive network (Weighted and R-2R Ladder). Accuracy and Resolution. A/D Conversion (successive approximation)

Recommended Books:

1. J. Millman and C.C. Halkias, Integrated Electronics, 1991, Tata Mc-GrawHill.
2. J.D. Ryder, Electronics: Fundamentals and Applications, 2004, Prentice Hall.
3. B. G. Streetman & S. K. Banerjee, Solid State Electronic Devices, 6/e, 2009, PHI Learning.
4. S. Salivahanan & N. S. Kumar, Electronic Devices & Circuits, 3/e, 2012, Tata Mc-GrawHill.
5. R. A. Gayakwad, OP-Amps and Linear Integrated Circuit, 4/e, 2000, Prentice Hall.

SEMESTER-V

C: 11-INTERNET TECHNOLOGY

(Credit: 06, Theory:04, Practical:02)

UNIT-I

Java: Use of Objects, Array and Array List class

UNIT-II

JavaScript: Data types, operators, functions, control structures, events and event handling.

UNIT-III

JDBC: JDBC Fundamentals, Establishing Connectivity and working with connection interface, Working with statements, Creating and Executing SQL Statements, Working with Result Set Objects. **UNIT-IV**

JSP: Introduction to Java Server Pages, HTTP and Servlet Basics, The Problem with Servlets, The

Anatomy of a JSP Page, JSP Processing, JSP Application Design with MVC, Setting Up the JSP Environment, Implicit JSP Objects, Conditional Processing, Displaying Values, Using an expression to Set an Attribute, Declaring Variables and Methods, Error Handling and Debugging, Sharing Data Between JSP Pages, Requests, and Users, Database Access.

UNIT-V

Java Beans: Java Beans Fundamentals, JAR files, Introspection, Developing a simple Bean, Connecting to DB

Recommended Books:

1. Ivan Bayross, Web Enabled Commercial Application Development Using HTML, DHTML, Javascript, Perl CGI , BPB Publications, 2009.
2. Cay Horstmann, BIG Java, Wiley Publication , 3/e, 2009.
3. Herbert Schildt , Java 7, The Complete Reference, , 8/e, 2009.
4. Jim Keogh ,The Complete Reference J2EE, TMH, , 2002.

C: 12-SOFTWARE ENGINEERING

(Credit: 06, Theory:04, Practical:02)

UNIT-I

Professional Software Development, Software Engineering Ethics, Software Processes, Software Process Models, Process Activities, Coping with Change, The Rational Unified Process, Agile Software Development, Agile Methods, Plan-Driven and Agile Development, Extreme Programming, Agile Project Management, Scaling Agile Methods.

UNIT-II

Requirements Engineering, Functional and Non-Functional Requirements, The Software Requirements Document, Requirements Specification, Requirements Engineering Processes, Requirements Elicitation and Analysis, Requirements Validation, Requirements Management, System Modelling, Context Models, Interaction Models, Structural Models, Behavioural Models, Model-Driven, Engineering, Architectural Design, Architectural Design Decisions, Architectural Views, Architectural Patterns, Application Architectures.

UNIT-III

Design and Implementation: Object-Oriented Design using the UML, Design Patterns, Implementation Issues, Open Source Development, Software Testing: Development Testing, Test-Driven Development, Release Testing, User Testing, Software Evolution: Evolution Processes, Program Evolution Dynamics, Software Maintenance, Legacy System Management, Dependability and Security.

UNIT-IV

Socio-technical Systems: Complex Systems, Systems Engineering, System Procurement, System Development, System Operation. Dependability and Security: Dependability Properties, Availability and Reliability, Safety, Security. Dependability and Security Specification: Risk-Driven Requirements, Specification, Safety Specification, Reliability Specification, Security, Specification, Formal Specification.

UNIT-V

Dependability Engineering: Redundancy and Diversity, Dependable Processes, Dependable Systems Architectures, Dependable Programming. Security Engineering: Security Risk Management, Design

for Security, System Survivability. Dependability and Security Assurance: Static Analysis, Reliability Testing, Security Testing, Process Assurance, Safety and Dependability Cases.

Recommended Books:

1. I. Sommerville, Software Engineering, 9/e, Addison Wesley.
2. R. Mall, Fundamentals of Software Engineering, 3/e, PHI.
3. R.S. Pressman, Software Engineering, A Practitioners Approach, 7/e, McGraw-Hill, 2009.
4. K.K. Aggarwal and Y. Singh, Software Engineering, 2/e, New Age International Publishers, 2008.

**DSE:1-Information Security (Credit: 06,
Theory:04, Practical:02)**

UNIT-I

Introduction: Security, Attacks, Computer Criminals, Security Services, Security Mechanisms. Cryptography: Substitution ciphers, Transpositions Cipher, Confusion, diffusion, Symmetric, Asymmetric Encryption. DES Modes of DES, Uses of Encryption, Hash function, key exchange, Digital Signatures, Digital Certificates.

UNIT-II

Program Security: Secure programs, Non malicious Program errors, Malicious codes virus, Trap doors, Salami attacks, Covert channels, Control against program.

UNIT-III

Threats: Protection in OS: Memory and Address Protection, Access control, File Protection, User Authentication. Database Security: Requirements, Reliability, Integrity, Sensitive data, Inference, Multilevel Security.

UNIT-IV

Security in Networks: Threats in Networks, Security Controls, firewalls, Intrusion detection systems, Secure e-mails.

UNIT-V

Administrating Security: Security Planning, Risk Analysis, Organisational Security Policy, Physical Security. Ethical issues in Security: Protecting Programs and data. Information and law.

Recommended Books:

1. C. P. Pfleeger, S. L. Pfleeger; Security in Computing, PHI, 2006.
2. W. Stallings; Network Security Essentials: Applications and Standards, 4/E, 2010.

**DSE: 2-MICROPROCESSOR
(Credit: 06, Theory:04, Practical:02)**

UNIT-I

An Introduction to Processor Design: Processor architecture and organization, Abstraction in hardware design, MUO - a simple processor, Instruction set design, Processor design trade-offs, The Reduced Instruction Set Computer, Design for low power consumption. The ARM Architecture: The Acorn RISC Machine, Architectural inheritance, The ARM programmer's model, ARM development tools.

UNIT-II ARM Assembly Language Programming: Data processing instructions, Data transfer instructions, Control flow instructions, Writing simple assembly language programs. ARM Organization and Implementation: Pipeline, Types, 3-stage pipeline ARM organization, 5-stage pipeline

ARM organization, ARM instruction execution, ARM implementation, The ARM coprocessor interface.

UNIT-IIIThe ARM Instruction Set: Introduction, Exceptions, Conditional execution, Branch and Branch with Link (B, BL), Branch, Branch with Link and exchange (BX, BLX), Software Interrupt (SWI), Data processing instructions, Multiply instructions, Single word and unsigned byte data transfer instructions, Half-word and signed byte data transfer instructions, Multiple register transfer instructions, Status register to general register transfer instructions, General register to status register transfer instructions, Coprocessor instructions. Coprocessor data operations, Coprocessor data transfers, Coprocessor register transfers, Breakpoint instruction (BRK - architecture v5T only), Unused instruction space, Memory faults, ARM architecture variants.

UNIT-IV

Architectural Support for High-Level Languages: Abstraction in software design, Data types, Floating-point data types, The ARM floating-point architecture, Expressions, Conditional statements, Loops, Functions and procedures, Use of memory, Run-time environment, Examples and exercises.

UNIT-V

Thumb Instruction Set: The Thumb bit in the CPSR, The Thumb programmer's model, Thumb branch instructions, Thumb software interrupt instruction, Thumb data processing instructions, Thumb single register data transfer instructions, Thumb multiple register data transfer instructions, Thumb breakpoint instruction, Thumb implementation, Thumb applications. Architectural Support for System Development: The ARM memory interface, The Advanced Microcontroller Bus Architecture (AMBA), The ARM reference peripheral specification, Hardware system prototyping tools, The ARMulator.

Recommended Books:

Steve Furber :ARM System-On-Chip Architecture.

SEMESTER-VI

C: 13-ARTIFICIAL INTELLIGENCE (Credit: 06, Theory:04, Practical:02)

UNIT-I

Intelligent Agents, Solving problems by searching, Uninformed search strategies (BFS, DFS, DLS, IDS, BD and Uniform cost search), Informed search and exploration (Greedy Best first, A* and its variations) Constraint satisfaction Problems, Adversarial search (Alpha-beta pruning).

UNIT-II

Knowledge and reasoning, logical agent (Wumpus world), Propositional logic, First order logic, Inference in first order logic (Forward chaining, backward chaining, Resolution), Knowledge representation.

UNIT-III

Planning, Partial-Order planning, Planning Graphs, Planning and acting in the real world, Uncertain knowledge and reasoning.

UNIT-IV

Learning from Observations, Decision trees, Neural network (Multilayer), Reinforcement Learning.

UNIT-V

NLP, Communication, A formal grammar for a fragment of English, Syntactic analysis (chat parsing), semantic Interpretation, Ambiguity of grammar, Machine Translation.

Recommended Books:

1. Stuart Russell and Peter Norvig, ARTIFICIAL INTELLIGENCE A MODERN APPROACH, 2/e, PHI.
2. D.W. Patterson, Introduction to A.I and Expert Systems, PHI, 2007.

3. Rich & Knight, Artificial Intelligence, 2/e, Tata McGraw Hill, 1991.

C:14-DESIGN AND ANALYSIS OF ALGORITHMS

(Credit: 06, Theory:04, Practical:02)

UNIT-I

Analysis and Design of Algorithm (Case study insertion sort and merge sort) Asymptotic Analysis, Divide and Conquer, Recurrence Relations, Strassen's Matrix Multiplication.

UNIT-II

Sorting: Quick sort, heap sort, Counting sort, lower bound for sorting, Randomized quicksort, Order Statistics.

UNIT-III

Amortized Analysis (Aggregate analysis, Accounting analysis, Potential analysis), 2-3-4 tree Advanced Data structure: Fibonacci heap, Red black tree, hashing, data structure on disjoint set, Scicinet Data Structure.

UNIT-IV

Dynamic Programming: Matrix Chain multiplication, LCS, TSP, Branch and Bound. Greedy Algorithm: MST: Kruskal, Prim's, Dijkstra Algorithm, Huffman Coding, Maxflow matching, Computational geometry: Convex Hull, 0-1-knapsack, fractional knapsack, Backtracking (4-Queen Prob.) **UNIT-V** Complexity Class: P, PSPACE, NP, NP-Hard, NP Complete, Satisfiability, Chequer, Vertex Cover, Independent set, Exact cover, Graph Coloring, Hamiltonian, Cycle Matching. Approximation Algorithm: Vertex Cover, TSP, Independent Set, Sum of subset.

Recommended Books:

1. T.H. Cormen, Charles E. Leiserson, Ronald L. Rivest, Clifford Stein Introduction to Algorithms, PHI, 3/e, 2009.
2. Sarabasse & A.V. Gelder Computer Algorithm, Introduction to Design and Analysis, Pearson 3/e, 1999.
3. E. Horowitz, S. Sahni, & S. Rajasekaran, Fundamentals of Computer Algorithms, 2/e, University Press.
4. A.V. Aho, J.E. Hopcroft, & J.D. Ullman, The Design and Analysis of Computer Algorithm, Pearson.

DSE:3-CLOUD COMPUTING
(Credit: 06, Theory:04, Practical:02)

Unit - I

Overview of Computing Paradigm: Recent trends in Computing: Grid Computing, Cluster Computing, Distributed Computing, Utility Computing, Cloud Computing. Introduction to Cloud Computing: Introduction to Cloud Computing, History of Cloud Computing, Cloud service providers, Benefits and limitations of Cloud Computing.

UNIT-II

Cloud Computing Architecture: Comparison with traditional computing architecture (client/server), Services provided at various levels, Service Models- Infrastructure as a Service (IaaS), Platform as a Service (PaaS), Software as a Service (SaaS), How Cloud Computing Works, Deployment, Models- Public cloud, Private cloud, Hybrid cloud, Community cloud, Case study of NIST architecture.

UNIT-III

Case Studies: Case Study of Service, Model using Google App Engine, Microsoft Azure, Amazon EC2, Eucalyptus.

UNIT-IV

Service Management in Cloud Computing, Service Level Agreements (SLAs), Billing & Accounting, Comparing Scaling Hardware: Traditional vs. Cloud, Economics of Scaling.

UNIT-V

Cloud Security: Infrastructure Security- Network level security, Host level security, Application level security, Data security and Storage- Data privacy and security Issues, Jurisdictional issues raised by Data location, Authentication in Cloud Computing.

Recommended Books:

1. Barrie Sosinsky, Cloud Computing Bible, Wiley-India, 2010.
2. Rajkumar Buyya, James Broberg, Andrzej, M. Goscinski, Cloud Computing Principles & Paradigms, Wiley-2011.
3. Nikos Antonopoulos, Lee Gillam, Cloud Computing: Principles, Systems and Applications, Springer, 2012.
4. Ronald L. Krutz, Russell Dean Vines, Cloud Security: A Comprehensive Guide to Secure Cloud Computing, Wiley-India, 2010.
5. Toby Velte, Anthony Velte, Robert Elsenpeter, Cloud Computing, A Practical Approach, Mc- Graw Hills, 2010.
6. Dimitris N. Chorafas, Cloud Computing Strategies, CRC Press, 2010.

DSE:4-PROJECT WORK(Credit: 06)

ELECTRONICS

CC 1: Basic Circuit Theory and Network Analysis (Credits: Theory-04, Practicals-02)

Theory Lectures 60

Unit- 1 (13 Lectures)

Basic Circuit Concepts: Voltage and Current Sources, Resistors: Fixed and Variable resistors, Construction and Characteristics, Color coding of resistors, resistors in series and parallel. Inductors: Fixed and Variable inductors, Self and mutual inductance, Faraday's law and Lenz's law of electromagnetic induction, Energy stored in an inductor, Inductance in series and parallel, Testing of resistance and inductance using multimeter. Capacitors: Principles of capacitance, Parallel plate capacitor, Permittivity, Definition of Dielectric Constant, Dielectric strength, Energy stored in a capacitor, Air, Paper, Mica, Teflon, Ceramic, Plastic and Electrolytic capacitor, Construction and application, capacitors in series and parallel, factors governing the value of capacitors, testing of capacitors using multimeter.

Unit- 2 (13 Lectures)

Circuit Analysis: Kirchhoff's Current Law (KCL), Kirchhoff's Voltage Law (KVL), Node Analysis, Mesh Analysis, Star-Delta Conversion. **DC Transient Analysis:** RC Circuit- Charging and discharging with initial charge, RL Circuit with Initial Current, Time Constant, RL and RC Circuits With Sources, DC Response of Series RLC Circuits.

Unit-3 (18 Lectures)

AC Circuit Analysis: Sinusoidal Voltage and Current, Definition of Instantaneous, Peak, Peak to Peak, Root Mean Square and Average Values. Voltage-Current relationship in Resistor, Inductor and Capacitor, Phasor, Complex Impedance, Power in AC Circuits: Instantaneous Power, Average Power, Reactive Power, Power Factor. Sinusoidal Circuit Analysis for RL, RC and RLC Circuits. Resonance in Series and Parallel RLC Circuits, Frequency Response of Series and Parallel RLC Circuits, Quality (Q) Factor and Bandwidth. Passive Filters: Low Pass, High Pass, Band Pass and Band Stop.

Unit-4 (16 Lectures)

Network Theorems: Principal of Duality, Superposition Theorem, Thevenin's Theorem, Norton's Theorem, Reciprocity Theorem, Millman's Theorem, Maximum Power Transfer Theorem. AC circuit analysis using Network theorems. Two Port Networks: Impedance (Z) Parameters, Admittance (Y) Parameters, Transmission (ABCD) Parameters.

Suggested books:

1. S. A. Nasar, Electric Circuits, Schaum's outline series, Tata McGraw Hill (2004)
2. Electrical Circuits, M. Nahvi and J. Edminister, Schaum's Outline Series, Tata McGraw-Hill.(2005)
3. Robert L. Boylestad,

Essentials of Circuit Analysis, Pearson Education (2004) 4. W. H. Hayt, J. E. Kemmerly, S. M. Durbin, Engineering Circuit Analysis, Tata McGraw Hill(2005) 5. Alexander and M. Sadiku, Fundamentals of Electric Circuits, McGraw Hill (2008)

Basic Circuit Theory and Network Analysis Lab (Hardware and Circuit Simulation Software) 60 Lectures

1. Familiarization with a) Resistance in series, parallel and series – Parallel. b) Capacitors & Inductors in series & Parallel. c) Multimeter – Checking of components. d) Voltage sources in series, parallel and series – Parallel e) Voltage and Current dividers
2. Measurement of Amplitude, Frequency & Phase difference using CRO. 3. Verification of Kirchoff's Law. 4. Verification of Norton's theorem. 5. Verification of Thevenin's Theorem. 6. Verification of Superposition Theorem. 7. Verification of the Maximum Power Transfer Theorem. 8. RC Circuits: Time Constant, Differentiator, Integrator. 9. Designing of a Low Pass RC Filter and study of its Frequency Response. 10. Designing of a High Pass RC Filter and study of its Frequency Response. 11. Study of the Frequency Response of a Series LCR Circuit and determination of its (a) Resonant Frequency (b) Impedance at Resonance (c) Quality Factor Q (d) Band Width.

CC 2: Mathematics Foundation for Electronics (Credits: Theory-04, Practicals-02)

Theory Lectures
60

Unit-1 (16 Lectures)

Ordinary Differential Equations: First Order Ordinary Differential Equations, Basic Concepts, Separable Ordinary Differential Equations, Exact Ordinary Differential Equations, Linear Ordinary Differential Equations. Second Order homogeneous and non-homogeneous Differential Equations. **Series solution of differential equations and special functions:** Power series method, Legendre Polynomials, Frobenius Method, Bessel's equations and Bessel's functions of first and second kind. Error functions and gamma function.

Unit-2 (14 Lectures)

Matrices: Introduction to Matrices, System of Linear Algebraic Equations, Gaussian Elimination Method, Gauss-Seidel Method, LU decomposition, Solution of Linear System by LU decomposition. Eigen Values and Eigen Vectors, Linear Transformation, Properties of Eigen Values and Eigen Vectors, Cayley-Hamilton Theorem, Diagonalization, Powers of a Matrix. Real and Complex Matrices, Symmetric, Skew Symmetric, Orthogonal Quadratic Form, Hermitian, Skew Hermitian, Unitary Matrices.

Unit-3 (14 Lectures)

Sequences and series: Sequences, Limit of a sequence, Convergence, Divergence and Oscillation of a sequence, Infinite series, Necessary condition for Convergence, Cauchy's Integral Test, D'Alembert's Ratio Test, Cauchy's nth Root Test, Alternating Series, Leibnitz's Theorem, Absolute Convergence and Conditional Convergence, Power Series.

Unit-4 (16 Lectures)

Complex Variables and Functions: Complex Variable, Complex Function, Continuity, Differentiability, Analyticity. Cauchy-Riemann (C- R) Equations, Harmonic and Conjugate Harmonic Functions, Exponential Function, Trigonometric Functions, Hyperbolic Functions. Line Integral in Complex Plane, Cauchy's Integral Theorem, Cauchy's Integral Formula, Derivative of Analytic Functions. Sequences, Series and Power Series, Taylor's Series, Laurent Series, Zeroes and Poles. Residue integration method, Residue integration of real Integrals.

Suggested Books

1. E. Kreyszig, advanced engineering mathematics, Wiley India (2008)
2. Murray Spiegel, Seymour Lipschutz, John Schiller, Outline of Complex Variables, Schaum Outline Series, Tata McGraw Hill (2007)
3. R. K. Jain, and S.R.K. Iyengar, Advanced Engineering Mathematics, Narosa Publishing House (2007)
4. C .R. Wylie and L. C. Barrett, Advanced Engineering Mathematics, Tata McGraw-Hill (2004)
5. B. V. Ramana, Higher Engineering Mathematics, Tata McGraw Hill Publishing Company Limited (2007)

Mathematics Foundation for Electronics Lab (Scilab/MATLAB/ any other Mathematical Simulation software) 60 Lectures

1. Solution of First Order Differential Equations
2. Solution of Second Order homogeneous Differential Equations
3. Solution of Second Order non-homogeneous Differential Equations
4. Convergence of a given series.
5. Divergence of a given series.
6. Solution of linear system of equations using Gauss Elimination method.
7. Solution of linear system of equations using Gauss – Seidel method.
8. Solution of linear system of equations using L-U decomposition method.

CC 3: Semiconductor Devices (Credits: Theory-04, Practicals-02)

Theory

Lectures 60 Unit 1 (14 Lectures)

Semiconductor Basics: Introduction to Semiconductor Materials, Crystal Structure, Planes and Miller Indices, Energy Band in Solids, Concept of Effective Mass, Density of States, Carrier Concentration at Normal Equilibrium in Intrinsic Semiconductors, Derivation of Fermi Level for Intrinsic & Extrinsic Semiconductors, Donors, Acceptors, Dependence of Fermi Level on Temperature and Doping Concentration,

Temperature Dependence of Carrier Concentrations. Carrier Transport Phenomena: Carrier Drift, Mobility, Resistivity, Hall Effect, Diffusion Process, Einstein Relation, Current Density Equation, Carrier Injection, Generation And Recombination Processes, Continuity Equation.

Unit 2 (14 Lectures)

P-N Junction Diode: Formation of Depletion Layer, Space Charge at a Junction, Derivation of Electrostatic Potential Difference at Thermal Equilibrium, Depletion Width and Depletion Capacitance of an Abrupt Junction. Concept of Linearly Graded Junction, Derivation of Diode Equation and I-V Characteristics. Zener and Avalanche Junction Breakdown Mechanism. Tunnel diode, varactor diode, solar cell: circuit symbol, characteristics, applications

Unit 3 (14 Lectures)

Bipolar Junction Transistors (BJT): PNP and NPN Transistors, Basic Transistor Action, Emitter Efficiency, Base Transport Factor, Current Gain, Energy Band Diagram of Transistor in Thermal Equilibrium, Quantitative Analysis of Static Characteristics (Minority Carrier Distribution and Terminal Currents), Base- Width Modulation, Modes of operation, Input and Output Characteristics of CB, CE and CC Configurations. Metal Semiconductor Junctions: Ohmic and Rectifying Contacts.

Unit 4 (18 Lectures)

Field Effect Transistors: JFET, Construction, Idea of Channel Formation, Pinch-Off and Saturation Voltage, Current-Voltage Output Characteristics. MOSFET, types of MOSFETs, Circuit symbols, Working and Characteristic curves of Depletion type MOSFET (both N channel and P Channel) and Enhancement type MOSFET (both N channel and P channel). Complimentary MOS (CMOS). **Power Devices:** UJT, Basic construction and working, Equivalent circuit, intrinsic Standoff Ratio, Characteristics and relaxation oscillator-expression. SCR, Construction, Working and Characteristics, Triac, Diac, IGBT, MESFET, Circuit symbols, Basic constructional features, Operation and Applications.

Suggested Books:

- 1) S. M. Sze, Semiconductor Devices: Physics and Technology, 2nd Edition, Wiley India edition (2002).
- 2) Ben G Streetman and S. Banerjee, Solid State Electronic Devices, Pearson Education (2006)
- 3) Dennis Le Croisette, Transistors, Pearson Education (1989)
- 4) Jasprit Singh, Semiconductor Devices: Basic Principles, John Wiley and Sons (2001)
- 5) Kanaan Kano, Semiconductor Devices, Pearson Education (2004)
- 6) Robert F. Pierret, Semiconductor Device Fundamentals, Pearson Education (2006)

Semiconductor Devices Lab (Hardware and Circuit Simulation Software) 60 Lectures

1. Study of the I-V Characteristics of Diode – Ordinary and Zener Diode.
2. Study of the I-V Characteristics of the CE configuration of BJT and obtain r_i , r_o , β .
3. Study of the I-V Characteristics of the

Common Base Configuration of BJT and obtain r_i, r_o, α . 4. Study of the I-V Characteristics of the Common Collector Configuration of BJT and obtain voltage gain, r_i, r_o . 5. Study of the I-V Characteristics of the UJT. 6. Study of the I-V Characteristics of the SCR. 7. Study of the I-V Characteristics of JFET. 8. Study of the I-V Characteristics of MOSFET. 9. Study of Characteristics of Solar Cell 10. Study of Hall Effect.

CC 4: Applied Physics (Credits: Theory- 04, Practicals-02)

Theory Lectures
60

Unit-1 (19 Lectures)

Quantum Physics: Inadequacies of Classical physics. Compton's effect, Photo-electric Effect, Wave-particle duality, de Broglie waves. Basic postulates and formalism of quantum mechanics: probabilistic interpretation of waves, conditions for physical acceptability of wave functions. Schrodinger wave equation for a free particle and in a force field (1 dimension), Boundary and continuity conditions. Operators in Quantum Mechanics, Conservation of probability, Time-dependent form, Linearity and superposition, Operators, Time-independent one dimensional Schrodinger wave equation, Stationary states, Eigen-values and Eigen functions. Particle in a one-dimensional box, Extension to a three dimensional box, Potential barrier problems, phenomenon of tunneling. Kronig Penney Model and development of band structure. Spherically symmetric potentials, the Hydrogen-like atom problem.

Unit-2 (11 Lectures)

Mechanical Properties of Materials: Elastic and Plastic Deformations, Hooke's Law, Elastic Moduli, Brittle and Ductile Materials, Tensile Strength, Theoretical and Critical Shear Stress of Crystals. Strengthening Mechanisms, Hardness, Creep, Fatigue, Fracture.

Unit-3 (15 Lectures)

Thermal Properties: Brief Introduction to Laws of Thermodynamics, Concept of Entropy, Concept of Phonons, Heat Capacity, Debye's Law, Lattice Specific Heat, Electronic Specific Heat, Specific Heat Capacity for Si and GaAs, Thermal Conductivity, Thermoelectricity, Seebeck Effect, Thomson Effect, Peltier Effect.

Unit-4 (15 Lectures)

Electric and Magnetic Properties: Conductivity of metals, Ohm's Law, relaxation time, collision time and mean free path, electron scattering and resistivity of metals, heat developed in current carrying conductor, Superconductivity. Classification of Magnetic Materials, Origin of Magnetic moment, Origin of dia, para, ferro and antiferro magnetism and their comparison, Ferrimagnetic materials, Saturation Magnetisation and Curie temperature, Magnetic domains, Concepts of Giant Magnetic Resistance (GMR), Magnetic recording.

Suggested Books:

1. S. Vijaya and G. Rangarajan, Material Science, Tata Mcgraw Hill (2003)
2. W. E. Callister, Material Science and Engineering: An Introduction, Wiley India (2006)
3. A. Beiser, Concepts of Modern Physics , McGraw-Hill Book Company (1987)
4. A. Ghatak & S. Lokanathan, Quantum Mechanics: Theory and Applications, Macmillan India (2004)

Applied Physics

Lab 60 Lectures

1. To determine Young's modulus of a wire by optical lever method.
2. To determine the modulus of rigidity of a wire by Maxwell's needle.
3. To determine the elastic constants of a wire by Searle's method.
4. To measure the resistivity of a Ge crystal with temperature by four –probe method from room temperature to 200 °C).
5. To determine the value of Boltzmann Constant by studying forward characteristics of diode.
6. To determine the value of Planck's constant by using LEDs of at least 4 different wavelengths. 7. To determine e/m of electron by Bar Magnet or by Magnetic Focusing.

CC 5: Electronics Circuits (Credits: Theory-04, Practicals-02)

Unit- 1 (14 Lectures)

Theory Lectures 60

Diode Circuits: Ideal diode, piecewise linear equivalent circuit, dc load line analysis, Quiescent (Q) point. Clipping and clamping circuits. Rectifiers: HWR, FWR (center tapped and bridge). Circuit diagrams, working and waveforms, ripple factor & efficiency, comparison. Filters: types, circuit diagram and explanation of shunt capacitor filter with waveforms. Zener diode regulator circuit diagram and explanation for load and line regulation, disadvantages of Zener diode regulator.

Unit- 2 (15 Lectures)

Bipolar Junction Transistor: Review of CE, CB Characteristics and regions of operation. Hybrid parameters. Transistor biasing, DC load line, operating point, thermal runaway, stability and stability factor, Fixed bias without and with RE, collector to base bias, voltage divider bias and emitter bias (+VCC and –VEE bias), circuit diagrams and their working. Transistor as a switch, circuit and working, Darlington pair and its applications. BJT amplifier (CE), dc and ac load line analysis, hybrid model of CE configuration, Quantitative study of the frequency response of a CE amplifier, Effect on gain and bandwidth for Cascaded CE amplifiers (RC coupled).

Unit- 3 (13 Lectures)

Feedback Amplifiers: Concept of feedback, negative and positive feedback, advantages and disadvantages of negative feedback, voltage (series and shunt), current (series and shunt) feedback amplifiers, gain, input and output impedances. Barkhausen criteria for oscillations, Study of phase shift oscillator, Colpitts oscillator and Hartley oscillator.

Unit- 4 (18 Lectures)

MOSFET Circuits: Review of Depletion and Enhancement MOSFET, Biasing of MOSFETs, Small Signal Parameters, Common Source amplifier circuit analysis, CMOS circuits. **Power Amplifiers:** Difference between voltage and power amplifier, classification of power amplifiers, Class A, Class B, Class C and their comparisons. Operation of a Class A single ended power amplifier. Operation of Transformer coupled Class A power amplifier, overall efficiency. Circuit operation of complementary symmetry Class B push pull power amplifier, crossover distortion, heat sinks. **Single tuned amplifiers:** Circuit diagram, Working and Frequency Response for each, Limitations of single tuned amplifier, Applications of tuned amplifiers in communication circuits.

Suggested Books:

1. Electronic Devices and circuit theory, Robert Boylestad and Louis Nashelsky, 9th Edition, 2013, PHI
2. Electronic devices, David A Bell, Reston Publishing Company
3. D. L. Schilling and C. Belove, Electronic Circuits: Discrete and Integrated, Tata McGraw Hill (2002)
4. Donald A. Neamen, Electronic Circuit Analysis and Design, Tata McGraw Hill (2002)
5. J. Millman and C. C. Halkias, Integrated Electronics, Tata McGraw Hill (2001)
6. J. R. C. Jaegar and T. N. Blalock, Microelectronic Circuit Design, Tata McGraw Hill (2010)
7. J. J. Cathey, 2000 Solved Problems in Electronics, Schaum's outline Series, Tata McGraw Hill (1991)
8. Allen Mottershed, Electronic Devices and Circuits, Goodyear Publishing Corporation

Simulation Software) 60 Lectures

1. Study of the half wave rectifier and Full wave rectifier.
2. Study of power supply using C filter and Zener diode.
3. Designing and testing of 5V/9 V DC regulated power supply and find its load-regulation
4. Study of clipping and clamping circuits .
5. Study of Fixed Bias, Voltage divider and Collector-to-Base bias Feedback configuration for transistors.
6. Designing of a Single Stage CE amplifier.
7. Study of Class A, B and C Power Amplifier.
8. Study of the Colpitt's Oscillator.
9. Study of the Hartley's Oscillator.
10. Study of the Phase Shift Oscillator
11. Study of the frequency response of Common Source FET amplifier.

CC 6: Digital Electronics and Verilog/VHDL (Credits: Theory-04, Practicals-02)

Theory Lectures
60

Unit-1 (11 Lectures)

Number System and Codes: Decimal, Binary, Hexadecimal and Octal number systems, base conversions, Binary, octal and hexadecimal arithmetic (addition, subtraction by complement method, multiplication), representation of signed and unsigned numbers, Binary Coded Decimal code. **Logic Gates and Boolean algebra:** Introduction to Boolean Algebra and Boolean operators, Truth Tables of OR, AND, NOT, Basic postulates and fundamental theorems of Boolean algebra, Truth tables, construction and symbolic representation of XOR, XNOR, Universal (NOR and NAND) gates. **Digital Logic families:** Fan-in, Fan out, Noise Margin, Power Dissipation, Figure of merit, Speed power product, TTL and CMOS families and their comparison.

Unit-2 (13 Lectures)

Combinational Logic Analysis and Design: Standard representation of logic functions (SOP and POS), Karnaugh map minimization, Encoder and Decoder, Multiplexers and Demultiplexers, Implementing logic functions with multiplexer, binary Adder, binary subtractor, parallel adder/subtractor.

Unit-3 (18 Lectures)

Sequential logic design: Latches and Flip flops , S-R Flip flop, J-K Flip flop, T and D type Flip flop, Clocked and edge triggered Flip flops, master slave flip flop, Registers, Counters (synchronous and asynchronous and modulo-N), State Table, State Diagrams, counter design using excitation table and equations. , Ring counter

and Johnson counter. **Programmable Logic Devices:** Basic concepts- ROM, PLA, PAL, CPLD, FPGA

Unit-4 (18 Lectures)

Introduction to Verilog: A Brief History of HDL, Structure of HDL Module, Comparison of VHDL and Verilog, Introduction to Simulation and Synthesis Tools, Test Benches. Verilog Modules, Delays, data flow style, behavioral style, structural style, mixed design style, simulating design. Introduction to Language Elements, Keywords, Identifiers, White Space Characters, Comments, format, Integers, reals and strings.

Logic Values, Data Types-net types, undeclared nets, scalars and vector nets, Register type, Parameters. Expressions, Operands, Operators, types of Expressions **Data flow Modeling and Behavioral Modeling:** Data flow Modeling: Continuous assignment, net declaration assignments, delays, net delays. Behavioral Modeling: Procedural constructs, timing controls, block statement, procedural assignments, conditional statement, loop statement, procedural continuous assignment. **Gate level modeling** - Introduction, built in Primitive Gates, multiple input gates, Tri-state gates, pull gates, MOS switches, bidirectional switches, gate delay, array instances, implicit nets, Illustrative Examples (both combinational and sequential logic circuits).

OR

Introduction to VHDL: A Brief History of HDL, Structure of HDL Module, Comparison of VHDL and Verilog, Introduction to Simulation and Synthesis Tools, Test Benches. VHDL Modules, Delays, data flow style, behavioral style, structural style, mixed design style, simulating design. Introduction to Language Elements, Keywords, Identifiers, White Space Characters, Comments, format. VHDL terms, describing hardware in VHDL, entity, architectures, concurrent signal assignment, event scheduling, statement concurrency, structural designs, sequential behavior, process statements, process declarative region, process statement region, process execution, sequential statements, architecture selection, configuration statements, power of configurations. **Behavioral Modeling:** Introduction to behavioral modeling, inertial delay, transport delay , inertial delay model, transport delay model, transport vs inertial delay, simulation delta drivers, driver creation, generics, block statements, guarded blocks. **Sequential Processing:** Process statement, sensitivity list, signal assignment vs variable assignment, sequential statements, IF, CASE ,LOOP, NEXT, ,EXIT and ASSERT statements, assertion BNF, WAIT ON signal, WAIT UNTIL expression, WAIT FOR time expression, multiple wait conditions, WAIT Time-Out, Sensitivity List vs WAIT Statement

Concurrent Assignment, Passive Processes. **Data types:** Object types-signal, variable, constant, Data types –scalar types, composite types, incomplete types, File Type caveats, subtypes, Subprograms and functions

Suggested Books:

1. M. Morris Mano Digital System Design, Pearson Education Asia, (Fourth Edition)
2. Thomas L. Floyd, Digital Fundamentals, Pearson Education Asia (1994)
3. W. H. Gothmann, Digital Electronics: An Introduction To Theory And Practice, Prentice Hall of India(2000)
4. R. L. Tokheim, Digital Principles, Schaum's Outline Series, Tata McGraw- Hill (1994)
5. A Verilog HDL Primer – J. Bhasker, BSP, 2003 II Edition.
6. Verilog HDL-A guide to digital design and synthesis-Samir Palnitkar, Pearson, 2nd edition.

Digital Electronics and Verilog/VHDL Lab (Hardware and Circuit Simulation Software) 60 lectures

1. To verify and design AND, OR, NOT and XOR gates using NAND gates.
2. To convert a Boolean expression into logic gate circuit and assemble it using logic gate IC's.
3. Design a Half and Full Adder.
4. Design a Half and Full Subtractor.
5. Design a seven segment display driver.
6. Design a 4 X 1 Multiplexer using gates.
7. To build a Flip- Flop Circuits using elementary gates. (RS, Clocked RS, D-type).
8. Design a counter using D/T/JK Flip-Flop.
9. Design a shift register and study Serial and parallel shifting of data.

Experiments in Verlog/VHDL

1. Write code to realize basic and derived logic gates.
2. Half adder, Full Adder using basic and derived gates.
3. Half subtractor and Full Subtractor using basic and derived gates. 4. Clocked D FF, T FF and JK FF (with Reset inputs).
5. Multiplexer (4x1, 8x1) and Demultiplexer using logic gates.
6. Decoder (2x4, 3x8), Encoders and Priority Encoders.
7. Design and simulation of a 4 bit Adder. 8. Code converters (Binary to Gray and vice versa). 9. 2 bit Magnitude comparator. 10. 3 bit Ripple counter.

CC 7: C Programming and Data Structures (Credits: Theory-04, Practicals-02)

Theory Lectures
60

Unit- 1 (12 Lectures)

C Programming Language: Introduction, Importance of C, Character set, Tokens, keywords, identifier, constants, basic data types, variables: declaration & assigning values. Structure of C program Arithmetic operators, relational operators, logical operators, assignment operators, increment and decrement operators, conditional operators, bit wise operators, expressions and evaluation of expressions, type cast operator, implicit conversions, precedence of operators. Arrays-concepts, declaration, accessing elements, storing elements, two-dimensional and multi-dimensional arrays. Input output statement and library functions (math and string related functions).

Unit-2 (19 Lectures)

Decision making, branching & looping: Decision making, branching and looping: if, if-else, else-if, switch statement, break, for loop, while loop and do loop. Functions: Defining functions, function arguments and passing, returning values from functions. **Structures:** defining and declaring a structure variables, accessing structure members, initializing a structure, copying and comparing structure variables, array of structures, arrays within structures, structures within structures, structures and functions. Pointers. **Introduction to C++:** Object oriented programming, characteristics of an object-oriented language.

Unit-3 (15 Lectures)

Data Structures: Definition of stack, array implementation of stack, conversion of infix expression to prefix, postfix expressions, evaluation of postfix expression. Definition of Queue, Circular queues, Array implementation of queues. Linked List and its implementation, Link list implementation of stack and queue, Circular and doubly linked list.

Unit-4 (14 Lectures)

Searching and sorting: Insertion sort, selection sort, bubble sort, merge sort, linear Search, binary search. **Trees :** Introduction to trees, Binary search tree, Insertion and searching in a BST, preorder, postorder and inorder traversal (recursive)

Suggested Books:

1. Yashavant Kanetkar, Let Us C , BPB Publications
2. Programming in ANSI C, Balagurusamy, 2nd edition, TMH.
3. Byron S Gottfried, Programming with C , Schaum Series
4. Brian W. Kernighan, Dennis M. Ritchie, The C Programming Language, Prentice Hall
5. Yashavant Kanetkar, Pointers in C, BPB Publications
6. S. Sahni and E. Horowitz, "Data Structures", Galgotia Publications
7. Tanenbaum: "Data Structures using C", Pearson/PHI.
8. Ellis Horowitz and Sartaz Sahani "Fundamentals of Computer Algorithms", Computer Science Press.

C Programming and Data Structures Lab

60 Lectures

1. Generate the Fibonacci series up to the given limit N and also print the number of elements in the series.
2. Find minimum and maximum of N numbers.
3. Find the GCD of two integer numbers.
4. Calculate factorial of a given number.
5. Find all the roots of a quadratic equation $Ax^2 + Bx + C = 0$ for non – zero coefficients A, B and C. Else report error.
6. Calculate the value of $\sin(x)$ and $\cos(x)$ using the series. Also print $\sin(x)$ and $\cos(x)$ value using

library function.

7. Generate and print prime numbers up to an integer N.
8. Sort given N numbers in ascending order.
9. Find the sum & difference of two matrices of order MxN and PxQ.
10. Find the product of two matrices of order MxN and PxQ.
11. Find the transpose of given MxN matrix.
12. Find the sum of principle and secondary diagonal elements of the given MxN matrix.
13. Calculate the subject wise and student wise totals and store them as a part of the structure.
14. Maintain an account of a customer using classes.
15. Implement linear and circular linked lists using single and double pointers.
16. Create a stack and perform Pop, Push, Traverse operations on the stack using Linear Linked list
17. Create circular linked list having information about a college and perform Insertion at front, Deletion at end.
18. Create a Linear Queue using Linked List and implement different operations such as Insert, Delete, and Display the queue elements.
19. Implement polynomial addition and subtraction using linked lists.
20. Implement sparse matrices using arrays and linked lists.
21. Create a Binary Tree to perform Tree traversals (Preorder, Postorder, Inorder) using the concept of recursion.
22. Implement binary search tree using linked lists. Compare its time complexity over that of linear search.
23. Implement Insertion sort, Merge sort, Bubble sort, Selection sort.

CC 8: Operational Amplifiers and Applications (Credits: Theory-04, Practicals-02)

Theory Lectures
60

Unit-1 (18 Lectures)

Basic Operational Amplifier: Concept of differential amplifiers (Dual input balanced and unbalanced output), constant current bias, current mirror, cascaded differential amplifier stages with concept of level translator, block diagram of an operational amplifier (IC 741)

Op-Amp parameters: input offset voltage, input offset current, input bias current, differential input resistance, input capacitance, offset voltage adjustment range, input voltage range, common mode rejection ratio, slew rate, supply voltage rejection ratio.

Unit-2 (18 Lectures)

Op-Amp Circuits: Open and closed loop configuration, Frequency response of an op-amp in open loop and closed loop configurations, Inverting, Non-inverting, Summing and difference amplifier, Integrator, Differentiator, Voltage to current converter, Current to voltage converter. **Comparators:** Basic comparator, Level detector, Voltage limiters, Schmitt Trigger. **Signal generators:** Phase shift oscillator, Wein bridge oscillator, Square wave generator, triangle wave generator, saw tooth wave generator, and Voltage controlled oscillator(IC 566).

Unit-3 (12 Lectures)

Multivibrators (IC 555): Block diagram, Astable and monostable multivibrator circuit, Applications of Monostable and Astable multivibrators. Phase locked loops (PLL): Block diagram, phase detectors, IC565. **Fixed and variable IC regulators:** IC 78xx and IC 79xx -concepts only, IC LM317- output voltage equation

Unit-4 (12 Lectures)

Signal Conditioning circuits: Sample and hold systems, Active filters: First order low pass and high pass butterworth filter, Second order filters, Band pass filter, Band reject filter, All pass filter, Log and antilog amplifiers.

Suggested Books:

1. R. A. Gayakwad, Op-Amps and Linear IC's, Pearson Education (2003)
2. R. F. Coughlin and F. F. Driscoll, Operational amplifiers and Linear Integrated circuits, Pearson Education (2001)
3. J. Millman and C.C. Halkias, Integrated Electronics, Tata McGraw-Hill,(2001)
4. A.P.Malvino, Electronic Principals,6th Edition , Tata McGraw-Hill,(2003)
5. K.L.Kishore,OP-AMP and Linear Integrated Circuits, Pearson(2011)

Operational Amplifiers and Application Lab (Hardware and Circuit Simulation Software) 60 Lectures

1. Study of op-amp characteristics: CMRR and Slow rate.
2. Designing of an amplifier of given gain for an inverting and non-inverting configuration using an op-amp.
3. Designing of analog adder and subtractor circuit.
4. Designing of an integrator using op- amp for a given specification and study its frequency response.

5. Designing of a differentiator using op- amp for a given specification and study its frequency response.
6. Designing of a First Order Low-pass filter using op-amp.
7. Designing of a First Order High-pass filter using op-amp.
8. Designing of a RC Phase Shift Oscillator using op-amp.
9. Study of IC 555 as an astable multivibrator.
10. Study of IC 555 as monostable multivibrator.
11. Designing of Fixed voltage power supply using IC regulators using 78 series and 79 series

CC 9: Signals & Systems **(Credits: Theory-04, Practicals-02)**

Theory Lectures
60

Unit-1 (17 Lectures)

Signals and Systems: Continuous and discrete time signals, Transformation of the independent variable, Exponential and sinusoidal signals, Impulse and unit step functions, Continuous-Time and Discrete-Time Systems, Basic System Properties.

Unit-2 (13 Lectures)

Linear Time -Invariant Systems (LTI): Discrete time LTI systems, the Convolution Sum, Continuous time LTI systems, the Convolution integral. Properties of LTI systems, Commutative, Distributive, Associative. LTI systems with and without memory, Invariability, Causality, Stability, Unit Step response. Differential and Difference equation formulation, Block diagram representation of first order systems.

Unit-3 (18 Lectures)

Fourier Series Representation of Periodic Signals: Continuous-Time periodic signals, Convergence of the Fourier series, Properties of continuous-Time Fourier series, Discrete-Time periodic signals, Properties of Discrete-Time Fourier series. Frequency-Selective filters, Simple RC highpass and lowpass filters **Fourier Transform:** Aperiodic signals, Periodic signals, Properties of Continuous-time Fourier transform, Convolution and Multiplication Properties, Properties of Fourier transform and basic Fourier transform Pairs.

Unit-4 (12 Lectures)

Laplace Transform: Laplace Transform, Inverse Laplace Transform, Properties of the Laplace Transform, Laplace Transform Pairs, Laplace Transform for signals, Laplace Transform Methods in Circuit Analysis, Impulse and Step response of RL, RC and RLC circuits.

Suggested Book:

1. V. Oppenheim, A. S. Wilsky and S. H. Nawab, Signals and Systems, Pearson Education (2007)
2. S. Haykin and B. V. Veen, Signal and Systems, John Wiley & Sons (2004)
3. C. Alexander and M. Sadiku, Fundamentals of Electric Circuits , McGraw Hill (2008)
4. H. P. Hsu, Signals and Systems, Tata McGraw Hill (2007)
5. S. T. Karris, Signal and Systems: with MATLAB Computing and Simulink Modelling, Orchard Publications (2008)
6. W. Y. Young, Signals and Systems with MATLAB, Springer (2009)
7. M. Roberts, Fundamentals of Signals and Systems, Tata McGraw Hill (2007)

Signals & Systems Lab (Scilab/MATLAB/ Other Mathematical Simulation software)

60

Lectures

1. Generation of Signals: continuous time
2. Generation of Signals: discrete time
3. Time shifting and time scaling of signals.
4. Convolution of Signals
5. Solution of Difference equations.
6. Fourier series representation of continuous time signals.
7. Fourier transform of continuous time signals.
8. Laplace transform of continuous time signals.
9. Introduction to Xcos/similar function and calculation of output of systems represented by block diagram

CC 10: Electronic Instrumentation (Credits: Theory-04, Practicals- 02)

Theory Lectures
60

Unit-1 (15 Lectures)

Qualities of Measurement: Specifications of instruments, their static and dynamic characteristics, Error (Gross error, systematic error, absolute error and relative error) and uncertainty analysis. Statistical analysis of data and curve fitting. **Basic Measurement Instruments:** PMMC instrument, galvanometer, DC measurement - ammeter, voltmeter, ohm meter, AC measurement, Digital voltmeter systems (integrating and non-integrating types), digital multimeters, digital frequency meter system (different modes and universal counter). **Connectors and Probes:** low capacitance probes, high voltage probes, current probes, identifying electronic connectors – audio and video, RF/Coaxial, USB etc.

Unit-2 (15 Lectures)

Measurement of Resistance and Impedance: Low Resistance: Kelvin's double bridge method, Medium

Resistance by Voltmeter Ammeter method, Wheatstone bridge method, High Resistance by Megger. A.C. bridges, Measurement of Self Inductance, Maxwell's bridge, Hay's bridge, and Anderson's bridge, Measurement of Capacitance, Schering's bridge, DeSauty's bridge, Measurement of frequency, Wien's bridge. **A-D and D-A Conversion:** 4 bit binary weighted resistor type D-A conversion, circuit and working. Circuit of R-2R ladder. A-D conversion characteristics, successive approximation ADC. (Mention of relevant ICs for all).

Unit-3 (16 Lectures)

Oscilloscopes: CRT, wave form display and electrostatic focusing, time base and sweep synchronization, measurement of voltage, frequency and phase by CRO, Oscilloscope probes, Dual trace oscilloscope, Sampling Oscilloscope, DSO and Powerscope: Block diagram, principle and working, Advantages and applications, CRO specifications (bandwidth, sensitivity, rise time). **Signal Generators:** Audio oscillator, Pulse Generator, Function generators.

Unit-4 (14 Lectures)

Transducers and sensors: Classification of transducers, Basic requirement/characteristics of transducers, active & passive transducers, Resistive (Potentiometer, Strain gauge – Theory, types, temperature compensation and applications), Capacitive (Variable Area Type – Variable Air Gap type – Variable Permittivity type), Inductive (LVDT) and piezoelectric transducers. Measurement of displacement, velocity and acceleration (translational and rotational). Measurement of pressure (manometers, diaphragm, bellows), Measurement of temperature (RTD, thermistor, thermocouple, semiconductor IC sensors), Light transducers (photoresistors, photovoltaic cells, photodiodes).

Suggested Books:

1. H. S. Kalsi, Electronic Instrumentation, TMH(2006)
2. W.D. Cooper and A. D. Helfrick, Electronic Instrumentation and Measurement Techniques, Prentice-Hall (2005).
3. Instrumentation Measurement and analysis: Nakra B C, Chaudry K, TMH
4. E.O.Doebelin, Measurement Systems: Application and Design, McGraw Hill Book - fifth Edition(2003).
5. Joseph J Carr, Elements of Electronic Instrumentation and Measurement, Pearson Education (2005)
6. David A. Bell, Electronic Instrumentation and Measurements, Prentice Hall (2013).
7. Oliver and Cage, "Electronic Measurements and Instrumentation", TMH (2009).
8. Alan S. Morris, "Measurement and Instrumentation Principles", Elsevier (Buterworth Heinmann- 2008).
9. A. K Sawhney, Electrical and Electronics Measurements and Instrumentation, DhanpatRai and Sons (2007).
10. C. S. Rangan, G. R. Sarma and V. S. Mani, Instrumentation Devices and Systems, Tata Mcgraw Hill (1998).

Electronic Instrumentation Lab 60 Lectures

1. Design of multi range ammeter and voltmeter using galvanometer.
2. Measurement of resistance by Wheatstone bridge and measurement of bridge sensitivity.
3. Measurement of Capacitance by de'Sautys.

4. Measure of low resistance by Kelvin's double bridge.
5. To determine the Characteristics of resistance transducer - Strain Gauge (Measurement of Strain using half and full bridge.)
6. To determine the Characteristics of LVDT.
7. To determine the Characteristics of Thermistors and RTD.
8. Measurement of temperature by Thermocouples and study of transducers like AD590 (two terminal temperature sensor), PT-100, J- type, K-type.
9. To study the Characteristics of LDR, Photodiode, and Phototransistor:Variable Illumination. (ii) Linear Displacement.
10. Characteristics of one Solid State sensor/ Fiber optic sensor

CC 11: Microprocessor and Microcontrollers (Credits: Theory- 04, Practicals-02)

Theory Lectures
60

Unit-1 (18 Lectures)

Introduction to Microprocessor: Introduction, Applications, Basic block diagram, Speed, Word size, Memory capacity, Classification of microprocessors (mention of different microprocessors being used) **Microprocessor 8085:** Features, Architecture -block diagram, General purpose registers, register pairs, flags, stack pointer, program counter, types of buses. Multiplexed address and data bus, generation of control signals, pin description of microprocessor 8085. Basic interfacing concepts, Memory mapped I/O and I/O mapped I/O. **8085 Instructions:** Operation code, Operand & Mnemonics. Instruction set of 8085, instruction classification, addressing modes, instruction format. Data transfer instructions, arithmetic instructions, increment & decrement instructions, logical instructions, branch instructions and machine control instructions. Assembly language programming examples.

Unit-2 (10 Lectures)

Stack operations, subroutine, call and return instructions. Delay loops, use of counters, timing diagrams-instruction cycle, machine cycle, T- states, time delay. Interrupt structure of 8085A microprocessor, processing of vectored and non-vectored interrupts, latency time and response time; Handling multiple interrupts

Microcontrollers: Introduction, different types of microcontrollers, embedded microcontrollers, processor architectures. Harvard vs. Princeton, CISC vs. RISC architectures, microcontroller memory types, microcontroller features, clocking, I/O pins, interrupts, timers, peripherals.

Unit-3 (18 Lectures)

PIC16F887 Microcontroller: Core features, Architecture, pin diagram, memory organization- Program and data memory organization, I/O Ports, oscillator module, Timer modules (Timer 0, Timer 1 and Timer 2), comparator module, analog-to-digital converter (ADC) module, data EEPROM, Enhanced capture/compare/PWM module, EUSART, master synchronous serial port (MSSP) module, special features of the CPU, interrupts, addressing modes, instruction set.

Unit-4 (14 Lectures)

Interfacing to PIC16F887: LED, Switches, Solid State Relay, Seven Segment Display, 16x2 LCD display, 4x4 Matrix Keyboard, Digital to Analog Converter, Stepper Motor and DC Motor. Interfacing program examples using C language.

Suggested Books:

1. Microprocessor Architecture, Programming and Applications with 8085, Ramesh S.Gaonkar - Wiley Eastern Limited- IV Edition.
2. Fundamentals of Microprocessor & Microcomputer: B. Ram—Danpat Rai Publications.
3. Microchip PIC16F87X datasheet
4. PIC Microcontrollers, Milan Verle, , mikro Elektronika, 1st edition (2008)
5. Muhammad Ali Mazidi, "Microprocessors and Microcontrollers", Pearson, 2006

Microprocessor and Microcontrollers Lab 60 Lectures 8085 Assembly language programs:

1. Program to transfer a block of data.
2. Program for multibyte addition
3. Program for multibyte subtraction
4. Program to multiply two 8-bit numbers.
5. Program to divide a 16 bit number by 8 bit number.
6. Program to search a given number in a given list.
7. Program to generate terms of Fibonacci series.
8. Program to find minimum and maximum among N numbers
9. Program to find the square root of an integer.
10. Program to find GCD of two numbers.
11. Program to sort numbers in ascending/descending order.
12. Program to verify the truth table of logic gates.

PIC Microcontroller Programming Note: Programs to be written using C programming language

1. LED blinking with a delay of 1 second.
2. Solid State Relay Interface
2. Interfacing of LCD (2X16).
3. Interfacing of stepper motor and Rotating stepper motor by N steps clockwise/anticlockwise with

speed control.

4. To test all the gates of a given IC74XX is good or bad.
5. Generate sine, square, saw tooth, triangular and staircase waveform using DAC interface.
6. Display of 4-digit decimal number using the multiplexed 7-segment display interface.
7. Analog to digital conversion using internal ADC and display the result on LCD.
8. Implementation of DC-Volt meter (0-5V) using internal ADC and LCD
9. Digital to analog conversion using PWM (pulse delay to be implemented using timers).
10. Speed control of DC motor using PWM (pulse delay to be implemented using timers).
11. Interfacing of matrix keyboard (4X4).
12. Serial communication between microcontroller and PC.

CC 12: Electromagnetics (Credits: Theory-04, Practicals-02)

Theory Lectures 60

Unit-1 (16 Lectures)

Vector Analysis: Scalars and Vectors, Vector Algebra, Rectangular (Cartesian) Coordinate System, Vector

Components and Unit Vector, Vector Field, Products, Cylindrical Coordinates, Spherical Coordinates, Differential Length, Area and Volume, Line Surface and Volume integrals, Del Operator, Gradient of a Scalar, Divergence and Curl of a Vector, the Laplacian. **Electrostatic Fields:** Coulomb's Law and Electric Field, Field due to Discrete and Continuous Charge Distributions, Electric Flux Density, Gauss's Law and Applications, Divergence Theorem and Maxwell's First Equation. Electric Potential, Potential due to a Charge and Charge distribution, Electric dipole. Electric Fields in Conductors, Current and Current Density, Continuity of Current, Metallic Conductor Properties and Boundary Conditions, Method of Images. Dielectric materials, Polarization, Dielectric Constant, Isotropic and Anisotropic dielectrics, Boundary conditions, Capacitance and Capacitors. Electrostatic Energy and Forces.

Unit- 2 (14 Lectures)

Poisson's Equation and Laplace's Equation: Derivation of Poisson's and Laplace's equation, Uniqueness Theorem, Examples of Solution of Laplace's Equation: Cartesian, Cylindrical and Spherical Coordinates.

Magnetostatics: Biot Savert's law and Applications, Magnetic dipole, Ampere's Circuital Law, Curl and Stoke's Theorem, Maxwell's Equation, Magnetic Flux and Magnetic Flux Density, Scalar and Vector Magnetic Potentials. Magnetization in Materials and Permeability, Anisotropic materials, Magnetic Boundary Conditions, Inductors and Inductances, Magnetic Energy, Magnetic Circuits. Inductances and Inductors, Magnetic Energy, Forces and Torques.

Unit-3 (13 Lectures)

Time-Varying Fields and Maxwell's Equations: Faraday's Law of Electromagnetic Induction, Stationary Circuit in Time-Varying Magnetic Field, Transformer and Motional EMF, Displacement Current, Maxwell's Equations in differential and integral form and Constitutive Relations. Potential Functions, Lorentz gauge and the Wave Equation for Potentials, Concept of Retarded Potentials. Electromagnetic Boundary Conditions. Time-Harmonic Electromagnetic Fields and use of Phasors

Unit-4 (17 Lectures)

Electromagnetic Wave Propagation: Time-Harmonic Electromagnetic Fields and use of Phasors, the Electromagnetic Spectrum, Wave Equation in a source free isotropic homogeneous media, Uniform Plane Waves in Lossless and Lossy unbounded homogeneous media, Wave Polarization, Phase and Group velocity, Flow of Electromagnetic Power and Poynting Vector. Uniform Plane wave incident on a Plane conductor boundary, concept of reflection and standing wave. **Guided Electromagnetic Wave Propagation:** Waves along Uniform Guiding Structures, TEM, TE and TM waves, Electromagnetic Wave Propagation in Parallel Plate and Rectangular Metallic Waveguides.

Suggested Books:

1. Murray. R. Spiegel, Vector Analysis, Schaum series, Tata McGraw Hill (2006)
2. M. N. O. Sadiku, Elements of Electromagnetics, Oxford University Press (2001)
3. W. H. Hayt and J. A. Buck, Engineering Electromagnetics, Tata McGraw Hill (2006)
4. D. C. Cheng, Field and Wave Electromagnetics, Pearson Education (2001)
5. J. A. Edminster, Electromagnetics, Schaum Series, Tata McGraw Hill (2006)
6. N. Narayan Rao, Elements of Engineering Electromagnetics, Pearson Education (2006)

7. Introduction to Electrodynamics, D.J. Griffiths, Pearson Education (2012)
8. Electromagnetic Wave and Radiating System, Jordan and Balmain, Prentice Hall (1979)

Electromagnetics Lab (using Scilab/ any other similar freeware) **60 Lectures**

1. Understanding and Plotting Vectors.
2. Transformation of vectors into various coordinate systems.
3. 2D and 3D Graphical plotting with change of view and rotation.
4. Representation of the Gradient of a scalar field, Divergence and Curl of Vector Fields.
5. Plots of Electric field and Electric Potential due to charge distributions.
6. Plots of Magnetic Flux Density due to current carrying wire.
7. Programs and Contour Plots to illustrate Method of Images
8. Solutions of Poisson and Laplace Equations – contour plots of charge and potential distributions
9. Introduction to Computational Electromagnetics: Simple Boundary Value Problems by FiniteDifference/Finite Element Methods.

**CC 13: Communication
Electronics (Credits: Theory-04,
Practicals- 02)**

**Theory Lectures
60**

Unit-1 (10 Lectures)

Electronic communication: Block diagram of an electronic communication system, electromagnetic spectrum-band designations and applications, need for modulation, concept of channels and base-band signals. Concept of Noise, Types of Noise, Signal to noise ratio, Noise Figure, Noise Temperature, Friss formula.

Unit-2 (20 Lectures)

Amplitude Modulation: Amplitude Modulation, modulation index and frequency spectrum. Generation of AM, Amplitude Demodulation (diode detector), Concept of Double side band suppressed carrier, Single side band suppressed carrier, other forms of AM (Pilot Carrier Modulation, Vestigial Side Band modulation, Independent Side Band Modulation). Block diagram of AM Transmitter and Receiver

Angle modulation: Frequency and Phase modulation, modulation index and frequency spectrum, equivalence between FM and PM, Generation of FM (direct and indirect methods), FM detector (PLL). Block diagram of FM Transmitter and Receiver Comparison between AM, FM and PM.

Unit -3 (14 Lectures)

Pulse Analog Modulation: Channel capacity, Sampling theorem, PAM, PDM, PPM modulation and detection techniques, Multiplexing, TDM and FDM. **Pulse Code**

Modulation: Need for digital transmission, Quantizing, Uniform and Non- uniform Quantization,

Quantization Noise, Companding, Coding, Decoding, Regeneration.

Unit -4 (16 Lectures)

Digital Carrier Modulation Techniques: Block diagram of digital transmission and reception, Information capacity, Bit Rate, Baud Rate and M-ary coding. Amplitude Shift Keying (ASK), Frequency Shift Keying (FSK), Phase Shift Keying (PSK), Binary Phase Shift Keying (BPSK) and Quadrature Phase Shift Keying (QPSK)

Suggested Books:

1. Electronic communication systems- Kennedy, 3rd edition, McGraw international publications
2. Principles of Electronic communication systems – Frenzel, 3rd edition, McGraw Hill
3. Communication Systems, S. Haykin, Wiley India (2006)
4. Advanced electronic communications systems – Tomasi, 6th edition, PHI.
5. Communication Systems, S. Haykin, Wiley India (2006)

Communication Electronics Lab (Hardware and Circuit Simulation Software) 60 Lectures

1. Study of Amplitude Modulation
2. Study of Amplitude Demodulation
3. Study of Frequency Modulation
4. Study of Frequency Demodulation
5. Study of Pulse Amplitude Modulation
6. AM Transmitter/Receiver
7. FM Transmitter/Receiver
8. Study of TDM, FDM
9. Study of Pulse Width Modulation
10. Study of Pulse Position Modulation
11. Study of Pulse Code Modulation
12. Study of Amplitude Shift Keying
13. Study of Phase Shift Keying,
14. Study of Frequency Shift Keying.

CC 14: Photonics (Credits: Theory-04, Practicals-02)

Theory Lectures
60

Unit-1 (22 Lectures)

Light as an Electromagnetic Wave: Plane waves in homogeneous media, concept of spherical waves. Reflection and transmission at an interface, total internal reflection, Brewster's Law. Interaction of electromagnetic waves with dielectrics: origin of refractive index, dispersion. **Interference :** Superposition of waves of same frequency, Concept of coherence, Interference by division of wavefront, Young's double slit, Division of Amplitude, thin film interference, anti-reflecting films, Newton's rings; Michelson interferometer. Holography. **Diffraction:** Huygen Fresnel Principle, Diffraction Integral, Fresnel and Fraunhofer approximations. Fraunhofer Diffraction by a single slit, rectangular aperture, double slit, Resolving power of microscopes and telescopes; Diffraction grating: Resolving power and Dispersive power

Unit-2 (13 Lectures)

Polarization: Linear, circular and elliptical polarization, polarizer-analyzer and Malus' law; Double refraction by crystals, Interference of polarized light, Wave propagation in uniaxial media. Half wave and quarter wave plates. Faraday rotation and electro-optic effect.

Unit-3 (13 Lectures)

Light Emitting Diodes: Construction, materials and operation. **Lasers:** Interaction of radiation and matter, Einstein coefficients, Condition for amplification, laser cavity, threshold for laser oscillation, line shape function. Examples of common lasers. The semiconductor injection laser diode. **Photodetectors:** Bolometer, Photomultiplier tube, Charge Coupled Device. Photo transistors and Photodiodes (p-i-n, avalanche), quantum efficiency and responsivity. **LCD Displays:** Types of liquid crystals, Principle of Liquid Crystal Displays, applications, advantages over LED displays.

Unit-4 (12 Lectures)

Guided Waves and the Optical Fiber: TE and TM modes in symmetric slab waveguides, effective index, field distributions, Dispersion relation and Group Velocity. Step index optical fiber, total internal reflection, concept of linearly polarized waves in the step index circular dielectric waveguides, single mode and multimode fibers, attenuation and dispersion in optical fiber.

Suggested Books:

1. Ajoy Ghatak, Optics, Tata McGraw Hill, New Delhi (2005)
2. E. Hecht, Optics, Pearson Education Ltd. (2002)
3. J. Wilson and J. F. B. Hawkes, Optoelectronics: An Introduction, Prentice Hall India (1996)
4. S. O. Kasap, Optoelectronics and Photonics: Principles and Practices, Pearson Education (2009)
5. Ghatak A.K. and Thyagarajan K., "Introduction to fiber optics," Cambridge Univ. Press. (1998)

Photonics Lab 60 Lectures

1. To verify the law of Malus for plane polarized light.
2. To determine wavelength of sodium light using Michelson's Interferometer.
3. To determine wavelength of sodium light using Newton's Rings.
4. To determine the resolving power and Dispersive power of Diffraction Grating.
5. Diffraction experiments using a laser.
6. Study of Faraday rotation.
7. Study of Electro-optic Effect.
8. To determine the specific rotation of scan sugar using polarimeter.
9. To determine characteristics of LEDs and Photo- detector.
10. To measure the numerical aperture of an optical fiber.

DSE 1: Power Electronics (Credits: Theory-04, Practicals-02)

Theory Lectures 60

Unit- 1 (12 Lectures)

Power Devices: Need for semiconductor power devices, Power diodes, Enhancement of reverse blocking capacity, Introduction to family of thyristors. **Silicon Controlled Rectifier (SCR):** structure, I-V characteristics, Turn-On and Turn-Off characteristics, ratings, Factors affecting the characteristics/ratings of SCR, Gate-triggering circuits, Control circuits design and Protection circuits, Snubber circuit.

Unit- 2 (14 Lectures)

Diac and Triac: Basic structure, working and V-I characteristic of, application of a Diac as a triggering device for a Triac. **Insulated Gate Bipolar Transistors (IGBT):** Basic structure, I-V Characteristics, switching characteristics, device limitations and safe operating area (SOA) etc. **Application of SCR:** SCR as a static switch, phase controlled rectification, single phase half wave, full wave and bridge rectifiers with inductive & non- inductive loads; AC voltage control using SCR and Triac as a switch. **Power MOSFETs:** operation modes, switching characteristics, power BJT, second breakdown, saturation and quasi-saturation state.

Unit- 3 (17 Lectures)

Power Inverters: Need for commutating circuits and their various types, d.c. link invertors, Parallel capacitor commutated invertors with and without reactive feedback and its analysis, Series Invertor, limitations and its improved versions, bridge invertors. **Choppers:** basic chopper circuit, types of choppers (Type A-D), step-down chopper, step-up chopper, operation of d.c. chopper circuits using self commutation (A & B-type commutating circuit), cathode pulse turn-off chopper (using class D commutation), load sensitive cathode pulse turn-off chopper (Jones Chopper), Morgan's chopper

Unit- 4 (17 Lectures)

Electromechanical Machines: DC Motors, Basic understanding of field and armature, Principle of operation, EMF equation, Back EMF, Factors controlling motor speed, Thyristor based speed control of dc motors, AC motor (Induction Motor only), Rotor and stator, torque & speed of induction motor, Thyristor control of ac motors(block diagrams only)

Suggested Books:

1. Power Electronics, P.C. Sen, TMH
2. Power Electronics & Controls, S.K. Dutta
3. Power Electronics, M.D. Singh & K.B. Khanchandani, TMH
4. Power Electronics Circuits, Devices and Applications, 3rd Edition, M.H. Rashid, Pearson Education
5. Power Electronics, Applications and Design, Ned Mohan, Tore.
6. Power Electronics, K. HariBabu, Scitech Publication.
7. Power Electronics, M.S. Jamil Asghar, PHI.
8. A Textbook of Electrical Technology-Vol-II, B.L. Thareja, A.K. Thareja, S.Chand

Power Electronics Lab 60 Lectures

1. Study of I-V characteristics of DIAC
2. Study of I-V characteristics of a TRIAC
3. Study of I-V characteristics of a SCR
4. SCR as a half wave and full wave rectifiers with R and RL loads
5. DC motor control using SCR.
6. DC motor control using TRIAC.
7. AC voltage controller using TRIAC with UJT triggering.
8. Study of parallel and bridge inverter.
9. Design of snubber circuit
10. VI Characteristic of MOSFET and IGBT (Both)
11. Study of chopper circuits

**DSE 2: Digital Signal Processing
(Credits: Theory-04, Practicals-02)**

Theory Lectures 60

Unit- 1 (15 Lectures)

Discrete Time systems: Discrete sequences, linear coefficient difference equation, Representation of DTS, LSI Systems. Stability and causality, frequency domain representations and Fourier transform of DT sequences.

Unit- 2 (15 Lectures)

Z-Transform: Definition and properties, Inverse Z Transform and stability. Parsevals Theorem and applications. **System Function:** signal flow graph, its use in representation and analysis of Discrete Time Systems. Techniques of representations. Matrix generation and solution for DTS evaluations.

Unit- 3 (15 Lectures)

Discrete Fourier Transform: DFT assumptions and Inverse DFT. Matrix relations, relationship with

FT and its inverse, circular convolution, DFT theorems, DCT. Computation of DFT. FFT Algorithms and processing gain, Discrimination, interpolation and extrapolation. Gibbs phenomena. FFT of real functions interleaving and resolution improvement. Word length effects.

Unit- 4 (15 Lectures)

Digital Filters: Analog filter review. System function for IIR and FIR filters, network representation. Canonical and decomposition networks. IIR filter realization methods and their limitations. FIR filter realization techniques. Discrete correlation and convolution; Properties and limitations.

Suggested Books:

1. A.V. Oppenheim and Schafer, Discrete Time Signal Processing, Prentice Hall, 1989.
2. John G. Proakis and D.G. Manolakis, Digital Signal Processing: Principles, Algorithms and Applications, Prentice Hall, 1997.

Digital Signal Processing Lab (Scilab/MATLAB/Other Mathematical Simulation software) 60 Lectures

1. Generation of unit sample sequence, unit step, ramp function, discrete time sequence, real sinusoidal sequence.
2. Generate and plot sequences over an interval.
3. Given $x[n]$, write program to find $X[z]$.
4. Fourier Transform, Discrete Fourier Transform and Fast Fourier Transform
5. Design of a Butterworth analog filter for low pass and high pass.
6. Design of digital filters.

DSE 3: Computer Networks (Credits: Theory-04, Practicals-02)

Theory Lectures 60

Unit- I (15 Lectures)

Data Communications: Components, protocols and standards, Network and Protocol Architecture, Reference Model ISO-OSI, TCP/IP-Overview, topology, transmission mode, digital signals, digital to digital encoding, digital data transmission, DTE-DCE interface, interface standards, modems, cable modem, transmission media- guided and unguided, transmission impairment, Performance, wavelength and Shannon capacity. Review of Error Detection and Correction codes. **Switching:** Circuit switching (space-division, time division and space-time division), packet switching (virtual circuit and Datagram approach), message switching.

Unit-2 (15 Lectures)

Data Link Layer: Design issues, Data Link Control and Protocols: Flow and Error Control, Stop-and-wait ARQ. Sliding window protocol, Go-Back-N ARQ, Selective Repeat

ARQ, HDLC, Point-to-Point Access: PPP Point-to-Point Protocol, PPP Stack, **Medium Access Sub layer**: Channel allocation problem, Controlled Access, Channelization, multiple access protocols, IEEE standard 802.3 & 802.11 for LANs and WLAN, high-speed LANs, Token ring, Token Bus, FDDI based LAN, Network Devices-repeaters, hubs, switches bridges.

Unit-3 (15 Lectures)

Network Layer: Design issues, Routing algorithms, Congestion control algorithms, Host to Host Delivery: Internetworking, addressing and routing, IP addressing (class full & Classless), Subnet, Network Layer Protocols: ARP, IPV4, ICMP, IPV6, ICMPV6.

Unit-4 (15 Lectures)

Transport Layer: Process to Process Delivery: UDP; TCP, congestion control and Quality of service.

Application Layer: Client Server Model, Socket Interface, Domain Name System (DNS): Electronic Mail (SMTP), file transfer (FTP), HTTP and WWW.

Suggested Books:

1. S. Tannenbum, D. Wetherall, "Computer Networks", Prentice Hall, Pearson, 5thEd
2. Behrouz A. Forouzan, "Data Communications and Networking", Tata McGraw-Hill, 4thEd

Computer Networks Lab 60 Lectures

1. Introduction to Computer Network laboratory Introduction to Discrete Event Simulation Discrete Event Simulation Tools - ns2/ns3, Omnet++
2. Using Free Open Source Software tools for network simulation of telnet and ftp between N sources - N sinks (N = 1, 2, 3). Evaluate the effect of increasing data rate on congestion.
3. Using Free Open Source Software tools for network simulation to study the effect of queuing disciplines on network performance - Random Early Detection/Weighted RED / Adaptive RED.
4. Using Free Open Source Software tools for network simulation for http, ftp and DBMS access in networks
5. Using Free Open Source Software tools for network simulation to study effect of VLAN on network performance - multiple VLANs and single router.
6. Using Free Open Source Software tools for network simulation to study effect of VLAN on network performance - multiple VLANs with separate multiple routers.
7. Using Free Open Source Software tools for network simulation to study the performance of wireless networks

BACHELOR OF SCIENCE(ITM)

SEMESTER-I

C:1-PROGRAMMING USING C (Credit:6, Theory:4, Practical: 2)

UNIT- I

Introduction to Programming Language, Introduction to C Programming, Character Set, C Tokens, Keywords & Identifiers, Constants, Variables, Data Types, Variables, Storage Classes, Operators (Arithmetic, Relational, Logical, Assignment, Increment & Decrement, Conditional, Bitwise), Expressions, Input and Output Operations.

UNIT- II

Decision Making and Branching: Simple IF Statement, IF. ELSE Statement, Nesting IF. ELSE Statement, ELSE IF Ladder, Switch Statement, Operator, GOTO Statement. Decision Making and Looping: The WHILE Statement, The DO Statement, The FOR Statement, Jumps in LOOPS. Arrays, Character Arrays and Strings.

UNIT- III

User-defined Functions: Need, Elements & Definition, Function Calls, Function Definition, Category of Functions, Recursion. Structures and Unions: Defining, Declaring, Accessing, Initialization Structure, Arrays of Structures, Arrays within Structures, Structures and Functions, Unions.

UNIT- IV

Pointers: Accessing the Address of a Variable, Declaring Pointer Variables, Initializations of Pointer Variable, Accessing a Variable through its Pointer, Chain of Pointers, Pointer Expressions, Pointer Increments and Scale Factor, Pointers and Arrays, Pointers and Character Strings, Array of Pointers, Pointers as Function Arguments, Functions Returning Pointers, Pointers to Functions, Pointers to Structures, Troubles with Pointers.

UNIT- V

File Management in C: Defining and Opening a File, Closing a File, Input/ Output Operations on Files, Error Handling During I/O Operations, Random Access to Files, Command Line Arguments, Dynamic Memory Allocation.

Recommended Books:

1. E. Balaguruswamy, Programming in ANSI C,4/e, (TMH).
2. Paul Deitel, Harvey Deitel, C: How to Program, 8/e, Prentice Hall.
3. J. R. Hanly, Problem Solving & Program Design in C, 7/e, Pearson.
4. B. Kernighan & D.M. Ritchie, The C Programming Language, 2/e PHI.

C: 2-COMPUTER ORGANIZATION (Credit:6, Theory:4, Practical: 2)

UNIT-I

Character Codes, Decimal System, Binary System, Decimal to Binary Conversion, Hexadecimal Notation, Boolean Algebra, Basic Logic Functions: Electronic Logic Gates, Synthesis of Logic Functions, Minimization of Logic Expressions, Minimization using Karnaugh Maps, Synthesis with NAND and NOR Gates.

UNIT-II

Flip-Flops, Gated Latches, Master-Slave Flip-Flops, Edge-Triggering, T Flip-Flops, JK Flip-Flops.

Registers and Shift Registers, Counters, Decoders, Multiplexers, Programmable Logic Devices (PLDs), Programmable Array Logic (PAL), Complex Programmable Logic Devices (CPLDs), Field-Programmable Gate Array (FPGA), Sequential Circuits, Timing Diagrams, The Finite State Machine Model, Synthesis of Finite State Machines.

UNIT-III

Basic Structure of Computers: Computer Types, Functional Units, Input Unit, Memory Unit, Arithmetic and Logic Unit, Output Unit, Control Unit, Basic Operational Concepts, Bus Structures, Software. Machine Instructions and Programs: Numbers, Arithmetic Operations, and Characters: Number Representation, Addition of Positive Numbers, Addition and Subtraction of Signed Numbers, Overflow of Integer Arithmetic, Characters, Memory Locations and Addresses, Byte Addressability, Word Alignment, Accessing Numbers, Characters, and Character Strings, Memory Operations, Instructions and Instruction Sequencing, Register Transfer Notation, Basic Instruction Types, Instruction Execution and Straight-Line Sequencing, Branching, Condition Codes, Generating Memory Addresses, Addressing Modes, Implementation of Variables and Constants, Indirection and Pointers, Indexing and Arrays, Relative Addressing.

UNIT-IV

THE ARM EXAMPLE: **Registers**, Memory Access, and Data Transfer, Register Structure, Memory Access Instructions and Addressing Modes, Register Move Instructions, Arithmetic and Logic Instructions: Arithmetic Instructions, Logic Instructions, Branch Instructions, Setting Condition Codes, Assembly Language, Pseudo-Instructions, I/O Operations, Subroutines, Vector Dot Product Program, Byte-Sorting Program, Linked-List Insertion and Deletion Subroutines. Basic Input-Output Operations, Stacks and Queues, Subroutines. PowerPC Example: Basic PowerPC Processor Organization, Load and Store Instructions, Arithmetic and Logic Instructions, Flow Control Instructions, Compare Instructions, Logic Instructions, Subroutines.

UNIT-V

Memory System: Semiconductor RAM Memories, Internal Organization of Memory Chips, Static Memories, Asynchronous DRAMS, Synchronous DRAMS, Structure of Large Memories, Memory System Considerations, RAMBUS Memory. Read-Only Memories: ROM, PROM, EPROM, EEPROM, Flash Memory, Speed, Size, and Cost of Memory. Secondary Storage: Magnetic Hard Disks, Optical Disks, Magnetic Tape Systems.

Recommended Books:

1. Carl Hamacher, Z. Vranesic, S. Zaky: Computer Organization, 5/e (TMH)
2. William Stallings: Computer Organization and Architecture (Design for Performance), 9/e
3. S. Brown, & Z. Vranesic, Fundamentals of Digital Logic Design with VHDL, 2/e, McGraw-Hill
4. J. P. Uyemura, A First Course in Digital System Design, An Integrated Approach, Cengage Learning.

GE:1-DISCRETE STRUCTURES

(Credit:6, Theory:4, Practical: 2)

UNIT-I Logic and Proofs: Propositional Logic, Propositional Equivalences, Predicates and Quantifiers, Nested Quantifiers, Rules of Inference, Introduction to Proofs, Normal Forms, Proof Methods and Strategy, Mathematical Induction, Strong Induction and Well-Ordering, Recursive Definitions and Structural Induction, Recursive Algorithms.

UNIT-II

Basic Structures: Sets, Set Operations, Functions, Recursive Functions, Sequences and Summations. Relations: Relations and their Properties, n-ary Relations and their Applications, Representing Relations, Closures of Relations, Equivalence Relations, Partial Ordering. Boolean.

UNIT-III

Algebra: Boolean Functions, Representing Boolean Functions, Logic Gates, Minimization of Circuits. Algebraic Structures & Coding Theory: The Structure of Algebras, Semi-groups, Monoids and Groups, Homomorphism, Normal Subgroups, and Congruence Relations, Rings, Integral Domains and Fields, Quotient and Product Algebras, Coding Theory. Polynomial Rings and Polynomial Codes.

UNIT-IV

Counting: Basics of Counting, The Pigeonhole Principle, Permutations and Combinations, Binomial Coefficients, Generalized Permutations and Combinations, Generating Permutations and Combinations. Advanced Counting Techniques, Applications of Inclusion-Exclusion, Discrete probability, Conditional probability, Bayes Theorem.

UNIT-V

Graphs: Graphs and Graph Models, Graph Terminology and Special Types of Graphs, Havel-Hakimi Theorem, Representing Graphs and Graph Isomorphism, Connectivity, Cut-Sets, Euler and Hamiltonian Paths, Shortest-Path Problem, Planar Graphs, Graph Coloring, Network Flows.

Recommended Books:

1. Kenneth H Rosen, Discrete Mathematics & Its Applications, McGraw-Hill. 7/e.
2. J. L. Hein, Discrete Structures, Logic, and Computability, 3rd Edition, Jones and Bartlett Publishers, 2009
3. C.L. Liu , D.P. Mahopatra, Elements of Discrete mathematics, 2nd Edition , Tata McGraw Hill, 1985
4. M. O. Albertson and J. P. Hutchinson, Discrete Mathematics with Algorithms , John wiley Publication, 1988.

SEMESTER-II

C: 3-PERSONAL MANAGEMENT & ORGANIZATIONAL BEHAVIOUR

(Credit:6, Theory:4, Practical: 2)

C: 4-PROGRAMMING USING C++

(Credit:6, Theory:4, Practical: 2)

UNIT-I

Principles of Object-Oriented Programming: Object-Oriented Programming (OOP) Paradigm, Basic Concepts of OOP, Benefits of OOP, Object Oriented Languages, Applications of OOP. Beginning with C++: Applications of C++, C++ statements, Example with Class, Structure of C++ Program, Creating the Source File, Compiling and Linking. Tokens, Expressions and Control Structures: Tokens, Keywords, Identifiers & Constants, Basic Data Types, User-Defined Data Types, Derived Data Types, Symbolic Constants, Type Compatibility, Declaration of Variables, Dynamic Initialization of Variables, Reference Variables, Operators in C++, Scope Resolution Operator, Member Deferencing Operators, Memory Management Operators, Manipulators, Type Cast Operators, Expressions and their Types, Special Assignment Expressions, Implicit Conversions, Operator Overloading, Operator Precedence, Control Structures.

UNIT- II

Functions in C++: The Main Function, Function Prototyping, Call By Reference, Return by Reference, Inline Functions, Default Arguments, Const. Arguments, Function Overloading, Friend & Virtual Functions, Math. Library Functions. Classes and Objects: Specifying a Class, Defining Member Functions, Making an outside Function Inline, Nested Member Functions, Private Member Functions, Arrays within a Class, Memory Allocation for Objects, Static Data Members, Static Member Functions, Arrays of Objects, Objects as Function Arguments, Friendly Functions, Returning Objects, Const. Member Functions, Pointer to Members, Local Classes.

UNIT- III

Constructors & Destructors: Constructors, Parameterized Constructors, Multiple Constructors in a Class, Constructors with Default Arguments, Dynamic Initialization of Objects, Copy Constructor, Dynamic Constructors, Constructing Two-Dimensional Arrays, Const. Objects, Destructors. Operator Overloading and Type Conversions: Defining Operator Overloading, Overloading Unary Operators, Overloading Binary Operators, Overloading Binary Operators using Friends, Manipulation of Strings using Operators, Rules for Overloading Operators, Type Conversions.

UNIT- IV

Inheritance : Defining Derived Classes, Single Inheritance, Making a Private Member Inheritance, Multilevel Inheritance, Multiple Inheritance, Hierarchical Inheritance, Hybrid Inheritance, Virtual Base Classes, Abstract Classes, Constructors in Derived Classes, Member Classes, Nesting of Classes. Pointers, Virtual Functions and Polymorphism: Pointers, Pointers to Objects, this Pointer, Pointers to Derived Classes, Virtual Functions, Pure Virtual Functions.

UNIT- V

Managing Console I/O Operations: C++ Streams, C++ Stream Classes, Unformatted I/O Operations, Formatted Console I/O Operations, Managing Output with Manipulators. Files: Classes for File Stream Operations, Opening and Closing a File, Detecting end-of-file, File Modes, File Pointers and their Manipulations, Sequential Input and Output Operations, Updating a File: Random Access, Error Handling During File Operations, Command-line Arguments.

Recommended Books:

1. E. Balgurusamy, Object Oriented Programming with C++ :, 4/e (TMH).
2. Paul Deitel, Harvey Deitel, "C++: How to Program", 9/e. Prentice Hall.
3. J. Farrell, Object-Oriented Programming, Cengage Learning.
4. Bjarne Stroustrup, "Programming – Principles and Practice using C++", 2/e, Addison-Wesley 2014.

C: 5-DATA STRUCTURES

(Credit:6, Theory:4, Practical: 2)

UNIT-I

Introduction and Overview: Definitions, Concept of Data Structures, Overview of Data Structures, Implementation of Data Structures. Arrays: Terminology, One-Dimensional Array, Multi-Dimensional Arrays, Pointer Arrays.

UNIT-II

Linked Lists: Single Linked List, Circular Linked List, Double Linked List, Circular Double Linked List, Application of Linked Lists, Memory Representation, Boundary Tag System, De-allocation Strategy, Buddy System, Compaction.

UNIT-III

Stacks: Definition, Representation of Stack (Array, Linked List), Operations on Stacks, Applications of Stack (Evaluation of Arithmetic Expressions, Code Generation, Implementation of Recursion, Factorial Calculation, Quick Sort, Tower of Hanoi, Activation Record Management).

UNITIV

Queues: Definition, Representation of Queues (Array, Linked List), Circular Queue, Deque, Priority Queue, Application of Queues (Simulation, CPU Scheduling in Multiprogramming Environment, Round Robin Algorithm).

UNITV

Tree: Binary Trees, Properties of Binary Tree, Linear Representation of Binary a Binary Tree, Linked Representation of a Binary Tree, Physical Implementation of Binary Tree in Memory, Operations on Binary Tree (Insertion, Deletion, Traversal, Merging of two Binary Trees), Types of Binary Trees (Expression Tree, Binary Search Tree, Heap Tree, Threaded Binary Trees, Height Balanced Binary Tree, Weighted Binary Tree, Decision Trees).

Recommended Books:

1. D. Samanta, Classic Data Structures:, 2/e (PHI).
2. D.S Malik, Data Structure using C++, 2/e, Cengage Learning, 2010.
3. Adam Drozdek, "Data Structures and algorithm in C++", 3/e, Cengage Learning, 2012.
4. Robert L. Kruse, "Data Structures and Program Design in C++", Pearson.

GE:2-STATISTICS FOR BUSINESS**(Credit:6, Theory:4, Practical: 2)****UNIT-I**

Probability and Probability Distribution: Events and the Sample Space, Calculating Probabilities using Simple events, Useful counting rules, Probability rules: Addition rule, Conditional probability and multiplication rule, Bayes rule.

UNIT-II

Probability Distributions: Random Variable, Discrete random variable, Mean and Standard deviation of discrete random variable, Discrete Probability Distributions: Binomial, Poisson and Hypergeometric probability distribution, Continuous Probability distribution: Normal distribution.

UNIT-III

Sampling Distribution: sampling plans and experimental designs, Sampling distribution of a statistic, Central Limit theorem, Sampling distribution of the Sample mean and Proportion. Large Sample Estimation: Point estimation, Interval estimation, Confidence interval of population mean, Population proportion, difference between two population means, difference between two population proportions.

UNIT-IV

Large Sample Tests of Hypothesis: Test of a Population mean, Test of difference of two population means, Test of hypothesis for a binomial proportion, Test of hypothesis for the difference between two binomial proportions. Inference from Small Samples: Students t Distribution, Small Sample inferences concerning a population mean and difference between two population means, Inferences concerning a population variance and difference between two population variances.

UNIT-V

Analysis of Variance: One-way classification, Two-way classification. Linear regression and Correlation: Method of least squares, Analysis of variance for linear regression, Testing the usefulness of the linear regression model, Estimation and Prediction using the fitted line. Carl Pearsons coefficient of Correlation, Test of hypothesis concerning the Correlation coefficient.

Recommended Books:

1. William Mendenhall, Robert J. Beaver, Barbara M. Beaver, Probability and Statistics 14/e, CENGAGE Learning.
2. W. W. Hines, D.C. Montgomery, D.M. Goldsman, & C.M. Borror, Probability & Statistics in Engineering"

SEMESTER-III

C: 6-OPERATING SYSTEMS**(Credit:6, Theory:4, Practical: 2)****UNIT-I**

Operating System, Computer-System Organization, Computer-System Architecture, Operating-System Structure, Operating-System Operations, Process Management, Memory Management, Storage Management, Protection and Security, Distributed Systems, Special Purpose Systems, Computing

Environments, Open-Source Operating Systems. Operating System Services, User Operating System Interface, System Calls, Types of System Calls, System Programs, Operating-System Design and Implementation, Operating System Structure, Virtual Machines, Operating System Debugging, Operating System Generations. System Boot.

UNIT-II

Process: Process Concept, Process Scheduling, Operations on Processes, Inter-Process Communication, Examples of IPC Systems, Communication in Client-Server Systems. Multithreaded Programming: Multithreading Models, Thread Libraries, Threading Issues, Operating-System Examples.

UNIT-III

Process Scheduling: Basic Concepts, Scheduling Criteria, Scheduling Algorithms, Thread Scheduling. Multiple-Process Scheduling. Synchronization: The Critical Section Problem, Peterson's Solution, Synchronization Hardware, Semaphores, Classical Problems of Synchronization, Monitors, Synchronization Examples, Atomic Transactions.

UNIT-IV

Deadlocks: System Model, Deadlock Characterization, Methods of Handling Deadlocks, Deadlock Prevention, Deadlock avoidance, Deadlock Detection, Recovery from Deadlock. Memory Management Strategies: Swapping, Contiguous Memory Allocation, Paging, Structure of the Page Table, Segmentation, Example: The Intel Pentium.

UNIT-V

Virtual-Memory Management: Demand Paging, Copy-on-Write, Page Replacement, Allocation of Frames, Thrashing, Memory-Mapped Files, Allocating Kernel Memory. File System: File Concept, Access Methods, Directory and Disk Structure, File-System Mounting, File Sharing, Protection.

Recommended Books:

1. A Silberschatz, P.B. Galvin, G. Gagne, Operating Systems Concepts, 8/e, John Wiley Publications 2008.
2. A.S. Tanenbaum, Modern Operating Systems, 3/e, Pearson Education 2007.
3. W. Stallings, Operating Systems, Internals & Design Principles, 5/e, Prentice Hall of India. 2008.
4. G. Nutt, Operating Systems: A Modern Perspective, 2/e, Pearson Education 1997.

C: 7-BUSINESS ACCOUNTING

(Credit:6, Theory:4, Practical: 2)

UNIT-I

Introduction to Financial Accounting. Accounting as an Information System. Importance, Scope, and Limitations. Users of Accounting Information. Generally Accepted Accounting Principles. The Accounting Equation. Nature of Accounts and Rules of Debit and Credit. Recording Transactions in General Journal. Recording Transactions in three column Cash Book. An overview of Subsidiary books Purchase Book, Purchase Returns Book, Sales Book, and Sales Returns Book. Opening and Closing Entries. Preparation of Ledger Accounts.

UNIT-II

Introduction to International Financial Reporting Standards (IFRS). Understanding Accounting Standards issued by the ICAI related to Disclosure of Accounting Policies, Depreciation Accounting, and Revenue Recognition. Methods of charging Depreciation Straight-line Method, and Written-down-value Method. Preparation of Trial Balance. Adjustment Entries. Post-adjusted Trial Balance. Bank Reconciliation Statement.

UNIT-III

Preparation of Financial Statements: Preparing Trading Account, Profit & Loss Account and Balance Sheet for a Sole Proprietor. Understanding contents of Financial Statements of a Joint Stock Company as per Companies Act 2013. Understanding the contents of a Corporate Annual Report. Preparation of Cash Flow Statement as per AS-3 (revised).

UNIT-IV

Analyzing Financial Statements: Objectives of Financial Statement Analysis; Sources of Information; Standards of Comparison; Techniques of Financial Statement Analysis - Horizontal Analysis, Vertical Analysis, and Ratio Analysis. Meaning and Usefulness of Financial Ratios; Analysis of Financial Ratios from the perspective of different Stakeholders like Investors, Lenders, and Short-term Creditors; Profitability Ratios, Solvency Ratios, Liquidity Ratios, and Turnover Ratios; Limitations of Ratio Analysis.

Recommended Books:

1. S.N. Maheshwari, Suneel K. Maheshwari, and Sharad K. Maheshwari: An Introduction to Accountancy, Vikas Publishing House Pvt. Ltd.
2. R. Narayanaswamy, Financial Accounting: A Managerial Perspective, PHI Learning Pvt. Ltd.
3. Charles T. Horngren, Gart L. Sundem, John A. Elliott, and Donna R. Philbrick, Introduction to Financial Accounting, Pearson.
4. J.R. Monga, Financial Accounting: Concepts and Applications, Mayur Paperbacks.
5. T.P. Ghosh, Financial Accounting for Managers: Taxmann Allied Services Pvt. Ltd.

C: 8-MANAGERIAL ECONOMICS

(Credit:6, Theory:4, Practical: 2)

UNIT-I

Demand, Supply and Market equilibrium: individual demand, market demand, individual supply, market supply, market equilibrium; Elasticities of demand and supply : Price elasticity of demand, income elasticity of demand, cross price elasticity of demand, elasticity of supply; Theory of consumer behavior : cardinal utility theory, ordinal utility theory(indifference curves, budget line, consumer choice, price effect, substitution effect, income effect for normal, inferior and giffen goods), revealed preference theory.

UNIT-II

Producer and optimal production choice : optimizing behavior in short run(geometry of product curves, law of diminishing margin productivity, three stages of production), optimizing behavior in long run (isoquants, isocost line, optimal combination of resources) Costs and scale : traditional theory of cost (short run and long run, geometry of cot curves, envelope curves), modern theory of cost (short run and long run), economies of scale, economies of scope.

UNIT-III Theory of firm and market organization : perfect competition (basic features, short run equilibrium of firm/industry, long run equilibrium of firm/industry, effect of changes in demand, cost and imposition of taxes) ; monopoly (basic features, short run equilibrium, long run equilibrium, effect of changes in demand, cost and imposition of taxes, comparison with perfect competition, welfare cost of monopoly), price discrimination, multiplant monopoly ; monopolistic competition (basic features, demand and cost, short run equilibrium, long run equilibrium, excess capacity) ; oligopoly (Cournots model, kinked demand curve model, dominant price leadership model, prisoners dilemma)

UNIT-IV

Factor market : demand for a factor by a firm under marginal productivity theory (perfect competition in the product market, monopoly in the product market), market demand for a factor, supply of labour, market supply of labour, factor market equilibrium.

Recommended Books:

1. Dominick Salvatore (2009). Principles of Microeconomics (5th ed.) Oxford University Press.
2. Lipsey and Chrystal. (2008). Economics.(11th ed.) Oxford University Press.
3. Koutosyannis (1979). Modern Micro Economics. Palgrave Macmillan.

4. Pindyck, Rubinfeld and Mehta. (2009). Micro Economics. (7th ed.), Pearson.

SEC:1-BUSINESS COMMUNICATION

(Credits:2)

GE:1-NUMERICAL TECHNIQUES

(Credit:6, Theory:4, Practical: 2)

UNIT-I

Introduction: Numbers and their accuracy, Chopping and Rounding off, Errors: Absolute and Relative errors, Floating point representations of numbers, Loss of significance. Solution of Algebraic and Transcendental Equations: Bisection Method, Newton-Raphson Method, Secant Method, Method of false position, Rate of convergence and comparison of iterative methods.

UNIT-II

Interpolation and Numerical Differentiation: Polynomial Interpolation, Interpolating polynomial: Lagrange form, Newton form, Nested form, Divided difference Interpolation, Inverse Interpolation, Errors in polynomial Interpolation. First derivative and second derivative via Taylor Series, Richardson Extrapolation.

UNIT-III

Numerical Integration: Trapezoidal Rule, Composite Trapezoidal rule, Simpsons 1/3 rule, Simpsons 3/8 rule, Gaussian Quadrature formulae (1-point, 2-point, 3-point)

UNIT-IV

Solution of System of Linear Equations: Gaussian Elimination method and Pivoting, LU factorization method, ill Conditioning, Iterative Methods: Jacobi iterative method, Gauss Seidel iterative method. Eigen Values and Eigen Vectors: Eigen value properties, Computation Eigen values by Power method.

UNIT-V

Solution of Ordinary Differential Equations: Taylor Series method, Runge-Kutta method of order 2 and order 4, Predictor-Corrector method: Adams-Bashforth-Moulton method. Smoothing of Data and the Method of Least Squares: Linear and non-linear least square method.

Recommended Books:

1. E. Ward Cheney and David R. Kincaid, Numerical Methods and Applications CENGAGE Learning India Private Ltd., New Delhi.
2. S.R.K. Iyengar, R.K. Jain, & M.K. Jain, Numerical Methods for Scientific & Engineering Computation, 6/e, New Age Int. Pub.
3. S.S. Sastry, Introductory Methods of Numerical Analysis, 5/e, EEE
4. Steven C. Chapra, Applied Numerical Methods with MATLAB, 2/e, McGraw-Hill.

SEMESTER-IV

C: 9-JAVA PROGRAMMING

(Credit:6, Theory:4, Practical: 2)

UNIT-I

Introduction to Java: Java Architecture and Features, Understanding the semantic and syntax

differences between C++ and Java, Compiling and Executing a Java Program, Variables, Constants, Keywords Data Types, Operators (Arithmetic, Logical and Bitwise) and Expressions, Comments, Doing Basic Program Output, Decision Making Constructs (conditional statements and loops) and Nesting, Java Methods (Defining, Scope, Passing and Returning Arguments, Type Conversion and Type and Checking, Built-in Java Class Methods).

UNIT-II

Arrays, Strings and I/O: Creating & Using Arrays (One Dimension and Multi-dimensional), Referencing Arrays Dynamically, Java Strings: The Java String class, Creating & Using String Objects, Manipulating Strings, String Immutability & Equality, Passing Strings To & From Methods, String Buffer Classes. Simple I/O using System.out and the Scanner class, Byte and Character streams, Reading/Writing from console and files. Object-Oriented Programming Overview: Principles of Object-Oriented Programming, Defining & Using Classes, Controlling Access to Class Members, Class Constructors, Method Overloading, Class Variables & Methods, Objects as parameters, final classes, Object class, Garbage Collection.

UNIT-III

Inheritance, Interfaces, Packages, Enumerations, Autoboxing and Metadata: Inheritance: (Single Level and Multilevel, Method Overriding, Dynamic Method Dispatch, Abstract Classes), Interfaces and Packages, Extending interfaces and packages, Package and Class Visibility, Using Standard Java Packages (util, lang, io, net), Wrapper Classes, Autoboxing/Unboxing, Enumerations and Metadata.

UNIT-IV

Exception Handling, Threading, Networking and Database Connectivity: Exception types, uncaught exceptions, throw, built-in exceptions, Creating your own exceptions; Multi-threading: The Thread class and Runnable interface, creating single and multiple threads, Thread prioritization, synchronization and communication, suspending/resuming threads. Using java.net package, Overview of TCP/IP and Datagram programming. Accessing and manipulating databases using JDBC.

UNIT-V

Applets and Event Handling: Java Applets: Introduction to Applets, Writing Java Applets, Working with Graphics, Incorporating Images & Sounds. Event Handling Mechanisms, Listener Interfaces, Adapter and Inner Classes. The design and Implementation of GUIs using the AWT controls, Swing components of Java Foundation Classes such as labels, buttons, text fields, layout managers, menus, events and listeners; Graphic objects for drawing figures such as lines, rectangles, ovals, using different fonts. Overview of servlets.

Recommended Books:

1. E. Balagurusamy, Programming with Java, 4/e, TMH
2. Bruce Eckel, "Thinking Java", 8/e, Pearson India, 2010.
3. John R. Hubbard, "Programming with JAVA", Schaum's Series, 2/e, 2004.
4. Cay S. Horstmann, Gary Cornell, "Core Java 2 Volume 1", 9/e, Printice Hall, 2012.

C: 10-DATABASE MANAGEMENT SYSTEM

(Credit:6, Theory:4, Practical: 2)

UNIT-I

Databases and Database Users, Database System Concepts and Architecture, Data Modelling using

the Entity-Relationship (ER) Model, The Enhanced Entity-Relationship (EER) Model.

UNIT-II

Relational Model: The Relational Data Model and Relational Database Constraints, The Relational Algebra and Relational Calculus.

UNIT-III

Relational Database Design by ER- and EER-to-Relational Mapping, SQL-99: Schema Definition, Constraints, Queries, and Views, Introduction to SQL Programming Techniques.

UNIT-IV

Functional Dependencies and Normalization for Relational Databases, Relational Database Algorithms and Further Dependencies, Practical Database Design Methodology and use of UML Diagrams.

UNIT-V

Disk Storage, Basic File Structures, and Hashing, Indexing Structures for Files, Algorithms for Query Processing and Optimization, Physical Database Design and Tuning.

Recommended Books:

1. R. Elmasri, S.B. Navathe, Fundamentals of Database Systems, 6/e, Pearson Education, 2010.
2. A. Silberschatz, H.F. Korth, S. Sudarshan, Database System Concepts 6/e, McGraw Hill, 2010.
3. R. Ramakrishnan, J. Gehrke, Database Management Systems, McGraw-Hill.
4. C. Coronel, S. Morris, & P. Rob, Database Principles (Fundamentals of Design, Implementation, and Management), 9/e, Cengage Learning.

C: 11-MANAGEMENT ACCOUNTING

(Credit:6, Theory:4, Practical: 2)

UNIT-I

Nature, Scope of Management Accounting: Meaning, definition, nature and scope of Management Accounting; Comparison of Management Accounting with Cost Accounting and Financial Accounting. Cost concepts: Meaning, Scope, Objectives, and Importance of Cost Accounting; Cost, Costing, Cost Control, and Cost Reduction; Elements of Cost, Components of total Cost, Cost Sheet. Classification of Costs: Fixed, Variable, Semivariable, and Step Costs; Product, and Period Costs; Direct, and Indirect Costs; Relevant, and Irrelevant Costs; Shut-down, and Sunk Costs; Controllable, and Uncontrollable Costs; Avoidable, and Unavoidable Costs; Imputed / Hypothetical Costs; Out-of-pocket Costs; Opportunity Costs; Expired, and Unexpired Costs; Conversion Cost. Cost Ascertainment: Cost Unit and Cost Center. Introduction to Overhead allocation, Overhead apportionment, and Overhead absorption.

UNIT-II

Cost-Volume-Profit Analysis: Contribution, Profit-Volume Ratio, Margin of safety, Cost Break-even Point, Composite Break-even Point, Cash Break-even Point, Key Factor, Break-even Analysis. Relevant Costs and Decision Making: Pricing, Product Profitability, Make or Buy, Exploring new markets, Export Order, Sell or Process Further, Shut down vs. Continue.

UNIT-III

Budgets and Budgetary Control: Meaning, Types of Budgets, Steps in Budgetary Control, Fixed and Flexible Budgeting, Cash Budget. Responsibility Accounting: Concept, Significance, Different

responsibility centers, Divisional performance Financial measures, Transfer pricing.

UNIT-IV

Standard Costing and Variance Analysis: Meaning of Standard Cost and Standard Costing, Advantages, Limitations and Applications; Material, Labor, Overhead and Sales variances. Introduction to Target Costing, Life Cycle Costing, Quality Costing, and Activity based Costing.

Recommended Books:

1. C.T. Horngren, Gary L. Sundem, Jeff O. Schatzberg, and Dave Burgstahler: Introduction to Management Accounting, Pearson.
2. M.N. Arora: A Textbook of Cost and Management Accounting, Vikas Publishing House Pvt. Ltd.
3. M.Y. Khan, and P.K. Jain, Management Accounting: Text Problems and Cases, McGraw Hill Education (India) Pvt. Ltd.
4. S.N. Maheshwari, and S.N. Mittal, Cost Accounting: Theory and Problems, Shree Mahavir Book Depot (Publishers).

SEC: 2-HTML PROGRAMMING

(Credit:2)

UNIT-I

Introduction

The Basics: The Head, the Body, Colors, Attributes, Lists, ordered and unordered.

UNIT-II

Links: Introduction, Relative Links, Absolute Links, Link Attributes, Using the ID Attribute to Link within a Document.

UNIT-III

Images: Putting an Image on a Page, Using Images as Links, Putting an Image in the Background

UNIT-IV

Tables, Creating a Table , Table Headers, Captions, Spanning Multiple Columns, Styling Table

UNIT-V

Forms: Basic Input and Attributes, Other Kinds of Inputs, Styling forms with CSS, Where To Go From Here

Recommended Books:

Introduction to HTML and CSS -O' Reilly.

GE:4-QUANTITATIVE TECHNIQUES

(Credit:6, Theory:4, Practical: 2)

UNIT-I

Linear Programming: Formulation of L.P. Problems, Graphical Solutions (Specialcases: Multiple optimal solution, infeasibility, unbounded solution); Simplex Methods(Special cases: Multiple optimal solution, infeasibility, degeneracy, unbounded solution)Big-M method and Two-phase method; Duality and Sensitivity (emphasis on formulation & economic interpretation); Formulation of Integer programming, Zero-oneprogramming, Goal Programming.

UNIT-II

Elementary Transportation: Formulation of Transport Problem, Solution by N.W. Corner Rule, Least Cost method, Vogels Approximation Method (VAM), Modified Distribution Method. (Special cases: Multiple Solutions, Maximization case, Unbalanced case, prohibited routes) Elementary Assignment: Hungarian Method, (Special cases: Multiple Solutions, Maximization case, Unbalanced case, Restrictions on assignment).

UNIT-III

Network Analysis: Construction of the Network diagram, Critical Path- float and slack analysis (Total float, free float, independent float), PERT, Project Time Crashing.

UNIT-IV

Decision Theory: Pay off Table, Opportunity Loss Table, Expected Monetary Value, Expected Opportunity Loss, Expected Value of Perfect Information and Sample Information.

UNIT-V

Markov Chains: Predicting Future Market Shares, Equilibrium Conditions (Questions based on Markov analysis) Limiting probabilities, Chapman Kolmogorov equation. Introduction to Game Theory: Pay off Matrix- Two person Zero-Sum game, Pure strategy, Saddle point; Dominance Rule, Mixed strategy, Reduction of $m \times n$ game and solution of 2×2 , $2 \times s$, and $r \times 2$ cases by Graphical and Algebraic methods; Introduction to Simulation: Monte Carlo Simulation.

Recommended Books:

1. N. D. Vohra: Quantitative Management, Tata McGraw Hill.
2. P. K. Gupta, Man Mohan, Kanti Swarup: Operations Research, Sultan Chand.
3. V. K. Kapoor: Operations Research, Sultan Chand & Sons.
4. J. K. Sharma: Operations Research Theory & Applications, Macmillan India, Limited.

SEMESTER-V

C: 12-DATA COMMUNICATIONS

(Credit:6, Theory:4, Practical: 2)

UNIT-I

Introduction: Data Communications, Networks, The Internet, Protocols and Standards. Network Models: Layered Tasks, The OSI Model, Layers in the OSI Model, TCP/ IP Protocol Suite, Addressing.

UNIT-II

Data and Signals: Analog and Digital, Periodic Analog Signals, Digital Signals, Transmission Impairment, Data Rate Limits, Performance. Digital Transmission: Digital-To-Digital Conversion, Analog-To-Digital Conversion, Transmission Modes. Analog Transmission: Digital-To-Analog Conversion, Analog-To-Analog Conversion.

UNIT-III

Multiplexing and Spreading: Multiplexing, Spread Spectrum. Transmission Media: Guided Media, Unguided Media (Wireless). Switching: Circuit Switched, Datagrams, Virtual Circuit Networks, Structure of a Switch. Telephone Network, Dial-Up MODEMS, Digital Subscriber Line (DSL), Cable TV Networks, Cable TV for Data Transfer.

UNIT-IV

Error Detection and Correction: Introduction, Block Coding, Linear Block Codes, Cyclic Codes, Checksum. Data Link Control: Framing, Flow and Error Control, Protocols, Noiseless Channels, Noisy Channels, HDLC, Point-To-Point Protocol. Multiple Access: Random Access, Controlled Access, Channelization. Wired LANs: IEEE Standards, Standard Ethernet, Changes in the Standard, Fast Ethernet, Gigabit Ethernet: Wireless LANs: IEEE 802.11, Bluetooth.

UNIT-V— Connecting LANs: Connecting Devices, Backbone Networks, Virtual LANs. Wireless LANs: Cellular Telephony, Satellite Networks. SONET: Architecture, SONET Layers, SONET Frames, STS Multiplexing, SONET Networks, Virtual Tributaries. Virtual-Circuit Networks. Frame Relay, ATM, ATM LANs.

Recommended Books:

1. B. A. Forouzan, Data Communications and Networking, 4/e, THM ,2007.
2. A. S. Tanenbaum, & David J. Wetherall, Computer Networks, 5/e, Pearson

C: 13-SOFTWARE ENGINEERING

(Credit:6, Theory:4, Practical: 2)

UNIT-I

Professional Software Development, Software Engineering Ethics, Software Processes, Software Process Models, Process Activities, Coping with Change, The Rational Unified Process, Agile Software Development, Agile Methods, Plan-Driven and Agile Development, Extreme Programming, Agile Project Management, Scaling Agile Methods.

UNIT-II

Requirements Engineering, Functional and Non-Functional Requirements, The Software Requirements Document, Requirements Specification, Requirements Engineering Processes, Requirements Elicitation and Analysis, Requirements Validation, Requirements Management, System Modelling, Context Models, Interaction Models, Structural Models, Behavioural Models, Model-Driven, Engineering, Architectural Design, Architectural Design Decisions, Architectural Views, Architectural Patterns, Application Architectures.

UNIT-III

Design and Implementation: Object-Oriented Design using the UML, Design Patterns, Implementation Issues, Open Source Development, Software Testing: Development Testing, Test-Driven Development, Release Testing, User Testing, Software Evolution: Evolution Processes, Program Evolution Dynamics, Software Maintenance, Legacy System Management, Dependability and Security.

UNIT-IV

Socio-technical Systems: Complex Systems, Systems Engineering, System Procurement, System Development, System Operation. Dependability and Security: Dependability Properties, Availability and Reliability, Safety, Security. Dependability and Security Specification: Risk-Driven Requirements, Specification, Safety Specification, Reliability Specification, Security, Specification, Formal Specification.

UNIT-V

Dependability Engineering: Redundancy and Diversity, Dependable Processes, Dependable Systems Architectures, Dependable Programming. Security Engineering: Security Risk Management, Design for Security, System Survivability. Dependability and Security Assurance: Static Analysis, Reliability Testing, Security Testing, Process Assurance, Safety and Dependability Cases.

Recommended Books:

1. I. Sommerville, Software Engineering, 9/e, Addison Wesley.
2. R. Mall, Fundamentals of Software Engineering, 3/e, PHI.
3. R.S. Pressman, Software Engineering, A Practitioners Approach, 7/e, McGraw-Hill, 2009.
4. K.K. Aggarwal and Y. Singh, Software Engineering, 2/e, New Age International Publishers, 2008.

DSE: 1-PROGRAMMING IN VISUAL BASIC

(Credit:6, Theory:4, Practical: 2)

UNIT-I

GUI Environment: Introduction to graphical user interface (GUI), programming language (procedural, object oriented, event driven), the GUI environment, compiling, debugging, and running the programs. Controls : Introduction to controls textboxes, frames, check boxes, option buttons, images, setting borders and styles, the shape control, the line control, working with multiple controls and their properties, designing the user interface, keyboard access, tab controls, default & cancel property, coding for controls.

UNIT-II

Operations: Data types, constants, named & intrinsic, declaring variables, scope of variables, val function, arithmetic operations, formatting data. Decision Making: If statement, comparing strings, compound conditions (and, or, not), nested if statements, case structure, using if statements with

option buttons & check boxes, displaying message in message box, testing whether input is valid or not.

UNIT-III

Modular programming: Menus, sub-procedures and sub-functions defining / creating and modifying a menu, using common dialog box, creating a new sub-procedure, passing variables to procedures, passing argument by value or by reference, writing a function/ procedure. Forms Handling : Multiple forms creating, adding, removing forms in project, hide, show method, load, unload statement, me keyword, referring to objects on a different forms.

UNIT-IV

Iteration Handling: Do/loops, for/next loops, using msgbox function, using string function Arrays and Grouped Data Control: Arrays - 1-dimension arrays, initializing an array using for each, user- defined data types, accessing information with user-defined data types, using list boxes with array, two dimensional arrays. lists, loops and printing list boxes & combo boxes, filling the list using property window/additem method, clear method, list box properties, removing an item from a list, list box/ combo box operations.

UNIT-V

Database Connectivity: Database connectivity of forms with back end tool like mysql, populating the data in text boxes, list boxes etc. searching of data in database. using forms. Updating/ editing of data based on a criterion.

Recommended Books:

Programming in Visual Basic 6.0 by Julia Case Bradley, Anita C. Millispangh (Tata Mcgraw Hill Edition 2000 (Fourteenth Reprint 2004).

DSE: 2-FINANCIAL MANAGEMENT

(Credit:6, Theory:4, Practical: 2)

UNIT-I

Nature of Financial Management: Finance and related disciplines; Scope of Financial Management; Profit Maximization, Wealth Maximization - Traditional and Modern Approach; Functions of finance Finance Decision, Investment Decision, Dividend Decision; Objectives of Financial Management; Organisation of finance function; Concept of Time Value of Money, present value, future value, and annuity; Risk & Return: Historical return, expected return, absolute return, holding period return, annualized return, arithmetic & geometric return; Risk - Systematic & unsystematic risk their sources and measures.

UNIT-II

Long -term investment decisions: Capital Budgeting - Principles and Techniques; Nature and meaning of capital budgeting; Estimation of relevant cash flows and terminal value; Evaluation techniques - Accounting Rate of Return, Net Present Value, Internal Rate of Return & MIRR, Net Terminal Value, Profitably Index Method. Concept and Measurement of Cost of Capital: Explicit and Implicit costs; Measurement of cost of capital; Cost of debt; Cost of perpetual debt; Cost of Equity Share; Cost of Preference Share; Cost of Retained Earning; Computation of over-all cost of capital based on Historical and Market weights.

UNIT-III

Capital Structures: Approaches to Capital Structure Theories - Net Income approach, Net Operating Income approach, Modigliani-Miller (MM) approach, Traditional approach, Capital Structure and Financial Distress, Trade-Off Theory.

Dividend Policy Decision - Dividend and Capital; The irrelevance of dividends: General, MM hypothesis; Relevance of dividends: Walter's model, Gordon's model; Leverage Analysis: Operating and Financial Leverage; EBIT -EPS analysis; Combined leverage.

UNIT-IV

Working Capital Management: Management of Cash - Preparation of Cash Budgets (Receipts and Payment Method only); Cash management technique, Receivables Management Objectives; Credit Policy, Cash Discount, Debtors.

Outstanding and Ageing Analysis; Costs - Collection Cost, Capital Cost, Default Cost, Delinquency Cost, Inventory Management (Very Briefly) - ABC Analysis; Minimum Level; Maximum Level; Reorder Level; Safety Stock; EOQ, Determination of Working Capital.

Recommended Books:

1. M.Y. Khan & P.K. Jain: Financial Management Text Problem and Cases, Tata McGraw Hill Publishing Co. Ltd.
2. R. P. Rustogi: Financial Management: Theory Concepts and Practices, Taxmann Publication.
3. I.M. Pandey: Financial Management: Theory and Practices, Vikas Publishing House.
4. R.A. Brealey, S.C. Myers, F. Allen & P. Mohanty: Principles of Corporate Finance, McGraw Hill Higher Education.
5. J.V. Horne & J.M. Wachowicz: Fundamentals of Financial Management Prentice Hall.

SEMESTER-VI

C: 14-INTERNET TECHNOLOGY

(Credit:6, Theory:4, Practical: 2)

UNIT-I

Java: Use of Objects, Array and Array List class.

UNIT-II

JavaScript: Data types, operators, functions, control structures, events and event handling.

UNIT-III

JDBC:JDBC Fundamentals, Establishing Connectivity and working with connection interface, Working with statements, Creating and Executing SQL Statements, Working with Result Set Objects. **UNIT-IV** JSP: Introduction to Java Server Pages, HTTP and Servlet Basics, The Problem with Servlets, The Anatomy of a JSP Page, JSP Processing, JSP Application Design with MVC, Setting Up the JSP Environment, Implicit JSP Objects, Conditional Processing, Displaying Values, Using an expression to Set an Attribute, Declaring Variables and Methods, Error Handling and Debugging, Sharing Data Between JSP Pages, Requests, and Users, Database Access.

UNIT-V

Java Beans: Java Beans Fundamentals, JAR files, Introspection, Developing a simple Bean, Connecting to DB.

Recommended Books:

1. Ivan Bayross, Web Enabled Commercial Application Development Using HTML, DHTML, Javascript, Perl CGI , BPB Publications, 2009.
2. Cay Horstmann, BIG Java, Wiley Publication , 3/e, 2009.
3. Herbert Schildt , Java 7, The Complete Reference, , 8/e, 2009.
4. Jim Keogh ,The Complete Reference J2EE, TMH, , 2002.

**C: 15-PROGRAMMING IN NET
(Credit:6, Theory:4, Practical: 2)****DSE: 3-E-COMMERCE
(Credit:6, Theory:4, Practical: 2)****UNIT-I**

An introduction to Electronic commerce: What is E-Commerce (Introduction And Definition), Main activities E-Commerce, Goals of E-Commerce, Technical Components of E-Commerce, Functions of E-Commerce, Advantages and disadvantages of E-Commerce, Scope of E-Commerce, Electronic Commerce Applications, Electronic Commerce and Electronic Business(C2C)(C2G,G2G, B2G, B2P, B2A, P2P, B2A, C2A, B2B, B2C).

UNIT-II

The Internet and WWW: Evolution of Internet, Domain Names and Internet Organization (.edu, .com, .mil, .gov, .net etc.) , Types of Network, Internet Service Provider, World Wide Web, Internet & Extranet, Role of Internet in B2B Application, building own Website, Cost, Time, Reach, Registering a Domain Name, Web promotion, Target email, Baner, Exchange, Shopping Bots.

UNIT-III

Internet Security: Secure Transaction, Computer Monitoring, Privacy on Internet, CorporateEmail privacy, Computer Crime(Laws , Types of Crimes), Threats, Attack on Computer System, Software Packages for privacy, Hacking, Computer Virus(How it spreads, Virus problem, virus protection, Encryption and Decryption, Secret key Cryptography, DES, Public Key Encryption, RSA, Authorisation and Authentication, Firewall, Digital Signature(How it Works).

UNIT-IV

Electronic Data Exchange: Introduction, Concepts of EDI and Limitation, Applications of EDI, Disadvantages of EDI, EDI model,Electronic Payment System: Introduction, Types of Electronic Payment System, Payment Types, Value Exchange System, Credit Card System, Electronic Fund Transfer, Paperless bill, Modern Payment Cash, Electronic Cash.

UNIT-V

Planning for Electronic Commerce: Planning Electronic Commerce initiates, Linking objectives to business strategies, Measuring cost objectives, Comparing benefits to Costs, Strategies for developing electronic commerce web sites.

Recommended Books:

1. E-Commerce Concepts, Models, Strategies-G.S.V.Murthy, Himalaya Publishing House.
2. E- Commerce:-Kamlesh K Bajaj and Debjani Nag.
3. Electronic commerce-Gray P. Schneider.
4. E-Commerce, Fundamentals & Applications: Chand (Wiley) Web and E-Commerce.

DSE: 4-PROJECT WORK
(Credit:6)

MATHEMATICS (HONOURS)

SEMESTER-I

C:1-CALCULUS-I

(Total Marks: 100)

Part-I (Marks: 70)

4 Lectures, 1 Tutorial (per week)

Unit-I

Hyperbolic functions, higher order derivatives, Leibnitz rule and its applications to problems of the type $e^{ax+b} \sin x$, $e^{ax+b} \cos x$, $(ax + b)^n \sin x$, $(ax + b)^n \cos x$, concavity and inflection points, asymptotes, curve tracing in Cartesian coordinates, tracing in polar coordinates of standard curves, L'Hospital's rule, applications in business, economics and life sciences.

Unit-II

Reduction formulae, derivations and illustrations of reduction formulae of the type $\int \sin^n x dx$, $\int \cos^n x dx$, $\int \tan^n x dx$, $\int \sec^n x dx$, $\int (\log x)^n dx$, $\int \sin^n x \cos^n x dx$, volumes by slicing, disks and washers methods, volumes by cylindrical shells, parametric equations, parameterizing a curve, arc length, arc length of parametric curves, area of surface of revolution.

Unit-III

Techniques of sketching conics, reflection properties of conics, rotation of axes and second degree equations, classification into conics using the discriminant, polar equations of conics. Sphere, Cone, Cylinder, Conicoids.

Unit-IV

Vector triple product, Introduction to vector functions, operations with vector-valued functions, limits and continuity of vector functions, differentiation and integration of vector functions, tangent and normal components of acceleration.

Part-II(PRACTICAL)

(Marks: 30)

List of Practical (Using any software/MATLAB) Practical/Lab work to be performed on a Computer.

1. Plotting the graphs of the functions e^{ax+b} , $\log(ax + b)$, $1/(ax + b)$, $\sin(ax + b)$, $\cos(ax + b)$, $|ax + b|$ and to illustrate the effect of a and b on the graph.
2. Plotting the graphs of the polynomial of degree 4 and 5, the derivative graph, the second derivative graph and comparing them.

3. Sketching parametric curves (eg. Trochoid, Cycloid, Epicycloids, Hypocycloid).
4. Obtaining the surface of revolution of curves.
5. Tracing of conics in cartesian/polar coordinates.
6. Sketching Ellipsoid, Hyperboloid of one and two sheets, Elliptic cone, Elliptic, Paraboloid, Hyperbolic paraboloid using cartesian coordinates.
7. Matrix operation (addition, multiplication, inverse, transpose).

Books Recommended:

1. H. Anton, I. Bivens and S. Davis: Calculus, 10-th Ed., John Wiley and Sons (Asia) P. Ltd., Singapore, 2002. Chapters: 3 (3.1, 3.2), 5 (5.2-5.5), 6(6.5, 6.8), 10 (10.1-10.5), 11(11.1, 11.4), 12(12.1, 12.2, 12.3, 12.6).
2. B.P. Acharya and D.C. Sahu: Analytical Geometry of Quadratic Surfaces, B.P. Acharya and D.C. Sahu, Kalyani Publishers, New Delhi, Ludhiana, Chapters: 2 and 3.
3. Shantinakaran: Text Book of Calculus(Part-II), S. Chand & Co. Pvt. Ltd., New Delhi, Chapters: 6,7, 10 (Art. 33-36).
4. Shantinakaran: Text Book of Calculus(Part-III), S. Chand & Co., Pvt. Ltd., New Delhi, Chapters: 1(Art.1,2), 3 (Art.7,8), 6 (15 restricted).

Books for Reference:

1. G.B. Thomas and R.L. Finney: Calculus, 9-th Ed., Pearson Education, Delhi, 2005.
2. R. Courant and F. John: Introduction to Calculus and Analysis (Volumes I & II), Springer- Verlag, New York, Inc., 1989.
3. Shanti Narayan and P.K. Mittal: Analytical Solid Geometry, S. Chand & Co. Pvt. Ltd., New Delhi.
4. M.J. Strauss, G.L. Bradley and K. J. Smith: Calculus, 3-rd Ed., Dorling Kindersley (India) P. Ltd. (Pearson Education), Delhi, 2007.

C:2-ALGEBRA-I

Total Marks: 100-(Theory: 80 Marks+Mid-Sem: 20 Marks)

5 Lectures, 1 Tutorial (per week)

Unit-I

Polar representation of complex numbers, n -th roots of unity, De Moivre's theorem for rational indices and its applications.

Unit-II

Equivalence relations, Basic Terminology, Functions, Inverse and composition of functions, One-to-One correspondence and cardinality of a set, Division algorithm, Divisibility and Euclidean algorithm, Prime numbers, Congruence relation between integers, Principles of Mathematical Induction, Statement of Fundamental Theorem of Arithmetic.

Unit-III

Systems of linear equations, row reduction and echelon forms, vector equations, the matrix equation $Ax = b$, solution sets of linear systems, applications of linear systems, linear independence.

Unit-IV

Introduction to linear transformations, Matrix of a linear transformation, Inverse of a matrix, Characterizations of invertible matrices. Subspaces of \mathbb{R}^n , Dimension of subspaces of \mathbb{R}^n and Rank of a matrix, Eigen values, Eigen Vectors and Characteristic equation of a matrix.

Books Recommended:

1. Titu Andreescu and Dorin Andrica: Complex Numbers from A to Z , Birkhauser, 2006. Chapter: 2.
2. Edgar G. Goodaire and Michael M. Parmenter: Discrete Mathematics with Graph Theory, 3-rd Ed., Pearson Education (Singapore) P. Ltd., Indian Reprint, 2005. Chapters: 2(2.4), 3, 4(4.1 – 4.1.6, 4.2 – 4.2.12, 4.3 – 4.3.9, 4.4 – 4.4.8), 5(5.1 – 5.1.4).
3. David C. Lay: Linear Algebra and its Applications, 3rd Ed., Pearson Education Asia, Indian Reprint, 2007. Chapters: 1(1.1 – 1.9), 2(2.1 – 2.3, 2.8, 2.9), 5(5.1, 5.2).

SEMESTER-II

C:3-REAL ANALYSIS (ANALYSIS-I)

Total Marks: 100-(Theory: 80 Marks+Mid-Sem: 20 Marks)

5 Lectures, 1 Tutorial (per week)

Unit-I

Review of Algebraic and Order Properties of \mathbb{R} , Upper bound & Lower bound, Least upper bound (LUB), Greatest lower bound (GLB), LUB & GLB property of an ordered field, Completeness of an ordered field, Incompleteness of \mathbb{Q} , Supremum and Infimum, Roots, Archimedean property, Rational & Irrational density theorems, Decimal representations of real numbers.

Unit-II

Idea of countable, uncountable sets and theorems relating to these sets, Sequences, Convergence & divergence of sequences, Limit of a sequence & Limit Theorems, Monotonic sequences, Weierstrass completeness principle, Nested Intervals, Cantor's completeness principle, Idea about higher order cardinals (restricted).

Unit-III

Subsequences, Bolzano Weierstrass theorem for sequences, Cluster points, Cauchy(Fundamental)

sequence, Cauchy's Convergence Criterion, Limit superior and Limit inferior, Convergence and divergence of infinite series, Series of positive terms, Tests of convergence.

Unit-IV

Absolute convergence, Rearrangement of terms of a series, Conditional convergence of a series, Open sets, Closed sets, Limit points, Closure, Interior and Boundary of sets. Bolzano Weierstrass theorem for sets.

Book Recommended:

1. G. Das and S. Pattanayak: Fundamentals of Mathematics Analysis, TMH Publishing Co. , Chapters: 2(2.1-2.7), 3(3.1-3.4), 4(4.1-4.8, 4.11-4.13), 5(5.1-5.5).

Books for Reference:

1. R.G. Bartle and D. R. Sherbert: Introduction to Real Analysis, 3-rd Ed., John Wiley and Sons (Asia) Pvt. Ltd., Singapore, 2002.
2. Gerald G. Bilodeau , Paul R. Thie, G.E. Keough: An Introduction to Analysis, 2-nd Ed., Jones & Bartlett, 2010.
3. Brian S. Thomson, Andrew. M. Bruckner and Judith B. Bruckner: Elementary Real Analysis, Prentice Hall, 2001.
4. S.K. Berberian: A First Course in Real Analysis, Springer Verlag, New York, 1994.
5. S.C. Mallik and S. Arora: Mathematical Analysis, New Age International Publications.
6. D. Somasundaram and B. Choudhury: A First Course in Mathematical Analysis, Narosa Publishing House.
7. S.L. Gupta and Nisha Rani: Real Analysis, Vikas Publishing House Pvt. Ltd., New Delhi.

C-:4-DIFFERENTIAL EQUATIONS

(Total Marks:100)

Part-I (Marks: 70)

4 Lectures, 1 Tutorial (per week)

Unit-I

Basic concepts of Differential equations and mathematical models. First order and first degree Ordinary differential equations(variables separable, homogeneous, exact, and linear). Applications of first order differential equations(Growth, Decay and Chemical Reactions, Heat flow, Oxygen debt, Economics). Equations of first order but of higher degree.

Unit-II

Second order linear equations(both homogeneous and non-homogeneous) with constant coefficients, second order equations with variable coefficients, variation of parameters, method of undetermined coefficients, Euler's equation, Second order differential equations with variable coefficients, Equations reducible to linear equations with constant coefficients.

Unit-III

Power series solutions of second order differential equations.

Unit-IV

Laplace transforms and its applications to solutions of differential equations.

Part-II(PRACTICAL)

(Marks: 30)

List of Practical (Using any Software/MATLAB) Practical/Lab work to be performed on a Computer.

1. Plotting of second order solution of family of differential equations.
2. Plotting of third order solution of family of differential equations.
3. Growth model (exponential case only).
4. Decay model (exponential case only).
5. Oxygen debt model.
6. Economic model.
7. Vibration problems.

Book Recommended:

1. J. Sinha Roy and S. Padhy: A Course of Ordinary and Partial Differential Equations, Kalyani Publishers, New Delhi. Chapters: 1, 2, 3, 4(4.1-4.8), 5, 7, 9(9.1-9.5, 9.10, 9.11, 9.13).

Books for Reference:

1. Martin Braun: Differential Equations and their Applications, Springer International.
2. M.D. Raisinghania: Advanced Differential Equations, S. Chand & Company Ltd., New Delhi.
3. G. Dennis Zill: A First Course in Differential Equations with Modelling Applications, Cengage Learning India Pvt. Ltd.
4. S.L. Ross: Differential Equations, John Wiley & Sons, India, 2004.

SEMESTER-III

C-5: THEORY OF REAL FUNCTIONS (ANALYSIS-II)

Total Marks: 100-(Theory: 80 Marks+Mid-Sem: 20 Marks)

5 Lectures, 1 Tutorial (per week)

Unit-I

Limits of functions ($\epsilon - \delta$ approach), Sequential criterion for limits, Divergence criteria. Limit theorems, one-sided limits. Infinite limits and limit at infinity. Continuous functions, Sequential criterion for continuity, Algebra of continuous functions and theorems related to continuity of functions.

Unit-II

Discontinuity and kinds of discontinuity, Further properties of continuity, Uniform continuity, Differentiable functions, Left hand & Right hand derivatives, Algebra of differentiable functions, Caratheodory's theorem.

Unit-III

Mean value conditions, Global and local maximum & minimum, Rolle's theorem, Generalized mean value theorem, Cauchy mean value theorem, Lagrange's mean value theorem and their applications, Darboux's theorem, Indeterminant forms, Higher order derivatives (Leibnitz theorem), Taylor's theorem and its applications to approximating functions by means of polynomials.

Unit-IV

Maxima and Minima, Taylor's theorem with different forms of remainder, Maclaurin's theorem, Deduction of Taylor's theorem from mean value theorem, Taylor's and Maclaurin's infinite series, Taylor's series and Maclaurin's series expansions of exponential and trigonometric functions, $\ln(1+x)$, $1/(ax+b)$ and $(1+x)^n$.

Books Recommended:

1. G. Das and S. Pattanayak: Fundamentals of Mathematics Analysis, TMH Publishing Co., Chapters: 6(6.1-6.7), 7(7.1-7.7), 9(9.7 only).
2. S.C. Mallik and S. Arora: Mathematical Analysis, New Age International Publications, Chapter: 6(8.1-8.6).

Books for Reference:

1. R. Bartle and D.R. Sherbert, Introduction to Real Analysis, John Wiley and Sons, 2003.
2. K.A. Ross, Elementary Analysis: The Theory of Calculus, Springer, 2004.
3. A. Mattuck, Introduction to Analysis, Prentice Hall, 1999.
4. S.R. Ghorpade and B.V. Limaye, A Course in Calculus and Real Analysis, Springer, 2006.

C-6: GROUP THEORY (ALGEBRA-II)

Total Marks: 100-(Theory: 80 Marks+Mid-Sem: 20 Marks)

5 Lectures, 1 Tutorial (per week)

Unit-I

Symmetries of a square, Dihedral groups, Definition and examples of groups including permutation groups and quaternion groups (illustration through matrices), Elementary properties of groups.

Subgroups and examples of subgroups, Centralizer, Normalizer, Center of a group, Product of two subgroups.

Unit-II

Properties of cyclic groups, Classification of subgroups of cyclic groups. Cycle notation for permutations, Properties of permutations, Even and Odd permutations, Alternating group, Properties of cosets, Lagranges theorem and consequences including Fermats Little theorem.

Unit-III

External direct product of a finite number of groups, Normal subgroups, Factor groups, Cauchy's theorem for finite abelian groups.

Unit-IV

Group homomorphisms, properties of homomorphisms, Cayley's theorem, Properties of isomorphisms, First isomorphism theorem, Second and Third isomorphism theorems (Statements only).

Book Recommended:

1. Joseph A. Gallian: Contemporary Abstract Algebra(4-th Edn.), Narosa Publishing House, New Delhi, Chapters: I, II, III, IV, V, VI(up to Theorem 6.2 only), VII, VIII, IX, X, XI.

Books for Reference:

1. D.S. Malik, J.M. Mordeson, and M.K. Sen: Fundamentals of Abstract Algebra, McGraw-Hill, 1997.
2. John B. Fraleigh: A First Course in Abstract Algebra, 7-th Ed., Pearson, 2002.
3. M. Artin: Abstract Algebra, 2-nd Ed., Pearson, 2011.
4. Joseph J. Rotman: An Introduction to the Theory of Groups, 4-th Ed., Springer Verlag, 1995.
5. I.N. Herstein: Topics in Algebra, Wiley Eastern Limited, India, 1975.

C-7: PARTIAL DIFFERENTIAL EQUATIONS & SYSTEMS OF ORDINARY DIFFERENTIAL EQUATIONS

(Total Marks: 100)

Part-I (Marks: 70)

04 Lectures (per week)

Unit-I

Systems of Linear Differential Equations: Basic theory of linear systems, Trial solution method for linear system with constant coefficients, Simultaneous linear first order equations in three variables, Methods of solution, Pfaffian differential equations, methods of solutions of Pfaffian differential equations in three variables.

Unit-II

Formation of first order partial differential equations, Linear and non-linear partial differential equations of first order, Special types of first-order equations, Solutions of partial differential equations of first order satisfying given conditions.

Unit-III

Linear partial differential equations with constant coefficients, Equations reducible to linear partial differential equations with constant coefficients, Partial differential equations with variable coefficients, Some standard forms of variable coefficients.

Unit-IV

Laplace equation, Solution of Laplace equations by separation of variables, One-dimensional Wave equation, Solution of the Wave equation (method of separation of variables), Diffusion equation, Solution of one-dimensional diffusion equation, Method of separation of variables.

Part-II(PRACTICAL)

(Marks: 30)

List of Practical (Using any Software/MATLAB) Practical/Lab work to be performed on a Computer.

1. To find the general solution of the non-homogeneous system of the form:

$$\frac{dx}{dt} = a_1x + b_1y + f_1(t), \quad \frac{dy}{dt} = a_2x + b_2y + f_2(t)$$

with given conditions.

2. Plotting the integral surfaces of a given first order PDE with initial data.

3. Solution of wave equation $\frac{\partial^2 u}{\partial t^2} - c^2 \frac{\partial^2 u}{\partial x^2} = 0$ for the following associated conditions:

(a) $u(x, 0) = \varphi(x)$, $u_t(x, 0) = \psi(x)$, $x \in \mathbb{R}$, $t > 0$. (b) $u(x, 0) = \varphi(x)$, $u_t(x, 0) = \psi(x)$, $u_x(0, t) = 0$, $x \in (0, \infty)$, $t > 0$. (c) $u(x, 0) = \varphi(x)$, $u_t(x, 0) = \psi(x)$, $u(0, t) = 0$, $x \in (0, \infty)$, $t > 0$. (d) $u(x, 0) = \varphi(x)$, $u_t(x, 0) = \psi(x)$, $u(0, t) = 0$, $u(1, t) = 0$, $0 < x < 1$, $t > 0$.

4. Solution of Diffusion equation $\frac{\partial u}{\partial t} - k^2 \frac{\partial^2 u}{\partial x^2} = 0$ for the following associated conditions:

(a) $u(x, 0) = \varphi(x)$, $u(0, t) = a$, $u(l, t) = b$, $0 < x < l$, $t > 0$.

(b) $u(x, 0) = \varphi(x)$, $x \in \mathbb{R}$, $0 < t < T$.

(c) $u(x, 0) = \varphi(x)$, $u(0, t) = a$, $x \in (0, \infty)$, $t \geq 0$.

Book Recommended:

1. J.Sinha Roy and S. Padhy: A Course on Ordinary and Partial Differential Equations, Kalyani Publishers, New Delhi, Ludhiana, 2012.
Chapters: 8 (8.1-8.3), 11, 12, 13(13.1-13.5), 15(15.1 & 15.5 only), 16(16.1 & 16.1.1 only), 17(17.1-17.3).

Books for References:

1. Tyn Myint-U and Lokenath Debnath: Linear Partial Differential Equations for Scientists and Engineers, 4-th edition, Springer, Indian reprint, 2006.

2. S.L. Ross: Differential equations, 3-rd Ed., John Wiley and Sons, India, 2004.

SEMESTER-IV

C-8: NUMERICALMETHODS

(Total Marks: 100)

Part-I (Marks: 70)

04 Lectures (per week)

Unit-I

Rate of convergence, Algorithms, Errors: Relative, Absolute, Round off, Truncation. Numerical solution of non-linear equations : Bisection method, Regular-Falsi method, Secant method, Newton-Raphson method, Fixed-point Iteration method, Newton-Raphson method for multiple roots, Aitken's O^2 process, Muller's method. Rate of convergence of these methods.

Unit-II

System of linear equations: Gaussian Elimination method, Gauss-Jordan method, Gauss Jacobi method, Gauss-Seidel method and their convergence analysis, .

Unit-III

Polynomial interpolation: Existence uniqueness of interpolating polynomials, Lagrange and Newtons divided difference interpolation, Error in interpolation, Central difference & averaging operators, Gauss-forward and backward difference interpolation, Simple numerical methods for derivatives, Interpolatory formulas.

Unit-IV

Numerical Integration: Some simple quadrature rules, Newton-Cotes rules, Trapezoidal rule, Simpsons rule, Simpsons $\frac{3}{8}$ -th rule, Compound quadrature rules, Compound mid-point rule, Compound

Trapezoidal rule, Compound Simpsons rule, Gauss-Legendre 2-point & 3-point rules. Numerical solutions of Differential Equations: Eulers method. Runge-Kutta methods of orders two, three and four.

Part-II(PRACTICAL)

(Marks: 30)

List of Practical (Using any Software/MATLAB) Practical/Lab work to be performed on a Computer.

1. Calculate the sum $1/1 + 1/2 + 1/3 + 1/4 + \dots + 1/N$.
2. To find the absolute value of an integer.
3. Enter 100 integers into an array and sort them in an ascending order.

4. Bisection Method.
5. Newton-Raphson Method.
6. Secant Method.
7. Regular-Falsi Method.
8. LU decomposition Method.
9. Gauss-Jacobi Method.
10. SOR Method or Gauss-Siedel Method.
11. Lagrange Interpolation or Newton Interpolation.
12. Simpsons rule.

Note: For any of the CAS (Computer aided software) Data types-simple data types, floating data types, character data types, arithmetic operators and operator precedence, variables and constant declarations, expressions, input/output, relational operators, logical operators and logical expressions, control statements and loop statements, arrays should be introduced to the students.

Book Recommended:

1. B.P. Acharya and R.N. Das: A Course on Numerical Analysis, Kalyani Publishers, New Delhi, Ludhiana. Chapters: 0(0.2, 0.8), 1(1.8, 1.9), 2(2.1-2.4, 2.6-2.9), 3(3.1-3.4, 3.6-3.11), 5(5.1- 5.3), 6(6.1-6.3, 6.5, 6.10, 6.11), 7(7.1-7.5 & 7.7).
2. Brian Bradie, A Friendly Introduction to Numerical Analysis, Pearson Education, India, 2007.

Books for Reference:

1. M.K. Jain, S.R.K. Iyengar and R.K. Jain: Numerical Methods for Scientific and Engineering Computation, 6th Ed., New age International Publisher, India, 2007.
2. C.F. Gerald and P.O. Wheatley: Applied Numerical Analysis, Pearson Education, India, 2008.
3. Uri M. Ascher and Chen Greif: A First Course in Numerical Methods, 7th Ed., PHI Learning Private Limited, 2013.
4. John H. Mathews and Kurtis D. Fink: Numerical Methods using Matlab, 4th Ed., PHI Learning Private Limited, 2012.
5. P. Khandasamy, K. Thilagavathy and K. Gunavathi: Numerical Methods, S. Chand & Company Ltd., 2012.
6. E. Balagurusamy: Numerical Methods, Tata McGraw-Hill Pub. Co. Ltd., 1999.

C-9: RIEMANN INTEGRATION & SERIES OF FUNCTIONS (ANALYSIS-III)

Total Marks: 100-(Theory: 80 Marks+Mid-Sem: 20 Marks)

5 Lectures, 1 Tutorial (per week)

Unit-I

Riemann integration, Inequalities of upper and lower sums, Riemann conditions of integrability. Riemann sum and definition of Riemann integral through Riemann sums, Equivalence of two definitions, Riemann integrability of monotone and continuous functions, Properties of the Riemann integral, Definition and integrability of piecewise continuous and monotone functions, Fundamental theorems of Calculus.

Unit-II

Improper integrals; Series and Integrals, Absolute convergence of integrals, Convergence of Beta and Gamma functions.

Unit-III

Point-wise and Uniform convergence of sequence of functions, Cauchy's criterion & Weierstrass M-test for uniform convergence, Dedekind test, Uniform convergence and Continuity, Term by term integration of series, Term by term differentiation of series.

Unit-IV

Power series (Cauchy Hadamard Theorem), Radius of convergence, Differentiation and integration of power series, Abels Limit Theorem, Stirling's formula, More about Taylor's series, Weierstrass Approximation Theorem.

Books Recommended:

1. G. Das and S. Pattanayak: Fundamentals of Mathematics Analysis, TMH Publishing Co., Chapters: 4(4.14 only), 8 (8.1-8.6), 9 (9.1-9.6, 9.8).
2. S.C. Mallik and S. Arora: Mathematical Analysis, New Age International Ltd., New Delhi, Chapters: 11(3.3, 4.3 only), 12(Restricted).

Books for Reference:

1. K.A. Ross, Elementary Analysis: The Theory of Calculus, Undergraduate Texts in Mathematics, Springer (SIE), Indian reprint, 2004.
2. R.G. Bartle D.R. Sherbert: Introduction to Real Analysis, 3rd Ed., John Wiley and Sons (Asia) Pvt. Ltd., Singapore, 2002.
3. Charles G. Denlinger: Elements of Real Analysis, Jones & Bartlett (Student Edition), 2011.
4. Shanti Narayan and M.D. Raisinghania: Elements of Real Analysis, S. Chand & Co. Pvt. Ltd.

C-10: RING THEORY & LINEAR ALGEBRA (ALGEBRA-III)

Total Marks: 100-(Theory: 80 Marks+Mid-Sem: 20 Marks)

5 Lectures, 1 Tutorial (per week)

Unit-I

Definition and examples of rings, Properties of rings, Subrings, Integral domains and Fields, Characteristic of a ring, Ideal, Ideal generated by a subset of a ring, Factor rings, Operations on Ideals, Prime and Maximal ideals.

Unit-II

Ring homomorphisms, Properties of ring homomorphisms, Isomorphism Theorems I, II and III, Field of quotients.

Unit-III

Vector spaces, Subspaces, Algebra of subspaces, Quotient spaces, Linear combination of vectors, Linear span, Linear independence, Basis and Dimension, Dimension of subspaces.

Unit-IV

Linear transformations, Null space, Range, Rank and Nullity of a linear transformation, Matrix representation of a linear transformation, Algebra of linear transformations. Isomorphisms, Isomorphism theorems, Invertibility and Isomorphisms, Change of co-ordinate matrix.

Book Recommended:

1. Joseph A. Gallian: Contemporary Abstract Algebra(8th Edn.), Narosa Publishing House, New Delhi. Chapters: 12, 13, 14, 15.
2. Stephen H. Friedberg, Arnold J. Insel, and Lawrence E. Spence: Linear Algebra, 4th Ed., Prentice- Hall of India Pvt. Ltd., New Delhi, 2004. Chapters: 1 (1.2-1.6), 2(2.1-2.5).

Books for Reference:

1. John B. Fraleigh: A First Course in Abstract Algebra, 7th Ed., Pearson, 2002.
2. M. Artin: Abstract Algebra, 2nd Ed., Pearson, 2011.
3. S. Lang: Introduction to Linear Algebra, 2nd Ed., Springer, 2005.
4. Gilbert Strang: Linear Algebra and its Applications, Cengage Learning India Pvt. Ltd.
5. S. Kumaresan: Linear Algebra- A Geometric Approach, Prentice Hall of India,1999.
6. Kenneth Hoffman, and Ray Alden Kunze: Linear Algebra, 2nd Ed., Prentice-Hall of India Pvt. Ltd., 1971.
7. I.N. Herstein: Topics in Algebra, Wiley Eastern Pvt. Ltd.

SEMESTER-V

C-11: MULTIVARIATE CALCULUS (CALCULUS-II)

Total Marks: 100-(Theory:80 Marks+Mid-Sem: 20 Marks)

5 Lectures, 1 Tutorial (per week)

Unit-I

Functions of several variables, limit and continuity of functions of two variables, Partial differentiation, Tangent planes, Approximation and Differentiability, Chain rule for one and two independent parameters.

Unit-II

Directional derivatives and gradient, Maximal property of the gradient, Normal property of the gradient, Tangent planes and the normal lines, Extrema of functions of two variables, Method of Lagrange multipliers, Lagrange Multipliers, Constrained optimization problems, A geometrical interpretation.

Unit-III

Double integration over rectangular region and over non-rectangular region, Double integrals in polar co-ordinates, Triple integrals, Triple integral over a parallelepiped and solid regions, Volume by triple integrals. cylindrical and spherical co-ordinates. Change of variables in double integrals and triple integrals.

Unit-IV

Definition of vector field, Divergence and Curl, Line integrals, Applications of line integrals: Mass and Work, Fundamental theorem and path independence for line integrals.

Unit-V

Green's theorem, Area as a line integral, Alternative forms of Green's theorem, Normal derivatives, Surface integrals, Integrals over parametrically defined surfaces. Stokes theorem, The Divergence theorem.

Book Recommended:

1. M.J. Strauss, G.L. Bradley and K. J. Smith: Calculus, 3rd Ed., Dorling Kindersley (India) Pvt. Ltd. (Pearson Education), Delhi, 2007. Chapters: 11(11.1(Pages: 541-543), 11.2- 11.6, 11.7(Pages:598-605), 11.8(Pages:610-614)), 12 (12.1, -12.3, 12.4(Pages:652-660), 12.5, 12.6), 13 (13.1-13.3, 13.4(Pages:712-716, 718-720), 13.5(Pages:723-726; 729-730), 13.6 (Pages:733-737), 13.7(Pages:742-745)).

Books for Reference:

1. G.B. Thomas and R.L. Finney: Calculus, 9th Ed., Pearson Education, Delhi, 2005.
2. E. Marsden, A.J. Tromba and A. Weinstein: Basic Multivariable Calculus, Springer (SIE), Indian reprint, 2005.
3. Santosh K. Sengar and S.P. Singh: Advanced Calculus, Cengage Learning India Pvt. Ltd.

C-12: PROBABILITY & STATISTICS

Total Marks:100-(Theory: 80 Marks+Mid-Sem: 20 Marks)

4 Lectures, 1 Tutorial (per week)

Unit-I

Sample space, Probability axioms, Independent events, Conditional probability & Bayes' theorem, Real random variables (discrete and continuous), Cumulative distribution function, Expectation of random variables, Some special expectations.

Unit-II

Multivariate distributions, Joint cumulative distribution functions, Joint probability distributions, Marginal & conditional distributions, Some probability distributions(Discrete case), Uniform distribution, Binomial distribution, Negative Binomial & Geometric distributions, Poisson distribution.

Unit-III

Some probability distributions(Continuous case), Uniform, Gamma, Exponential, Beta distributions, Normal distributions, Normal approximation to the Binomial distribution, Bivariate normal distribution.

Unit-IV

Distribution of two random variables, Expectation of function of two random variables, Moment generating functions, Conditional distributions & expectations, Correlation coefficient, Co-variance, Independent random variables, Linear regression for two variables.

Unit-V

Limit theorems, Markov's inequality, Chebyshev's inequality, Statement and interpretation of Weak and Strong law of large numbers, Central Limit theorem for independent and identically distributed random variables with finite variance, Markov Chains: Introduction, Chapman-Kolmogorov equations.

Books Recommended:

1. Irwin Miller and Marylees Miller, John E. Freund: Mathematical Statistics with Applications, 7th Ed., Pearson Education, Asia, 2006. Chapters: 2 (excluding Art.9), 3 (excluding Art.8), 4, 5(5.1, 5.2, 5.4, 5.5,5.7), 6(6.1-6.7), 14(14.1, 14.2)
2. Sheldon Ross: Introduction to Probability Models, 9th Ed., Academic Press, Indian Reprint, 2007. Chapters:8(8.1-8.4(up to pages 428)), 9(9.1, 9.2).

Books for Reference:

1. Alexander M. Mood, Franklin A. Graybill and Duane C. Boes: Introduction to the Theory of Statistics, 3rd Ed., Tata McGraw- Hill, Reprint 2007.
2. S.C. Gupta and V.K. Kapoor: Fundamentals of Mathematical Statistics, S. Chand and Company Pvt. Ltd., New Delhi.
3. Sheldon Ross: A First Course in Probability, Pearson Education.
4. Robert V. Hogg, Joseph W. McKean and Allen T. Craig: Introduction to Mathematical Statistics, Pearson Education, Asia, 2102.

5. Kai Lai Chung: Elementary Probability Theory with Stochastic Processes, 3-rd Edn., Springer International Student Edition.

SEMESTER-VI

C-13: METRIC SPACES & COMPLEX ANALYSIS (ANALYSIS-IV)

Total Marks: 100-(Theory: 80 Marks+Mid-Sem: 20 Marks)

5 Lectures, 1 Tutorial (per week)

Unit-I

Metric spaces: Definition and examples, Open & Closed spheres, Neighborhoods, Interior points, Open set, Closed set, Boundary points, Limit points & isolated points, Closure of a set, Dense sets, Separable metric spaces, Sequences in metric spaces, Convergent sequences, Cauchy sequences, Complete metric spaces, Distance between sets & diameter of a set, Subspaces, Cantor's theorem.

Unit-II

Continuous functions: Definition & characterizations, Sequential criterion and other characterizations of continuity, Uniform continuity, Homeomorphism, Connectedness, Connected subsets of \mathbb{R} , Separated sets, Disconnected sets, Contraction mappings, Banach Fixed point theorem.

Unit-III

Properties of complex numbers, Regions in the complex plane, Functions of complex variable, Mappings, Limits & Continuity of complex functions, Derivatives, Differentiation formulas, Cauchy-Riemann equations, Sufficient conditions for differentiability, Polar Co-ordinates, Analytic functions, Examples of analytic functions.

Unit-IV

Exponential function, Logarithmic function, Trigonometric function, Derivatives of these functions, Definite integrals of functions, Contours, Contour integrals and its examples, Upper bounds for moduli of contour integrals, Theorems on antiderivatives, Cauchy- Goursat theorem (statement only), Cauchy integral formula, Its extension and consequences.

Unit-V

Liouville's theorem and the Fundamental theorem of Algebra, Convergence of sequences and series, Taylor series with examples, Laurent series (without proof) with examples, Absolute and uniform convergence of power series.

Books Recommended:

1. P.K. Jain and K. Ahmad: Metric Spaces, Narosa Publishing House, New Delhi. Chapters: 2(1-9, 12), 3(1-4), 4(1-4), 6(1-2, 4), 7(1 only).
2. James Ward Brown and Ruel V. Churchill: Complex Variables and Applications, 8th Ed., McGraw Hill International Edition, 2009. Chapters: 1(11 only), 2(12, 13, 15-25), 3(29, 30, 34), 4(37-41, 43-46, 50-53), 5(55-60, 62,63,66).

Books for Reference:

1. Satish Shirali and Harikishan L. Vasudeva: Metric Spaces, Springer Verlag, London, 2006.
2. S. Kumaresan: Topology of Metric Spaces, 2nd Ed., Narosa Publishing House, 2011.
3. S. Arumgum, A.T. Issac and A. Somasundaram: Complex Analysis, Scitech Publ. Pvt. Ltd.
4. S. Ponnusamy: Foundations of Complex Analysis, Alpha Science International Ltd.
5. J.B. Conway: Functions of one complex variable, Springer International Student Edn..
6. N. Das: Complex Function Theory, Allied Publishers Pvt. Ltd., Mumbai.

C-14: LINEAR PROGRAMMING

Total Marks: 100-(Theory: 80 Marks+Mid-Sem: 20 Marks)

5 Lectures, 1 Tutorial (per week)

Unit-I

Introduction to linear programming problems(LPP), Mathematical formulation of the LPP with illustrations, Graphical method, General Linear programming problems, Canonical & standard form of LPP.

Unit-II

Theory of Simplex method, Optimality and unboundedness, the Simplex algorithm, Simplex method in tableau format, Introduction to artificial variables, Two-phase method, Big-M method and their comparisons.

Unit-III

Duality in LPP: Introduction, General Primal-Dual pair, Formulation of the Dual problem, Primal- Dual relationships, Duality theorems, Complementary slackness theorem, Duality & Simplex method, Economic interpretation of the Duality.

Unit-IV

Transportation Problem(TP): LP formulation of TP, Existence of solution and Duality in TP, Solution of Transportation problems, North-West corner method, Least-Cost method and Vogel approximation method for determination of starting basic solution, Algorithm for solving transportation problem, Assignment problem and its mathematical formulation, Solution methods of Assignment problem, Special cases in Assignment problems.

Unit-V

Games and Strategies: Introduction, Formulation of two person zero sum games, solving two person zero sum games, Maximin-Minimax principle, Games without saddle points, Games with mixed strategies, Graphical solution procedure to $(2 \times n)$ and $(m \times 2)$ games.

Book Recommended:

1. Kanti Swarup, P.K. Gupta and Man Mohan: Operations Research, S. Chand and Co. Pvt. Ltd., Chapters: 2, 3, 4, 5(5.1-5.8), 10(10.1-10.10), 11(11.1-11.4), 17(17.1-17.6).

Books for Reference:

1. G. Hadley: Linear Programming, Narosa Publishing House, New Delhi, 2002.
2. N.V.R. Naidu, G. Rajendra and T. Krishna Rao: Operations Research, I.K. International Publishing House Pvt. Ltd., New Delhi, Bangalore.
3. R. Veerachamy and V. Ravi Kumar: Operations Research- I.K. International Publishing House Pvt. Ltd., New Delhi, Bangalore.
4. P.K. Gupta and D.S. Hira: Operations Research, S. Chand and Company Pvt. Ltd., New Delhi.
5. Mokhtar S. Bazaraa, John J. Jarvis and Hanif D. Sherali: Linear Programming and Network Flows, 2-nd Ed., John Wiley and Sons, India, 2004.
6. F.S. Hillier and G.J. Lieberman: Introduction to Operations Research, 9-th Ed., Tata McGraw Hill, Singapore, 2009.
7. Hamdy A. Taha: Operations Research, An Introduction, 8-th Ed., PrenticeHall India, 2006.

DISCIPLINE SPECIFIC ELECTIVES(DES)

DSE-1 Programming in C++ (Compulsory)

(Total Marks; 100)

Part-I(Marks: 70)

Introduction to structured programming: data types- simple data types, floating data types, character data types, string data types, arithmetic operators and operators precedence, variables and constant declarations, expressions, input using the extraction operator `&&` and `cin`, output using the insertion operator `ij` and `cout`, preprocessor directives, increment(++) and decrement(–) operations, creating a C++ program, input/ output, relational operators, logical operators and logical expressions, if and if-else statement, switch and break statements. for, while and do-while loops and continue statement, nested control statement, value returning functions, value versus reference parameters, local and global variables, one dimensional array, two dimensional array, pointer data and pointer variables.

Book Recommended:

1. D. S. Malik: C++ Programming Language, Edition-2009, Course Technology, Cengage Learning, India Edition. Chapters: 2(Pages:37-95), 3(Pages:96-129), 4(Pages:134-178), 5(Pages:181- 236), 6, 7(Pages:287-304), 9 (pages: 357-390), 14(Pages:594-600).

Books for Reference:

1. E. Balaguruswami: Object oriented programming with C++, fifth edition, Tata McGraw Hill Education Pvt. Ltd.
2. R. Johnsonbaugh and M. Kalin-Applications Programming in ANSI C, Pearson Education.
3. S. B. Lippman and J. Lajoie, C++ Primer, 3rd Ed., Addison Wesley, 2000.
4. Bjarne Stroustrup , The C++ Programming Language, 3rd Ed., Addison Welsley.

Part-II(PRACTICAL, Marks:30)

List of Practicals (Using any software) Practical/Lab work to be performed on a Computer.

1. Calculate the Sum of the series $\frac{1}{1} \pm \frac{1}{2} \pm \frac{1}{3} + \frac{1}{N}$ for any positive integer N .
2. Write a user defined function to find the absolute value of an integer and use it to evaluate the function $(-1)^n/|n|$, for $n = -2, -1, 0, 1, 2$.
3. Calculate the factorial of any natural number.
4. Read floating numbers and compute two averages: the average of negative numbers and the average of positive numbers.
5. Write a program that prompts the user to input a positive integer. It should then output a message indicating whether the number is a prime number.
6. Write a program that prompts the user to input the value of a, b and c involved in the equation $ax^2+bx+c=0$ and outputs the type of the roots of the equation. Also the program should outputs all the roots of the equation.
7. write a program that generates random integer between 0 and 99. Given that first two Fibonacci numbers are 0 and 1, generate all Fibonacci numbers less than or equal to generated number.
8. Write a program that does the following:
 - a. Prompts the user to input five decimal numbers.
 - b. Prints the five decimal numbers.
 - c. Converts each decimal number to the nearest integer.
 - d. Adds these five integers.
 - e. Prints the sum and average of them.
9. Write a program that uses whileloops to perform the following steps:
 - a. Prompt the user to input two integers :first Num and second Num (first Num shoul be less than second Num).
 - b. Output all odd and even numbers between first Num and second Num.
 - c. Output the sum of all even numbers between first Num and second Num.
 - d. Output the sum of the square of the odd numbers firs tNum and second Num.
 - e. Output all uppercase letters corresponding to the numbers between first Num and second Num, if any.

10. Write a program that prompts the user to input five decimal numbers. The program should then add the five decimal numbers, convert the sum to the nearest integer, and print the result.
11. Write a program that prompts the user to enter the lengths of three sides of a triangle and then outputs a message indicating whether the triangle is a right triangle or a scalene triangle.
12. Write a value returning function smaller to determine the smallest number from a set of numbers. Use this function to determine the smallest number from a set of 10 numbers.
13. Write a function that takes as a parameter an integer (as a long value) and returns the number of odd, even, and zero digits. Also write a program to test your function.
14. Enter 100 integers into an array and sort them in an ascending/ descending order and print the largest/ smallest integers.
15. Enter 10 integers into an array and then search for a particular integer in the array.
16. Multiplication/ Addition of two matrices using two dimensional arrays.
17. Using arrays, read the vectors of the following type: $A = (12345678)$, $B = (02340156)$ and compute the product and addition of these vectors.
18. Read from a text file and write to a text file.
19. Write a function, reverse Digit, that takes an integer as a parameter and returns the number with its digits reversed. For example, the value of function reverse Digit 12345 is 54321 and the value of reverse Digit -532 is -235.

DSE-2

Total Marks:100-(Theory: 80 Marks+Mid-Sem: 20 Marks)

5 Lectures, 1 Tutorial (per week)

(Any one of the following)

1-DISCRETE MATHEMATICS

Unit-I

Propositional Logic, Propositional equivalences, Predicates and Quantifiers, Nested quantifiers, Rules of Inference, Methods of proof, Relations and their properties, n-ary relations and their applications, The basic counting, the Pigeon-hole principle, Generalized Permutations and Combinations.

Unit-II

Recurrence relations, Modelling with recurrence relations, Solving linear homogeneous recurrence relations with constant coefficients, Generating functions, Solving recurrence relations using generating functions, Principle of Inclusion-Exclusion & applications.

Unit-III

Partially ordered sets, Hasse diagram of partially ordered sets, maps between ordered sets, Boolean

expressions and Boolean functions, Duality principle, Lattices as ordered sets, Lattices as algebraic structures, sublattices, Boolean algebra and its properties.

Unit-IV

Graphs: Basic concepts and graph terminology, representing graphs and graph isomorphism, Cut-vertices and Cut-edges, Distance in a graph (restricted), Connectivity, Euler and Hamiltonian path, Shortest-Path problems, Planar graphs, Graph coloring.

Book Recommended:

1. Kenneth H. Rosen: Discrete Mathematics and Applications, Tata McGraw Hill Publications, Chapters: 1(1.1-1.6), 4(4.1, 4.2, 4.5), 5(5.1, 5.2, 5.5), 6(6.1, 6.2, 6.4-6.6), 7(7.1, 7.2), 8, 10(10.1, 10.2).

Books for References:

1. B A. Davey and H. A. Priestley: Introduction to Lattices and Order, Cambridge University Press, Cambridge, 1990.
2. Edgar G. Goodaire and Michael M. Parmenter: Discrete Mathematics with Graph Theory (2nd Edition), Pearson Education (Singapore) Pte. Ltd., Indian Reprint 2003.
3. Rudolf Lidl and Gnter Pilz: Applied Abstract Algebra (2nd Edition), Undergraduate Texts in Mathematics, Springer (SIE), Indian reprint, 2004.
4. D.S. Malik: Discrete Mathematics: Theory & Applications, Cengage Learning India Pvt. Ltd.
5. Kevin Ferland: Discrete Mathematical Structures, Cengage Learning India Pvt. Ltd.

2-MATHEMATICAL MODELLING

Unit-I

Simple situations requiring Mathematical modelling. The technique of Mathematical modelling, Mathematical modelling through differential equations, linear growth and decay models, non-linear growth and decay models, compartment models, Mathematical modelling of geometrical problems through ordinary differential equations of first order.

Unit-II

Mathematical modelling in population dynamics, Mathematical modelling of epidemics through systems of ordinary differential equations of first order, compartment models through systems of ordinary differential equations, Mathematical modelling in economics through systems of ordinary differential equations of first order.

Unit-III

Mathematical models in medicine, arms race, battles and international trade in terms of systems of ordinary differential equations, Mathematical modelling of planetary motions, Mathematical modelling of circular motion and motion of satellites, mathematical modelling through linear differential equations of second order.

Unit-IV

Situation giving rise to partial differential equations models, mass balance equations: First method of getting PDE models, momentum balance equations. The second method of obtaining partial differential models, variational principles, third function, fourth method of obtaining partial differential equation models, models for traffic flow of a highway. Situation that can be modelled through graphs, mathematical models in terms of directed graphs, optimization principles and techniques, Mathematical modelling through calculus of variations.

Book Recommended:

1. J.N. Kapur: Mathematical Modelling, Chapters: 1(1.1 and 1.2), 2(2.1 to 2.4, 2.6), 3(3.1 to 3.5), 4(4.1 to 4.3), 6(6.1 to 6.6), 7(7.1 to 7.2), 9(9.1 and 9.2).

3-NUMBER THEORY

Unit-I

Divisibility theorem in integers, Primes and their distributions, Fundamental theorem of arithmetic, Greatest common divisor, Euclidean algorithms, Modular arithmetic, Linear Diophantine equation, prime counting function, statement of prime number theorem, Goldbach conjecture.

Unit-II

Introduction to congruences, Linear Congruences, Chinese Remainder theorem, Polynomial congruences, System of linear congruences, complete set of residues, Chinese remainder theorem, Fermat's little theorem, Wilson's theorem.

Unit-III

Number theoretic functions, sum and number of divisors, totally multiplicative functions, definition and properties of the Dirichlet product, the Mbius inversion formula, the greatest integer function, Euler's phi function, Euler's theorem, reduced set of residues, some properties of Euler's phi-function.

Unit-IV

Order of an integer modulo n , primitive roots for primes, composite numbers having primitive roots, Euler's criterion, the Legendre symbol and its properties, quadratic reciprocity, quadratic congruences with composite moduli.

Book Recommended:

1. D.M. Burton: Elementary Number Theory, McGraw Hill, Chapters: 2(2.1 to 2.4), 3(3.1 to 3.3), 4(4.1 to 4.4), 5(5.1 to 5.4), 6(6.1 to 6.3), 7(7.1 to 7.3), 8(8.1 to 8.2), 9(9.1 to 9.3).

Books for Reference:

1. K.H. Rosen: Elementary Number Theory & its Applications, Pearson Education Wesley.
2. I. Niven and H.S. Zuckerman: An Introduction to Theory of Numbers, Wiley Eastern Pvt. Ltd.

3. Tom M. Apostol: Introduction to Analytic Number Theory, Springer International Student Edn.
4. Neville Robinns: Beginning Number Theory (2nd Edition), Narosa Publishing House Pvt. Limited, Delhi, 2007.

4-BOOLEAN ALGEBRA & AUTOMATA THEORY

Unit-I

Definition, examples and basic properties of ordered sets, maps between ordered sets, duality principle, lattices as ordered sets, lattices as algebraic structures, sublattices, products and homomorphisms. Definition, examples and properties of modular and distributive lattices, Boolean algebras, Boolean polynomials, minimal forms of Boolean polynomials, QuinnMcCluskey method, Karnaugh diagrams, switching circuits and applications of switching circuits.

Unit-II

Introduction: Alphabets, strings, and languages. Finite Automata and Regular Languages: deterministic and non-deterministic finite automata, regular expressions, regular languages and their relationship with finite automata, pumping lemma and closure properties of regular languages.

Unit-III

Context Free Grammars and Pushdown Automata: Context free grammars (CFG), parse trees, ambiguities in grammars and languages, pushdown automaton (PDA) and the language accepted by PDA, deterministic PDA, Non- deterministic PDA, properties of context free languages; normal forms, pumping lemma, closure properties, decision properties.

Unit-IV

Turing Machines: Turing machine as a model of computation, programming with a Turing machine, variants of Turing machine and their equivalence. Undecidability: Recursively enumerable and recursive languages, undecidable problems about Turing machines: halting problem, Post Correspondence Problem, and undecidability problems About CFGs.

Books Recommended:

1. B A. Davey and H. A. Priestley, Introduction to Lattices and Order, Cambridge University Press, Cambridge, 1990.
2. Edgar G. Goodaire and Michael M. Parmenter, Discrete Mathematics with Graph Theory, (2nd Ed.), Pearson Education (Singapore) P.Ltd., Indian Reprint 2003.
3. Rudolf Lidl and Gnter Pilz, Applied Abstract Algebra, 2nd Ed., Undergraduate Texts in Mathematics, Springer (SIE), Indian reprint, 2004.
4. J. E. Hopcroft, R. Motwani and J. D. Ullman, Introduction to AutomataTheory, Languages, and Computation, 2nd Ed., Addison-Wesley, 2001.
5. H.R. Lewis, C.H. Papadimitriou, C. Papadimitriou, Elements of the Theory of Computation, 2nd Ed., Prentice-Hall, NJ, 1997.

6. J.A. Anderson, Automata Theory with Modern Applications, Cambridge University Press, 2006.

DSE-3

**Total Marks:100-(Theory:80 Marks+Mid-Sem:20 Marks) 5 Lectures,
1 Tutorial (per week)
(Any one of the following)**

1-DIFFERENTIAL GEOMETRY

Unit-I

Theory of Space Curves: Space curves, Planer curves, Curvature, torsion and Serret-Frenet formulae. Osculating circles, Osculating circles and spheres. Existence of space curves. Evolutes and involutes of curves.

Unit-II

Osculating circles, Osculating circles and spheres. Existence of space curves. Evolutes and involutes of curves.

Unit-III

Developables: Developable associated with space curves and curves on surfaces, Minimal surfaces.

Unit-IV

Theory of Surfaces: Parametric curves on surfaces. Direction coefficients. First and second Fundamental forms. Principal and Gaussian curvatures. Lines of curvature, Eulers theorem. Rodrigues formula, Conjugate and Asymptotic lines.

Book Recommended:

1. C.E. Weatherburn, Differential Geometry of Three Dimensions, Cambridge University Press 2003. Chapters:1(1-4, 7,8,10), 2(13, 14, 16, 17), 3, 4(29-31, 35, 37, 38).

Books for References

1. T.J. Willmore, An Introduction to Differential Geometry, Dover Publications, 2012.
2. S. Lang, Fundamentals of Differential Geometry, Springer, 1999.
3. B. O'Neill, Elementary Differential Geometry, 2nd Ed., Academic Press, 2006.
4. A.N. Pressley-Elementary Differential Geometry, Springer.
5. B.P. Acharya and R.N. Das-Fundamentals of Differential Geometry, Kalyani Publishers, Ludhiana, New Delhi.

2-MECHANICS

Unit-I

Moment of a force about a point and an axis, couple and couple moment, Moment of a couple about a line, resultant of a force system, distributed force system, free body diagram, free body involving interior sections, general equations of equilibrium, two point equivalent loading, problems arising from structures, static indeterminacy.

Unit-II

Laws of Coulomb friction, application to simple and complex surface contact friction problems, transmission of power through belts, screw jack, wedge, first moment of an area and the centroid, other centers, Theorem of Pappus-Guldinus, second moments and the product of area of a plane area, transfer theorems, relation between second moments and products of area, polar moment of area, principal axes.

Unit-III

Conservative force field, conservation for mechanical energy, work energy equation, kinetic energy and work kinetic energy expression based on center of mass, moment of momentum equation for a single particle and a system of particles.

Unit-IV

Translation and rotation of rigid bodies, Chasles theorem, general relationship between time derivatives of a vector for different references, relationship between velocities of a particle for different references, acceleration of particle for different references.

Book Recommended:

1. I.H. Shames and G. Krishna Mohan Rao, Engineering Mechanics: Statics and Dynamics, (4th Ed.), Dorling Kindersley (India) Pvt. Ltd. (Pearson Education), Delhi, 2009. Chapters:3, 4, 5, 6(6.1-6.7), 7, 11, 12(12.5, 12.6), 13.

Books for Reference:

1. R.C. Hibbeler and Ashok Gupta, Engineering Mechanics: Statics and Dynamics, 11th Ed., Dorling Kindersley (India) Pvt. Ltd. (Pearson Education), Delhi.
2. Grant R Fowles, Analytical Mechanics, Cengage Learning India Pvt. Ltd.

3-MATHEMATICAL FINANCE

Unit-I

Basic principles: Comparison, arbitrage and risk aversion, Interest (simple and compound, discrete and continuous), time value of money, inflation, net present value, internal rate of return (calculation by bisection and Newton-Raphson methods), comparison of NPV and IRR. Bonds, bond prices and yields, Macaulay and modified duration, term structure of interest rates: spot and forward rates, explanations of term structure, running present value, floating-rate bonds, immunization, convexity, puttable and callable bonds.

Unit-II

Asset return, short selling, portfolio return, (brief introduction to expectation, variance, covariance

and correlation), random returns, portfolio mean return and variance, diversification, portfolio diagram, feasible set, Markowitz model (review of Lagrange multipliers for 1 and 2 constraints), Two fund theorem, risk free assets, One fund theorem, capital market line, Sharpe index. Capital Asset Pricing Model (CAPM), betas of stocks and portfolios, security market line, use of CAPM in investment analysis and as a pricing formula, Jensen's index.

Unit-III

Forwards and futures, marking to market, value of a forward/futures contract, replicating portfolios, futures on assets with known income or dividend yield, currency futures, hedging (short, long, cross, rolling), optimal hedge ratio, hedging with stock index futures, interest rate futures, swaps.

Unit-IV

Lognormal distribution, Lognormal model / Geometric Brownian Motion for stock prices, Binomial Tree model for stock prices, parameter estimation, comparison of the models. Options, Types of options: put / call, European / American, pay off of an option, factors affecting option prices, put call parity.

Books Recommended:

1. David G. Luenberger, Investment Science, Oxford University Press, Delhi, 1998. Chapters:1, 2, 3, 4, 6, 7, 8(8.5-8.8), 10(except 10.11, 10.12), 11(except 11.2 11.8).
2. John C. Hull, Options, Futures and Other Derivatives (6th Edition), Prentice-Hall India, Indian reprint, 2006. Chapters: 3, 5, 6, 7(except 7.10, 7.11), 8, 9.
3. Sheldon Ross, An Elementary Introduction to Mathematical Finance (2nd Edition), Cambridge University Press, USA, 2003. Chapter:3

Books for References:

1. R.C. Hibbeler and Ashok Gupta, Engineering Mechanics: Statics and Dynamics, 11th Ed., Dorling Kindersley (India) Pvt. Ltd. (Pearson Education), Delhi.
2. Grant R Fowles, Analytical Mechanics, Cengage Learning India Pvt. Ltd.

4-RING THEORY & LINEAR ALGEBRA-II

Unit-I

Polynomial rings over commutative rings, division algorithm and consequences, principal ideal domains, factorization of polynomials, reducibility tests, irreducibility tests, Eisenstein criterion, unique factorization in $\mathbb{Z}[x]$.

Unit-II

Divisibility in integral domains, irreducibles, primes, unique factorization domains, Euclidean domains.

Unit-III

Dual spaces, dual basis, double dual, transpose of a linear transformation and its matrix in the

dual basis, annihilators, Eigenspaces of a linear operator, diagonalizability, invariant subspaces and Cayley-Hamilton theorem, the minimal polynomial for a linear operator.

Unit-IV

Inner product spaces and norms, Gram-Schmidt orthogonalisation process, orthogonal complements, Bessels inequality, the adjoint of a linear operator, Least Squares Approximation, minimal solutions to systems of linear equations, Normal and self-adjoint operators, Orthogonal projections and Spectral theorem.

Books Recommended:

1. Joseph A. Gallian: Contemporary Abstract Algebra (4th Ed.), Narosa Publishing House, 1999. Chapters: 16, 17, 18.
2. Stephen H. Friedberg, Arnold J. Insel, Lawrence E. Spence: Linear Algebra (4th Edition), Prentice-Hall of India Pvt. Ltd., New Delhi, 2004. Chapters: 2(2.6 only), 5(5.1, 5.2, 5.4), 6(6.1, 6.4, 6.6), 7(7.3 only).

Books for Reference:

(For LINEAR ALGEBRA)

1. S Lang: Introduction to Linear Algebra (2nd edition), Springer, 2005
2. Gilbert Strang: Linear Algebra and its Applications, Thomson, 2007
3. S. Kumaresan: Linear Algebra- A Geometric Approach, Prentice Hall of India, 1999.
4. 4. Kenneth Hoffman, Ray Alden Kunze: Linear Algebra 2nd Ed., Prentice-Hall Of India Pvt. Limited, 1971.

(For RING THEORY)

1. John B. Fraleigh: A first course in Abstract Algebra, 7th Edition, Pearson Education India, 2003.
2. Herstein: Topics in Algebra (2nd edition), John Wiley & Sons, 2006
3. Michael Artin: Algebra (2nd edition), Pearson Prentice Hall, 2011
4. Robinson, Derek John Scott.: An introduction to abstract algebra, Hindustan book agency, 2010.

DSE-4

PROJECT WORK/DISSERTATION (Compulsory)
Total Marks:100-(Project:75 Marks+Viva-Voce:25 Marks)

SKILL ENHANCEMENT COURSES (SEC)
(Credit: 2 each, Total Marks:50) SEC-1
to SEC-4

SEC-1

COMMUNICATIVE ENGLISH & WRITING SKILL (Compulsory)

SEC-2

(Any one of the following)

1-COMPUTER GRAPHICS

Development of computer Graphics: Raster Scan and Random Scan graphics storages, displays processors and character generators, colour display techniques, interactive input/output devices. Points, lines and curves: Scan conversion, line-drawing algorithms, circle and ellipse generation, conic-section generation, polygon filling anti aliasing. Two-dimensional viewing: Coordinate systems, linear transformations, line and polygon clipping algorithms.

Books Recommended:

1. D. Hearn and M.P. Baker-Computer Graphics, 2nd Ed., PrenticeHall of India, 2004.
2. J.D. Foley, A van Dam, S.K. Feiner and J.F. Hughes-Computer Graphics: Principals and Practices, 2nd Ed., Addison-Wesley, MA, 1990.
3. D.F. Rogers-Procedural Elements in Computer Graphics, 2nd Ed., McGraw Hill Book Company, 2001.
4. D.F. Rogers and A.J. Admas-Mathematical Elements in Computer Graphics, 2nd Ed., McGraw Hill Book Company, 1990.

2-LOGIC & SETS

Introduction, propositions, truth table, negation, conjunction and disjunction. Implications, biconditional propositions, converse, contra positive and inverse propositions and precedence of logical operators. Propositional equivalence: Logical equivalences. Predicates and quantifiers: Introduction, Quantifiers, Binding variables and Negations. Sets, subsets, Set operations and the laws of set theory and Venn diagrams. Examples of finite and infinite sets. Finite sets and counting principle. Empty set, properties of empty set. Standard set operations. Classes of sets. Power set of a set. Difference and Symmetric difference of two sets. Set identities, Generalized union and intersections. Relation: Product set, Composition of relations, Types of relations, Partitions, Equivalence Relations with example of congruence modulo relation, Partial ordering relations, nary relations.

Books Recommended:

1. R.P. Grimaldi-Discrete Mathematics and Combinatorial Mathematics, Pearson Education, 1998.
2. P.R. Halmos-Naive Set Theory, Springer, 1974.
3. E. Kamke-Theory of Sets, Dover Publishers, 1950.

3-COMBINATORIAL MATHEMATICS

Basic counting principles, Permutations and Combinations (with and without repetitions), Binomial theorem, Multinomial theorem, Counting subsets, Set-partitions, Stirling numbers Principle of Inclusion and Exclusion, Derangements, Inversion formulae Generating functions: Algebra of formal power series, Generating function models, Calculating generating functions, Exponential generating functions. Recurrence relations: Recurrence relation models, Divide and conquer relations, Solution of recurrence relations, Solutions by generating functions. Integer partitions, Systems of distinct representatives.

Books Recommended:

1. J.H. van Lint and R.M. Wilson-A Course in Combinatorics, 2nd Ed., Cambridge University Press, 2001.
2. V. Krishnamurthy-Combinatorics, Theory and Application, Affiliated East-West Press 1985.
3. P.J. Cameron-Combinatorics, Topics, Techniques, Algorithms, Cambridge University Press, 1995.
4. M. Jr. Hall-Combinatorial Theory, 2nd Ed., John Wiley & Sons, 1986.
5. S.S. Sane-Combinatorial Techniques, Hindustan Book Agency, 2013.
6. R.A. Brualdi-Introductory Combinatorics, 5th Ed., Pearson Education Inc., 2009.

4-INFORMATION SECURITY

Overview of Security: Protection versus security; aspects of security data integrity, data availability, privacy; security problems, user authentication, Orange Book. Security Threats: Program threats, worms, viruses, Trojan horse, trap door, stack and buffer over flow; system threats- intruders; communication threats- tapping and piracy. Security Mechanisms: Intrusion detection, auditing and logging, tripwire, system-call monitoring.

Books Recommended:

1. C. Pfleeger and S.L. Pfleeger-Security in Computing , 3rd Ed., Prentice-Hall of India, 2007.
2. D. Gollmann-Computer Security, John Wiley and Sons, NY, 2002.
3. J. Piwprzyk, T. Hardjono and J. Seberry-Fundamentals of Computer Security, Springer- Verlag Berlin, 2003.

4. J.M. Kizza-Computer Network Security, Springer, 2007.
5. M. Merkow and J. Breithaupt-Information Security: Principles and Practices, Pearson Education, 2006.

GENERIC ELECTIVES(Interdisciplinary)
(04 Papers, 02 papers each from two Allied disciplines) (Credit: 06 each,
Marks:100)
GE-1 to GE-4

GE-1 : CALCULUS & ORDINARY DIFFERENTIAL EQUATIONS

Total Marks:100-(Theory: 80 Marks+Mid-Sem: 20 Marks)

Unit-I

Curvature, Asymptotes, Tracing of Curves (Cartenary, Cycloid, Folium of Descartes), Rectification, Quadrature, Elementary ideas about Sphere, Cones, Cylinders and Conicoids.

Unit-II

Review of limits, continuity and differentiability of functions of one variables and their properties, Limit and Continuity of functions of several variables, Partial derivatives, Partial derivatives of higher orders, Homogeneous functions, Change of variables, Mean value theorem, Taylors theorem and Maclaurins theorem for functions of two variables(statements & applications).

Unit-III

Maxima and Minima of functions of two and three variables, Implicit functions, Lagranges multipliers (Formulae & its applications), Concepts of Multiple integrals & its applications.

Unit-IV

Ordinary Differential Equations of order one and degree one (variables separable, homogeneous, exact and linear). Equations of order one but higher degree. Second order linear equations with constant coefficients, homogeneous forms, Second order equations with variable coefficients, Variation of parameters.

Books Recommended:

1. S.K. Sengar and S.P. Singh: Advanced Calculus, Cengage Learning India Pvt. Ltd.(6th Indian Reprint), Chapters: 1(1.11-1.14 restricted), 2(2.1-2.13 restricted), 4(4.1-4.11), 5, 7(7.1-7.3 restricted), 11(restricted).
2. Shantinayakan: Text Book of Calculus, Part-II, S. Chand and Co., Chapter-8 (Art. 24, 25, 26)
3. Shantinayakan: Text Book of Calculus, Part-III, S. Chand and Co., Chapter-1 (Art 1,2), 3, 4(Art. 10 to 12 ommitting Simpsons Rule), 5(Art-13) and 6(Art-15).
4. B.P. Acharya and D.C. Sahu: Analytical Geometry of Quadratic Surfaces, Kalyani Publishers, New Delhi, Ludhiana.

5. J. Sinharoy and S. Padhy: A Course of Ordinary and Partial Differential Equations, Kalyani Publishers. Chapters: 2(2.1 to 2.7), 3, 4(4.1 to 4.7), 5.

Books for Reference:

1. Shanti Narayan and P.K. Mittal: Analytical Solid Geometry, S. Chand & Company Pvt.Ltd., New Delhi.
2. David V. Weider: Advanced Calculus, Dover Publications.
3. Martin Braun: Differential Equations and their Applications-Martin Braun, Springer International.
4. M.D. Raisinghania: Advanced Differential Equations, S. Chand & Company Ltd., New Delhi.
5. G. Dennis Zill: A First Course in Differential Equations with Modelling Applications, Cengage Learning India Pvt. Ltd.

GE-2: LINEAR ALGEBRA, ABSTRACT ALGEBRA & NUMERICAL ANALYSIS

Total Marks:100-(Theory: 80 Marks+Mid-Sem: 20 Marks)

Unit-I

Vector space, Subspace, Span of a set, Linear dependence and Independence, Dimensions and Basis. Linear transformations, Range, Kernel, Rank, Nullity, Inverse of a linear map, Rank-Nullity theorem.

Unit-II

Matrices and linear maps, Rank and Nullity of a matrix, Transpose of a matrix, Types of matrices. Elementary row operations, System of linear equations, Matrix inversion using row operations, Determinant and Rank of matrices, Eigen values, Eigen vectors.

Unit-III

Group Theory: Definition and examples, Subgroups, Normal subgroups, Cyclic groups, Cosets, Quotient groups, Permutation groups, Homomorphism. Elementary ideas about Rings, Field (definitions, statements, and examples only).

Unit-IV

Convergence, Errors: Relative, Absolute, Round off, Truncation. Transcendental and Polynomial equations: Bisection method, Newtons method, Secant method. Rate of convergence of these methods. System of linear algebraic equations: Gaussian Elimination and Gauss Jordan methods. Interpolation: Lagrange and Newtons methods. Error bounds. Finite difference operators. Gregory forward and backward difference interpolation (statements, definitions and uses/examples only).

Books Recommended:

1. V. Krishnamurty, V. P. Mainra, J. L. Arora: An introduction to Linear Algebra, Affiliated East-West Press Pvt. Ltd., New Delhi, Chapters: 3, 4(4.1 to 4.7), 5(except 5.3), 6(6.1, 6.2, 6.5, 6.6, 6.8), 7(7.4 only).

2. I.N. Herstein: Topics in Algebra, Wiley Eastern Pvt. Ltd. Chapters: 2(2.1-2.7), 3(3.1, 3.2).
3. B.P. Acharya and R.N. Das: A Course on Numerical Analysis, Kalyani Publishers, New Delhi, Ludhiana. Chapters: 1, 2(2.1 to 2.4, 2.6, 2.8, 2.9), 3(3.1 to 3.4), 4(4.1, 4.2), 5(5.1- 5.3), 6(6.1- 6.3, 6.10, 6.11).

Books for References:

1. I.H. Seth: Abstract Algebra, Prentice Hall of India Pvt. Ltd., New Delhi.
2. S. Kumaresan: Linear Algebra, A Geometric Approach, Prentice Hall of India.
3. Rao and Bhimasankaran: Linear Algebra, Hindustan Publishing House.
4. S. Singh: Linear Algebra, Vikas Publishing House Pvt. Ltd., New Delhi.
5. Gilbert Strang: Linear Algebra & its Applications, Cengage Learning India Pvt. Ltd.
6. Gallian: Contemporary Abstract Algebra, Narosa publishing House.
7. Artin: Algebra, Prentice Hall of India.
8. V.K. Khanna and S.K. Bhambri: A Course in Abstract Algebra, Vikas Publishing House Pvt. Ltd., New Delhi.

PHYSICS(HONOURS)

SEMESTER-I

C-I: MATHEMATICAL PHYSICS-I

(Credits: Theory-04, Practicals-02)
Marks:100 (Theory:70, Practical: 30)
Theory: 40 Classes (1 hr. duration)

The emphasis of course is on applications in solving problems of interest to physicists. The students are to be examined entirely on the basis of problems, seen and unseen.

UNIT-I

Calculus: Calculus of functions of more than one variable: Partial derivatives, exact and inexact differentials, Integrating factor, with simple illustration. Constrained Maximization using Lagrange Multipliers. (4 Lectures)

Vector Calculus: Recapitulation of vectors: Properties of vectors under rotations. Scalar product and its invariance under rotations. Vector product, Scalar triple product and their interpretation in terms of area and volume respectively. Scalar and Vector fields. (5 Lectures)

UNIT-II

Orthogonal Curvilinear Coordinates: Orthogonal Curvilinear Coordinates, Derivation of Gradient, Divergence, Curl and Laplacian in Cartesian, Spherical and Cylindrical Coordinate Systems. Comparison of velocity and acceleration in cylindrical and spherical coordinate system. (7 Lectures)

Dirac Delta function and its properties: Definition of Dirac delta function. Representation as limit of a Gaussian function and rectangular function. Properties of Dirac delta function. (3 Lectures)

UNIT-III

Vector Differentiation: Directional derivatives and normal derivative. Gradient of a scalar field and its geometrical interpretation. Divergence and curl of a vector field. Del and Laplacian operators. Vector identities, Gradient, divergence, curl and Laplacian in spherical and cylindrical coordinates. (8 Lectures)

UNIT-IV

Vector Integration: Ordinary Integrals of Vectors. Multiple integrals, Jacobian. Notion of infinitesimal line, surface and volume elements. Line, surface and volume integrals of Vector fields. Flux of a vector field. Gauss' divergence theorem, Green's and Stokes Theorems and their applications (no rigorous proofs). (13 Lectures)

Reference Books:

1. Mathematical Methods for Physicists, G.B. Arfken, H.J. Weber, F.E. Harris, 2013, 7th Edn., Elsevier.
2. An introduction to ordinary differential equations, E.A. Coddington, 2009, PHI learning.

3. Differential Equations, George F. Simmons, 2007, McGraw Hill.
4. Mathematical Tools for Physics, James Nearing, 2010, Dover Publications.
5. Mathematical methods for Scientists and Engineers, D.A. McQuarrie, 2003, Viva Book
6. Advanced Engineering Mathematics, D.G. Zill and W.S. Wright, 5 Ed., 2012, Jones and Bartlett Learning
7. Advanced Engineering Mathematics, Erwin Kreyszig, 2008, Wiley India.
8. Essential Mathematical Methods, K.F.Riley & M.P.Hobson, 2011, Cambridge Univ. Press
9. Mathematical Physics and Special Relativity-M. Das, P.K. Jena and B.K. Dash (Srikrishna Prakashan) 2nd Edition 2009
10. Mathematical Physics—H. K. Dass, Dr. Rama Verma (S. Chand Higher Academics), th Edition 2011.
11. Mathematical PhysicsC. Harper, (Prentice Hall India) 2006.
12. Mathematical Physics-Goswami (Cengage Learning) 2014
13. Mathematical Method for Physical Sciences- M. L. Boas (Wiley India) 2006

PHYSICS LAB-C:I

20 Classes (2 hrs. duration)

The aim of this Lab is not just to teach computer programming and numerical analysis but to emphasize its role in solving problems in Physics.

- Highlights the use of computational methods to solve physical problems.
- The course will consist of lectures (both theory and practical) in the Lab.
- Evaluation done not on the programming but on the basis of formulating the problem.
- Aim at teaching students to construct the computational problem to be solved.
- Students can use any one operating system Linux or Microsoft Windows.

Topics	Description with Applications
Introduction and Overview	Computer architecture and organization, memory and Input/output devices.
Basics of scientific computing	Binary and decimal arithmetic, Floating point numbers, algorithms, Sequence, Selection and Repetition, single and double precision arithmetic, underflow & overflow emphasize the importance of making equations in terms of dimensionless variables, Iterative methods.
Errors and error Analysis	Truncation and round off errors, Absolute and relative errors, Floating point computations.
Review of C & C++ programming fundamentals	Introduction to Programming, constants, variables and data types, operators and Expressions, I/O statements, scanf and printf, c in and c out, Manipulators for data formatting, Control statements (decision making and looping statements) (If-statement. If-else Statement. Nested if Structure. Else-if Statement. Ternary Operator.

	Goto Statement. Switch Statement. Unconditional and Conditional Looping. While Loop. Do-While Loop. FOR Loop. Break and Continue Statements. Nested Loops), Arrays (1D & 2D) and strings, user defined functions, Structures and Unions, Idea of classes and objects.
Programs	Sum & average of a list of numbers, largest of a given list of numbers and its location in the list, sorting of numbers in ascending descending order, Binarysearch.
Random number generation	Area of circle, area of square, volume of sphere, value of π .

Referred Books:

1. Introduction to Numerical Analysis, S.S. Sastry, 5th Edn. , 2012, PHI Learning Pvt. Ltd.
2. Schaum's Outline of Programming with C++. J. Hubbard, 2000, McGraw-Hill Pub.
3. Numerical Recipes in C: The Art of Scientific Computing, W.H. Pressetal, 3rd Edn. 2007, Cambridge University Press.
4. A first course in Numerical Methods, U.M. Ascher & C. Greif, 2012, PHI Learning.
5. Elementary Numerical Analysis, K.E. Atkinson, 3 rd Edn. , 2007 , Wiley India Edition.
6. Numerical Methods for Scientists & Engineers, R.W. Hamming, 1973, Courier Dover Pub.
7. An Introduction to computational Physics, T. Pang, 2nd Edn., 2006,Cambridge Univ. Press.

C-2: MECHANICS

(Credits: Theory-04, Practicals-02)

Marks:100 (Theory:70, Practical: 30)

Theory: 40 Classes (1 hr. duration)

UNIT-I

Rotational Dynamics: Centre of Mass and Laboratory frames. Angular momentum of a particle and system of particles. Torque. Principle of conservation of angular momentum. Rotation about a fixed axis. **Moment of Inertia.** Calculation of moment of inertia for rectangular, cylindrical and spherical bodies. Kinetic energy of rotation. Motion involving both translation and rotation. (9 Lectures)

Non-Inertial Systems: Non-inertial frames and fictitious forces. Uniformly rotating frame. Laws of Physics in rotating coordinate systems. Centrifugal force. Coriolis force and its applications. (3 Lectures)

UNIT-II

Elasticity: Relation between Elastic constants. Twisting torque on a Cylinder or Wire. (3 Lectures)

Fluid Motion: Kinematics of Moving Fluids: Poiseuilles Equation for Flow of a Liquid through a Capillary Tube . (3 Lectures)

Oscillations: SHM: **Simple Harmonic Oscillations.** Differential equation of SHM and its solution. Kinetic energy, potential energy, total energy and their time-average values. Damped oscillation. Forced oscillations: Transient and steady states; Resonance, sharpness of resonance; power dissipation and Quality Factor. (5 Lectures)

UNIT-III

Gravitation and Central Force Motion: Law of gravitation. Gravitational potential energy. Inertial and gravitational mass. Potential and field due to spherical shell and solid sphere. (3 Lectures)

Motion of a particle under a central force field. Two-body problem and its reduction to one-body problem and its solution. The energy equation and energy diagram. **Keplers Laws.** Satellite in circular orbit and applications. Geosynchronous orbits. Weightlessness. Basic idea of global positioning system (GPS). Physiological effects on astronauts.(5 Lectures)

UNIT-IV

Special Theory of Relativity: Michelson-Morley Experiment and its outcome. Postulates of Special Theory of Relativity. Lorentz Transformations. Simultaneity and order of events. Lorentz contraction. Time dilation. Relativistic transformation of velocity, frequency and wave number. Relativistic addition of velocities. Variation of mass with velocity. Massless Particles. Mass-energy Equivalence. Relativistic Doppler effect. Relativistic Kinematics. Transformation of Energy and Momentum. Energy-Momentum Four Vector. (9 Lectures)

Reference Books:

1. An introduction to mechanics, D. Kleppner, R.J. Kolenkow, 1973, McGraw-Hill.
2. Mechanics, Berkeley Physics, vol.1, C.Kittel, W.Knight, et.al. 2007, Tata McGraw-Hill.
3. Physics, Resnick, Halliday and Walker 8/e. 2008, Wiley.
4. Analytical Mechanics, G.R. Fowles and G.L. Cassiday. 2005, Cengage Learning.

5. Feynman Lectures, Vol. I, R.P.Feynman, R.B.Leighton, M.Sands, 2008, Pearson Education
6. Introduction to Special Relativity, R. Resnick, 2005, John Wiley and Sons.
7. University Physics, Ronald Lane Reese, 2003, Thomson Brooks/Cole.
(Additional Books for Reference)
8. Mechanics, D.S. Mathur, S. Chand and Company Limited, 2000
9. University Physics. F.W Sears, M.W Zemansky, H.D Young 13/e, 1986, Addison Wesley
10. Physics for scientists and Engineers with Modern Phys., J.W. Jewett, R.A.Serway, 2010, Cengage Learning
11. Theoretical Mechanics, M.R. Spiegel, 2006, Tata McGraw Hill.
12. Mechanics - J. C. Slater and N. H. Frank (McGraw-Hill)

PHYSICS LAB-C:II

20 Classes (2 hrs. duration)

1. To study the random error in observations.
2. To determine the height of a building using a Sextant.
3. To study the Motion of Spring and calculate (a) Spring constant, (b) g and (c) Modulus of rigidity.
4. To determine the Moment of Inertia of a Flywheel.
5. To determine g and velocity for a freely falling body using Digital Timing Technique
6. To determine Coefficient of Viscosity of water by Capillary Flow Method (Poiseuilles method).
7. To determine the Young's Modulus of a Wire by Optical Lever Method.
8. To determine the Modulus of Rigidity of a Wire by Maxwells needle. 9. To determine the elastic Constants of a wire by Searles method.
9. To determine the value of g using Bar Pendulum.
10. To determine the value of g using Katers Pendulum

Reference Books:

1. Advanced Practical Physics for students, B. L. Flint and H.T. Worsnop, 1971, AsiaPublishing House
2. Advanced level Physics Practicals, Michael Nelson and Jon M. Ogborn, 4th Edition, reprinted 1985, Heinemann Educational Publishers
3. A Text Book of Practical Physics, I.Prakash & Ramakrishna, 11th Edn, 2011, Kitab Mahal

SEMESTER-II

C-3: ELECTRICITY AND MAGNETISM

(Credits: Theory-04, Practicals-02)

Marks:100 (Theory:70, Practical: 30)

Theory: 40 Classes (1 hr. duration)

UNIT-I

Electric Field and Electric Potential: Electric field: Electric field lines. Electric flux. Gauss Law with applications to charge distributions with spherical, cylindrical and planar symmetry. (3 Lectures)

Conservative nature of Electrostatic Field. Electrostatic Potential. Laplaces and Poissonequations. The Uniqueness Theorem. Potential and Electric Field of a dipole. Force and Torque on a dipole. (3 Lectures)

Electrostatic energy of system of charges. Electrostatic energy of a charged sphere. Conductors in an electrostatic Field. Surface charge and force on a conductor. Capacitance of a system of charged conductors. Parallel-plate capacitor. Capacitance of an isolated conductor. Method of Images and its application to: (1) Plane Infinite Sheet and (2) Sphere. (4 Lectures)

UNIT-II

Magnetic Field: Magnetic force between current elements and definition of Magnetic Field B. Biot-Savarts Law and its simple applications: straight wire and circular loop. Current Loop as a Magnetic Dipole and its Dipole Moment (Analogy with Electric Dipole). Amperes Circuital Law and its application to (1) Solenoid and (2) Toroid. Properties of B: curl and divergence. Vector Potential. Magnetic Force on (1) point charge (2) current carrying wire (3) between current elements. Torque on a current loop in a uniform Magnetic Field. Ballistic Galvanometer: Torque on a current Loop. Ballistic Galvanometer: Current and Charge Sensitivity. Electromagnetic damping. Logarithmic damping. CDR. (10 Lectures)

UNIT-III

Dielectric Properties of Matter: Electric Field in matter. Polarization, Polarization Charges. Electrical Susceptibility and Dielectric Constant. Capacitor (parallel plate, spherical, cylindrical) filled with dielectric. Displacement vector D. Relations between E, P and D. Gauss Law in dielectrics. (4 Lecturers)

Magnetic Properties of Matter: Magnetization vector (M). Magnetic Intensity (H). Magnetic Susceptibility and permeability. Relation between B, H, M. Ferromagnetism. B-H curve and hysteresis. (4 Lecturers)

Electromagnetic Induction: Faradays Law. Lenzs Law. Self Inductance and Mutual Inductance. Reciprocity Theorem. Energy stored in a Magnetic Field. (2 Lectures)

UNIT-IV

Electrical Circuits: AC Circuits: Kirchhoffs laws for AC circuits. Complex Reactance and Impedance. Series LCR Circuit: (1) Resonance, (2) Power Dissipation and (3) Quality Factor, and (4) Band Width,. Parallel LCR Circuit. (5 Lectures)

Network theorems: Ideal Constant-voltage and Constant-current Sources. Network Theorems:

Thevenin theorem, Norton theorem, Superposition theorem, Reciprocity theorem, Maximum Power Transfer theorem. Growth & decay of currents in RC, RL, and LCR Series circuits for DC. (5 Lectures)

Reference Books:

1. Electricity, Magnetism & Electromagnetic Theory, S. Mahajan and Choudhury, 2012, Tata McGraw
2. Electricity and Magnetism, Edward M. Purcell, 1986 McGraw-Hill Education
3. Introduction to Electrodynamics, D.J. Griffiths, 3rd Edn., 1998, Benjamin Cummings.
4. Feynman Lectures Vol.2, R.P.Feynman, R.B.Leighton, M. Sands, 2008, Pearson Education
5. Elements of Electromagnetics, M.N.O. Sadiku, 2010, Oxford University Press.
6. Electricity and Magnetism, J.H.Fewkes & J.Yarwood. Vol. I, 1991, Oxford Univ. Press.

PHYSICS LAB-C:III

20 Classes (2 hrs. duration)

1. Use a Multimeter for measuring (a) Resistances, (b) AC and DC Voltages, (c) DC Current, (d) Capacitances, and (e) Checking electrical fuses.
2. To study the characteristics of a series RC Circuit.
3. To determine an unknown Low Resistance using Potentiometer.
4. To determine an unknown Low Resistance using Carey Fosters Bridge.
5. To compare capacitances using DeSautys bridge.
6. Measurement of field strength B and its variation in a solenoid (determine dB/dx)
7. To verify the Thevenin and Norton theorems.
8. To verify the Superposition, and Maximum power transfer theorems.
9. To determine self inductance of a coil by Andersons bridge.
10. To study response curve of a Series LCR circuit and determine its (a) Resonant frequency, (b) Impedance at resonance, (c) Quality factor Q, and (d) Band width.
11. To study the response curve of a parallel LCR circuit and determine its (a) Antiresonant frequency and (b) Quality factor Q.
12. Measurement of charge and current sensitivity and CDR of Ballistic Galvanometer
13. Determine a high resistance by leakage method using Ballistic Galvanometer.
14. To determine self-inductance of a coil by Rayleighs method.

15. To determine the mutual inductance of two coils by Absolute method.

Reference Books:

1. Advanced Practical Physics for students, B.L. Flint and H.T. Worsnop, 1971, Asia Publishing House
2. A Text Book of Practical Physics, I.Prakash & Ramakrishna, 11th Ed., 2011, Kitab Mahal
3. Advanced level Physics Practicals, Michael Nelson and Jon M. Ogborn, 4th Edition, reprinted 1985, Heinemann Educational Publishers
4. A Laboratory Manual of Physics for undergraduate classes, D.P.Khandelwal, 1985, Vani Pub.

C-4: WAVES AND OPTICS

(Credits: Theory-04, Practicals-02)

Marks:100 (Theory:70, Practical: 30)

Theory: 40 Classes (1 hr. duration)

UNIT-I

Geometrical optics: Fermats principle, reflection and refraction at plane interface, Matrix formulation of geometrical Optics. Idea of dispersion. **Application to thick lense, Ramsden and Huygens eyepiece.**(5 Lecturers)

Wave Optics: Electromagnetic nature of light. Definition and properties of wave front. Huygens Principle. Temporal and Spatial Coherence. Division of amplitude and wavefront. Youngs double slit experiment. Lloyds Mirror and Fresnels Biprism. Phase change on reflection: Stokestreatment. (5 Lecturers)

UNIT-II

Wave Motion: Plane and Spherical Waves. Longitudinal and Transverse Waves. Plane Progressive (Travelling) Waves. Wave Equation. Particle and Wave Velocities. Differential Equation. Pressure of a Longitudinal Wave. Energy Transport. Intensity of Wave. Water Waves: Ripple and Gravity Waves. (5 Lectures)

Superposition of two perpendicular Harmonic Oscillations: Graphical and Analytical Methods. Lissajous Figures (1:1 and 1:2) and their uses. Superposition of N harmonic waves. (3 Lectures)

UNIT-III

Interference: **Interference in Thin Films:** parallel and wedge-shaped films. Fringes of equal inclination (Haidinger Fringes); Fringes of equal thickness (Fizeau Fringes). Newtons Rings: Measurement of wavelength and refractive index. (5 Lecturers)

Interferometer: Michelson Interferometer-(1) Idea of form of fringes (No theory required), (2) Determination of Wavelength, (3) Wavelength Difference, (4) Refractive Index, and (5) Visibility of Fringes. Fabry-Perot interferometer. . (5 Lectures)

UNIT-IV

Fraunhofer diffraction: Single slit. Circular aperture, Resolving Power of a telescope. Double slit. Multiple slits. Diffraction grating. Resolving power of grating. (6 Lectures)

Fresnel Diffraction: Fresnel's Assumptions. Fresnel's Half-Period Zones for Plane Wave. Explanation of Rectilinear Propagation of Light. Theory of a Zone Plate: Multiple Foci of a Zone Plate. Fresnel's Integral, Fresnel diffraction pattern of a straight edge, a slit and a wire. (6 Lectures)

Reference Books:

1. Waves: Berkeley Physics Course, vol. 3, Francis Crawford, 2007, Tata McGraw-Hill.
2. Fundamentals of Optics, F.A. Jenkins and H.E. White, 1981, McGraw-Hill
3. Principles of Optics, Max Born and Emil Wolf, 7th Edn., 1999, Pergamon Press.
4. Optics, Ajoy Ghatak, 2008, Tata McGraw Hill
5. The Physics of Vibrations and Waves, H. J. Pain, 2013, John Wiley and Sons.
6. The Physics of Waves and Oscillations, N.K. Bajaj, 1998, Tata McGraw Hill.
7. Optics - Brijlal & Subramaniam- (S. Chand Publication) 2014.
8. Geometrical and Physical Optics R.S. Longhurst, Orient Blackswan, 01-Jan-1986
9. Vibrations and Waves - A. P. French, (CBS) Indian print 2003
10. Optics, E. Hecht (Pearson India)

PHYSICS LAB-C:IV

20 Classes (2 hrs. duration)

1. To determine the frequency of an electric tuning fork by Melde's experiment and verify $2T$ law.
2. To investigate the motion of coupled oscillators.
3. To study Lissajous Figures.
4. Familiarization with: Schuster's focusing; determination of angle of prism.
5. To determine refractive index of the material of a prism using sodium source.
6. To determine the dispersive power and Cauchy constants of the material of a prism using mercury source.
7. To determine the wavelength of sodium source using Michelson's interferometer.
8. To determine wavelength of sodium light using Fresnel Biprism.
9. To determine wavelength of sodium light using Newton's Rings.
10. To determine the thickness of a thin paper by measuring the width of the interference fringes produced by a wedge-shaped film.

11. To determine wavelength of (1) Na source and (2) spectral lines of Hg source using plane diffraction grating.
12. To determine dispersive power and resolving power of a plane diffraction grating.

Reference Books:

1. Advanced Practical Physics for students, B.L. Flint and H.T. Worsnop, 1971, Asia Publishing House
2. A Text Book of Practical Physics, I. Prakash & Ramakrishna, 11th Ed., 2011, Kitab Mahal
3. Advanced level Physics Practicals, Michael Nelson and Jon M. Ogborn, 4th Edition, reprinted 1985, Heinemann Educational Publishers
4. A Laboratory Manual of Physics for undergraduate classes, D.P. Khandelwal, 1985, Vani

SEMESTER-III

C-5: MATHEMATICAL PHYSICS-II

(Credits: Theory-04, Practicals-02)

Marks:100 (Theory:70, Practical: 30)

Theory: 40 Classes (1 hr. duration)

The emphasis of the course is on applications in solving problems of interest to physicists. Students are to be examined on the basis of problems, seen and unseen.

UNIT-I

Fourier series: Periodic functions. Orthogonality of sine and cosine functions, Dirichlet Conditions (Statement only). Expansion of periodic functions in a series of sine and cosine functions and determination of Fourier coefficients. Complex representation of Fourier series. Expansion of functions with arbitrary period. Expansion of non-periodic functions over an interval. Even and odd functions and their Fourier expansions. Application. Summing of Infinite Series. Term-by-Term differentiation and integration of Fourier series. Parseval Identity. (11 Lectures)

UNIT-II

Frobenius Method and Special Functions: Singular Points of Second Order Linear Differential Equations and their importance, Frobenius method and its applications to differential equations: Legendre & Hermite Differential Equations. Properties of Legendre & Hermite Polynomials: Rodrigues Formula, Generating Function, Orthogonality. Simple recurrence relations. Expansion of function in a series of Legendre Polynomials. Associated Legendre polynomials and spherical harmonics. (10 Lectures)

UNIT-III

Some Special Integrals: Beta and Gamma Functions and Relation between them. Expression of Integrals in terms of Gamma Functions. Error Function (Probability Integral). (5 Lectures) Theory of Errors: Systematic and Random Errors. Propagation of Errors. Normal Law of Errors. Standard and Probable Error. (4 Lectures)

UNIT-IV

Partial Differential Equations: Solutions to partial differential equations, using separation of variables: Laplace's Equation in problems of rectangular, cylindrical and spherical symmetry. Conducting and dielectric sphere in an external uniform electric field. Wave equation and its solution for vibrational modes of a stretched string. (10 Lectures)

Reference Books:

1. Mathematical Methods for Physicists: Arfken, Weber, 2005, Harris, Elsevier.
2. Fourier Analysis by M.R. Spiegel, 2004, Tata McGraw-Hill.
3. Mathematics for Physicists, Susan M. Lea, 2004, Thomson Brooks/Cole.
4. Differential Equations, George F. Simmons, 2006, Tata McGraw-Hill.
5. Partial Differential Equations for Scientists & Engineers, S.J. Farlow, 1993, Dover Pub.
6. Mathematical methods for Scientists & Engineers, D.A. McQuarrie, 2003, Viva Books
7. Mathematical Physics and Special Relativity –M. Das, P.K. Jena and B.K. Dash (Srikrishna Prakashan) 2nd Edition 2009
8. Mathematical Physics–H. K. Dass, Dr. Rama Verma (S. Chand Higher Academics) 6th Edition 2011.
9. Mathematical Physics C. Harper, (Prentice Hall India) 2006.
10. Mathematical Physics–Goswami (CENGAGE Learning) 2014
11. Mathematical Method for Physical Sciences – M. L. Boas (Wiley India) 2006
12. Mathematics for Physicists, P. Dennery and A. Krzywicki Dover)
13. Advanced Engineering Mathematics, E. Kreyszig (New Age Publication) 2011.

PHYSICS LAB-C:V

20 Classes (2 hrs. duration)

The aim of this Lab is to use the computational methods to solve physical problems. Course will consist of lectures (both theory and practical) in the Lab. Evaluation done not on the programming but on the basis of formulating the problem.

Topics	Description with Applications
Introduction to Numerical computation software Scilab	Introduction to Scilab, Advantages and disadvantages, Scilab environment, Command window, Figure window, Edit window, Variables and arrays, Initialising variables in Scilab, Multidimensional arrays, Subarray, Special values, Displaying output data, data file, Scalar and array operations, Hierarchy of operations, Built in Scilab functions, Introduction to plotting, 2D and 3D plotting (2), Branching Statements and program design, Relational & logical operators, the while loop, for loop, details of loop operations, break & continue statements, nested loops, logical arrays and vectorization (2) User defined functions, Introduction to Scilab functions, Variable passing in Scilab, optional arguments, preserving data between calls to a function, Complex and Character data, string function, Multidimensional arrays (2) an introduction to Scilab file processing, file opening and closing, Binary I/o functions, comparing binary and formatted functions, Numerical methods and developing the skills of writing a program (2).
Curve fitting, Least square fit, Goodness of fit, standard deviation	Ohms law to calculate R, Hookes law to calculate spring constant
Solution of Linear system of equations by Gauss elimination method and Gauss Seidal method. Diagonalization of matrices, Inverse of a matrix, Eigen vectors, eigen values problems.	Solution of mesh equations of electric circuits (3 meshes) Solution of coupled spring mass systems (3 masses)

<p>Solution of ODE First order Differential equation Euler, modified Euler and Runge-Kutta second order methods Second order differential equation. Fixed difference method.</p>	<p>First order differential equation</p> <ul style="list-style-type: none"> • Radioactive decay • Current in RC, LC circuits with DC source • Newtons law of cooling • Classical equations of motion <p>Second order Differential Equation</p> <ul style="list-style-type: none"> • Harmonic oscillator (no friction) • Damped Harmonic oscillator • Over damped • Critical damped • Oscillatory • Forced Harmonic oscillator • Transient and • Steady state solution • Apply above to LCR circuits also.
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Reference Books:

1. Mathematical Methods for Physics and Engineers, K.F Riley, M.P. Hobson and S. J.20 Bence, 3rd ed., 2006, Cambridge University Press
2. Complex Variables, A.S. Fokas & M.J. Ablowitz, 8th Ed., 2011, Cambridge Univ. Press
3. First course in complex analysis with applications, D.G. Zill and P.D. Shanahan, 1940, Jones & Bartlett
4. Simulation of ODE/PDE Models with MATLAB, OCTAVE and SCILAB: Scientific and Engineering Applications: A.V. Wouwer, P. Saucez, C.V. Fernandez. 2014 Springer
5. Scilab by example: M. Affouf 2012, ISBN: 978-1479203444
6. Scilab (A free software to Matlab): H.Ramchandran, A.S.Nair. 2011 S.Chand & Company
7. Scilab Image Processing: Lambert M. Surhone. 2010 Betascript Publishing

C-6: THERMAL PHYSICS

(Credits: Theory-04, Practicals-02)
Marks:100 (Theory:70, Practical: 30)
Theory: 40 Classes (1 hr. duration)

UNIT-I

Introduction to Thermodynamics: Recapitulation of Zeroth and First law of thermodynamics: Second Law of Thermodynamics: Reversible and Irreversible process with examples. Conversion of Work into Heat and Heat into Work. Heat Engines. Carnots Cycle, Carnot engine & efficiency. Refrigerator & coefficient of performance, 2nd Law of Thermodynamics: Kelvin-Planck and Clausius Statements and their Equivalence. **Carnots Theorem. Applications of Second Law of Thermodynamics:** Thermodynamic Scale of Temperature and its Equivalence to Perfect Gas Scale. (5 Lectures)

Entropy: Concept of Entropy, Clausius Theorem. Clausius Inequality, Second Law of Thermodynamics in terms of Entropy. Entropy of a perfect gas. Principle of Increase of Entropy. Entropy Changes in Reversible and Irreversible processes with examples. Entropy of the Principle of Increase of Entropy. Temperature-Entropy diagrams for Carnots Cycle. Third Law of Thermodynamics. Unattainability of Absolute Zero. (6 Lectures)

UNIT-II

Thermodynamic Potentials: Extensive and Intensive Thermodynamic Variables. Thermodynamic Potentials: Internal Energy, Enthalpy, Helmholtz Free Energy, Gibbs Free Energy. Their Definitions, Properties and Applications. Surface Films and Variation of Surface Tension with Temperature. Magnetic Work, Cooling due to adiabatic demagnetization, first and second order Phase Transitions with examples, Clausius Clapeyron Equation and Ehrenfest equations (5 Lectures)

Maxwells Thermodynamic Relations: Derivations and applications of Maxwells Relations, Maxwells Relations:(1) Clausius Clapeyron equation, (2) Values of C_p-C_v , (3) Tds Equations, (4) Joule-Kelvin coefficient for Ideal and Van der Waal Gases, (5) Energy equations, (6) Change of Temperature during Adiabatic Process. (5 Lectures)

UNIT-III

Kinetic Theory of Gases

Distribution of Velocities: Maxwell-Boltzmann Law of Distribution of Velocities in an Ideal Gas and its Experimental Verification. Sterns Experiment. Mean, RMS and Most Probable Speeds. Degrees of Freedom. Law of Equipartition of Energy (No proof required). Specific heats of Gases. (5 Lectures)

Molecular Collisions: Mean Free Path. Collision Probability. Estimates of Mean Free Path. Transport Phenomenon in Ideal Gases: (1) Viscosity, (2) Thermal Conductivity and (3) Diffusion. Brownian motion and its Significance. (4 Lectures)

UNIT-IV

Real Gases: Behavior of Real Gases: Deviations from the Ideal Gas Equation. The Virial Equation. Andrews Experiments on CO_2 Gas. Critical Constants. Continuity of Liquid and Gaseous State. Vapour and Gas. Boyle Temperature. Van der Waals Equation of State for Real Gases. Values of Critical Constants. Law of Corresponding States. Comparison with Experimental Curves. P-V Diagrams. Joules Experiment. Free Adiabatic Expansion of a Perfect Gas. Joule-Thomson Porous Plug Experiment. Joule-Thomson Effect for Real and Van der Waal Gases. Temperature of Inversion. Joule-Thomson Cooling. (10 Lectures)

Reference Books:

1. Heat and Thermodynamics, M.W. Zemansky, Richard Dittman, 1981, McGraw-Hill.
2. A Treatise on Heat, Meghnad Saha, and B.N.Srivastava, 1958, Indian Press
3. Thermal Physics, S. Garg, R. Bansal and Ghosh, 2nd Edition, 1993, Tata McGraw-Hill
4. Modern Thermodynamics with Statistical Mechanics, Carl S. Helrich, 2009, Springer.
5. Thermodynamics, Kinetic Theory & Statistical Thermodynamics, Sears & Salinger. 1988, Narosa.

6. Concepts in Thermal Physics, S.J. Blundell and K.M. Blundell, 2nd Ed., 2012, Oxford University Press
7. Heat and Thermal Physics-Brijlal & Subramaiam (S.Chand Publication)2014
8. Thermal Physics– C. Kittel and H. Kroemer (McMillan Education India)2010

PHYSICS LAB-C:VI

20 Classes (2hr duration)

1. To determine Mechanical Equivalent of Heat, J, by Callender and Barnes constant flow method.
2. To determine the Coefficient of Thermal Conductivity of Cu by Searles Apparatus.
3. To determine the Coefficient of Thermal Conductivity of Cu by Angstroms Method.
4. To determine the Coefficient of Thermal Conductivity of a bad conductor by Lee and Charltons disc method.
5. To determine the Temperature Coefficient of Resistance by Platinum Resistance Thermometer (PRT).
6. To study the variation of Thermo-Emf of a Thermocouple with Difference of Temperature of its Two Junctions.
7. To calibrate a thermocouple to measure temperature in a specified Range using (1) Null Method, (2) Direct measurement using Op-Amp difference amplifier and to determine Neutral Temperature.
8. To determine J by Calorimeter.

Reference Books:

1. Advanced Practical Physics for students, B. L. Flint and H.T. Worsnop, 1971, Asia Publishing House
2. A Text Book of Practical Physics, I.Prakash & Ramakrishna, 11th Ed., 2011, Kitab Mahal
3. Advanced level Physics Practicals, Michael Nelson and Jon M. Ogborn, 4th Edition, reprinted 1985, Heinemann Educational Publishers
4. A Laboratory Manual of Physics for undergraduate classes,D.P.Khandelwal,1985, Vani Pub.

C-7: DIGITAL SYSTEMS AND APPLICATIONS

(Credits: Theory-04, Practicals-02)

Marks:100 (Theory:70, Practical: 30)

Theory: 40 Classes (1 hr. duration)

UNIT-I

Digital Circuits: Difference between Analog and Digital Circuits. Binary Numbers. Decimal to Binary and Binary to Decimal Conversion. BCD, Octal and Hexadecimal numbers. AND, OR and NOT Gates (realization using Diodes and Transistor). NAND and NOR Gates as Universal Gates. XOR and XNOR Gates and application as Parity Checkers. (5 Lectures)

Boolean algebra: De Morgan's Theorems. Boolean Laws. Simplification of Logic Circuit using Boolean algebra. Fundamental Products. Idea of Minterms and Maxterms. Conversion of a Truth table into Equivalent Logic Circuit by (1) Sum of Products Method and (2) Karnaugh Map. (5 Lectures)

UNIT-II

Data processing circuits: Basic idea of Multiplexers, De-multiplexers, Decoders, Encoders. (3 Lectures)

Arithmetic Circuits: Binary Addition. Binary Subtraction using 2's Complement. Half and Full Adders. Half & Full Subtractors, 4-bit binary Adder/Subtractor. (4 Lectures)

Timers: IC 555: block diagram and applications: Astable multivibrator and Monostable multivibrator. (3 Lectures)

UNIT-III

Integrated Circuits (Qualitative treatment only): Active & Passive components. Discrete components. Wafer. Chip. Advantages and drawbacks of ICs. Scale of integration: SSI, MSI, LSI and VLSI (basic idea and definitions only). Classification of ICs. Examples of Linear and Digital ICs. (5 Lectures)

Introduction to CRO: Block Diagram of CRO. Electron Gun, Deflection System and Time Base. Deflection Sensitivity. Applications of CRO: (1) Study of Waveform, (2) Measurement of Voltage, Current, Frequency, and Phase Difference. (5 Lectures)

UNIT-IV

Introduction to Computer Organization: Input/output Devices. Data storage (idea of RAM and ROM). Computer memory. Memory organization & addressing. Memory Interfacing. Memory Map. (4 Lectures)

Shift registers: Serial-in-Serial-out, Serial-in-Parallel-out, Parallel-in-Serial-out and Parallel-in-Parallel-out Shift Registers (only up to 4 bits). (2 Lectures)

Counters (4 bits): Ring Counter. Asynchronous counters, Decade Counter. Synchronous Counter. (4 Lectures)

Reference Books:

1. Digital Principles and Applications, A.P. Malvino, D.P. Leach and Saha, 7th Ed., 2011, Tata McGraw
2. Fundamentals of Digital Circuits, Anand Kumar, 2nd Edn, 2009, PHI Learning Pvt. Ltd.
3. Digital Circuits and systems, Venugopal, 2011, Tata McGraw Hill.
4. Digital Systems: Principles & Applications, R.J. Tocci, N.S. Widmer, 2001, PHI Learning

5. Logic circuit design, Shimon P. Vingron, 2012, Springer.
6. Digital Electronics, Subrata Ghoshal, 2012, Cengage Learning.
7. Microprocessor Architecture Programming & applications with 8085, 2002, R.S. Goankar, Prentice Hall.
8. Concept of Electronics: D.C.Tayal (Himalay Publication) 2011.
9. Electronics-V. K. Meheta (S. Chand Publication),2013
10. The Art of Electronics, P. Horowitz and W. Hill, CUP.

PHYSICS PRACTICAL-C:VII

20 Classes (2 hrs. duration)

1. To measure (a) Voltage, and (b) Time period of a periodic waveform using CRO.
2. To test a Diode and Transistor using a Multimeter.
3. To design a switch (NOT gate) using a transistor.
4. To verify and design AND, OR, NOT and XOR gates using NAND gates.
5. To design a combinational logic system for a specified Truth Table.
6. To convert a Boolean expression into logic circuit and design it using logic gate ICs.
7. To minimize a given logic circuit.
8. Half Adder, Full Adder and 4-bit binary Adder.
9. Half Subtractor, Full Subtractor, Adder-Subtractor using Full Adder I.C.
10. To build Flip-Flop (RS, Clocked RS, D-type and JK) circuits using NAND gates.
11. To build JK Master-slave flip-flop using Flip-Flop ICs
12. To build a 4-bit Counter using D-type/JK Flip-Flop ICs and study timing diagram.
13. To make a 4-bit Shift Register (serial and parallel) using D-type/JK Flip-Flop ICs.
14. To design an astable multivibrator of given specifications using 555 Timer.
15. To design a monostable multivibrator of given specifications using 555 Timer.

Reference Books:

1. Modern Digital Electronics, R.P. Jain, 4th Edition, 2010, Tata McGraw Hill.
2. Basic Electronics: A text lab manual, P.B. Zbar, A.P. Malvino, M.A. Miller, 1994, Mc-Graw Hill.

3. Microprocessor Architecture Programming and applications with 8085, R.S. Goankar, 2002, Prentice Hall.
4. Microprocessor 8085:Architecture, Programming and interfacing, A. Wadhwa, 2010, PHI Learning.

SEMESTER-IV

C-VIII: MATHEMATICAL PHYSICS-III

(Credits: Theory-04, Practicals-02)
 Marks:100 (Theory:70, Practical: 30)
 Theory: 40 Classes (1 hr. duration)

The emphasis of the course is on applications in solving problems of interest to physicists. Students are to be examined on the basis of problems, seen and unseen.

UNIT-I

Complex Analysis: Brief Revision of Complex Numbers and their Graphical Representation. Euler's formula, De Moivre's theorem, Roots of Complex Numbers. Functions of Complex Variables. Analyticity and Cauchy-Riemann Conditions. Examples of analytic functions. Singular functions: poles and branch points, order of singularity, branch cuts. Integration of a function of a complex variable. Cauchy's Inequality. Cauchy's theorem, Cauchy's Integral formula. Simply and multiply connected. (10 Lectures)

UNIT-II

Integrals Transforms: Laurent and Taylor's expansion. Residues and Residue Theorem. Application in solving Definite Integrals. Fourier Transforms: Fourier Integral theorem. Fourier Transform. Examples. Fourier transform of trigonometric, Gaussian, finite wave train & other functions. Representation of Dirac delta function as a Fourier Integral. (10 Lectures)

UNIT-III

Integrals Transforms: Fourier transform of derivatives, Inverse Fourier transform, Convolution theorem. Properties of Fourier transform (translation, change of scale, complex conjugation, etc.). Three dimensional Fourier transforms with examples. Application of Fourier Transforms to differential equations: One dimensional Wave and Diffusion/Heat Flow Equations. (10 Lectures)

UNIT-IV

Laplace Transforms: Laplace Transform (LT) of Elementary functions. Properties of LTs: Change of Scale Theorem, Shifting Theorem. LTs of Derivatives and Integrals of Functions, Derivatives and Integrals of LTs. LT of Unit Step function, Dirac Delta function, Periodic Functions. Convolution Theorem. Inverse LT. Application of Laplace Transforms to Differential Equations: Damped Harmonic Oscillator, Simple Electrical Circuits. (10 Lectures)

Reference Books:

1. Mathematical Methods for Physics and Engineers, K.F Riley, M.P. Hobson and S. J. Bence, 3rd ed., 2006, Cambridge University Press
2. Mathematical Methods for Physicists: Arfken, Weber, 2005, Harris, Elsevier.
3. Advanced Engineering Mathematics, E. Kreyszig (New Age Publication) 2011.
4. Mathematics for Physicists, P. Dennery and A. Krzywicki, 1967, Dover Publications
5. Complex Variables, A. S. Fokas & M. J. Ablowitz, 8th Ed., 2011, Cambridge Univ. Press

6. Complex Variables and Applications, J.W. Brown & R.V. Churchill, 7th Ed. 2003, Tata McGraw-Hill
7. First course in complex analysis with applications, D.G. Zill and P.D. Shanahan, 1940, Jones & Bartlett.
8. Mathematical Physics—H. K. Dass, Dr. Rama Verma (S. Chand Higher Academics) 6th Edition 2011.
9. Mathematical Physics C. Harper, (Prentice Hall India) 2006.
10. Mathematical Physics-Goswami (Cengage Learning) 2014
11. Mathematical Method for Physical Sciences - M. L. Boas (Wiley India) 2006
12. Introduction to the theory of functions of a complex variable- E.T.Copson (Oxford) Univ. Press, 1970

PHYSICS PRACTICAL-C:VIII

20 Classes (2 hrs. duration)

Scilab based simulations experiments based on Mathematical Physics problems like

1. Solve differential equations:

(i) $\frac{dy}{dx} = e^{-x}$ with $y = 0$ for $x = 0$. (ii) $\frac{dy}{dx} + e^{-xy} = x^2$. (iii) $\frac{d^2y}{dt^2} + 2\frac{dy}{dt} = -y$.

(iv) $\frac{d^2y}{dt^2} + e^{-t}\frac{dy}{dt} = -y$.

1 2. Dirac Delta Function: Evaluate $\int_{-\infty}^{\infty} \frac{e^{-x^2}}{\sqrt{2\pi\sigma^2}} (x+3) dx$ for $\sigma = 1, 0.1, 0.01$ and show it tends to 5.

3. Fourier Series: Program to $\sum_{n=1}^{\infty} (0.2)^n$.
Evaluate the Fourier coefficients of a given periodic function (square wave)

4. Frobenius method and Special functions: $\int_{-1}^1 P_n(\mu)P_m(\mu) d\mu = \delta_{n,m}$. Plot $P_n(x)$, $J(x)$. Show recursion relation.

5. Calculation of error for each data point of observations recorded in experiments done in previous semesters (choose any two).

6. Calculation of least square fitting manually without giving weightage to error. Confirmation of least square fitting of data through computer program.

7. Evaluation of trigonometric functions e.g. $\sin \theta$, Given Bessels function at N — points, find its value at an intermediate point. Complex analysis: Integrate $1/(x^2 + 2)$ numerically and check with computer integration.

8. Integral transform: FFT of e^{-x^2} .

Reference Books:

1. Mathematical Methods for Physics and Engineers, K.F Riley, M.P. Hobson and S. J. Bence, 3rd ed., 2006, Cambridge University Press
2. Mathematics for Physicists, P. Dennery and A. Krzywicki, 1967, Dover Publications
3. Simulation of ODE/PDE Models with MATLAB, OCTAVE and SCILAB: Scientific and Engineering Applications: A. Vande Wouwer, P. Saucez, C. V. Fernandez. 2014 Springer ISBN: 978-3319067896
4. Scilab by example: M. Affouf, 2012. ISBN: 978-1479203444
5. Scilab (A free software to Matlab): H.Ramchandran, A.S.Nair. 2011 S.Chand & Company
6. Scilab Image Processing: Lambert M. Surhone. 2010 Betascript Publishing.

C-IX: ELEMENTS OF MODERN PHYSICS

(Credits: Theory-04, Practicals-02)

Marks:100 (Theory:70, Practical: 30)

Theory: 40 Classes (1 hr. duration)

UNIT-I

Atomic Spectra and Models: Inadequacy of classical physics, Brief Review of Black body Radiation , **Photoelectric effect**, Compton effect, dual nature of radiation, wave nature of particles. Atomic spectra, Line spectra of hydrogen atom, Ritz Rydberg combination principle. Alpha Particle Scattering, Rutherford Scattering Formula, Rutherford Model of atom and its limitations, Bohrs model of H atom, explanation of atomic spectra, correction for finite mass of the nucleus, Bohr correspondence principle, limitations of Bohr model, discrete energy exchange by atom, Frank Hertz Expt. Sommerfeld's Modification of Bohrs Theory. (11 Lectures)

UNIT-II

Wave Particle Duality: de Broglie hypothesis, Experimental confirmation of matter wave, Davis- son Germer Experiment, velocity of de Broglie wave, wave particle duality, Complementarity. Superposition of two waves, phase velocity and group velocity , wave packets ,Gaussian WavePacket , spatial distribution of wave packet, Localization of wave packet in time.

Time development of a wave Packet ; Wave Particle Duality, Complementarity . **Heisenberg Uncertainty Principle** ,Illustration of the Principle through thought Experiments of Gamma ray microscope and electron diffraction through a slit. Estimation of ground state energy of harmonic oscillator and hydrogen atom, non existence of electron in the nucleus. **Uncertainty and Complementarities**. (11 Lectures)

UNIT-III

Nuclear Physics: Size and structure of atomic nucleus and its relation with atomic weight; Impossibility of an electron being in the nucleus as a consequence of the uncertainty principle. Nature of nuclear force, NZ graph, **Liquid Drop model: semi-empirical mass formula and binding energy**,

Nuclear Shell Model and magic numbers. Radioactivity: stability of the nucleus; Law of radioactive decay; Mean life and half-life (8 Lectures)

UNIT-IV

Alpha decay; Beta decay- energy released, spectrum and Pauli's prediction of neutrino; Gamma ray emission, energy-momentum conservation: electron-positron pair creation by gamma photons in the vicinity of a nucleus.

Fission and fusion- mass deficit, relativity and generation of energy; Fission - nature of fragments and emission of neutrons. Nuclear reactor: slow neutrons interacting with Uranium 235; Fusion and thermonuclear reactions driving stellar energy (brief qualitative discussions). (10 Lectures)

Reference Books:

1. Concepts of Modern Physics, Arthur Beiser, 2002, McGraw-Hill.
2. Introduction to Modern Physics, Rich Meyer, Kennard, Coop, 2002, Tata McGraw Hill
3. Introduction to Quantum Mechanics, David J. Griffith, 2005, Pearson Education.
4. Physics for scientists and Engineers with Modern Physics, Jewett and Serway, 2010, Cengage Learning.
5. Quantum Mechanics: Theory & Applications, A.K.Ghatak & S.Lokanathan, 2004, Macmillan
6. Modern Physics Bernstein, Fishbane and Gasiorowicz (Pearson India) 2010
7. Quantum Physics of Atoms, Molecules, Solids, Nuclei and Particles – R. Eisberg (Wiley India), 2012.

(Additional Books for Reference)

8. Modern Physics, J.R. Taylor, C.D. Zafiratos, M.A. Dubson, 2004, PHI Learning.
9. Theory and Problems of Modern Physics, Schaum's outline, R. Gautreau and W. Savin, 2nd Edn, Tata McGraw-Hill Publishing Co. Ltd.
10. Quantum Physics, Berkeley Physics, Vol.4. E.H.Wichman, 1971, Tata McGraw-Hill Co.
11. Basic ideas and concepts in Nuclear Physics, K.Heyde, 3rd Edn., Institute of Physics Pub.
12. Six Ideas that Shaped Physics: Particle Behave like Waves, T.A.Moore, 2003, McGraw Hill
13. Modern Physics-Serway (CENGAGE Learnings) 2014
14. Modern Physics —Murugesan and Sivaprasad (S. Chand Higher Academics)
15. Physics of Atoms and Molecules Bransden (Pearson India) 2003

PHYSICS PRACTICAL-C:IX

20 Classes (2 hrs. duration)

1. Measurement of Planck's constant using black body radiation and photo-detector

2. Photo-electric effect: photo current versus intensity and wavelength of light; maximum energy of photo-electrons versus frequency of light
3. To determine work function of material of filament of directly heated vacuum diode.
4. To determine the Planck's constant using LEDs of at least 4 different colours.
5. To determine the wavelength of H-alpha emission line of Hydrogen atom.
6. To determine the ionization potential of mercury.
7. To determine the absorption lines in the rotational spectrum of Iodine vapour.
8. To determine the value of e/m by (a) Magnetic focusing or (b) Bar magnet.
9. To setup the Millikan oil drop apparatus and determine the charge of an electron.
10. To show the tunneling effect in tunnel diode using I-V characteristics.
11. To determine the wavelength of laser source using diffraction of single slit.
12. To determine the wavelength of laser source using diffraction of double slits.
13. To determine (1) wavelength and (2) angular spread of He-Ne laser using plane diffraction grating

Reference Books:

1. Advanced Practical Physics for students, B.L. Flint and H.T. Worsnop, 1971, Asia Publishing House
2. Advanced level Physics Practicals, Michael Nelson and Jon M. Ogborn, 4th Edition, reprinted 1985, Heinemann Educational Publishers
3. A Text Book of Practical Physics, I. Prakash & Ramakrishna, 11th Edn, 2011, Kitab Mahal

C-X: ANALOG SYSTEMS AND APPLICATIONS

(Credits: Theory-04, Practicals-02)
 Marks:100 (Theory:70, Practical: 30)
 Theory: 40 Classes (1 hr. duration)

UNIT-I

Semiconductor Diodes: P and N type semiconductors. Energy Level Diagram. Conductivity and Mobility, Concept of Drift velocity. PN Junction Fabrication (Simple Idea). Barrier Formation in PN Junction Diode. Static and Dynamic Resistance. Current Flow Mechanism in Forward and Reverse Biased Diode. Drift Velocity. Derivation for Barrier Potential, Barrier Width and Current for Step Junction. (5 Lectures)

Two-terminal Devices and their Applications: (1) Rectifier Diode: Half-wave Rectifiers.

Centre-tapped and Bridge Full-wave Rectifiers, Calculation of Ripple Factor and Rectification Efficiency, (2) Zener Diode and Voltage Regulation. Principle and structure of (1) LEDs, (2) Photodiode, (3) Solar Cell. (5 Lectures)

UNIT-II

Bipolar Junction transistors: n-p-n and p-n-p Transistors. Characteristics of CB, CE and CC Configurations. Current gains α and β Relations between α and β . Load Line analysis of Transistors. DC Load line and Q-point. Physical Mechanism of Current Flow. Active, Cutoff and Saturation Regions. (5 Lectures)

Amplifiers: Transistor Biasing and Stabilization Circuits. Fixed Bias and Voltage Divider Bias. Transistor as 2-port Network. h-parameter Equivalent Circuit. Analysis of a single-stage CE amplifier using Hybrid Model. Input and Output Impedance. Current, Voltage and Power Gains. Classification of Class A, B & C Amplifiers. (5 Lectures)

UNIT:III

Coupled Amplifier: RC-coupled amplifier and its frequency response. (4 Lectures)

Feedback in Amplifiers: Effects of Positive and Negative Feedback on Input Impedance, Output Impedance, Gain, Stability, Distortion and Noise. (2 Lectures)

Sinusoidal Oscillators: Barkhausen's Criterion for self-sustained oscillations. RC Phase shift oscillator, determination of Frequency. Hartley & Colpitts oscillators. (4 Lectures)

UNIT-IV

Operational Amplifiers (Black Box approach): Characteristics of an Ideal and Practical Op-Amp. (IC 741) Open-loop and Closed-loop Gain. Frequency Response. CMRR. Slew Rate and concept of Virtual ground. (5 Lectures)

Applications of Op-Amps: (1) Inverting and non-inverting amplifiers, (2) Adder, (3) Subtractor, (4) Differentiator, (5) Integrator, (6) Log amplifier, (7) Zero crossing detector (8) Wein bridge oscillator. (5 Lectures)

Reference Books:

1. Integrated Electronics, J. Millman and C.C. Halkias, 1991, Tata Mc-Graw Hill.
2. Electronics: Fundamentals and Applications, J.D. Ryder, 2004, Prentice Hall.
3. Solid State Electronic Devices, B.G. Streetman & S.K. Banerjee, 6th Edn., 2009, PHI Learning
4. Electronic Devices & circuits, S. Salivahanan & N.S. Kumar, 3rd Ed., 2012, Tata Mc-Graw Hill
5. OP-Amps and Linear Integrated Circuit, R. A. Gayakwad, 4th edition, 2000, Prentice Hall
6. Electronic circuits: Handbook of design & applications, U. Tietze, C. Schenk, 2008, Springer
7. Semiconductor Devices: Physics and Technology, S.M. Sze, 2nd Ed., 2002, Wiley India
8. Electronic Devices, 7/e Thomas L. Floyd, 2008, Pearson India
9. Concept of Electronics: D.C. Tayal (Himalay Publication) 2011
10. Electronic devices :Circuits and Applications :W.D. Stanley Prentice Hall

11. Electronics- V. K. Meheta (S. Chand Publication)2013
12. Electronic Circuits :L.Schilling and Velove: 3rd Ed Mc Graw Hill
13. ElectronicsRaskhit & Chattopadhyay (New age International Publication)2011
14. Electricity and Electronic-D.C.Tayal (Himalaya Pub.)2011
15. Electronic devices and circuits R.L. Boylstad (Pearson India) 2009.

PHYSICS PRACTICAL-C:X

20 Classes (2 hrs. duration)

1. To study V-I characteristics of PN junction diode, and Light emitting diode.
2. To study the V-I characteristics of a Zener diode and its use as voltage regulator.
3. Study of V-I & power curves of solar cells, and find maximum power point & efficiency.
4. To study the characteristics of a Bipolar Junction Transistor in CE configuration.
5. To study the various biasing configurations of BJT for normal class A operation.
6. To design a CE transistor amplifier of a given gain (mid-gain) using voltage divider bias.
7. To study the frequency response of voltage gain of a RC-coupled transistor amplifier.
8. To design a Wien bridge oscillator for given frequency using an op-amp.
9. To design a phase shift oscillator of given specifications using BJT.
10. To study the Colpitt's oscillator.
11. To design a digital to analog converter (DAC) of given specifications.
12. To study the analog to digital convertor (ADC) IC.
13. To design an inverting amplifier using Op-amp (741,351) for dc voltage of given gain
14. To design inverting amplifier using Op-amp (741,351) and study its frequency response
15. To design non-inverting amplifier using Op-amp (741,351) & study its frequency response
16. To study the zero-crossing detector and comparator
17. To add two dc voltages using Op-amp in inverting and non-inverting mode
18. To design a precision Differential amplifier of given I/O specification using Op-amp.
19. To investigate the use of an op-amp as an Integrator.
20. To investigate the use of an op-amp as a Differentiator.

21. To design a circuit to simulate the solution of a 1st/2nd order differential equation.

Reference Books:

1. Basic Electronics: A text lab manual, P.B. Zbar, A.P. Malvino, M.A. Miller, 1994, Mc-Graw Hill.
2. OP-Amps and Linear Integrated Circuit, R. A. Gayakwad, 4th edition, 2000, Prentice Hall.
3. Electronic Principle, Albert Malvino, 2008, Tata Mc-Graw Hill.
4. Electronic Devices & circuit Theory, R.L. Boylestad & L.D. Nashelsky, 2009, Pearson

SEMESTER-V

C-XI: QUANTUM MECHANICS AND APPLICATIONS

(Credits: Theory-04, Practicals-02)

Marks:100 (Theory:70, Practical: 30)

Theory: 40 Classes (1hr duration)

UNIT:I

Schrodinger equation & the operators: Time dependent Schrodinger equation and dynamical evolution of a quantum state; Properties of Wave Function. Interpretation of Wave Function Probability and probability current densities in three dimensions; Conditions for Physical Acceptability of Wave Functions. Normalization. Linearity and Superposition Principles. Hermitian operator, Eigen values and Eigen functions. Position, momentum and Energy operators; commutator of position and momentum operators; Expectation values of position and momentum. Wave Function of a Free Particle. (8 Lectures)

UNIT:II

Time independent Schrodinger equation: Hamiltonian, stationary states and energy eigen values; expansion of an arbitrary wave function as a linear combination of energy eigen functions; General solution of the time dependent Schrodinger equation in terms of linear combinations of stationary states; Application to spread of Gaussian wave-packet for a free particle in one dimension; wave packets, Fourier transforms and momentum space wave function; Position-momentum uncertainty principle. (6 Lectures)

UNIT:III

General discussion of bound states in an arbitrary potential: continuity of wave function, boundary condition and emergence of discrete energy levels; application to one-dimensional problem-square well potential; Quantum mechanics of simple harmonic oscillator-energy levels and energy eigen functions ground state, zero point energy & uncertainty principle. One dimensional infinitely rigid box- energy eigen values and eigen functions, normalization; Quantum dot as example; Quantum mechanical scattering and tunnelling in one dimension-across a step potential & rectangular potential barrier. (14 Lectures)

UNIT-IV

Atoms in Electric & Magnetic Fields: Electron angular momentum. Space quantization. Electron Spin and Spin Angular Momentum. Larmors Theorem. Spin Magnetic Moment. Stern- Gerlach Experiment. Zeeman Effect: Electron Magnetic Moment and Magnetic Energy, Gyromagnetic Ratio and Bohr Magneton.

Atoms in External Magnetic Fields: Normal and Anomalous Zeeman Effect. Paschen Back and Stark Effect (Qualitative Discussion only). (12 Lectures)

Reference Books:

1. A Text book of Quantum Mechanics, P. M.Mathews and K.Venkatesan, 2nd Ed., 2010, Mc-Graw Hill
2. Quantum Mechanics, Robert Eisberg and Robert Resnick, 2nd Edn., 2002, Wiley.
3. Quantum Mechanics, Leonard I. Schiff, 3rd Edn. 2010, Tata McGraw Hill.
4. Quantum Mechanics, G. Aruldas, 2nd Edn. 2002, PHI Learning of India.
5. Quantum Mechanics, Bruce Cameron Reed, 2008, Jones and Bartlett Learning. Quantum Mechanics: Foundations & Applications, Arno Bohm, 3rd Edn., 1993, Springer
6. Quantum Mechanics for Scientists & Engineers, D.A.B. Miller, 2008, Cambridge University Press
7. Quantum Physics-S. Gasiorowicz (Wiley India) 2013
8. Quantum Mechanics -J.L. Powell and B. Craseman (Narosa) 1988
9. Introduction to Quantum Mechanics- M.Das, P.K.Jena,(SriKrishna Prakashan)
10. Basic Quantum Mechanics A.Ghatak (Mc Millan India) 2012
11. Introduction to Quantum Mechanics R. Dicke and J. Wittke
12. Quantum Mechanics- Eugen Merzbacher, 2004, John Wiley and Sons, Inc.
13. Introduction to Quantum Mechanics, D.J. Griffith, 2nd Ed. 2005, Pearson Education
14. Quantum Mechanics, Walter Greiner, 4th Edn., 2001, Springer
15. Quantum Mechanics - F. Mandl (CBS) 2013
16. Cohen-Tannoudji, B Diu and F Lalo, Quantum Mechanics (2 vols) Wiley-VCH 1977

PHYSICS PRACTICAL-C:XI

20 Classes (2hr duration)

Use C/C++/Scilab for solving the following problems based on Quantum Mechanics like

1. Solve the s-wave Schrodinger equation for the ground state and the first excited state of the hydrogen atom:
Here, m is the reduced mass of the electron. Obtain the energy eigenvalues and plot the corresponding wavefunctions. Remember that the ground state energy of the hydrogen atom is -13.6 eV. Take $e = 3.795$ (eV)^{1/2}, $c = 1973$ (eV) and $m = 0.511 \times 10^6$ eV/c².
2. Solve the s-wave radial Schrodinger equation for an atom:
where m is the reduced mass of the system (which can be chosen to be the mass of an electron), for the screened coulomb potential Find the energy (in eV) of the ground state of the atom to an accuracy of three significant digits. Also, plot the corresponding wavefunction. Take $e = 3.795$ (eV)^{1/2}, $m = 0.511 \times 10^6$ eV/c², and $a = 3, 5, 7$. In these units $c = 1973$ (eV). The ground state energy is expected to be above -12 eV in all three cases.

3. Solve the s-wave radial Schrodinger equation for a particle of mass m :
For the anharmonic oscillator potential for the ground state energy (in MeV) of particle to an accuracy of three significant digits. Also, plot the corresponding wave function. Choose $m = 940 \text{ MeV}/c^2$, $k = 100 \text{ MeV fm}^{-2}$, $b = 0, 10, 30 \text{ MeV fm}^{-3}$ In these units, $c = 197.3 \text{ MeV fm}$. The ground state energy is expected to lie between 90 and 110 MeV for all three cases.
4. Solve the s-wave radial Schrodinger equation for the vibrations of hydrogen molecule:
Where is the reduced mass of the two-atom system for the Morse potential Find the lowest vibrational energy (in MeV) of the molecule to an accuracy of three significant digits. Also plot the corresponding wave function.
Take: $m = 940 \times 10^6 \text{ eV}/c^2$, $D = 0.755501 \text{ eV}$, $\alpha = 1.44$, $\rho = 0.131349$ Laboratory based experiments:
5. Study of Electron spin resonance- determine magnetic field as a function of the resonance frequency.
6. Study of Zeeman effect: with external magnetic field; Hyperfine splitting
7. To show the tunneling effect in tunnel diode using I-V characteristics.
8. Quantum efficiency of CCDs

Reference Books:

1. Schaum's outline of Programming with C++. J.Hubbard, 2000, McGraw-Hill Publication
2. Numerical Recipes in C: The Art of Scientific Computing, W.H. Press et al., 3rd Edn., 2007, Cambridge University Press.
3. An introduction to computational Physics, T.Pang, 2nd Edn., 2006, Cambridge Univ. Press
4. Simulation of ODE/PDE Models with MATLAB, OCTAVE and SCILAB: Scientific & Engineering Applications: A. Vande Wouwer, P. Saucez, C. V. Fernandez. 2014 Springer.
5. Scilab (A Free Software to Matlab): H. Ramchandran, A.S. Nair. 2011 S. Chand & Co.
6. Scilab Image Processing: L.M. Surhone. 2010 Betascript Publishing ISBN:978-6133459274

C-XII: SOLID STATE PHYSICS

(Credits: Theory-04, Practicals-02)
Marks:100 (Theory:70, Practical: 30)
Theory: 40 Classes (1 hr. duration)

UNIT:I

Crystal Structure: Solids- Amorphous and Crystalline Materials. Lattice Translation Vectors. Lattice with a Basis Central and Non-Central Elements. Unit Cell. Miller Indices. Types of Lattices, Reciprocal Lattice. Brillouin Zones. **Diffraction of X-rays by Crystals. Bragg's Law.** Atomic and

Geometrical Factor. (8 Lectures)

UNIT:II

Elementary Lattice Dynamics: Lattice Vibrations and Phonons: Linear **Monoatomic and Di-atomic Chains**. Acoustical and Optical Phonons. Qualitative Description of the Phonon Spectrum in Solids. Dulong and Petits Law, **Einstein and Debye theories of specific heat of solids. T3 law** (6 Lectures)

Magnetic Properties of Matter: Dia-, Para-, Ferri- and Ferromagnetic Materials. Classical Langevin Theory of diaand Paramagnetic Domains. Curies law, Weiss Theory of Ferromagnetism and Ferromagnetic Domains. (6 Lectures)

UNIT:III

Dielectric Properties of Materials: Polarization. Local Electric Field at an Atom. Depolar- ization Field. Electric Susceptibility. Polarizability. Clausius Mosotti Equation. Classical Theory of Electric Polarizability. (4 Lectures)

Lasers: Einsteins A and B coefficients. Metastable states. Spontaneous and Stimulated emissions. Optical Pumping and Population Inversion. Three-Level and Four-Level Lasers. **Ruby Laser and He-Ne Laser**. (4 Lectures)

UNIT-IV

Elementary band theory: Kronig Penny model. Band Gap. Conductor, Semiconductor (P and N type) and insulator. Conductivity of Semiconductor, mobility, Hall Effect. Measurement of conductivity (O4 probe method) & Hall coefficient. (8 Lectures)

Superconductivity: Experimental Results. Critical Temperature. Critical magnetic field. **Meissner effect. Type I and type II Superconductors**, Londons Equation and Penetration Depth. Isotope effect. Idea of BCS theory (No derivation).(4 Lectures)

Reference Books:

1. Introduction to Solid State Physics, Charles Kittel, 8th Edition, 2004, Wiley India Pvt. Ltd.
2. Elements of Solid State Physics, J.P. Srivastava, 2nd Edition, 2006, Prentice-Hall of India
3. Introduction to Solids, Leonid V. Azaroff, 2004, Tata Mc-Graw Hill
4. Solid State Physics, N.W. Ashcroft and N.D. Mermin, 1976, Cengage Learning
5. Solid-state Physics, H. Ibach and H. Luth, 2009, Springer
6. Elementary Solid State Physics, 1/e M. Ali Omar, 1999, Pearson India
7. Solid State Physics, M.A. Wahab, 2011, Narosa Publications
8. Solid State Physics S. O. Pillai (New Age Publication)
9. Solid State Physics- R.K.Puri & V.K. Babbar (S.Chand Publication)2013
10. Lasers and Non linear Optics B.B.Laud-Wiley Eastern.
11. LASERS: Fundamentals and Applications Thyagarajan and Ghatak (McMillanIndia), 2012

PHYSICS PRACTICAL-C:XII

20 Classes (2 hrs. duration)

1. Measurement of susceptibility of paramagnetic solution (Quinck's Tube Method)
2. To measure the Magnetic susceptibility of Solids.
3. To determine the Coupling Coefficient of a Piezoelectric crystal.
4. To measure the Dielectric Constant of a dielectric Materials with frequency
5. To determine the complex dielectric constant and plasma frequency of metal using Surface Plasmon resonance (SPR)
6. To determine the refractive index of a dielectric layer using SPR
7. To study the PE Hysteresis loop of a Ferroelectric Crystal.
8. To draw the BH curve of Fe using Solenoid & determine energy loss from Hysteresis.
9. To measure the resistivity of a semiconductor (Ge) with temperature by four-probe method (room temperature to 150 oC) and to determine its band gap.
10. To determine the Hall coefficient of a semiconductor sample.

Reference Books:

1. Advanced Practical Physics for students, B.L. Flint and H.T. Worsnop, 1971, Asia Publishing House.
2. Advanced level Physics Practicals, Michael Nelson and Jon M. Ogborn, 4th Edition, reprinted 1985, Heinemann Educational Publishers.
3. A Text Book of Practical Physics, I.Prakash & Ramakrishna, 11th Ed., 2011, Kitab Mahal
4. Elements of Solid State Physics, J.P. Srivastava, 2nd Ed., 2006, Prentice-Hall of India.

C-XIII: ELECTROMAGNETIC THEORY

(Credits: Theory-04, Practicals-02)

Marks:100 (Theory:70, Practical: 30)

Theory: 40 Classes (1 hr. duration)

UNIT:I

Maxwell Equations: Maxwells equations. Displacement Current. Vector and Scalar Potentials. Gauge

Transformations: Lorentz and Coulomb Gauge. Boundary Conditions at Interface between Different Media. Wave Equations. Plane Waves in Dielectric Media. Poynting Theorem and Poynt- ing Vector. Electromagnetic (EM) Energy Density. Physical Concept of Electromagnetic Field Energy Density. (8 Lectures)

UNIT:II

EM Wave Propagation in Unbounded Media: Plane EM waves through vacuum and isotropic dielectric medium, transverse nature of plane EM waves, refractive index and dielectric constant, wave impedance.

Propagation through conducting media, relaxation time, skin depth. Electrical conductivity of ionized gases, plasma frequency, refractive index, skin depth, application to propagation through ionosphere. (8 Lectures)

UNIT:III

EM Wave in Bounded Media: Boundary conditions at a plane interface between two media. Reflection & Refraction of plane waves at plane interface between two dielectric media-Laws of Reflection & Refraction. Fresnel's Formulae for perpendicular & parallel polarization cases, Brewster's law. Reflection & Transmission coefficients. Total internal reflection, evanescent waves. Metallic reflection (normal Incidence).

Optical Fibres: Numerical Aperture. Step and Graded Indices (Definitions Only). Single and Multiple Mode Fibres (Concept and Definition Only). (12 Lectures)

UNIT-IV

Polarization of Electromagnetic Waves: Description of Linear, Circular and Elliptical Polarization. Propagation of E.M. Waves in Anisotropic Media. Symmetric Nature of Dielectric Tensor. Fresnel's Formula. Uniaxial and Biaxial Crystals. Light Propagation in Uniaxial Crystal. Double Refraction. Polarization by Double Refraction. Nicol Prism. Ordinary & extraordinary refractive indices. Production & detection of Plane, Circularly and Elliptically Polarized Light. Phase Retardation Plates: Quarter-Wave and Half-Wave Plates. Babinet Compensator and its Uses. Analysis of Polarized Light.

Rotatory Polarization: Optical Rotation. Biot's Laws for Rotatory Polarization. Fresnel's Theory of optical rotation. Calculation of angle of rotation. Experimental verification of Fresnel's theory. Specific rotation. Laurent's half-shade polarimeter. (12 Lectures)

Reference Books:

1. Introduction to Electrodynamics, D.J. Griffiths, 3rd Ed., 1998, Benjamin Cummings.
2. Elements of Electromagnetics, M.N.O. Sadiku, 2001, Oxford University Press.
3. Introduction to Electromagnetic Theory, T.L. Chow, 2006, Jones & Bartlett Learning
4. Fundamentals of Electromagnetics, M.A.W. Miah, 1982, Tata McGraw Hill
5. Electromagnetic field Theory, R.S. Kshetrimayun, 2012, Cengage Learning
6. Electromagnetic Field Theory for Engineers & Physicists, G. Lehner, 2010, Springer
7. Electricity and Magnetism —D C Tayal (Himalaya Publication)2014
8. Introduction to Electrodynamics-A.Z.Capri & P.V.Panat (Alpha Science) 2002
9. Optics E.Hecht, (Pearson India) **(Additional Books for Reference)**
10. Electromagnetic Fields & Waves, P.Lorrain & D.Corson, 1970, W.H.Freeman & Co.

11. Electromagnetics, J.A. Edminster, Schaum Series, 2006, Tata McGraw Hill.
12. Electromagnetic field theory fundamentals, B. Guru and H. Hizioglu, 2004, Cambridge University Press
13. Electromagnetic Theory-A. Murthy (S. Chand Publication)2014
14. Classical Electrodynamics, J. D. Jackson (Wiley India)

PHYSICS PRACTICAL-C:XIII

20 Classes (2 hrs. duration)

1. To verify the law of Malus for plane polarized light.
2. To determine the specific rotation of sugar solution using Polarimeter.
3. To analyze elliptically polarized Light by using a Babinets compensator.
4. To study dependence of radiation on angle for a simple Dipole antenna.
5. To determine the wavelength and velocity of ultrasonic waves in a liquid (Kerosene Oil, Xylene, etc.) by studying the diffraction through ultrasonic grating.
6. To study the reflection, refraction of microwaves
7. To study Polarization and double slit interference in microwaves.
8. To determine the refractive index of liquid by total internal reflection using Wollastons air-film.
9. To determine the refractive Index of (1) glass and (2) a liquid by total internal reflection using a Gaussian eyepiece.
10. To study the polarization of light by reflection and determine the polarizing angle for air- glass interface.
11. To verify the Stefan's law of radiation and to determine Stefans constant.
12. To determine the Boltzmann constant using V-I characteristics of PN junction diode.

Reference Books:

1. Advanced Practical Physics for students, B.L. Flint and H.T. Worsnop, 1971, Asia Publishing House.
2. Advanced level Physics Practicals, Michael Nelson and Jon M. Ogborn, 4th Edition, reprinted 1985, Heinemann Educational Publishers
3. A Text Book of Practical Physics, I.Prakash & Ramakrishna, 11th Ed., 2011, Kitab Mahal
4. Electromagnetic Field Theory for Engineers & Physicists, G. Lehner, 2010, Springer

C-XIV: STATISTICAL MECHANICS

(Credits: Theory-04, Practicals-02)

Marks:100 (Theory:70, Practical: 30)

Theory: 40 Classes (1 hr. duration)

UNIT:I

Classical Statistics: Macrostate & Microstate, Elementary Concept of Ensemble, Microcanonical, Canonical and grand canonical ensemble. Phase Space, Entropy and Thermodynamic Probability, Maxwell-Boltzmann Distribution Law, Partition Function, Thermodynamic Functions of an Ideal Gas, Classical Entropy Expression. (12 Lectures)

UNIT:II

Gibbs Paradox, Sackur Tetrode equation, Law of Equipartition of Energy (with proof) Applications to Specific Heat and its Limitations, Thermodynamic Functions of a Two-Energy Levels System, Negative Temperature.(8 Lectures)

UNIT:III

Radiation: Properties of Thermal Radiation. Blackbody Radiation. Pure temperature dependence. Kirchhoffs law. Stefan-Boltzmann law: Thermodynamic proof. Radiation Pressure. Wiens Displacement law. Wiens Distribution Law. **Sahas Ionization Formula. Rayleigh-Jeans Law. Ultraviolet Catastrophe.** Plancks Law of Blackbody Radiation: Experimental Verification. Deduction of (1) Wiens Distribution Law, (2) Rayleigh-Jeans Law, (3) Stefan-Boltzmann Law, (4) Wiens Displacement law from Plancks law.(12 Lectures)

UNIT=IV

Quantum Statistics: Identical particles, macrostates and micro states. Fermions and Bosons, **Bose Einstein distribution function and Fermi-Dirac Distribution function.** Bose-Einstein Condensation, Bose deviation from Planck's law, Effect of temperature on F-D distribution function, degenerate Fermigas, Density of States, Fermi energy.(8 Lectures)

Reference Books:

1. Statistical Mechanics-R.K.Pathria & Paul D. Beale (Academic Press) 3rd Edition (2011)
2. Statistical Physics, Berkeley Physics Course, F. Reif, 2008, Tata McGraw-Hill
3. Statistical and Thermal Physics, S. Lokanathan and R.S. Gambhir. 1991, Prentice Hall
4. Thermodynamics, Kinetic Theory and Statistical Thermodynamics, Francis W. Sears and Gerhard L. Salinger, 1986, Narosa.
5. Modern Thermodynamics with Statistical Mechanics, Carl S. Helrich, 2009, Springer
6. An Introduction to Statistical Mechanics & Thermodynamics, R.H. Swendsen, 2012, Oxford Univ. Press.
7. An introduction to Equilibrium Statistical Mechanics: Palash Das (I.K.International Publication) 2012
8. Statistical Physics - F. Mandl (CBS) 2012

9. Statistical Physics of Particles-M. Kardar (CUP 2007)

PHYSICS PRACTICAL-C:XIV

20 Classes (2 hrs. duration)

Use C/C++/Scilab for solving the problems based on Statistical Mechanics like

1. Plot Plancks law for Black Body radiation and compare it with Weins Law and Raleigh- Jeans Law at high temperature (room temperature) and low temperature.
2. Plot Specific Heat of Solids by comparing (a) Dulong-Petit law, (b) Einstein distribution function, (c) Debye distribution function for high temperature (room temperature) and low temperature and compare them for these two cases
3. Plot Maxwell-Boltzmann distribution function versus temperature.
4. Plot Fermi-Dirac distribution function versus temperature.
5. Plot Bose-Einstein distribution function versus temperature.

Reference Books:

1. Elementary Numerical Analysis, K.E. Atkinson, 3 r d Edn. 2007, Wiley India Edition
2. Statistical Mechanics, R.K. Pathria, Butterworth Heinemann: 2nd Ed., 1996, Oxford Univer- sity Press.
3. Thermodynamics, Kinetic Theory and Statistical Thermodynamics, Francis W. Sears and Gerhard L. Salinger, 1986, Narosa.
4. Modern Thermodynamics with Statistical Mechanics, Carl S. Helrich, 2009, Springer
5. Simulation of ODE/PDE Models with MATLAB, OCTAVE and SCILAB: Scientific and En- gineering Applications: A. Vande Wouwer, P. Saucez, C. V. Fernndez. 2014 Springer ISBN: 978-3319067896
6. Scilab by example: M. Affouf, 2012. ISBN: 978-1479203444
7. Scilab Image Processing: L.M.Surhone. 2010, Betascript Pub., ISBN: 978- 6133459274

Discipline Specific Elective (DSE)
(4 papers including the Project) DSE-1 to
DSE-4 (6 Credits each)

CLASSICAL DYNAMICS
(Credits: Theory-05, Tutorial-01) Theory: 50
Classes (1 hr. duration)

The emphasis of the course is on applications in solving problems of interest to physicists. Students are to be examined on the basis of problems, seen and unseen.

UNIT-I

Classical Mechanics of Point Particles: Generalised coordinates and velocities. Hamilton's Principle, Lagrangian and Euler-Lagrange equations. Applications to simple systems such as coupled oscillators. Canonical momenta & Hamiltonian. **Hamilton's equations of motion.** Applications: Hamiltonian for a harmonic oscillator, particle in a central force field. **Motion of charged particles in external electric and magnetic fields.** (25 Lectures)

UNIT-II

Special Theory of Relativity: Postulates of Special Theory of Relativity. **Lorentz Transformations.** Minkowski space. The invariant interval, light cone and world lines. Space-time diagrams. **Time-dilation, length contraction & twin paradox.** Four-vectors: space-like, time-like & light-like. Four-velocity and acceleration. Metric and alternating tensors. Four-momentum and energy-momentum relation. Doppler effect from a four vector perspective. Concept of four-force. **Conservation of four-momentum.** Relativistic kinematics. **Application to two-body decay of an unstable particle.** (25 Lectures) **Reference Books:**

1. Classical Mechanics, H.Goldstein, C.P. Poole, J.L. Safko, 3rd Edn. 2002, Pearson Education.
2. Mechanics, L. D. Landau and E. M. Lifshitz, 1976, Pergamon.
3. Classical Mechanics: An introduction, Dieter Strauch, 2009, Springer.
4. Solved Problems in classical Mechanics, O.L. Delange and J. Pierrus, 2010, Oxford Press
5. Classical Mechanics-J. C.Upadhyay (Himalaya Publication) 2014
6. Classical Dynamics of Particles and Systems S. T. Thornton (Cengage Learning) 2012
7. Introduction to Classical Mechanics-R. K. Takwale, S.Puranik-(Tata Mc Graw Hill)
8. Classical Mechanics-M. Das, P.K.Jena, M. Bhuyan, R.N.Mishra (Srikrishna Prakashan)

NUCLEAR & PARTICLE PHYSICS
(Credits: Theory-05, Tutorials-01) Theory: 50
Classes (1 hr. duration)

UNIT-I

General Properties of Nuclei: Constituents of nucleus and their Intrinsic properties, quantitative facts about mass, radii, charge density (matter density), binding energy, average binding energy and its variation with mass number, main features of binding energy versus mass number curve, N/A plot, angular momentum, parity, magnetic moment, electric moments, nuclear excited states. **Nuclear Models:** Liquid drop model approach, semi empirical mass formula and significance of its various terms, condition of nuclear stability, two nucleon separation energies, evidence for nuclear shell structure, nuclear magic numbers, basic assumption of shell model,

Radioactivity decay: (a) α -decay: basics of α -decay processes, theory of α -emission, Gamow factor, Geiger Nuttall law. (b) β -decay: energy kinematics for β -decay, positron emission, electron capture, neutrino hypothesis. (c) Elementary idea of Gamma decay.

Nuclear Reactions: Types of Reactions, Conservation Laws, kinematics of reactions, Q-value, (25 Lectures)

UNIT-II

Detector for Nuclear Radiations: Gas detectors: estimation of electric field, mobility of particle, for ionization chamber and GM Counter. Basic principle of Scintillation Detectors and construction of photo-multiplier tube (PMT). Semiconductor Detectors (Si and Ge) for charge particle and photon detection (concept of charge carrier and mobility), neutron detector.

Particle Accelerators: Van-de Graaff generator (Tandem accelerator), Linear accelerator, Cyclotron, Synchrotrons.

Particle physics: Particle interactions; basic features, types of particles and its families. Symmetries and Conservation Laws: energy and momentum, angular momentum, parity, baryon number, Lepton number, Isospin, Strangeness and charm. Elementary ideas of quarks and gluons. (25 Lectures)

Reference Books:

1. Introductory nuclear Physics by Kenneth S. Krane (Wiley India Pvt. Ltd., 2008).
2. Concepts of nuclear physics by Bernard L. Cohen. (Tata Mcgraw Hill, 1998).
3. Introduction to High Energy Physics, D.H. Perkins, Cambridge Univ. Press
4. Introduction to Elementary Particles, D. Griffith, John Wiley & Sons
5. Basic ideas and concepts in Nuclear Physics - An Introductory Approach by K. Heyde (IOP-Institute of Physics Publishing, 2004).
6. Theoretical Nuclear Physics, J.M. Blatt & V.F. Weisskopf (Dover Pub.Inc., 1991)
7. Atomic and Nuclear Physics -A. B. Gupta, Dipak Ghosh. (Books and Allied Publishers)
8. Physics of Atoms and Molecules Bransden (Pearson India) 2003
9. Subatomic Physics - Henley and Gracia (World Scientific) 2012

10. Introduction to Nuclear and Particle Physics-A.Das and T.Ferbel (World Scientific)

11. Radiation detection and measurement, G.F. Knoll (John Wiley & Sons, 2000).

COMPUTATIONAL PHYSICS

(Credits: Theory-05, Tutorials-01) Theory: 50
Classes (1 hr. duration)

The aim of this course is not just to teach computer programming and numerical analysis but to emphasize its role in solving problems in Physics.

- Highlights the use of computational methods to solve physical problems
- Use of computer language as a tool in solving physics problems (applications)
- Course will consist of hands on training on the Problem solving on Computers.

UNIT-I

Introduction: Importance of computers in Physics, paradigm for solving physics problems for solution. Usage of linux as an Editor. **Algorithms and Flowcharts:** Algorithm- Definition, properties and development. Flowchart- Concept of flowchart, symbols, guidelines, types. Examples: Cartesian to Spherical Polar Coordinates, Roots of Quadratic Equation, Sum of twomatrices, Sum and Product of a finite series, calculation of $\sin(x)$ as a series, algorithm for plotting (1) lissajous figures and (2) trajectory of a projectile thrown at an angle with the horizontal.

Scientific Programming: Some fundamental Linux Commands (Internal and External com- mands). Development of FORTRAN, Basic elements of FORTRAN: Character Set, Constants and their types, Variables and their types, Keywords, Variable Declaration and concept of instruction and program. Operators: Arithmetic, Relational, Logical and Assignment Operators. Expressions: Arithmetic, Relational, Logical, Character and Assignment Expressions. Fortran Statements: I/O Statements (unformatted/formatted), Executable and Non-Executable Statements, Layout of For- tran Program, Format of writing Program and concept of coding, Initialization and Replacement Logic. Examples from physics problems. (25 Lectures)

UNIT-II

Control Statements: Types of Logic (Sequential, Selection, Repetition), Branching Statements (Logical IF, Arithmetic IF, Block IF, Nested Block IF, SELECT CASE and ELSE IF Ladder state- ments), Looping Statements (DO-CONTINUE, DO-ENDDO, DOWHILE, Implied and Nested DO Loops), Jumping Statements (Unconditional GOTO, Computed GOTO, Assigned GOTO) Sub- scripted Variables (Arrays: Types of Arrays, DIMENSION Statement, Reading and Writing Arrays), Functions and Subroutines (Arithmetic Statement Function, Function Subprogram and Subroutine), RETURN, CALL, COMMON and EQUIVALENCE Statements), Structure, Disk I/O Statements, open a file, writing in a file, reading from a file. Examples from physics problems.

Programming:

1. Exercises on syntax on usage of FORTRAN
2. To print out all natural even/ odd numbers between given limits.
3. To find maximum, minimum and range of a given set of numbers.
4. To find a set of prime numbers and Fibonacci series.

(25 Lectures)

Reference Books:

1. Introduction to Numerical Analysis, S.S. Sastry, 5th Edn., 2012, PHI Learning Pvt. Ltd.
2. Computer Programming in Fortran 77. V. Rajaraman (Publisher: PHI).
3. Schaums Outline of Theory and Problems of Programming with Fortran, S Lipsdutz and A Poe, 1986Mc-Graw Hill Book Co.
4. Computational Physics: An Introduction, R. C. Verma, et al. New Age International Publish- ers, New Delhi(1999)
5. A first course in Numerical Methods, U.M. Ascher and C. Greif, 2012, PHI Learning
6. Elementary Numerical Analysis, K.E. Atkinson, 3 rd Edn., 2007, Wiley India Edition.

NANO MATERIALS & APPLICATIONS

**(Credits: Theory-05, Tutorial-01) Theory: 50
Classes (1 hr. duration)**

UNIT-I

Nanoscale Systems: Length scales in physics, Nanostructures: 1D, 2D and 3D nanostructures (nanodots, thin films, nanowires, nanorods), Band structure and density of states of materials at nanoscale, Size Effects in nano systems, Quantum confinement: Applications of Schrodinger equation- Infinite potential well, potential step, potential box, quantum confinement of carriers in 3D, 2D, 1D nanostructures and its consequences.

Synthesis Of Nanostructure Materials: Top down and Bottom up approach, Photolithogra- phy. Ball milling. Gas phase condensation. Vacuum deposition. Physical vapor deposition (PVD): Thermal evaporation, E-beam evaporation, Pulsed Laser deposition. Chemical vapor deposition (CVD). Sol-Gel. Electro deposition. Spray pyrolysis. Hydrothermal synthesis. Preparation through colloidal methods. MBE growth of quantum dots. (25 Lectures)

UNIT-II

Characterization: X-Ray Diffraction. Optical Microscopy. Scanning Electron Microscopy. Trans- mission Electron Microscopy. Atomic Force Microscopy. Scanning Tunneling Microscopy.

Applications: Applications of nanoparticles, quantum dots, nanowires and thin films for photonic devices (LED, solar cells). Single electron devices (no derivation). CNT based transistors. Nano- material Devices: Quantum dots heterostructure lasers, optical switching and optical data storage. Magnetic quantum well; magnetic dots - magnetic data storage. Micro Electromechanical Systems (MEMS), Nano Electromechanical Systems (NEMS). (25 Lectures)

Reference books:

1. C.P. Poole, Jr. Frank J. Owens, Introduction to Nanotechnology (Wiley India Pvt. Ltd.).
2. S.K. Kulkarni, Nanotechnology: Principles & Practices (Capital Publishing Company)

3. K.K. Chattopadhyay and A. N. Banerjee, Introduction to Nanoscience and Technology (PHI Learning Private Limited).
4. Richard Booker, Earl Boysen, Nanotechnology (John Wiley and Sons).
5. M. Hosokawa, K. Nogi, M. Naita, T. Yokoyama, Nanoparticle Technology Handbook (Elsevier, 2007).
6. Bharat Bhushan, Springer Handbook of Nanotechnology (Springer-Verlag, Berlin, 2004).
7. Nanotechnology- Rakesh Rathi (S Chand & Company, New Delhi)

BIO-PHYSICS

**(Credits: Theory-05, Tutorials-01) Theory: 50
Classes (1 hr. duration)**

UNIT-I

Building Blocks & Structure of Living State: Atoms and ions, molecules essential for life, what is life. Living state interactions: Forces and molecular bonds, electric & thermal interactions, electric dipoles, Casimir interactions, domains of physics in biology.

Heat Transfer in bio-materials: Heat Transfer Mechanism, The Heat equation, Joule heating of tissue.

Living State Thermodynamics: Thermodynamic equilibrium, first law of thermodynamics and conservation of energy. Entropy and second law of thermodynamics, Physics of many particle systems, Two state systems, continuous energy distribution, Composite systems, Casimir contribution of free energy, Protein folding and unfolding. (25 Lectures)

UNIT-II

Open systems and chemical thermodynamics: Enthalpy, Gibbs Free Energy and chemical potential, activation energy and rate constants, enzymatic reactions, ATP hydrolysis & synthesis, Entropy of mixing, The grand canonical ensemble, Hemoglobin.

Diffusion and transport: Maxwell-Boltzmann statistics, Fick's law of diffusion, sedimentation of Cell Cultures, diffusion in a centrifuge, diffusion in an electric field, Lateral diffusion in membranes, Navier-Stokes equation, low Reynolds Number Transport, Active and passive membrane transport. **Fluids:** Laminar and turbulent fluid flow, Bernoulli's equation, equation of continuity, Venturi effect, Fluid dynamics of circulatory systems, capillary action.

Bio-energetics and Molecular motors: Kinesins, Dyneins, and microtubule dynamics, Brownian motion, ATP synthesis in Mitochondria, Photosynthesis in Chloroplasts, Light absorption in biomolecules, vibrational spectra of bio-biomolecules. (25 Lectures)

Reference Books:

1. Introductory Biophysics, J. Claycomb, JQP Tran, Jones & Bartlett Publishers
2. Aspects of Biophysics, Hugh S W, John Wiley and Sons.
3. Essentials of Biophysics by P Narayanan, New Age International.

4. Molecular Biophysics- P.K.Banarjee (S. Chand Publication), 2014.
5. Essentials of Biophysics : P. Narayanan, (New Age International, New Delhi), 2005 .
6. Biophysics: An introduction : Rodney Cotterill, John Wiley and Sons Ltd, 2002.
7. Biophysics- Dr.G.R.Chatwal (Himalaya Pub.),2011.

**Project Work (Credits:
06) (Compulsory)**

SKILL ENHANCEMENT COURSE
(Credit: 04 each)- SEC-1 and SEC-2

1- Communicative English and English Writing Skill(Compulsory) (Credits: 02)
Theory: 20 Classes (1 hr.duration)

2-BASIC INSTRUMENTATION SKILLS
(Credits: 02)
Theory: 20 Classes (1 hr. duration)

This course is to get exposure with various aspects of instruments and their usage through hands-on mode. Experiments listed below are to be done in continuation of the topics.

UNIT-I

Basic of Measurement: Instruments accuracy, precision, sensitivity, resolution range etc. Errors in measurements and loading effects.

Multimeter: Principles of measurement of dc voltage and dc current, ac voltage, ac current and resistance. Specifications of a multimeter and their significance.

Electronic Voltmeter: Advantage over conventional multimeter for voltage measurement with respect to input impedance and sensitivity. Principles of voltage, measurement (block diagram only). Specifications of an electronic Voltmeter/ Multimeter and their significance.

AC millivoltmeter: Type of AC millivoltmeters: Amplifier- rectifier, and rectifier- amplifier. Block diagram ac millivoltmeter, specifications and their significance.

Cathode Ray Oscilloscope: Block diagram of basic CRO. Construction of CRT, Electron gun, electrostatic focusing and acceleration (Explanation only no mathematical treatment), brief discussion on screen phosphor, visual persistence & chemical composition. Time base operation, synchronization. Front panel controls. Specifications of a CRO and their significance. Use of CRO for the measurement of voltage (dc and ac frequency, time period. Special features of dual trace, introduction to digital oscilloscope, probes. Digital storage Oscilloscope: Block diagram and principle of working. (10 Lectures)

UNIT-II

Signal Generators and Analysis Instruments: Block diagram, explanation and specifications of low frequency signal generators. pulse generator, and function generator. Brief idea for testing, specifications. Distortion factor meter, wave analysis.

Digital Instruments: Principle and working of digital meters. Comparison of analog & digital instruments. Characteristics of a digital meter. Working principles of digital voltmeter.

Digital Multimeter: Block diagram and working of a digital multimeter. Working principle of time interval, frequency and period measurement using universal counter/ frequency counter, time- base stability, accuracy and resolution. (10 Lectures)

The test of lab skills will be of the following test items:

1. Use of an oscilloscope.
2. CRO as a versatile measuring device.
3. Circuit tracing of Laboratory electronic equipment,
4. Use of Digital multimeter/VTVM for measuring voltages
5. Circuit tracing of Laboratory electronic equipment,
6. Winding a coil / transformer.
7. Study the layout of receiver circuit.
8. Trouble shooting a circuit
9. Balancing of bridges

Laboratory Exercises:

1. To observe the loading effect of a multimeter while measuring voltage across a low resistance and high resistance.
2. To observe the limitations of a multimeter for measuring high frequency voltage and currents.
3. To measure Q of a coil and its dependence on frequency, using a Q- meter.
4. Measurement of voltage, frequency, time period and phase angle using CRO.
5. Measurement of time period, frequency, average period using universal counter/ frequency counter.
6. Measurement of rise, fall and delay times using a CRO.
7. Measurement of distortion of a RF signal generator using distortion factor meter.
8. Measurement of R, L and C using a LCR bridge/ universal bridge.

Open Ended Experiments:

1. Using a Dual Trace Oscilloscope.
2. Converting the range of a given measuring instrument (voltmeter, ammeter).

Reference Books:

1. A text book in Electrical Technology - B L Theraja - S Chand and Co.
2. Performance and design of AC machines - M G Say ELBS Edn.
3. Digital Circuits and systems, Venugopal, 2011, Tata McGraw Hill.
4. Logic circuit design, Shimon P. Vingron, 2012, Springer.

5. Digital Electronics, Subrata Ghoshal, 2012, Cengage Learning.
6. Electronic Devices and circuits, S. Salivahanan & N. S.Kumar, 3rd Ed., 2012, Tata Mc-Graw Hill.
7. Electronic circuits: Handbook of design and applications, U.Tietze, Ch.Schenk, 2008, Springer
8. Electronic Devices, 7/e Thomas L. Floyd, 2008, Pearson India.

3-RENEWABLE ENERGY & ENERGY HARVESTING

(Credits: 02)

Theory: 20 Classes (1hr duration)

The aim of this course is not just to impart theoretical knowledge to the students but to provide them with exposure and hands-on learning wherever possible.

UNIT-I

Fossil fuels and Alternate Sources of energy: Fossil fuels and nuclear energy, their limitation, need of renewable energy, non-conventional energy sources. An overview of developments in Offshore Wind Energy, Tidal Energy, Wave energy systems, Ocean Thermal Energy Conversion, solar energy, biomass, biochemical conversion, biogas generation, geothermal energy tidal energy, Hydroelectricity.

Solar energy: Solar energy, its importance, storage of solar energy, solar pond, non plate collector, solar distillation, solar cooker, solar green houses, solar cell, absorption air conditioning. Need and characteristics of photovoltaic (PV) systems, PV models and equivalent circuits, and sun tracking systems.(10 Lectures)

UNIT-II

Wind Energy harvesting: Fundamentals of Wind energy, Wind Turbines and different electrical machines in wind turbines, Power electronic interfaces, and grid interconnection topologies.

Ocean Energy: Ocean Energy Potential against Wind and Solar, Wave Characteristics and Statistics, Wave Energy Devices. Tide characteristics and Statistics, Tide Energy Technologies, Ocean Thermal Energy, Osmotic Power, Ocean Bio-mass. Geothermal Energy: Geothermal Resources, Geothermal Technologies.

Hydro Energy: Hydropower resources, hydropower technologies, environmental impact of hydro power sources. (10 Lectures)

Reference Books:

1. Non-conventional energy sources - G.D Rai - Khanna Publishers, New Delhi
2. Solar energy - M P Agarwal - S Chand and Co. Ltd.
3. Solar energy - Suhas P Sukhative Tata McGraw - Hill Publishing Company Ltd.
4. Godfrey Boyle, Renewable Energy, Power for a sustainable future, 2004, Oxford University Press, in association with The Open University.
5. Dr. P Jayakumar, Solar Energy: Resource Assesment Handbook, 2009

6. J.Balfour, M.Shaw and S. Jarosek, Photovoltaics, Lawrence J Goodrich (USA).

7. [http://en.wikipedia.org/wiki/Renewable energy](http://en.wikipedia.org/wiki/Renewable_energy).

4-APPLIED OPTICS

(Credits: 02)

THEORY: 20 Classes (1 hr. duration)

Theory includes only qualitative explanation. Minimum five experiments should be performed covering minimum three sections.

UNIT-I

Sources and Detectors: Lasers, Spontaneous and stimulated emissions, Theory of laser action, Einsteins coefficients, Light amplification, Characterization of laser beam, He-Ne laser, Semiconductor lasers.

Elementary ideas of Fourier Optics.

Concept of Spatial frequency filtering, Fourier transforming property of a thin lens. (10 Lectures)

UNIT-II

Holography

Basic principle and theory: coherence, resolution, Types of holograms, white light reflection hologram, application of holography in microscopy, interferometry, and character recognition.

Photonics: Fibre Optics

Optical fibres and their properties, Principal of light propagation through a fibre, The numerical aperture, Attenuation in optical fibre and attenuation limit, Single mode and multimode fibres, Fibre optic sensors: Fibre Bragg Grating. (10 Lectures)

Reference Books:

1. Fundamental of optics, F. A. Jenkins & H. E. White, 1981, Tata McGraw Hill.
2. LASERS: Fundamentals & applications, K.Thyagrajan & A.K.Ghatak, 2010, Tata McGraw Hill
3. Fibre optics through experiments, M.R.Shenoy, S.K.Khijwania, et.al. 2009, Viva Books.
4. Nonlinear Optics, Robert W. Boyd, (Chapter-I), 2008, Elsevier.
5. Optics, Karl Dieter Moller, Learning by computing with model examples, 2007, Springer.
6. Optical Systems and Processes, Joseph Shamir, 2009, PHI Learning Pvt. Ltd.
7. Optoelectronic Devices and Systems, S.C. Gupta, 2005, PHI Learning Pvt. Ltd.
8. Optical Physics, A.Lipson, S.G.Lipson, H.Lipson, 4th Edn., 1996, Cambridge Univ. Press.
9. Optics E.Hecht, (Pearson India).

GENERIC ELECTIVE (GE) (Minor-Physics)
For other Departments/Disciplines-(Credit: 06 each)

**GE:I-MECHANICS & PROPERTIES OF MATTER, OSCILLATION & WAVES,
THERMAL PHYSICS, ELECTRICITY, MAGNETISM & ELECTRONICS**

(Credits: Theory - 04, Practicals 02)

Theory: 40 classes (1 hr. duration each)-Full Marks: 70

UNIT-I: Mechanics & Properties of Matter

Moment of Inertia Parallel axis and perpendicular axis theorem, M.I. of a Solid sphere and Solid cylinder, Gravitational potential and field due to a thin spherical shell and a solid sphere at external points and internal points. Relation among elastic constants, depression at free end of a light cantilever. Surface tension, pressure difference across a curved membrane, viscous flow, Poiseulle's formula. (8 classes) 14 Marks

UNIT-II: Oscillation and Waves

Simple harmonic motion, damped harmonic motion, under damped, over damped and critically damped motion, Forced vibration, Resonance. Wave equation in a medium, Velocity of Longitudinal waves in an elastic medium and velocity of transverse wave in a stretched string. Composition of SHM, Lissajous figures for superposition of two orthogonal simple harmonic vibrations (a) with same frequency, (b) frequency with 2:1. (8 classes) 14 Marks

UNIT-III: Thermal Physics

Entropy, change in entropy in reversible and irreversible process, Carnot engine and its efficiency. Carnot Theorem, Second law of thermodynamics, Kelvin-Planck, Clausius formula. Thermal conductivity, differential equation for heat flow in one dimension. Maxwell thermodynamic relation (statement only), Clausius-Clapeyron equation. Black body radiation, Planck radiation formula (No derivation). (8 classes) 14 Marks

UNIT-IV: Electricity and Magnetism

Gauss law of electrostatics, use of Gauss law to compute electrostatic field due to a linear charge distribution. Magnetic induction B, Lorentz force law. Biot-Savart's law, Magnetic induction due to long straight current carrying conductor, and in the axis of a current carrying circular coil. Ampere's Circuital law, its differential form. The law of electromagnetic equations, its differential and integral form. Maxwell's electro-magnetic equations and their physical significance.

Growth and decay of currents in LR and RC circuits, time constant, alternating currents in RC, RL and LCR circuits, impedance, power factor, resonance. (8 classes) 14 Marks

UNIT-V: Electronics

Extrinsic and intrinsic semiconductors, P-type and N-type semiconductors. PN-Junction as rectifier, Half wave and Full wave rectifiers (Bridge type), efficiency, ripple factor, use of RC, LC, and filters, working of PNP and NPN transistors, transistor configurations in CE and CB circuits and relation between α and β . JFET, its operation and characteristics of V-I curve. (8 classes) 14 Marks

Reference Books:

1. Properties of Matter D.S. Mathur (S. Chand Publication).
2. Heat and Thermodynamics A.B. Gupta & H.B. Ray (New Central Book Agency).
3. Sound M. Ghosh (S. Chand Publication).
4. Introduction to Electrodynamics D.I. Griffith (Prentice Hall of India).
5. Foundations of Electronics Chattopadhyaya and Rakshit.
6. Physics of Degree students Vol.I M. Das, P.K. Jena, M. Bhuyan, D.K. Rout (Srikrishna Prakashan).
7. Physics of Degree students Vol.I M. Das, P.K. Jena, M. Bhuyan, and others (Srikrishna Prakashan).
8. University Physics Sears, Zemansky, H.D. Young (Addison Wesley).

GE:I LAB.

20 classes (2 hours duration each)-Full Marks: 30

1. Measurement of length (or diameter) using Vernier calipers, Screw gauge and travelling microscope.
2. To determine the moment of inertia of a fly wheel.
3. To determine the Young's modulus Y of a wire by Searls method.
4. To determine the modulus of rigidity of a wire by Maxwells needle/Torsion Pendulum (Dynamic method).
5. To determine g by bar pendulum.
6. To determine the elastic constants of a wire by Searls method.
7. To determine the value of Y of a rubber by using travelling microscope.
8. To determine the Rigidity of modulus by static method.
9. To determine the frequency of a telescope by using Sonometer.
10. Verification of Laws of Vibration of a string by using Sonometer.
11. To compare capacitances using DeSauty bridge.
12. To determine the Law of resistance by using Foster bridge.
13. To determine the Mechanical equivalent of heat J by Callender and Barnes constants flow method.
14. To determine the J by Joules Calorimeter.
15. To determine the coefficient of viscosity of water by Capillary flow method (Poiseilles method).
16. Compare the specific heat of two liquids by method of Cooling.

Reference Books:

1. Advanced Practical Physics for students, B.L.Flint & H.T.Worsnop, 1971, Asia Publishing House B.B. Swain.
2. A Laboratory Manual of Physics for Undergraduate Classes, D.P.Khandelwal (1985), VaniPublication.
3. A Text book of Practical Physics, Indu Prakash and Ramakrishna, 11th Edition (2011), Kitab Mahal, New Delhi.

GE:II-OPTICS, SPECIAL THEORY OF RELATIVITY, ATOMIC PHYSICS, QUANTUM MECHANICS & NUCLEAR PHYSICS

(Credits: Theory - 04, Practicals 02) Theory:
40 classes (1hr duration each)-Full Marks: 70

UNIT-I: Optics-I

Elementary ideas of monochromatic aberrations and their minimization, chromatic aberration, achromatic combination. Theory of formation of Primary and Secondary rainbow. Condition of interference. Coherent sources. Youngs Double Slit experiment. Biprism and measurement of wave length of light of by it. Colour of thin films and Newtons rings. Fresnel and Fraunhofer diffraction, diffraction by Single slit Plane transmission grating.(8 classes) 14 Marks

UNIT-II: Optics-II and Relativity

Electromagnetic nature of light, polarized and unpolarized light, polarization by reflection and refraction. Brewsters Law, Malus Law, Double refraction. Ordinary and extraordinary rays. Galilean transformation, Newtonian relativity and its limitation, Michelson Morley experiment and its consequence, postulates of special theory of relativity. Lorentz transformation, length contraction, time dilation, relativistic mass and momentum, mass energy relation.(8 classes) 14 Marks

UNIT-III: Atomic Physics

Inadequacy of classical physics, brief outline of Rayleigh Jeans theory and Plancks quantum theory of radiation, particle nature of electromagnetic radiation photo electric effect, Compton effect, dual nature of radiation, wave nature of particles, de-Broglie hypothesis, matter wave, wave-particle duality, Davisson-Germer experiment.

Bohrs theory of Hydrogen atom, explanation of Hydrogen Spectra correction for finite mass of the nucleus. Bohrs correspondence principle, limitations of Bohrs theory. Discrete energy, exchange by atom Frank Hertz experiment.(8 classes) 14 Marks

UNIT-IV: Quantum Mechanics

Heisenbergs Uncertainty relation. Time dependent Schrodingers wave equation in one dimension and three dimensions. The physical interpretation of the wave function. Probability density and probability current density. Equation of continuity. Normalization of the Wave function, Expectation value of an observable, Ehrenfests theorem.

Time independent Schrodingers wave equation in one dimension particle in a box, energy eigen values and eigen functions.(8 classes) 14 Marks

UNIT-V: Nuclear Physics

Properties of the nucleus Charge, Size, Spin, Magnetic Moment, Mass, Mass defect, Binding energy, Packing fraction, Nuclear force, and its characteristics features. Radioactive decay laws, average life, half life, nuclear fission, nuclear fusion, Linear accelerators, and cyclotron.(8 classes) 14 Marks

Reference Books:

1. Principles of Optics A.B. Gupta.
2. Fundamentals of Optics Jenkins and White.
3. Relativity R. Resnick.
4. Modern Physics H.S. Mani and G.K. Meheta.

5. Quantum Mechanics J.L. Powel and B. Craseman.
6. Atomic and Nuclear Physics Gupta and Ghosh (Books and allied).
7. Physics of Degree students Vol. III M. Das, P.K. Jena and others (SrikrishnaPrakashan).
8. Physics of Degree students Vol. IV M. Das, P.K. Jena and others (SrikrishnaPrakashan).
9. Concept of Modern Physics Arthur Beiser (Mc-graw Hill) (2009).
10. University Physics Sears, Zemansky, H.D. Young (Addison Wesley).

GE:II LAB.

20 classes (2 hours duration each)-Full Marks: 30

1. Determination of Horizontal component of Earths magnetic field and magnetic moment of a bar magnet using deflection and oscillation magnetometer.
2. Determination of E.C.E. of a Copper by taking 3 readings.
3. Familiarization with Schuster focusing and determination of angle of prism.
4. Determination of Refractive index of the material of a prism using Sodium light.
5. To determine the wavelength of light using plane diffraction grating.
6. To determine the wavelength of light using Newtons ring.
7. Determination of refractive index of (a) glass and (b) liquid by using travelling microscope.
8. Determination of radius of curvature of a convex/concave mirror by using Kohlrauschs method.
9. To determine the magnifying power of a given telescope.
10. Verification of inverse square law of magnetism by using a deflection magnetometer.
11. To draw the static characteristics of a P-N junction diode.
12. Obtain the static characteristics of a P-N-P / N-P-N transistor / Triode Valve.
13. To determine the reduction factor of a tangent Galvanometer.
14. Variation of magnetic field along the axis of a circular coil carrying current.
15. To study the characteristics of a series RC circuit.

Reference Books:

1. Advanced Practical Physics for students, B.L.Flint & H.T.Worsnop, 1971, Asia Publishing House.
2. A Laboratory Manual of Physics for Undergraduate Classes, D.P.Khandelwal (1985), VaniPublication.
3. A Text book of Practical Physics, Indu Prakash And Ramakrishna, 11th Edition (2011), Kitab Mahal, New Delhi.

PHYSICS(PASS)

SEMESTER-I

DSC 1A: MECHANICS

(Credits: Theory-04, Practicals-02) Theory:
40 Classes (1 hr. duration)-Marks: 70

UNIT-I

Vectors: Vector algebra. Scalar and vector products. Derivatives of a vector with respect to a parameter. (2 Lectures)

Ordinary Differential Equations: 1st order homogeneous differential equations. 2nd order homogeneous differential equations with constant coefficients. (2 Lectures)

Laws of Motion: Frames of reference. Newtons Laws of motion. Dynamics of a system of particles. Centre of Mass. (4 Lectures)

Momentum and Energy: Conservation of momentum. Work and energy. Conservation of energy. Motion of rockets. (2 Lectures)

Rotational Motion: Angular velocity and angular momentum. Torque. Conservation of angular momentum. (3 Lectures)

Gravitation: Newtons Law of Gravitation. Motion of a particle in a central force field (motion is in a plane, angular momentum is conserved, areal velocity is constant). Keplers Laws (statement only). Satellite in circular orbit and applications. Geosynchronous orbits. Basic idea of global positioning system (GPS). Weightlessness. Physiological effects on astronauts. (7 Lectures)

UNIT-II

Oscillations: Simple harmonic motion. Differential equation of SHM and its solutions. Kinetic and Potential Energy, Total Energy and their time averages. Damped oscillations. (6 Lectures) **Elasticity:**

Hooke's law - Stress-strain diagram - Elastic moduli-Relation between elastic constants - Poissons Ratio-Expression for Poissons ratio in terms of elastic constants - Work done in stretching and work done in twisting a wire - Twisting couple on a cylinder - Determination of Rigidity modulus by static torsion - Torsional pendulum-Determination of Rigidity modulus and moment of inertia - q , η and σ by Searles method. (8 Lectures)

Special Theory of Relativity: Constancy of speed of light. Postulates of Special Theory of Relativity. Length contraction. Time dilation. Relativistic addition of velocities. (6 Lectures)

Note: *Students are not familiar with vector calculus. Hence all examples involve differentiation either in one dimension or with respect to the radial coordinate.*

Reference Books:

1. University Physics. F.W. Sears, M.W. Zemansky and H.D. Young, 13/e, 1986. Addison- Wesley
2. Mechanics Berkeley Physics, v.1: Charles Kittel, et. al. 2007, Tata McGraw-Hill.

3. Physics Resnick, Halliday & Walker 9/e, 2010, Wiley
4. University Physics, Ronald Lane Reese, 2003, Thomson Brooks/Cole.
5. Properties of Matter - D.S. Mathur (S.Chand publication) 2013
6. Mechanics- D.C.Tayal (Himalaya Publication) 2013
7. Classical Dynamics of Particles and Systems S. T. Thornton (Cengage Learning) 2012
8. Analytical Mechanics-Fowles (Cengage Learnings) 2014

DSC 1A-LAB: MECHANICS

20 Classes (2 hrs. duration)-Marks:30

1. Measurements of length (or diameter) using vernier caliper, screw gauge and travelling microscope.
2. To determine the Height of a Building using a Sextant.
3. To determine the Moment of Inertia of a Flywheel.
4. To determine the Young's Modulus of a Wire by Optical Lever Method.
5. To determine the Modulus of Rigidity of a Wire by Maxwells needle.
6. To determine the Elastic Constants of a Wire by Searles method.
7. To determine g by Bar Pendulum.
8. To determine g by Katers Pendulum.
9. To study the Motion of a Spring and calculate (a) Spring Constant, (b) g.

Reference Books:

1. Advanced Practical Physics for students, B.L. Flint and H.T. Worsnop, 1971, Asia Publishing House.
2. Advanced level Physics Practicals, Michael Nelson and Jon M. Ogborn, 4th Edition, reprinted 1985, Heinemann Educational Publishers.
3. A Text Book of Practical Physics, Indu Prakash and Ramakrishna, 11th Edition, 2011, Kitab Mahal, New Delhi.

SEMESTER-II

DSC 1B: ELECTRICITY, MAGNETISM AND EMT

(Credits: Theory-04, Practicals-02) Theory:
40 Classes (1 hr. duration)-Marks:70

UNIT-I

Vector Analysis: Scalar and Vector product, gradient, divergence, Curl and their significance, Vector Integration, Line, surface and volume integrals of Vector fields, Gauss-divergence theorem and Stoke's theorem of vectors (statement only). (8 Lectures)

Electrostatics: Electrostatic Field, electric flux, Gauss's theorem of electrostatics. Applications of Gauss theorem- Electric field due to point charge, infinite line of charge, uniformly charged spherical shell and solid sphere, plane charged sheet, charged conductor. Electric potential as line integral of electric field, potential due to a point charge, electric dipole, uniformly charged spherical shell and solid sphere. Calculation of electric field from potential. Capacitance of an isolated spherical conductor. Parallel plate, spherical and cylindrical condenser. Energy per unit volume in electrostatic field. Dielectric medium, Polarisation, Displacement vector. Gauss's theorem in dielectrics. Parallel plate capacitor completely filled with dielectric. (12 Lectures)

UNIT-II

Magnetism:

Magnetostatics: Biot-Savart's law and its applications- straight conductor, circular coil, solenoid carrying current. Divergence and curl of magnetic field. Magnetic vector potential. Ampere's circuital law. Magnetic properties of materials: Magnetic intensity, magnetic induction, permeability, magnetic susceptibility. Brief introduction of dia-, para-and ferromagnetic materials. (6 Lectures)

Electromagnetic Induction: Faraday's laws of electromagnetic induction, Lenz's law, self and mutual inductance, L of single coil, M of two coils. Energy stored in magnetic field. (4 Lectures)

Maxwell's equations and Electromagnetic wave propagation: Equation of continuity of current, Displacement current, Maxwell's equations, Poynting vector, energy density in electro- magnetic field, electromagnetic wave propagation through vacuum and isotropic dielectric medium, transverse nature of EM waves, polarization. (10 Lectures)

Reference Books:

1. Electricity and Magnetism, Edward M. Purcell, 1986, McGraw-Hill Education
2. Electricity & Magnetism, J.H. Fewkes & J.Yarwood. Vol. I, 1991, Oxford Univ. Press
3. Electricity and Magnetism, D C Tayal, 1988, Himalaya Publishing House.
4. University Physics, Ronald Lane Reese, 2003, Thomson Brooks/Cole.
5. D.J.Griffiths, Introduction to Electrodynamics, 3rd Edn, 1998, Benjamin Cummings.
6. Electricity and Magnetism- K.K Tewari (S. Chand Higher Academics)2013
7. Electricity and Magnetism -D. C. Tayal (Himalay Pub.)2014

DSC 1B-LAB: ELECTRICITY, MAGNETISM AND EMT

20 Classes (2 hrs. duration)-Marks:30

1. To use a Multimeter for measuring (a) Resistances, (b) AC and DC Voltages, (c) DC Current, and (d) checking electrical fuses.
2. Ballistic Galvanometer:
 - (i) Measurement of charge and current sensitivity
 - (ii) Measurement of CDR
 - (iii) Determine a high resistance by Leakage Method

- (iv) To determine Self Inductance of a Coil by Rayleighs Method. 3. To compare capacitances using DeSautys bridge.
4. Measurement of field strength B and its variation in a Solenoid (Determine dB/dx) 5. To study the Characteristics of a Series RC Circuit.
6. To study a series LCR circuit LCR circuit and determine its (a) Resonant frequency, (b) Quality factor
7. To study a parallel LCR circuit and determine its (a) Anti-resonant frequency and (b) Quality factor Q
8. To determine a Low Resistance by Carey Fosters Bridge.
9. To verify the Thevenin and Norton theorems.
10. To verify the Superposition, and Maximum Power Transfer Theorems.

Reference Books:

1. Advanced Practical Physics for students, B.L.Flint & H.T.Worsnop, 1971, Asia Publishing House.
2. Advanced level Physics Practicals, Michael Nelson and Jon M. Ogborn, 4th Edition, reprinted 1985, Heinemann Educational Publishers
3. A Text Book of Practical Physics, I.Prakash & Ramakrishna, 11th Ed.2011, Kitab Mahal

SEMESTER-III

DSC 1C: THERMAL PHYSICS AND STATISTICAL MECHANICS

(Credits: Theory-04, Practicals-02) Theory:

40 Classes (1 hr. duration)-Marks: 70

UNIT-I

Laws of Thermodynamics: Thermodynamic Description of system: Zeroth Law of thermo- dynamics and temperature. First law and internal energy, conversion of heat into work, Various Thermodynamical Processes, Applications of First Law: General Relation between CP and CV, Work Done during Isothermal and Adiabatic Processes, Compressibility and Expansion Coefficient, Reversible and irreversible processes, Second law and Entropy, Carnots cycle & theorem, Entropy changes in reversible & irreversible processes, Entropy-temperature diagrams, Third law ofthermo- dynamics, Unattainability of absolute zero. (10 Lectures)

Thermodynamical Potentials: Enthalpy, Gibbs, Helmholtz and Internal Energy functions, Maxwells relations and applications - Joule-Thompson Effect, Clausius- Clapeyron Equation, Ex- pression for (CP CV), CP/CV, TdS equations. (10 Lectures)

UNIT-II

Kinetic Theory of Gases: Derivation of Maxwells law of distribution of velocities and its exper- imental verification, Mean free path (Zeroth Order), Transport Phenomena: Viscosity, Conduction and Diffusion (for vertical case), Law of equipartition of energy (no derivation) and its applications to specific heat of gases; mono-atomic and diatomic gases. (10 Lectures)

Theory of Radiation: Blackbody radiation, Spectral distribution, Concept of Energy Density,

Derivation of Planck's law, Deduction of Wiens distribution law, Rayleigh- Jeans Law, Stefan Boltzmann Law and Wiens displacement law from Plancks law. (6 Lectures)

Statistical Mechanics: Maxwell-Boltzmann law - distribution of velocity - Quantum statistics- Phase space - Fermi-Dirac distribution law - electron gas - Bose-Einstein distribution law - photon gas - comparison of three statistics. (4 Lectures)

Reference Books:

1. Thermal Physics, S. Garg, R. Bansal and C. Ghosh, 1993, Tata McGraw-Hill.
2. A Treatise on Heat, Meghnad Saha, and B.N. Srivastava, 1969, Indian Press.
3. Thermodynamics, Enrico Fermi, 1956, Courier Dover Publications.
4. Thermodynamics, Kinetic theory & Statistical thermodynamics, F.W.Sears and G.L. Salinger. 1988, Narosa
5. University Physics, Ronald Lane Reese, 2003, Thomson Brooks/Cole.
6. Thermal and Statistical Physics —M. Das , P. K. Jena and others (Sri Krishna Prakashan)
7. Heat and Thermal Physics-Brijlal & Subramaiaam (S.Chand Publication)2014
8. Thermal Physics– C. Kittel and H. Kroemer (McMillan Education India)2010
9. Thermodynamics & Statistical Physics-J.K.Sharma, K.K.Sarkar (Himalaya Pub.)2014

DSC 1C-LAB: THERMAL PHYSICS AND STATISTICAL MECHANICS

20 Classes (2 hrs. duration)-Marks:30

1. To determine Mechanical Equivalent of Heat, J, by Callender and Barnes constant flow method.
2. Measurement of Plancks constant using black body radiation.
3. To determine Stefans Constant.
4. To determine the coefficient of thermal conductivity of Cu by Searles Apparatus.
5. To determine the Coefficient of Thermal Conductivity of Cu by Angstroms Method.
6. To determine the coefficient of thermal conductivity of a bad conductor by Lee and Charltons disc method.
7. To determine the temperature co-efficient of resistance by Platinum resistance thermometer.
8. To study the variation of thermo emf across two junctions of a thermocouple with temperature.
9. To record and analyze the cooling temperature of an hot object as a function of time using a thermocouple and suitable data acquisition system.
10. To calibrate Resistance Temperature Device (RTD) using Null Method/Off- Balance Bridge.

Reference Books:

1. Advanced Practical Physics for students, B.L.Flint & H.T.Worsnop, 1971, Asia Publishing House.

2. A Text Book of Practical Physics, Indu Prakash and Ramakrishna, 11th Edition, 2011, Kitab Mahal, New Delhi.
3. A Laboratory Manual of Physics for Undergraduate Classes, D.P.Khandelwal, 1985, Vani Publication.

SEMESTER-IV

DSC 1D: WAVES AND OPTICS

(Credits: Theory-04, Practicals-02) Theory:
40 Classes (1hr duration)-Marks: 70

UNIT-I

Fluids: Surface Tension- Synclastic and anticlastic surface - Excess of pressure - Application to spherical and cylindrical drops and bubbles - variation of surface tension with temperature - Jaegers method. Viscosity - Rate flow of liquid in a capillary tube - Poiseuilles formula - Determination of coefficient of viscosity of a liquid - Variations of viscosity of liquid with temperature- lubrication. (6 Lectures)

Sound: Simple harmonic motion - forced vibrations and resonance - Fouriers Theorem - Application to saw tooth wave and square wave - Intensity and loudness of sound - Decibels - Intensity levels - musical notes - musical scale. Acoustics of buildings: Reverberation and time of reverberation - Absorption coefficient - Sabines formula - measurement of reverberation time - Acoustic aspects of halls and auditoria. (6 Lectures)

Superposition of Two Perpendicular Harmonic Oscillations: Graphical and Analytical Methods. Lissajous Figures (1:1 and 1:2) and their uses. (2 Lectures)

Waves Motion- General: Transverse waves on a string. Travelling and standing waves on a string. Normal Modes of a string. Group velocity, Phase velocity. Plane waves. Spherical waves, Wave intensity. (2 Lectures)

Wave Optics: Electromagnetic nature of light. Definition and Properties of wave front. Huygens Principle. (2 Lectures)

UNIT-II

Interference: Interference: Division of amplitude and division of wavefront. Youngs Double Slit experiment. Lloyds Mirror and Fresnels Biprism. Phase change on reflection: Stokes treatment. Interference in Thin Films: parallel and wedge-shaped films. Fringes of equal inclination (Haidinger Fringes); Fringes of equal thickness (Fizeau Fringes). Newtons Rings: measurement of wavelength and refractive index. (10 Lectures)

Michelsons Interferometer: (1) Idea of form of fringes (no theory needed), (2) Determination of wavelength, (3) Wavelength difference, (4) Refractive index, and (5) Visibility of fringes. (2 Lectures)

Diffraction: Fraunhofer diffraction- Single slit; Double Slit. Multiple slits and Diffraction grating. Fresnel Diffraction: Half-period zones. Zone plate. Fresnel Diffraction pattern of a straight edge, a slit and a wire using half-period zone analysis. (7 Lectures)

Polarization: Transverse nature of light waves. Plane polarized light production and analysis. Circular and elliptical polarization. (3 Lectures)

Reference Books:

1. Fundamentals of Optics, F.A Jenkins and H.E White, 1976, McGraw-Hill
2. Principles of Optics, B.K. Mathur, 1995, Gopal Printing
3. Fundamentals of Optics, H.R. Gulati and D.R. Khanna, 1991, R. Chand Publications
4. University Physics. F.W. Sears, M.W. Zemansky and H.D. Young. 13/e, 1986. Addison- Wesley.

DSC 1D-LAB: WAVES AND OPTICS

20 Classes (2 hrs. duration)-Marks: 30

1. To investigate the motion of coupled oscillators.
2. To determine the Frequency of an Electrically Maintained Tuning Fork by Melde's Experiment and to verify $2T$ Law.
3. To study Lissajous Figures.
4. Familiarization with Schuster's focussing; determination of angle of prism.
5. To determine the Coefficient of Viscosity of water by Capillary Flow Method (Poiseuille's method).
6. To determine the Refractive Index of the Material of a Prism using Sodium Light.
7. To determine Dispersive Power of the Material of a Prism using Mercury Light.
8. To determine the value of Cauchy Constants.
9. To determine the Resolving Power of a Prism.
10. To determine wavelength of sodium light using Fresnel Biprism.
11. To determine wavelength of sodium light using Newton's Rings.
12. To determine the wavelength of Laser light using Diffraction of Single Slit.
13. To determine wavelength of (1) Sodium and (2) Spectral lines of the Mercury light using plane diffraction Grating
14. To determine the Resolving Power of a Plane Diffraction Grating.
15. To measure the intensity using photosensor and laser in diffraction patterns of single and double slits.

Reference Books:

1. Advanced Practical Physics for students, B.L. Flint and H.T. Worsnop, 1971, Asia Publishing House.
2. Advanced level Physics Practicals, Michael Nelson and Jon M. Ogborn, 4th Edition, reprinted 1985, Heinemann Educational Publishers
3. A Text Book of Practical Physics, Indu Prakash and Ramakrishna, 11th Edition, 2011, Kitab Mahal, New Delhi.

DISCIPLINE SPECIFIC ELECTIVE(DSE)

(Select Two Papers).

DSE: DIGITAL AND ANALOG CIRCUITS AND INSTRUMENTATION

(Credits: Theory-04, Practicals-02)

Theory: 40 Lectures-Marks: 70

UNIT-1:

Digital Circuits

Difference between Analog and Digital Circuits. Binary Numbers. Decimal to Binary and Binary to Decimal Conversion, AND, OR and NOT Gates (Realization using Diodes and Transistor). NAND and NOR Gates as Universal Gates. XOR and XNOR Gates. (5 Lectures)

De Morgan's Theorems. Boolean Laws. Simplification of Logic Circuit using Boolean Algebra. Fundamental Products. Minterms and Maxterms. Conversion of a Truth Table into an Equivalent Logic Circuit by (1) Sum of Products Method and (2) Karnaugh Map. (5 Lectures)

UNIT-2:

Semiconductor Devices and Amplifiers:

Semiconductor Diodes: p and n type semiconductors. Barrier Formation in PN Junction Diode. Qualitative Idea of Current Flow Mechanism in Forward and Reverse Biased Diode. PN junction and its characteristics. Static and Dynamic Resistance. Principle and structure of (1) LEDs (2) Photodiode (3) Solar Cell. (5 Lectures)

Bipolar Junction transistors: n-p-n and p-n-p Transistors. Characteristics of CB, CE and CC Configurations. Current gains α and β . Relations between α and β . Load Line analysis of Transistors. DC Load line and Q-point. Active, Cutoff, and Saturation Regions. Voltage Divider Bias Circuit for CE Amplifier. h-parameter Equivalent Circuit. Analysis of a single-stage CE amplifier using Hybrid Model. Input and Output Impedance. Current, Voltage and Power Gains. Class A, B, and C Amplifiers. (10 Lectures)

UNIT-3:

Operational Amplifiers (Black Box approach):

Characteristics of an Ideal and Practical Op-Amp (IC 741), Open-loop & Closed-loop Gain. CMRR, concept of Virtual ground. Applications of Op-Amps: (1) Inverting and Non-inverting Amplifiers, (2) Adder, (3) Subtractor, (4) Differentiator, (5) Integrator, (6) Zero Crossing Detector. (7 Lectures)

Instrumentations:

Introduction to CRO: Block Diagram of CRO. Applications of CRO: (1) Study of Waveform, (2) Measurement of Voltage, Current, Frequency, and Phase Difference. (3 Lectures)

Power Supply: Half-wave Rectifiers. Centre-tapped and Bridge Full-wave Rectifiers Calculation of Ripple Factor and Rectification Efficiency, Basic idea about capacitor filter, Zener Diode and Voltage Regulation (5 Lectures)

Reference Books:

1. Integrated Electronics, J. Millman and C.C. Halkias, 1991, Tata Mc-Graw Hill.
2. Electronic devices and circuits, S. Salivahanan and N.Suresh Kumar, 2012, Tata Mc-Graw Hill.
3. Microelectronic Circuits, M.H. Rashid, 2ndEdn.,2011, Cengage Learning.
4. Modern Electronic Instrumentation & Measurement Tech., Helfrick & Cooper, 1990, PHI Learning
5. Digital Principles & Applications, A.P.Malvino, D.P.Leach & Saha, 7th Ed.,2011, Tata Mc- Graw Hill
6. Fundamentals of Digital Circuits, A. Anand Kumar, 2nd Edition, 2009, PHI Learning Pvt. Ltd.
7. OP-AMP and Linear Digital Circuits, R.A. Gayakwad, 2000, PHI Learning Pvt. Ltd.

DSC-LAB: DIGITAL AND ANALOG CIRCUITS AND INSTRUMENTATION

20 Classes (2 hrS. duration)-Marks:30

1. To measure (a) Voltage, and (b) Frequency of a periodic waveform using a CRO.
2. To verify and design AND, OR, NOT and XOR gates using NAND gates.
3. To minimize a given logic circuit.
4. Half adder, Full adder and 4-bit Binary Adder.
5. Adder-Subtractor using Full Adder I.C.
6. To design an astable multivibrator of given specifications using 555 Timer.
7. To design a monostable multivibrator of given specifications using 555 Timer.
8. To study IV characteristics of PN diode, Zener and Light emitting diode.
9. To study the characteristics of a Transistor in CE configuration.
10. To design a CE amplifier of a given gain (mid-gain) using voltage divider bias.
11. To design an inverting amplifier of given gain using Op-amp 741 and study its frequency response.
12. To design a non-inverting amplifier of given gain using Op-amp 741 and study its Frequency Response.
13. To study a precision Differential Amplifier of given I/O specification using Opamp.
14. To investigate the use of an op-amp as a Differentiator.
15. To design a Wien Bridge Oscillator using an op-amp.

Reference Books:

1. Basic Electronics: A text lab manual, P.B.Zbar, A.P.Malvino, M.A.Miller, 1994,Mc-Graw Hill.
2. Electronics: Fundamentals and Applications, J.D. Ryder, 2004, Prentice Hall.
3. OP-Amps and Linear Integrated Circuit, R. A. Gayakwad, 4th edition, 2000, Prentice Hall.
4. Electronic Principle, Albert Malvino, 2008, Tata Mc-Graw Hill.

DSE: SOLID STATE PHYSICS
(Credits: Theory-04, Practicals-02)
Theory: 40 Lectures-Marks: 70

Prerequisites: Knowledge of Elements of Modern Physics

UNIT-1:

Crystal Structure: Solids-Amorphous and Crystalline Materials. Lattice Translation Vectors. Lattice with a Basis Central and Non-Central Elements. Unit Cell. Miller Indices. Reciprocal Lattice. Types of Lattices. Brillouin Zones. Diffraction of X-rays by Crystals. Braggs Law. Atomic and Geometrical Factor. (8 Lectures)

Elementary Lattice Dynamics: Lattice Vibrations and Phonons-Linear Monoatomic and Di-atomic Chains. Acoustical and Optical Phonons. Qualitative Description of the Phonon Spectrum in Solids. Dulong and Petits Law, Einstein and Debye theories of specific heat of solids. T3 law (6 Lectures)

Magnetic Properties of Matter: Dia-, Para-, Ferri- and Ferromagnetic Materials. Classical Langevin Theory of dia and Paramagnetic Domains. Quantum Mechanical Treatment of Paramagnetism. Curies law, Weiss Theory of Ferromagnetism and Ferromagnetic Domains. Discussion of B-H Curve. Hysteresis and Energy Loss. (8 Lectures)

UNIT-II

Dielectric Properties of Materials: Polarization. Local Electric Field at an Atom. Depolarization Field. Electric Susceptibility. Polarizability. Clausius Mosotti Equation. Classical Theory of Electric Polarizability. Normal and Anomalous Dispersion. Cauchy and Sellmeier relations. Langevin-Debye equation. Complex Dielectric Constant. Optical Phenomena. Application: Plasma Oscillations, Plasma Frequency, Plasmons. (6 Lectures)

Elementary band theory: Kronig Penny model. Band Gaps. Conductors, Semiconductors and insulators. P and N type Semiconductors. Conductivity of Semiconductors, mobility, Hall Effect, Hall coefficient. (6 Lectures)

Superconductivity: Experimental Results. Critical Temperature. Critical magnetic field. Meissner effect. Type I and type II Superconductors, Londons Equation and Penetration Depth. Isotope effect. (6 Lectures)

Reference Books:

1. Introduction to Solid State Physics, Charles Kittel, 8th Ed., 2004, Wiley India Pvt. Ltd.
2. Elements of Solid State Physics, J.P. Srivastava, 2nd Ed., 2006, Prentice-Hall of India
3. Introduction to Solids, Leonid V. Azaroff, 2004, Tata Mc-Graw Hill
4. Solid State Physics, N.W. Ashcroft and N.D. Mermin, 1976, Cengage Learning
5. Solid-state Physics, H. Ibach and H. Luth, 2009, Springer
6. Elementary Solid State Physics, 1/e M. Ali Omar, 1999, Pearson India

7. Solid State Physics, M.A. Wahab, 2011, Narosa Publications

DSC LAB: SOLID STATE PHYSICS

20 Classes (2 hrs. duration)-Marks: 30

1. Measurement of susceptibility of paramagnetic solution (Quinck's Tube Method).
2. To measure the Magnetic susceptibility of Solids.
3. To determine the Coupling Coefficient of a Piezoelectric crystal.
4. To measure the Dielectric Constant of a dielectric Materials with frequency.
5. To determine the complex dielectric constant and plasma frequency of metal using Surface Plasmon resonance (SPR).
6. To determine the refractive index of a dielectric layer using SPR.
7. To study the PE Hysteresis loop of a Ferroelectric Crystal.
8. To study the BH curve of iron using a Solenoid and determine the energy loss.
9. To measure the resistivity of a semiconductor (Ge) crystal with temperature by four-probe method (room temperature to 150 oC) and to determine its band gap.
10. To determine the Hall coefficient of a semiconductor sample.

Reference Books:

1. Advanced Practical Physics for students, B.L. Flint and H.T. Worsnop, 1971, Asia Publishing House.
2. Advanced level Physics Practicals, Michael Nelson and Jon M. Ogborn, 4th Edition, reprinted 1985, Heinemann Educational Publishers
3. A Text Book of Practical Physics, I.Prakash & Ramakrishna, 11th Edn., 2011, Kitab Mahal
4. Elements of Solid State Physics, J.P. Srivastava, 2nd Ed., 2006, Prentice-Hall of India

DSE: ELEMENTS OF MODERN PHYSICS

(Credits: Theory-04, Practicals-02)

Theory: 40 Lectures-Marks: 70

UNIT-I

Plancks quantum, Plancks constant and light as a collection of photons; Photoelectric effect and Compton scattering. De Broglie wavelength and matter waves; Davisson-Germer experiment.(6 Lectures)

Problems with Rutherford model-instability of atoms and observation of discrete atomic spectra; Bohr's quantization rule and atomic stability; calculation of energy levels for hydrogen like atoms and their spectra. (4 Lectures)

Position measurement-gamma ray microscope thought experiment; Wave-particle duality, Heisenberg uncertainty principle- impossibility of a particle following a trajectory; Estimating minimum energy of a confined particle using uncertainty principle; Energy-time uncertainty principle. (4 Lectures)

Two slit interference experiment with photons, atoms & particles; linear superposition principle as a consequence; Matter waves and wave amplitude; Schrodinger equation for non-relativistic particles; Momentum and Energy operators; stationary states; physical interpretation of wavefunction, probabilities and normalization; Probability and probability current densities in one dimension. (8 Lectures)

UNIT-II

One dimensional infinitely rigid box-energy eigenvalues and eigenfunctions, normalization; Quantum dot as an example; Quantum mechanical scattering and tunnelling in one dimension - across a step potential and across a rectangular potential barrier. (8 Lectures)

Size and structure of atomic nucleus and its relation with atomic weight; Impossibility of an electron being in nucleus as a consequence of the uncertainty principle. Nature of nuclear force, NZ graph, semi-empirical mass formula and binding energy. (4Lectures)

Radioactivity: stability of nucleus; Law of radioactive decay; Mean life and half-life; α decay; β decay-energy released, spectrum and Pauli's prediction of neutrino; γ -ray emission.(4 Lectures) Fission and fusion-mass deficit, relativity and generation of energy; Fission - nature of fragments and emission of neutrons. Nuclear reactor: slow neutrons interacting with Uranium 235; Fusion and thermonuclear reactions. (2 Lectures)

Reference Books:

1. Concepts of Modern Physics, Arthur Beiser, 2009, McGraw-Hill.
2. Modern Physics, J.R. Taylor, C.D. Zafiratos, M.A. Dubson,2009, PHI Learning
3. Six Ideas that Shaped Physics:Particle Behave like Waves, Thomas A. Moore, 2003, McGraw Hill
4. Quantum Physics, Berkeley Physics,Vol.4. E.H. Wichman, 2008, Tata McGraw-Hill Co.
5. Modern Physics, R.A. Serway, C.J. Moses, and C.A.Moyer, 2005, Cengage Learning

DSC LAB: ELEMENTS OF MODERN PHYSICS

20 Classes (2 hrs. duration)-Marks: 30

1. To determine value of Boltzmann constant using V-I characteristic of PN diode.
2. To determine work function of material of filament of directly heated vacuum diode.
3. To determine the ionization potential of mercury.
4. To determine value of Plancks constant using LEDs of at least 4 different colours.
5. To determine the wavelength of H-alpha emission line of Hydrogen atom.
6. To determine the absorption lines in the rotational spectrum of Iodine vapour.
7. To study the diffraction patterns of single and double slits using laser and measure its intensity variation using Photosensor & compare with incoherent source Na.
8. Photo-electric effect: photo current versus intensity and wavelength of light; maximum energy of photo-electrons versus frequency of light.
9. To determine the value of e/m by (a) Magnetic focusing or (b) Bar magnet.

10. To setup the Millikan oil drop apparatus and determine the charge of an electron.

Reference Books:

1. Advanced Practical Physics for students, B.L. Flint and H.T. Worsnop, 1971, Asia Publishing House.
2. Advanced level Physics Practicals, Michael Nelson and Jon M. Ogborn, 4th Edition, reprinted 1985, Heinemann Educational Publishers
3. A Text Book of Practical Physics, Indu Prakash and Ramakrishna, 11th Edition, 2011, Kitab Mahal, New Delhi.

SKILL ENHANCEMENT COURSE(Four)

(Credit: 02 each)-SEC:1 to SEC:4

1. COMMUNICATIVE ENGLISH & ENGLISH WRITINGSKILL(Compulsory)

(Credits: Theory-02)

2. COMPUTATIONAL PHYSICS

(Credits: Theory-02) Theory:
20 Classes (1 hr. duration)

UNIT-I

Introduction: Importance of computers in Physics, paradigm for solving physics problems for solution. Usage of linux as an Editor. Algorithms and Flowcharts: Algorithm: Definition, properties and development. Flowchart: Concept of flowchart, symbols, guidelines, types. Examples: Cartesian to Spherical Polar Coordinates, Roots of Quadratic Equation, Sum of a finite series.

Scientific Programming: Development of FORTRAN, Basic elements of FORTRAN: Character Set, Constants and their types, Variables and their types, Keywords, Variable Declaration and concept of instruction and program. Fortran Statements: I/O Statements (unformatted/formatted), Executable and Non-Executable Statements, Layout of Fortran Program, Format of writing. (10 Lectures)

UNIT-II

Control Statements: Types of Logic (Sequential, Selection, Repetition), Branching Statements (Logical IF, Arithmetic IF, Block IF, Nested Block IF, SELECT CASE and ELSE IF Ladder statements), DO Loop Statements, Jumping Statements (Unconditional GOTO, Computed GOTO, Assigned GOTO) Subscripted Variables (Arrays: Types of Arrays, DIMENSION Statement, Reading and Writing Arrays), Functions and Subroutines (Arithmetic Statement Function, Function Subprogram and Subroutine), RETURN, CALL Statements), open a file, writing in a file, reading from a file.

Programming:

1. Exercises on syntax on usage of FORTRAN.
2. To print out all natural even/ odd numbers between given limits.
3. To find maximum, minimum and range of a given set of numbers.
4. To find a set of prime numbers and Fibonacci series. (10 Lectures)

Reference Books:

1. Introduction to Numerical Analysis, S.S. Sastry, 5th Edn., 2012, PHI Learning Pvt. Ltd.
2. Computer Programming in Fortran 77. V. Rajaraman (Publisher: PHI).
3. Schaums Outline of Theory and Problems of Programming with Fortran, S Lipsdutz and A Poe, 1986Mc-Graw Hill Book Co.

4. Computational Physics: An Introduction, R. C. Verma, et al. New Age International Publishers, New Delhi(1999).
5. A first course in Numerical Methods, U.M. Ascher and C. Greif, 2012, PHI Learning.
6. Elementary Numerical Analysis, K.E. Atkinson, 3 r d Edn., 2007, Wiley India Edition.

3. BASIC INSTRUMENTATION SKILLS

(Credits: Theory-02) Theory: 20
Classes (1 hr. duration)

This course is to get exposure with various aspects of instruments and their usage through hands-on mode. Experiments listed below are to be done in continuation of the topics.

UNIT-I

Basic of Measurement: Instruments accuracy, precision, sensitivity, resolution range etc. Errors in measurements and loading effects. Multimeter: Principles of measurement of dc voltage and dc current, ac voltage, ac current and resistance. Specifications of a multimeter and their significance.

Electronic Voltmeter: Advantage over conventional multimeter for voltage measurement with respect to input impedance and sensitivity. Principles of voltage, measurement (block diagram only). Specifications of an electronic Voltmeter/ Multimeter and their significance.

AC millivoltmeter: Type of AC millivoltmeters: Amplifier- rectifier, and rectifier- amplifier. Block diagram ac millivoltmeter, specifications and their significance.

Cathode Ray Oscilloscope: Block diagram of basic CRO. Construction of CRT, Electron gun, electrostatic focusing and acceleration (Explanation only no mathematical treatment), brief discussion on screen phosphor, visual persistence & chemical composition. Time base operation, synchronization. Front panel controls. Specifications of a CRO and their significance.

Use of CRO for the measurement of voltage (dc and ac frequency, time period. Special features of dual trace, introduction to digital oscilloscope, probes. Digital storage Oscilloscope: Block diagram and principle of working. (10 Lectures)

UNIT-II

Signal Generators and Analysis Instruments: Block diagram, explanation and specifications of low frequency signal generators. pulse generator, and function generator. Brief idea for testing, specifications. Distortion factor meter, wave analysis.

Digital Instruments: Principle and working of digital meters. Comparison of analog & digital instruments. Characteristics of a digital meter. Working principles of digital voltmeter.

Digital Multimeter: Block diagram and working of a digital multimeter. Working principle of time interval, frequency and period measurement using universal counter/ frequency counter, time- base stability, accuracy and resolution. (10 Lectures)

The test of lab skills will be of the following test items:

1. Use of an oscilloscope.
2. CRO as a versatile measuring device.

3. Circuit tracing of Laboratory electronic equipment.
4. Use of Digital multimeter/VTVM for measuring voltages,
5. Circuit tracing of Laboratory electronic equipment.
6. Winding a coil / transformer.
7. Study the layout of receiver circuit.
8. Trouble shooting a circuit.
9. Balancing of bridges.

Laboratory Exercises:

1. To observe the loading effect of a multimeter while measuring voltage across a low resistance and high resistance.
2. To observe the limitations of a multimeter for measuring high frequency voltage and currents.
3. To measure Q of a coil and its dependence on frequency, using a Q- meter.
4. Measurement of voltage, frequency, time period and phase angle using CRO.
5. Measurement of time period, frequency, average period using universal counter/ frequency counter.
6. Measurement of rise, fall and delay times using a CRO.
7. Measurement of distortion of a RF signal generator using distortion factor meter.
8. Measurement of R, L and C using a LCR bridge/ universal bridge.

Open Ended Experiments:

1. Using a Dual Trace Oscilloscope.
2. Converting the range of a given measuring instrument (voltmeter, ammeter).

Reference Books:

1. A text book in Electrical Technology - B L Theraja - S Chand and Co.
2. Performance and design of AC machines - M G Say ELBS Edn.
3. Digital Circuits and systems, Venugopal, 2011, Tata McGraw Hill.
4. Logic circuit design, Shimon P. Vingron, 2012, Springer.
5. Digital Electronics, Subrata Ghoshal, 2012, Cengage Learning.
6. Electronic Devices and circuits, S. Salivahanan & N. S.Kumar, 3rd Ed., 2012, Tata Mc-Graw Hill.
7. Electronic circuits: Handbook of design and applications, U.Tietze, Ch.Schenk, 2008, Springer.
8. Electronic Devices, 7/e Thomas L. Floyd, 2008, Pearson India.

4. RENEWABLE ENERGY AND ENERGY HARVESTING

(Credits: Theory-02) Theory:
20 Classes (1 hr. duration)

The aim of this course is not just to impart theoretical knowledge to the students but to provide them with exposure and hands-on learning wherever possible.

UNIT-I

Fossil fuels and Alternate Sources of energy: Fossil fuels and nuclear energy, their limitation, need of renewable energy, non-conventional energy sources. An overview of developments in Offshore Wind Energy, Tidal Energy, Wave energy systems, Ocean Thermal Energy Conversion, solar energy, biomass, biochemical conversion, biogas generation, geothermal energy tidal energy, Hydroelectricity.

Solar energy: Solar energy, its importance, storage of solar energy, solar pond, non plate collector, solar distillation, solar cooker, solar green houses, solar cell, absorption air conditioning. Need and characteristics of photovoltaic (PV) systems, PV models and equivalent circuits, and sun tracking systems. (10 Lectures)

UNIT-II

Wind Energy harvesting: Fundamentals of Wind energy, Wind Turbines and different electrical machines in wind turbines, Power electronic interfaces, and grid interconnection topologies.

Ocean Energy: Ocean Energy Potential against Wind and Solar, Wave Characteristics and Statistics, Wave Energy Devices.

Tide characteristics and Statistics, Tide Energy Technologies, Ocean Thermal Energy, Osmotic Power, Ocean Bio-mass.

Geothermal Energy: Geothermal Resources, Geothermal Technologies.

Hydro Energy: Hydropower resources, hydropower technologies, environmental impact of hydro power sources.(10 Lectures)

Reference Books:

1. Non-conventional energy sources - G.D Rai - Khanna Publishers, New Delhi
2. Solar energy - M P Agarwal - S Chand and Co. Ltd.
3. Solar energy - Suhas P Sukhative Tata McGraw - Hill Publishing Company Ltd.
4. Godfrey Boyle, Renewable Energy, Power for a sustainable future, 2004, Oxford University Press, in association with The Open University.
5. Dr. P Jayakumar, Solar Energy: Resource Assesment Handbook, 2009
6. J.Balfour, M.Shaw and S. Jarosek, Photovoltaics, Lawrence J Goodrich (USA).
7. [http://en.wikipedia.org/wiki/Renewable energy](http://en.wikipedia.org/wiki/Renewable_energy).

5. APPLIED OPTICS

(Credits: Theory-02) Theory:

20 Classes (1 hr. duration)

Theory includes only qualitative explanation. Minimum five experiments should be performed covering minimum three sections.

UNIT-I

Sources and Detectors: Lasers, Spontaneous and stimulated emissions, Theory of laser action, Einsteins coefficients, Light amplification, Characterization of laser beam, He-Ne laser, Semiconductor lasers.

Elementary ideas of Fourier Optics: Concept of Spatial frequency filtering, Fourier trans- forming property of a thin lens. (10 Lectures)

UNIT-II

Holography

Basic principle and theory: coherence, resolution, Types of holograms, white light reflection hologram, application of holography in microscopy, interferometry, and character recognition. **Photonics:** Fibre Optics, Optical fibres and their properties, Principal of light propagation through a fibre, The numerical aperture, Attenuation in optical fibre and attenuation limit, Single mode and multimode fibres, Fibre optic sensors: Fibre Bragg Grating. (10 Lectures)

Reference Books:

1. Fundamental of optics, F. A. Jenkins & H. E. White, 1981, Tata McGraw hill.
2. LASERS: Fundamentals & applications, K.Thyagrajan & A.K.Ghatak, 2010, Tata McGraw Hill
3. Fibre optics through experiments, M.R.Shenoy, S.K.Khijwania, et.al. 2009, Viva Books
4. Nonlinear Optics, Robert W. Boyd, (Chapter-I), 2008, Elsevier.
5. Optics, Karl Dieter Moller, Learning by computing with model examples, 2007, Springer.
6. Optical Systems and Processes, Joseph Shamir, 2009, PHI Learning Pvt. Ltd.
7. Optoelectronic Devices and Systems, S.C. Gupta, 2005, PHI Learning Pvt. Ltd.
8. Optical Physics, A.Lipson, S.G.Lipson, H.Lipson, 4th Edn., 1996, Cambridge Univ. Press.

ZOOLOGY(HONOURS)

SEMESTER-I

C:1-DIVERSITY AND EVOLUTION OF NON-CHORDATA (PROTISTA TO PSEUDOCOELOMATES)

(Credits:6, Theory-4, Practical-2) Lectures:
60 (Theory:40, Practical:20) Max.
Marks:100 (Theory:70, Practical:30)

UNIT-I: Kingdom Protista

General characteristics and classification up to classes; Life cycle, pathogenicity and prophylaxis of *Plasmodium vivax*, *Trypanosoma gambiense* and *Entamoeba histolytica*; Locomotion and reproduction in Protista.

UNIT-II: Phylum Porifera and Ctenophora

General characteristics and classification up to classes; Canal system in sponges; General characteristics and evolutionary significance; Evolution of Parazoa and Metazoa.

UNIT-III: Phylum Cnidaria

General characteristics and classification up to classes; Metagenesis in *Obelia*; Polymorphism in Cnidaria; Corals and coral reefs.

UNIT-IV: Phylum Platyhelminthes

General characteristics and classification up to classes; Life cycle, pathogenicity and prophylaxis of *Faciola hepatica* and *Taenia solium*; Parasitic adaptations.

UNIT-V: Phylum Nematelminthes

General characteristics and classification up to classes; Life cycle, pathogenicity and prophylaxis of *Ascaris lumbricoides* and *Wuchereria Bancrofti*; Parasitic adaptations.

Note: Classification to be followed from “ Barnes RD (1982) Invertebrate Zoology; 5th Edition.”

PRACTICAL

Kingdom Protista

1. Morphology of *Paramecium*, Binary fission and Conjugation in *Paramecium*.
2. Life stages of *Plasmodium vivax*, *Trypanosoma gambiense* and *Entamoeba histolytica* (Slides/Microphotographs).
3. Examination of pond water for protists.

Phylum Porifera

4. Study of *Sycon* (including T.S. and L.S.), *Hyalonema*, and *Euplectella*.
5. Temporary mounts of spicules, gemmules and sponging fibres.

Phylum Cnidaria

6. Study of *Obelia*, *Physalia*, *Millepora*, *Aurelia*, *Ephyra* larva, *Tubipora*, *Corallium*, *Alcyonium*, *Gorgonia* and *Metridium* (including T.S. and L.S.).

Phylum Ctenophora

7. Any one specimen/slide.

Phylum Platyhelminthes

8. Study of adult *Fasciola hepatica*, *Taenia solium* and their life stages (Slides/microphotographs).

Phylum Nematelminthes

9. Study of adult *Ascaris lumbricoides*, *Wuchereria bancrofti* and their life stages (Slides/microphotographs).

Note: Classification to be followed from “ Barnes RD (1982) Invertebrate Zoology; 5th Edition.”

Recommended Books:

1. Arora MP (2006) Non-Chordata-I. 1st edition. Himalaya Publishing House, New Delhi.
2. Arora MP (2008) Non-Chordata-II. 1st edition. Himalaya Publishing House, New Delhi.
3. Barnes RD (1982) Invertebrate Zoology. 6th Edition. Holt Saunders International Edition.
4. Barnes RSK, Calow P, Olive PJW, Golding DW & Spicer JI (2002) The Invertebrates: A New Synthesis. 3rd Edition. Blackwell Science, USA.
5. Barrington EJW (1979) Invertebrate Structure and Functions. 2nd Edition. ELBS and Nelson.
6. Boradale LA and Potts EA (1961) Invertebrates: A Manual for the use of Students. Asia Publishing Home.
7. Jordan EL and Verma PS (1963) Invertebrate Zoology. Revised Edition. S. Chand, New Delhi.
8. Mohanty PK (2000) Illustrated Dictionary of Biology. Kalyani Publishers, Ludhiana.

C:2-PERSPECTIVES IN ECOLOGY AND BIOSTATISTICS

(Credits:6, Theory-4, Practical-2) Lectures:

60 (Theory:40, Practical:20) Max.

Marks:100 (Theory:70, Practical:30)

UNIT-I: Introduction to Ecology and Ecosystem

Relevance of studying ecology; History of ecology; Laws of limiting factors; Detailed study of temperature and light as physical factors; Types of ecosystem; Food chain, Detritus and grazing food chains; Food web; Energy flow through the ecosystem; Ecological pyramids.

UNIT-II: Population

Unitary and modular populations; Unique and group attributes of population: Density, natality, mortality, life tables, fecundity tables, survivorship curves, age ratio, sex ratio, dispersal and dispersion; Exponential and logistic growth, equation and patterns, r and K strategies, Population regulation-density-dependent and independent factors; Population interactions, Gause's Principle with laboratory and field examples; Lotka-Volterra equation for competition and Predation, functional and numerical responses.

UNIT-III: Community

Community characteristics: dominance, diversity, species richness, abundance, stratification; Ecotone and edge effect; Ecosystem development (succession) with example and Theories pertaining to climax community; Nutrient and biogeochemical cycle, Nitrogen cycle and Sulphur cycle.

UNIT-IV: Conservation of Biodiversity

Types of biodiversity, its significance, loss of biodiversity; Conservation strategies (in situ and ex situ); Endangered species concept; Role of ZSI, WWF, IUCN; Wildlife (Protection) Act, 1972.

UNIT-V: Biostatistics

Concept, definition and scope of biostatistics, biological data, sampling techniques, measures of central tendency (mean, median and mode), measures of dispersion, hypothesis and testing of hypothesis

(chi square test, t test and Z test), correlation and regression analysis; Data analysis using EXCEL programme.

PRACTICAL

1. Study of life tables and plotting of survivorship curves of different types from the hypothetical/real data provided.
2. Determination of population density in a natural/hypothetical community by quadrat method and calculation of Shannon-Weiner diversity index for the same community.
3. Study of an aquatic ecosystem: fauna and flora Measurement of area, temperature, turbidity/penetration of light, determination of pH, and Dissolved Oxygen content (Winklers method), Chemical Oxygen Demand and free CO₂.
4. Report on a visit to National Park/Biodiversity Park/Wildlife sanctuary.
5. Determination of mean, median, mode and standard deviation of biological data.

Recommended Books

1. Colinvaux PA (1993) Ecology. II Edition. John Wiley and Sons, Inc., USA.
2. Dash MC (1993) Fundamentals of Ecology. McGraw Hill Book Company, New Delhi.
3. Joshi N and Joshi PC (2012) Ecology and Environment. 1st Edition. Himalaya Publishing House, New Delhi.
4. Odum EP (2008) Fundamentals of Ecology. Indian Edition. Brooks/Cole.
5. Ricklefs, R.E., (2000). Ecology. 5th Edition. Chiron Press.
6. Robert Leo Smith Ecology and field biology Harper and Row.
7. Singh JS, Gupta SR and Singh SP (2014) Ecology, Environmental Science and Conservation. S. Chand, New Delhi.
8. Chainy, GBN, Mishra G and Mohanty PK. Basic Biostatistics, Kalyani Publisher.

C:3-DIVERSITY AND EVOLUTION OF NON-CHORDATA (COELOMATE NONCHORDATES)

(Credits:6, Theory-4, Practical-2) Lectures:
60 (Theory:40, Practical:20) Max.
Marks:100 (Theory:70, Practical:30)

UNIT-I: Phylum Annelida

General characteristics and classification up to classes; Evolution of Coelom; Metamerism and Excretion in Annelida.

UNIT-II: Phylum Arthropoda

General characteristics and classification up to classes; Vision in Arthropoda; Respiration in Arthropoda; Moulting in insects, Metamorphosis in insects; Social life in insects (bees and termites) and Larval forms in Crustacea.

UNIT-III: Phylum Onychophora

General characteristics and evolutionary significance and affinities of Peripatus.

UNIT-IV: Phylum Mollusca

General characteristics and classification up to classes; Respiration in Mollusca; Torsion and detorsion in Gastropoda; Pearl formation in bivalves and Evolutionary significance of trochophore larva.

UNIT-V: Phylum Echinodermata

General characteristics and classification up to classes; Water-vascular system in Asterozoa; Larval forms in Echinodermata and Evolutionary significance (Affinities with Chordates).

Note: Classification to be followed from “ Barnes, R.D. (1982). Invertebrate Zoology, 5th Edition, Holt Saunders International Edition.”

PRACTICAL

Phylum Annelida

1. Study of Aphrodite, Nereis, Sabella, Terebella, Serpula, Chaetopterus, Pheretima and Hirudinaria.
2. T.S. through pharynx, gizzard, and typhlosolar intestine of earthworm.
3. T.S. through crop of leech.

Phylum Arthropoda

4. Study of Limulus, Palamnaeus, Palaemon, Daphnia, Balanus, Sacculina, Cancer, Eupagurus, Scolopendra, Julus, termite, louse, honeybee, silk moth, wasp and dragon fly. **Phylum Onychophora**
5. Any one specimen/slide.

Phylum Mollusca

6. Study of Chiton, Dentalium, Pila, Doris, Helix, Unio, Ostrea, Mytilus, Loligo, Sepia, Octopus and Nautilus and Cypraea (cowrie).

Phylum Echinodermata

7. Study of echinoderm larvae.
8. Study of Pentaceros, Asterias, Ophiura, Clypeaster, Echinus, Echinocardium, Cucumaria and Antedon.

Note: Classification to be followed from “ Barnes, R.D. (1982). Invertebrate Zoology, 5th Edition, Holt Saunders International Edition.”

Recommended books

1. Arora MP (2006) Non-Chordata-I. 1st edition. Himalaya Publishing House, New Delhi.
2. Arora MP (2008) Non-Chordata-II. 1st edition. Himalaya Publishing House, New Delhi.
3. Barnes RD (1982) Invertebrate Zoology. 6th Edition. Holt Saunders International Edition.
4. Barnes RSK, Calow P, Olive PJW, Golding DW & Spicer JI (2002) The Invertebrates: A New Synthesis. 3rd Edition. Blackwell Science, USA.
5. Barrington EJW (1979) Invertebrate Structure and Functions. 2nd Edition. ELBS and Nelson.
6. Boradale LA and Potts EA (1961) Invertebrates: A Manual for the use of Students. Asia Publishing Home.
7. Jordan EL and Verma PS (1963) Invertebrate Zoology. Revised Edition. S. Chand, New Delhi.
8. Mohanty PK (2000) Illustrated Dictionary of Biology. Kalyani Publishers, Ludhiana.

C:4-PHYSIOLOGY: LIFE SUSTAINING SYSTEMS

(Credits:6, Theory-4, Practical-2) Lectures:
60 (Theory:40, Practical:20) Max.
Marks:100 (Theory:70, Practical:30)

UNIT-I: Digestive System

Structural organization, histology and functions of gastrointestinal tract and its associated glands; Mechanical and chemical digestion of food; Absorptions of carbohydrates, lipids, proteins, water, minerals and vitamins; Role of gastrointestinal hormones on the secretion and control of enzymes of gastrointestinal tract.

UNIT-II: Respiratory System

Histology of trachea and lung; Mechanism of respiration, Pulmonary ventilation; Respiratory volume and capacity; Transport of oxygen in the blood; Oxygen- hemoglobin and myoglobin, dissociation curve and the factors influencing it; Carbon monoxide poisoning; Carbon dioxide transport in the blood; buffering action of blood and haemoglobin and Control of respiration.

UNIT-III: Excretory System

Structure of kidney and its histological details; Renal blood supply; Mechanism of urine formation and its regulation and Regulation of acid-base balance.

UNIT-IV: Blood

Components of blood and their functions; Structure and functions of haemoglobin; Haemopoiesis; Haemostasis, Coagulation of blood and Disorders of blood.

UNIT-V: Heart

Structure of heart; Coronary circulation; Structure of conducting and working of myocardial fibers; Origin and conduction of cardiac impulses functions of AV node; Cardiac cycle; Cardiac output and its regulation-Frank-Starling Law of the heart; Nervous and chemical regulation of heart rate; Blood pressure and its regulation and Electrocardiogram.

PRACTICAL

1. Enumeration of red blood cells using haemocytometer.
2. Estimation of haemoglobin using Sahli's haemoglobinometer.
3. Preparation of haemin and haemochromogen crystals.
4. Recording of blood pressure using a Sphygmomanometer.
5. Examination of sections of mammalian oesophagus, stomach, duodenum, ileum, rectum liver, trachea, lung and kidney.

Recommended Books

1. Arey LB (1974) Human Histology. 4th Edition. W.B. Saunders, USA.
2. Chatterjee CC (2008) Human Physiology. Vol. I and II. Medical Allied Agency, Kolkata.
3. Guyton AC and Hall JE (2006) Textbook of Medical Physiology. 9th Edition. W.B. Saunders Company, Philadelphia.
4. Tortora GJ and Derrickson B (2012) Principles of Anatomy & Physiology. 13th Edition John Wiley and sons, USA.
5. Victor PE (2008) diFiores Atlas of Histology with Functional Correlations. 12th Edition, Lippincott W. & Wilkins, USA.

C:5-DIVERSITY AND DISTRIBUTION OF CHORDATA

(Credits:6, Theory-4, Practical-2) Lectures:
60 (Theory:40, Practical:20) Max.
Marks:100 (Theory:70, Practical:30)

UNIT-I: Protochordata and Origin of Chordates

General characters of Hemichordata, Urochordata and Cephalochordata; Study of larval forms in protochordates; Retrogressive metamorphosis in Urochordata; Dipleurula concept and the Echinoderm theory of origin of chordates.

UNIT-II: Introduction to Vertebrata and Agnatha

Advanced features of vertebrates over Protochordata; General characters and classification of cyclostomes up to class; Structural peculiarities and affinities of Petromyzon and Myxine.

UNIT-III: Pisces and Amphibia

General characters of Chondrichthyes and Osteichthyes and classification up to order; Migration; Osmoregulation and Parental care in fishes; Scales in fishes; Origin of Tetrapoda (Evolution of terrestrial ectotherms); General characters and classification up to order and Parental care in Amphibians.

UNIT-IV: Reptilia and Aves

General characters and classification up to order; Skull in Reptilia; Affinities of Sphenodon; Poison apparatus and Biting mechanism in snakes; General characters and classification up to order; Principles and aerodynamics of flight, Flight adaptations; Archaeopteryx- a connecting link and Migration in birds.

UNIT-V: Mammals and Zoogeography

General characters and classification up to order; Affinities of Prototheria and Metatheria; Dentition in mammals; Adaptive radiation with reference to locomotory appendages; Zoogeographical realms; Theories pertaining to distribution of animals and Distribution of vertebrates in different realms.

PRACTICAL

Protochordata

1. Balanoglossus, Herdmania, Branchiostoma and Colonial Urochordata.
2. Sections of Balanoglossus through proboscis and branchiogenital regions.
3. Sections of Amphioxus through pharyngeal, intestinal and caudal regions.
4. Permanent slide of spicules of Herdmania.

Agnatha

5. Petromyzon and Myxine.

Fishes

6. Sphyrna, Pristis, Trygon, Torpedo, Chimaera, Notopterus, Mystus, Heteropneustes, Hippocampus, Exocoetus, Echeinis, Anguilla, Tetradon, Diodon, Anabas and Flat fish.

Amphibia

7. Ichthyophis/Ureotyphlus, Necturus, Duttaphrynus, Polypedates, Hyla, Alytes and Salamandra.

Reptiles

8. Chelone, Trionyx, Hemidactylus, Varanus, Uromastix, Chamaeleon, Draco, Ophiosaurus, Bungarus, Vipera, Naja, Hydrophis, Zamenis and Crocodylus.
9. Key for Identification of poisonous and non-poisonous snakes.

Aves

10. Study of six common birds from different orders.
11. Types of beaks and claws.
12. Types of feathers.

Mammalia

13. Sorex, Bat (Insectivorous and Frugivorous), Funambulus, Loris, Herpestes and Hemiechenis.

Recommended Books

1. Agarwal VK (2011) Zoology for degree students. S. Chand, New Delhi.
2. Arora MP (2006) Chordata-1. 1st Edition. Himalaya Publishing House, New Delhi.
3. Hall BK and Hallgrímsson B (2008) Strickberger's Evolution. 4th Edition. Jones and Bartlett Publishers Inc., USA.
4. Jordan EL and Verma PS (1963) Chordate Zoology. Revised Edition. S. Chand, New Delhi.
5. Young JZ (2004) The Life of Vertebrates. 3rd Edition. Oxford University Press, USA.

C:6-PHYSIOLOGY CONTROLLING AND COORDINATING SYSTEM

(Credits:6, Theory-4, Practical-2) Lectures:

60 (Theory:40, Practical:20) Max.

Marks:100 (Theory:70, Practical:30)

UNIT-I: Tissues and Glands, Bone and cartilage

Structure, location, function and classification of Epithelial tissue, Connective tissue, Muscular tissue, Nervous tissue; Types of glands and their functions; Structure and types of bones and cartilages; Ossification, bone growth and resorption.

UNIT-II: Nervous System

Structure of neuron, resting membrane potential; Origin of action potential and its propagation across the myelinated and unmyelinated nerve fibers; types of synapses, Synaptic transmission; Neuromuscular junction; Reflex action and its types, Reflex arc and Physiology of hearing and vision.

UNIT-III: Muscle

Histology of different types of muscle; Ultra structure of skeletal muscle; Molecular and chemical basis of muscle contraction; Characteristics of muscle twitch; Motor Unit, summation and tetanus.

UNIT-IV: Reproductive System

Histology of male and female reproductive systems; Puberty; Physiology of reproduction of male and female; Methods of contraception (depicted through flow chart).

UNIT-V: Endocrine System

Functional Histology of endocrine glands – pineal, pituitary, thyroid, parathyroid, thymus, pancreas, adrenals; Hormones secreted by them and their mechanism of action; Gonadal hormones; Classification of hormones; Regulation of their secretion; Mode of hormone action; Signal transduction pathways utilized by steroidal and non-steroidal hormones; Hypothalamus (neuroendocrine gland), principal nuclei involved in neuroendocrine control of anterior pituitary and endocrine system and Placental hormones.

PRACTICAL

1. Demonstration of the unconditioned reflex action (Deep tendon reflex such as knee jerk reflex).
2. Preparation of temporary mounts: Squamous epithelium, Striated muscle fibres and nerve cells.
3. Examination of sections of mammalian skin, Cartilage, Bone, Spinal cord, Nerve cell, Pituitary, Pancreas, Testis, Ovary, Adrenal, Thyroid and Parathyroid.

Recommended Books

1. Arey LB (1974) Human Histology. 4th Edition. W.B. Saunders, USA.

- Chatterjee CC (2008) Human Physiology. Vol. I and II. Medical Allied Agency, Kolkata.
- Guyton AC and Hall JE (2006) Textbook of Medical Physiology. 9th Edition. W.B. Saunders Company, Philadelphia.
- Tortora GJ and Derrickson B (2012) Principles of Anatomy & Physiology. 13th Edition John Wiley and sons, USA.
- Victor PE (2008) diFiore Atlas of Histology with Functional Correlations. 12th Edition, Lippincott W. and Wilkins, USA.

C:7-COMPARATIVE ANATOMY OF VERTEBRATES

(Credits:6, Theory-4, Practical-2) Lectures:

60 (Theory:40, Practical:20) Max.

Marks:100 (Theory:70, Practical:30)

UNIT-I: Integumentary System and Skeletal System

Structure, functions and derivatives of integument; Axial and appendicular skeletons; Jaw suspension in vertebrates.

UNIT-II: Digestive and Respiratory System

Alimentary canal and associated glands; Skin, gills, lungs and air sacs and Accessory respiratory organs in fishes.

UNIT-III: Circulatory System

General plan of circulation; Evolution of heart and aortic arches.

UNIT-IV: Urinogenital System

Succession of kidney; Evolution of urinogenital ducts and Types of mammalian uteri.

UNIT-V: Nervous System and Sense Organs

Comparative account of brain; Autonomic nervous system; Spinal Nerves; Spinal cord; Cranial nerves in Mammals; Classification of receptors; visual receptors, chemoreceptors and mechanoreceptors.

PRACTICAL

- Study of placoid, cycloid and ctenoid scales through permanent slides/photographs.
- Disarticulated skeleton of Frog, Varanus, Fowl and Rabbit.
- Carapace and plastron of turtle or tortoise.
- Mammalian skulls (One herbivorous and one carnivorous animal).

Recommended Books

- Hilderbrand M and Gaslow GE. Analysis of Vertebrate Structure. John Wiley and Sons., USA.
- Kardong KV (2005) Vertebrates Comparative Anatomy, Function and Evolution. 4th Edition. McGraw-Hill Higher Education, New York.
- Kent GC and Carr RK (2000) Comparative Anatomy of the Vertebrates. 9th Edition. The McGraw-Hill Companies, New York.
- Weichert CK and William Presch (1970) Elements of Chordate Anatomy. Tata McGraw Hill, New York.

C:8-BIOCHEMISTRY OF METABOLIC PROCESSES

(Credits:6, Theory-4, Practical-2) Lectures:
60 (Theory:40, Practical:20) Max.
Marks:100 (Theory:70, Practical:30)

UNIT-I: Biomolecules

Structures and properties of important mono-, di- and polysaccharides; Fatty acids, triglycerides and steroids; and amino acids and proteins.

UNIT-II: Carbohydrate Metabolism

Glycolysis; Citric acid cycle; pentose phosphate pathway; Gluconeogenesis; Shuttle systems (Malate-aspartate shuttle, Glycerol 3-phosphate shuttle); Glycogenolysis; Glycogenesis.

UNIT-III: Lipid Metabolism

β -oxidation of saturated fatty acids with even and odd number of carbon atoms; Biosynthesis of palmitic acid and Ketogenesis and its regulation.

UNIT-IV: Protein Metabolism

Catabolism of amino acids: Transamination, Deamination; Urea cycle; Fate of C-skeleton of Glucogenic and Ketogenic amino acids.

UNIT-V: Enzymes and Oxidative Phosphorylation

Kinetics and Mechanism of action of enzymes; Inhibition of enzyme action; Allosteric enzymes; Oxidative phosphorylation in mitochondria; Respiratory chain, ATP synthase, Inhibitors and Uncouplers.

PRACTICAL

1. Identification of unknown carbohydrates in given solutions (Starch, Sucrose, Lactose, Galactose, Glucose, Fructose).
2. Colour tests of functional groups in protein solutions.
3. Action of salivary amylase under optimum conditions.
4. Effect of pH on the action of salivary amylase.
5. Effect of temperature on the action of salivary amylase.
6. Estimation of total protein in given solutions by Lowrys method.

Recommended Books

1. Berg JM, Tymoczko JL and Stryer L (2007) Biochemistry. 6th Edition, W.H. Freeman and Co., New York.
2. Cox MM and Nelson DL (2008) Lehninger Principles of Biochemistry. 5th Edition. W.H. Freeman and Co., New York.
3. Devesena T (2014) Enzymology. 2nd Edition. Oxford University Press, UK.
4. Hames BD and Hooper NM (2000) Instant Notes in Biochemistry. 2nd Edition. BIOS Scientific Publishers Ltd., U.K.
5. Murray RK, Bender DA, Botham KM, Kennelly PJ, Rodwell VW and Well PA (2009) Harpers Illustrated Biochemistry. 28th Edition. International Edition. The McGraw-Hill Companies Inc., New York.

C:9-CELL BIOLOGY

(Credits:6, Theory-4, Practical-2) Lectures:
60 (Theory:40, Practical:20) Max.
Marks:100 (Theory:70, Practical:30)

UNIT-I: Cells and Plasma Membrane

Prokaryotic and Eukaryotic cells; Mycoplasma; Virus, Viroids, Virions and Prions; Various models

of plasma membrane; Transport across membranes; Cell junctions: Occluding junctions (Tight junctions), Anchoring junctions (desmosomes), Communicating junctions (gap junctions) and Plasmodesmata.

UNIT-II: Endomembrane System, Mitochondria and Peroxisomes

The Endoplasmic Reticulum; Golgi apparatus; Mechanism of vesicular transport; Lysosomes; Structure and function of mitochondria: Chemi-osmotic hypothesis; Semiautonomous nature of mitochondria; Endosymbiotic hypothesis and Peroxisomes.

UNIT-III: Cytoskeleton and Nucleus

Structure and functions of intermediate filament, microtubules and microfilaments; Ultra structure of nucleus; Nuclear envelope: Structure of nuclear pore complex; Chromosomal DNA and its packaging; Structure and function of Nucleolus.

UNIT-IV: Cell Cycle and Cell Signaling

Cell cycle, Regulation of cell cycle; Signaling molecules and their receptors.

UNIT-V: Apoptosis and Cancer

Extrinsic (Death Receptor) Pathway and Intrinsic (Mitochondrial) Pathway; Growth and development of tumors and Metastasis.

PRACTICAL

1. Gram's staining technique for visualization of prokaryotic cells.
2. Study various stages of mitosis from permanent slides.
3. Study various stages of meiosis from permanent slides.
4. Study the presence of Barr body in human female blood cells/cheek cells. (Preparation of permanent slides).
5. Cytochemical demonstration (Preparation of permanent slides).
 - (i) DNA by Feulgen reaction.
 - (ii) Mucopolysaccharides by PAS reaction.
 - (iii) Proteins by Mercurobromophenol blue.
 - (iv) DNA and RNA by Methyl Green Pyronin.

(In practical examination, 05 marks should be of permanent slide submission; one mark each for DNA, PAS, Proteins, MGP and Barr body slide.)

Recommended Books

1. Becker WM, Kleinsmith LJ, Hardin J and Bertoni G P (2009) The World of the Cell. 7th Edition. Pearson Benjamin Cummings Publishing, San Francisco.
2. Bruce Albert, Bray Dennis, Levis Julian, Raff Martin, Roberts Keith and Watson James (2008) Molecular Biology of the Cell. 5th Edition. Garland publishing Inc., New York.
3. Cooper GM and Hausman RE (2009) The Cell: A Molecular Approach. 5th Edition. ASM Press, Washington D.C.
4. De Robertis EDP and De Robertis EMF (2006) Cell and Molecular Biology. 8th Edition. Lippincott Williams and Wilkins, Philadelphia.
5. Karp G (2010) Cell and Molecular Biology: Concepts and Experiments. 6th Edition. John Wiley and Sons. Inc., USA.

C:10-PRINCIPLES OF GENETICS

(Credits:6, Theory-4, Practical-2) Lectures:
60 (Theory:40, Practical:20) Max.
Marks:100 (Theory:70, Practical:30)

UNIT-I: Mendelian Genetics and its Extension

Principles of inheritance; Incomplete dominance and co-dominance; Multiple alleles, Lethal alleles; Epistasis; Pleiotropy; Sex-linked inheritance.

UNIT-II: Linkage, Crossing Over and Chromosomal Mapping

Linkage and crossing over; Cytological basis of crossing over; Molecular mechanisms of crossing over; Recombination frequency as a measure of linkage intensity; Two factor and three factor crosses; Interference and coincidence and Somatic cell hybridization.

UNIT-III: Mutations

Gene mutations; Chromosomal mutations: Deletion, duplication, inversion, translocation; Aneuploidy and polyploidy; Induced versus spontaneous mutations; Backward and forward mutations; Suppressor mutations; Molecular basis of mutations in relation to UV light and chemical mutagens; Detection of mutations: CLB method, attached X method and DNA repair mechanisms.

UNIT-IV: Sex Determination and Quantitative Genetics

Chromosomal mechanisms of sex determination; Sex-linked, sex-influenced and sex limited characters; Polygenic inheritance and Transgressive variation.

UNIT-V: Extra-chromosomal Inheritance

Criteria for extra-chromosomal inheritance; Antibiotic resistance in Chlamydomonas; Mitochondrial mutations and Maternal effects.

PRACICAL

1. To study the Mendelian laws and gene interactions and their verification by Chi square analyses using seeds/beads/Drosophila.
2. Identification of various mutants of Drosophila.
3. To calculate allelic frequencies by Hardy-Weinberg Law.
4. Linkage maps based on data from crosses of Drosophila.
5. Study of human karyotype (normal and abnormal).
6. Pedigree analysis of some human inherited traits.
7. Preparation of polytene chromosomes from larva of Chironomous/Drosophila.
8. To study mutagenicity in Salmonella/E. coli by Ames test.

Recommended Books

1. Gardner EJ, Simmons MJ, Snustad DP (2008) Principles of Genetics. 8th Edition. Wiley India.
2. Griffiths AJF, Wessler SR, Lewontin RC and Carroll SB. Introduction to Genetic Analysis. 9th Edition. W. H. Freeman and Co., NewYork.
3. Klug WS, Cummings MR, Spencer CA and Palladino MA (2012) Concepts of Genetics. 10th Edition. Pearson Education, Inc., USA.
4. Russell PJ (2009) Genetics- A Molecular Approach. 3rd Edition. Benjamin Cummings, USA.
5. Snustad DP and Simmons MJ (2012) Principles of Genetics. 6th Edition. John Wiley and Sons Inc., USA.
6. Verma PS and AgarwalVK (2010) Genetics. 9th Edition. S. Chand, New Delhi.

C:11-DEVELOPMENTAL BIOLOGY

(Credits:6, Theory-4, Practical-2) Lectures:
60 (Theory:40, Practical:20) Max.
Marks:100 (Theory:70, Practical:30)

UNIT-I: Introduction

History and basic concepts: Epigenesis, preformation, Mosaic and regulative development; Discovery of induction; Cell-Cell interaction; Pattern formation; Differentiation and growth; Differential gene expression; Cytoplasmic determinants and asymmetric cell division.

UNIT-II: Early Embryonic Development

Gametogenesis (Spermatogenesis, Oogenesis); Types of eggs; Egg membranes; Fertilization: Changes in gametes, monospermy and polyspermy; Planes and patterns of cleavage; Early development of frog and chick up to gastrulation; Fate maps; Embryonic induction and organizers.

UNIT-III: Late Embryonic Development

Fate of germ layers; Extra-embryonic membranes in birds; Implantation of embryo in humans and Placenta (Structure, types and functions of placenta).

UNIT-IV: Post Embryonic Development

Metamorphosis: Changes, hormonal regulations in amphibians; Regeneration: Modes of regeneration (epimorphosis, morphallaxis and compensatory regeneration); Ageing: Concepts and models.

UNIT-V: Implications of Developmental Biology

Teratogenesis: Teratogenic agents and their effects on embryonic development; *in vitro* Fertilization; Stem cell culture and Amniocentesis.

PRACTICAL

1. Study of whole mounts and sections of developmental stages of frog through permanent slides: Cleavage stages, blastula, gastrula, neurula, tail-bud stage, tadpole (external and internal gill stages).
2. Study of whole mounts of developmental stages of chick through permanent slides: Primitive streak (13 and 18 hours), 21, 24, 28, 33, 36, 48, 72, and 96 hours of incubation (Hamilton and Hamburger stages).
3. Study of developmental stages (above mentioned) by raising chick embryo in the laboratory.
4. Study of the developmental stages and life cycle of *Drosophila* from stock culture.
5. Study of different types of placenta.
6. Project report on *Drosophila* culture/chick embryo development.

Recommended Books

1. Balinsky BI and Fabian BC (1981) An Introduction to Embryology. 5th Edition. International Thompson Computer Press.
2. Gilbert SF (2010) Developmental Biology. 9th Edition. Sinauer Associates, Inc., USA.
3. Kalthoff (2008) Analysis of Biological Development. 2nd Edition. McGraw-Hill, New York.
4. Wolpert L, Beddington R, Jessell T, Lawrence P, Meyerowitz E and Smith J (2002) Principles of Development. 1st Edition, Oxford University Press, New York.

C:12-MOLECULAR BIOLOGY

(Credits:6, Theory-4, Practical-2)

Lectures: 60 (Theory:40, Practical:20)

Max. Marks:100 (Theory:70, Practical:30)

UNIT-I: Nucleic Acids and DNA Replication

Salient features of DNA double helix; Watson and Crick model of DNA; DNA denaturation and renaturation; DNA topology - linking number and DNA topoisomerases; Cot curves; Structure of RNA, tRNA and DNA and RNA associated proteins; DNA Replication in prokaryotes and eukaryotes; Mechanism of DNA replication; Role of proteins and enzymes in replication; Licensing factors; Semiconservative, bidirectional and semi-discontinuous replication; RNA priming; Replication of circular and linear ds-DNA and replication of telomeres.

UNIT-II: Transcription

RNA polymerase and transcription Unit; Mechanism of transcription in prokaryotes and Eukaryotes; Synthesis of rRNA and mRNA; Transcription factors and regulation of transcription.

UNIT-III: Translation

Genetic code, Degeneracy of the genetic code and Wobble Hypothesis; Process of protein synthesis in prokaryotes: Ribosome structure and assembly in prokaryotes, fidelity of protein synthesis, aminoacyl tRNA synthetases and charging of tRNA; Proteins involved in initiation, elongation and termination of polypeptide chain; Inhibitors of protein synthesis; Difference between prokaryotic and eukaryotic translation.

UNIT-IV: Post Transcriptional Modifications and Processing of Eukaryotic RNA Structure of globin mRNA; Split genes: concept of introns and exons, splicing mechanism, alternative splicing, exon shuffling, and RNA editing.

UNIT-V: Gene Regulation and Regulatory RNAs

Transcription regulation in prokaryotes: Principles of transcriptional regulation with examples from lac operon and trp operon; Transcription regulation in eukaryotes: Activators, repressors, enhancers, silencers elements; Gene silencing, Genetic imprinting; Ribo-switches, RNA interference, miRNA and siRNA.

PRACTICAL

1. Study of DNA replication using Photographs or slides and special cases, e.g., Polytenyusing permanent slides of polytene chromosomes.
2. Preparation of liquid culture medium (LB) and raise culture of *E. coli*.
3. Estimation of the growth kinetics of *E. coli* by turbidity method.
4. Preparation of solid culture medium (LB) and growth of *E. coli* by spreading and streaking.
5. Demonstration of antibiotic sensitivity/resistance of *E. coli* to antibiotic pressure and interpretation of results.
6. Quantitative estimation of salmon sperm/calf thymus DNA using colorimeter (Diphenylamine reagent) or spectrophotometer (A260 measurement).
7. Quantitative estimation of RNA using Orcinol reaction.

Recommended Books

1. Becker WM, Kleinsmith LJ, Hardin J and Bertoni GP (2009) The World of the Cell. 7th Edition. Pearson Benjamin Cummings Publishing, San Francisco.
2. Bruce Alberts, Alexander Johnson, Julian Lewis, Martin Raff, Keith Roberts, Peter Walter (2008) Molecular Biology of the Cell, 4th Edition. Garland publishing Inc., New York.
3. Cooper GM and Hausman RE (2007) The Cell: A Molecular Approach. 4th Edition, ASM Press, USA.
4. De Robertis EDP and De Robertis EMF (2006) Cell and Molecular Biology. 8th Edition; Lippincott Williams and Wilkins, Philadelphia.

5. Karp G (2010) Cell and Molecular Biology: Concepts and Experiments. 6th Edition; John Wiley and Sons. Inc., USA.

C:13-IMMUNOLOGY

(Credits:6, Theory-4, Practical-2) Lectures:
60 (Theory:40, Practical:20) Max.
Marks:100 (Theory:70, Practical:30)

UNIT-I: Immune System and Immunity

Historical perspective of Immunology, Early theories of Immunology, Haematopoiesis, Cells and organs of the Immune system; Anatomical barriers, Inflammation, Cell and molecules involved in innate immunity, Adaptive immunity (Cell mediated and humoral), Passive: Artificial and natural Immunity, Active: Artificial and natural Immunity and Immune dysfunctions.

UNIT-II: Antigens

Antigenicity and immunogenicity, Immunogens, Adjuvants and haptens, Factors influencing immunogenicity, B and T -Cell epitopes.

UNIT-III: Immunoglobulins

Structure and functions of different classes of immunoglobulins, Antigen-antibody interactions, Immunoassays, Polyclonal sera, Monoclonal antibodies and Hybridoma technology.

UNIT-IV: Major Histocompatibility Complex and Complement System

Structure and functions of endogenous and exogenous pathway of antigen presentation; Components and pathways of complement activation.

UNIT-V: Cytokines, Hypersensitivity and Vaccines

Properties and functions of cytokines; Cytokine-based therapies; Gell and Coombs classification and Brief description of various types of hypersensitivities; Types of vaccines: Recombinant vaccines and DNA vaccines.

PARCTICAL

1. Demonstration of lymphoid organs.
2. Ouchterlony's double immuno-diffusion method.
3. Determination of ABO blood group.
4. Preparation of single cell suspension of splenocytes from chick spleen, cell counting and viability test.
5. ELISA/ dot Elisa (using kit).
6. Principles, experimental set up and applications of immuno-electrophoresis, RIA, F.

Recommended Books

1. Abbas KA and Lichtman HA (2003) Cellular and Molecular Immunology. 5th Edition. Saunders Publication, Philadelphia.
2. David M, Jonathan B, David RB and Ivan R (2006) Immunology. 7th Edition. Elsevier Publication, USA .
3. Kindt TJ, Goldsby RA, Osborne BA and Kuby J (2006) Immunology. 6th Edition. W.H. Freeman and Company, New York.

C:14-EVOLUTIONARY BIOLOGY

(Credits:6, Theory-4, Practical-2) Lectures:
60 (Theory:40, Practical:20) Max.
Marks:100 (Theory:70, Practical:30)

UNIT-I: History of Life, theories of Evolution and Extinction

Chemogeny, Biogeny, RNA World, Major Events in History of Life; Lamarckism; Darwinism; Neo-Darwinism; Background of extinction, Mass extinction (Causes, Names of five major extinctions, K-T extinction in detail) and Role of extinction in evolution.

UNIT-II: Evidences of Evolution

Fossils and its types; Dating of fossils, Phylogeny of horse and human; Molecular evidences (Globin gene families as an example) and Molecular clock concept.

UNIT-III: Processes of Evolutionary Change

Organic variations; Isolating mechanisms; Natural selection (Industrial melanism, Pesticide/Antibiotic resistance); Types of natural selection (Directional, Stabilizing, Disruptive), Sexual Selection and Artificial selection.

UNIT-IV: Principles of population genetics

Concept of gene pool, Gene frequencies equilibrium frequency (Hardy-Weinberg equilibrium), Shift in gene frequency without selection Genetic drift, Mutation pressure and Gene flow and Shifts in gene frequencies with selection.

UNIT-V: Species Concept and Evolution above species level

Biological concept of species (Advantages and Limitations); Sibling species, Polymorphic species, Polytypic species, Ring species; Modes of speciation (Allopatric, Sympatric); Macro-evolutionary Principles (Darwins Finches); Convergence, Divergence and Parallelism.

PRACTICAL

1. Study of fossil evidences from plaster cast models and pictures.
2. Study of homology and analogy from suitable specimens/ pictures.
3. Demonstration of changing allele frequencies with and without selection.
4. Construction of cladogram based on morphological characteristics.
5. Construction of phylogenetic tree with bioinformatics tools (Clustal X and Phylip).
6. Interpretation of phylogenetic trees.

Recommended Books

1. Barton NH, Briggs DEG, Eisen JA, Goldstein DB and Patel NH (2007) Evolution. Cold Spring Harbour Laboratory Press.
2. Campbell NA and Reece JB (2011) Biology. 9th Edition. Pearson Education Inc., NewYork.
3. Douglas JF (1997) Evolutionary Biology. Sinauer Associates,USA.
4. Hall BK and Hallgrimsson B (2008) Evolution. 4th Edition. Jones and Bartlett Publishers,USA.
5. Pevsner J (2009) Bioinformatics and Functional Genomics. 2nd Edition. Wiley-Blackwell, USA.
6. Ridley M (2004) Evolution. 3rd Edition. Blackwell Publishing, USA.

DISCIPLINE SPECIFIC ELECTIVE

DSE:1-ANIMAL BEHAVIOUR

(Credits:6, Theory-4, Practical-2) Lectures:
60 (Theory:40, Practical:20) Max.
Marks:100 (Theory:70, Practical:30)

UNIT-I: Introduction and Mechanisms of Behaviour

Origin and history of Ethology; Brief profiles of Karl von Frisch, Ivan Pavlov, Konrad Lorenz, Niko Tinbergen; Proximate and ultimate behavior; Objective of behaviour, Behaviour as a basis of evolution; Behaviour as a discipline of science; Innate behaviour, Instinct, Stimulus filtering, Sign stimuli and Code breakers.

UNIT-II: Patterns of Behaviour

Reflexes: Types of reflexes, reflex path, characteristics of reflexes (latency, after discharge, summation, fatigue, inhibition) and its comparison with complex behavior.

Orientation: Primary and secondary orientation; kinesis-orthokinesis, klinokinesis; taxistropotaxis and klinotaxis and menotaxis (light compass orientation) and mnemotaxis.

Learning: Associative learning, classical and operant conditioning, Habituation and Imprinting.

UNIT-III: Social Behaviour

Insects society; Honey bee: Society organization, polyethism, foraging, round dance, waggledance, Experiments to prove distance and direction component of dance, learning ability in honey bee, formation of new hive/queen; Reciprocal altruism, Hamiltons rule and inclusive fitness with suitable examples.

UNIT-IV: Sexual Behaviour

Asymmetry of sex, Sexual dimorphism, Mate choice, Intra-sexual selection (male rivalry), Inter-sexual selection (female choice), Infanticide, Consequences of mate choice for female fitness, Sexual conflict for male versus female parental care and Courtship behaviour in three spine stickleback.

UNIT-V: Biological Clocks

Circadian rhythm, Tidal rhythm, Lunar rhythm, Advantages of biological clocks, Jet lag and Entrainment.

PRACTICAL

1. To study different types of animal behaviour such as habituation, social life, courtship behaviour in insects, and parental care from short videos/movies and prepare a short report.
2. To study nests and nesting habits of the birds and social insects.
3. To study the behavioural responses of wood lice to dry condition.
4. To study behavioural responses of wood lice in response to humid condition.
5. To study geotaxis behaviour in earthworm.
6. To study the phototaxis behaviour in insect larvae.
7. Visit to Forest/ Wild life Sanctuary/Biodiversity Park/Zoological Park to study behavioural activities of animals and prepare a short report.

Recommended Books

1. David McF. Animal Behaviour. Pitman Publishing Limited, London, UK.
2. John A (2001) Animal Behaviour. 7th Edition. Sinauer Associate Inc., USA.
3. Manning A and Dawkins MS. An Introduction to Animal Behaviour. Cambridge University Press, USA.
4. Paul WS and John A (2013) Exploring Animal Behaviour. 6th Edition. Sinauer Associate Inc., Massachusetts, USA.

DSE:2-ECONOMIC ZOOLOGY

(Credits:6, Theory-4, Practical-2) Lectures:
60 (Theory:40, Practical:20) Max.
Marks:100 (Theory:70, Practical:30)

UNIT-I: Bee-keeping and Bee Economy (Apiculture)

Varieties of honey bees and Bee pasturage; Setting up an apiary: Langstroths/Newton's hive, bee veil, brood and storage chambers, iron frames and comb sheets, drone excluder, rearing equipments, handling of bees, artificial diet; Diseases of honey bee, American and European Foulbrood, and their management; Honey extraction techniques; Physicochemical analysis of honey; Other beneficial products from bee; Visit to an apiculture institute and honey processing Units.

UNIT-II: Silk and Silk Production (Sericulture)

Different types of silk and silkworms in India; Rearing of Bombyx mori, Rearing racks and trays, disinfectants, rearing appliances, black boxing, Chawki rearing, bed cleaning, mountages, harvesting of cocoons; Silkworm diseases: Pebrine, Flacherie, Grasserie, Muscardine and Aspergillosis, and their management; Silkworm pests and parasites: Uzi fly, Dermestid beetles and their management; Silk reeling techniques and Quality assessment of silk fibre.

UNIT-III: Aquaculture I

Brood stock management; Induced breeding of fish; Management of hatchery of fish; Management of nursery, rearing and stocking ponds; Preparation and maintenance of fish aquarium; Preparation of compound diets for fish; Role of water quality in aquaculture; Fish diseases: Bacterial, viral and parasitic; Preservation and processing of harvested fish; Fishery by-products.

UNIT-IV: Aquaculture II

Prawn farming; Culture of crab; Pearl culture and Culture of air breathing fishes.

UNIT-V: Dairy and Poultry Farming

Introduction; Indigenous and exotic breeds; Rearing, housing, feed and rationing; Commercial importance of dairy and poultry farming; Varietal improvement techniques; Diseases and their management; Dairy or poultry farm management and business plan; Visit to any dairy farm or Poultry farm.

* Submission of report on anyone field visits mentioned above.

PRACTICAL

1. Study of different types of bees (Queens, Drones and Worker bees).
2. Study of different types of silk moths.
3. Study of different types of pearls.
4. Study of different types of fish diseases.
5. Identification of different types of scales in fishes.
6. Study of different types of fins.
7. Study of different modified structures of fishes (Saw of sawfish, Hammer of hammer head fish, tail of sharks etc.)
8. Identification of various types of natural silks.

Recommended Books

1. Dhyani Singh Bisht, Apiculture, ICAR Publication.
2. Dunham RA (2004) Aquaculture and Fisheries Biotechnology Genetic Approaches. CABI publications, U.K.
3. Hafez ESE (1962) Reproduction in Farm Animals. Lea and Fabiger Publishers.
4. Knobil E and Neill JD (2006) The Physiology of Reproduction. Vol. 2. Elsevier Publishers, USA.
5. Prost PJ (1962) Apiculture. Oxford and IBH, New Delhi.

6. Singh S. Beekeeping in India, Indian council of Agricultural Research, New Delhi.
7. Srivastava CBL (1999) Fishery Science and Indian Fisheries. Kitab Mahal publications, India.

DSE:3-MICROBIOLOGY

(Credits:6, Theory-4, Practical-2) Lectures:
60 (Theory:40, Practical:20) Max.
Marks:100 (Theory:70, Practical:30)

UNIT-I:

History of Microbiology; Microbial World Characterization, Classification and identification of microbes.

UNIT-II:

Prokaryotes: General morphology and classification of bacteria, their characters and economic importance; Gram-positive and Gram-negative bacteria.

UNIT-III:

Eukaryotes: General morphology of Protista and Fungi classification and economic importance.

UNIT-IV:

Viruses: structure, genome, replication cycle; Epidemiology of infectious diseases with reference of human hosts Bacterial (Tuberculosis), Viral (Hepatitis), Protozoan (Amoebiasis) and Fungal (any one) disease.

UNIT-V:

Microbe interactions-Immune Responses-Antibiotics and other chemotherapeutic agents; Applied microbiology in the fields of food, agriculture, industry and environment.

PRATICAL

1. Cleaning of glasswares, sterilisation principle and methods - moist heat - dry heat and filtration methods.
2. Media preparation: Liquid media, Solid media, Agar slants, Agar plates. Basal, enriched, selective media preparation - quality control of media, growth supporting properties, sterility check of media.
3. Pure culture techniques: Streak plate, pour plate and decimal dilution.
4. Cultural characteristics of microorganisms: Growth on different media, growth characteristics and description and demonstration of pigment production.
5. Staining techniques: Smear preparation, simple staining, Grams staining, Acidfast staining and staining for meta chromatic granules.
6. Morphology of microorganisms.
7. Antibiotic sensitivity testing: Disc diffusion test - Quality control with standard strains.
8. Physiology characteristics: IMViC test, H₂S, Oxidase, catalase, urease test, Carbohydrate fermentation, Maintenance of pure culture, Paraffin method, Stab culture and maintenance of mold culture.

Recommended Books

1. Ahsan J and Sinha SP (2010) A Hand book on Economic Zoology. S Chand, NewDelhi.
2. Arora DR and Arora B (2001) Medical Parasitology.2nd Edition.CBS Publications and Distributers.
3. Atwal AS (1993) Agricultural Pests of India and South East Asia. Kalyani Publishers, Ludhiana.
4. Dubey RC and Maheshwari DK (2013) A Textbook of Microbiology. S. Chand, New Delhi.
5. Dunham RA (2004) Aquaculture and Fisheries Biotechnology Genetic Approaches. CABI publications.
6. Pelczar MJ, Chan ECS and Krieg NR (1993) Microbiology.5th Edition, Tata McGraw Hill Publishing Co.Ltd.

7. Pradhan, S (1983) Insect Pests of Crops. National Book Trust of India, New Delhi.
8. Shukla, G.S. and Upadhya, V.B. (2013) Economic Zoology. 5th Edition, Rastogi Publications, Meerut.

DSE:4-PROJECT WORK
(Credits:6, Max. Marks:100)

SKILL ENHANCEMENT COURSES(SEC)

SEC:1-COMMUNICATIVE ENGLISH & ENGLISH WRITING SKILL

(Compulsory)

(Credits: 02) Theory: 20 Classes (1hr duration)

SEC:2-PUBLIC HEALTH AND HYGIENE

(Credits:2)

Lectures:30, Max. Marks:50

UNIT-I:

Scope of Public health and Hygiene; nutrition and health; classification of foods; Nutritional deficiencies; Vitamin deficiencies.

UNIT-II:

Pollution: water pollution, air pollution, soil pollution, noise pollution, thermal pollution and radioactive pollution.

UNIT-III:

Environment and Health hazards; Environmental degradation and health hazards due to pollutants.

UNIT-IV:

Communicable diseases and their control measures such as Measles, Polio, Chikungunya, Rabies, Plague, Leprosy and AIDS.

UNIT-V:

Non-Communicable diseases and their preventive measures such as Hypertension, Coronary Heart diseases, Stroke, Diabetes, Obesity and Mental ill-health.

Recommended Books

1. Arora DR and Arora B (2001) Medical Parasitology.2nd Edition.CBS Publications and Distributers.
2. Dubey RC and Maheshwari DK (2013) A text book of Microbiology. S. Chand, New Delhi.
3. Pelczar MJ, Chan ECS and Krieg NR (1993) Microbiology.5th Edition. Tata McGraw Hill Publishing Co. Ltd.

GENERIC ELECTIVE PAPERS(GE)

Credits: 06 each)

GE-1: ANIMAL DIVERSITY (NON-CHORDATE), PHYSIOLOGY AND ENDOCRINOLOGY

(Credits:6, Theory-4, Practical-2) Lectures:
60 (Theory:40, Practical:20) Max.
Marks:100 (Theory:70, Practical:30)

General characteristics and classification up to classes and study of types mentioned

UNIT-I:

Protozoa: Paramecium with reference to structure and reproduction.

Porifera: Structure of Sycon and Canal system in sponges.

Cnidaria: Structure, reproduction and life cycle of Aurelia.

UNIT-II:

Platyhelminthes: Structure, reproduction and life cycle of Fasciola.

Nemathelminthes: Structure, reproduction and life cycle of Ascaris.

Annelida: Structure, digestion and excretion of Hirudinaria.

UNIT-III:

Arthropoda: External morphology, digestive and excretory system of Paleamon.

Mollusca: Morphology and respiration of Pila.

Echimodermata: Morphology and water vascular system of Asterias.

UNIT-IV: Mammalian Physiology

Digestion, Respiration, Transport of respiratory gases, Structure of heart and cardiac cycle, Composition and clotting of blood, Blood group, Structure of neuron and transmission of nerve impulse, Structure of skeletal muscle and muscle contraction.

UNIT-V: Endocrinology

Structure and function of Pituitary, Thyroid and Gonads.

Note: Classification to be followed from " Barnes RD (1982) Invertebrate Zoology. 5th Edition."

PRACTICAL

Experiment (Physiology) Estimation of haemoglobin concentration in man, Estimation of casein in milk, Estimation of lipid in any given sample.

Endocrinology slides as mentioned in syllabus Museum Specimens and slides Slides: Morphology of Paramecium, Binary fission and Conjugation in Paramecium. Section through Sycon, Spicules and Gemmules of sponge, Ephyra larva.

Museum specimens: Spongilla, Sycon, Gorgonia, Physallia, Porpita, Penatulla, Nereis, Aphrodite, Sacculina, Eupagurus, Chiton, Aplysia, Octopus, Starfish, sea-Urchin, sea Cucumber.

Recommended Books

1. Arora MP (2006) Non-Chordata-I. 1st edition. Himalaya Publishing House, New Delhi.
2. Arora MP (2008) Non-Chordata-II. 1st edition. Himalaya Publishing House, New Delhi.

3. Barnes RD (1982) Invertebrate Zoology. 6th Edition. Holt Saunders International Edition.
4. Barnes RSK, Calow P, Olive PJW, Golding DW & Spicer JI (2002) The Invertebrates: A New Synthesis. 3rd Edition. Blackwell Science, USA.
5. Barrington EJW (1979) Invertebrate Structure and Functions. 2nd Edition. ELBS and Nelson.
6. Boradale LA and Potts EA (1961) Invertebrates: A Manual for the use of Students. Asia Publishing Home.
7. Jordan EL and Verma PS (1963) Invertebrate Zoology. Revised Edition. S. Chand, New Delhi.
8. A text book of medical Physiology. Guyton and Hall.
9. Human physiology. Chatterjee.
10. Principle of Anatomy and Physiology. Tortora and Derrickson.
11. A book of Physiology and Functional Histology, A K berry.
12. Mohanty PK (2000) Illustrated Dictionary of Biology. Kalyani Publishers, Ludhiana.

GE-2: ANIMAL DIVERSITY (PROTOCHORDATA, CHORDATA), DEVELOPMENTAL BIOLOGY AND IMMUNOLOGY

(Credits:6, Theory-4, Practical-2) Lectures:
60 (Theory:40, Practical:20) Max.
Marks:100 (Theory:70, Practical:30)

UNIT-I: Protochordata and Origin of Chordates

General characters of Hemichordata, Urochordata and Cephalochordata; Structure, Digestive system, Respiratory and reproduction in Balanoglossus, Herdmania and Amphioxus.

UNIT-II: Pisces and Amphibia

General characters of Chondrichthyes and Osteichthyes and classification up to order; Digestive and reproductive system in Scoliodon General characters and classification of amphibian up to order, Circulatory and Nervous system (Brain and Cranial nerves).

UNIT-III: Reptilia, Aves and Mammals

Urogenital system of Calotes; Respiratory system of Pigeon and Flight adaptation in Birds; Digestive and Nervous System (Brain and Cranial nerves) of rabbit.

UNIT-IV: Developmental Biology

Gametogenesis, structure of gametes, Mechanism of fertilization, Types of Cleavage, Development of Amphioxus and frog up to formation of three germ layers.

UNIT-V: Immunology

Innate and acquired immunity, Antigens, structure and function of immunoglobulins, Antigen- Antibody interaction, Vaccines.

PRACTICAL

Immunology: Blood Grouping

Museum specimens: Balanoglossus, Herdmania, Amphioxus, Exocoetus, Hippocampus, Anabas, Ambystoma, Axolotl larva, Polypedates, Ichthyophis, Draco, Chelone, Trionyx, Hemidactylus, Varanus, Chamaeleon, Sea snake, Cobra, Viper, Krait, Pigeon, Crow, Bat, Rat.

Slides: Sections through Balanoglossus and Amphioxus; Tissue sections through Liver, Pancreas; Embryological slides of frog.

Bones: Amphibia and mammals.

Recommended Books

1. Agarwal VK (2011) Zoology for degree students. S. Chand, NewDelhi.
2. Arora MP (2006) Chordata-1. 1st Edition. Himalaya Publishing House, New Delhi.
3. Hall BK and Hallgrimsson B (2008) Strickbergers Evolution. 4th Edition. Jones and Bartlett Publishers Inc., USA.
4. Jordan EL and Verma PS (1963) Chordate Zoology. Revised Edition.S. Chand, New Delhi.
5. Young JZ (2004) The Life of Vertebrates. 3rd Edition. Oxford University Press, USA.
6. Kindt TJ, Goldsby RA, Osborne BA, Immunology.
7. Gilbert SF, Developmental Biology.

GE-3: FOOD, NUTRITION AND HEALTH

(Credits:6, Theory-4, Practical-2) Lectures:
60 (Theory:40, Practical:20) Max.
Marks:100 (Theory:70, Practical:30)

UNIT-I:

Food; Diet; Nutrient; Vitamins; Disorders due to deficiency of vitamins; Synthetic foods and drinks.

UNIT-II:

Functions of food; Components of food; Nutrients (Macro and micronutrients): their biochemical role and dietary sources; Food groups and the concept of a balanced diet; Causes of food spoilage; Food adulteration; Nutrition through the life cycle- Physiological considerations, nutrient needs and dietary pattern for various groups adults, pregnant and nursing mothers, infants, preschool and school children, adolescents and elderly.

UNIT-III:

Nutritional Biochemistry Carbohydrates, Lipids, Proteins - Definition, Classification, Structure and properties Significance of acid value, iodine value and saponification value of lipids; Essential and Non-essential amino acids; Enzymes- Definition, Classification, Properties; Coenzymes Vitamins- Fat-soluble and Water-soluble vitamins; their Structure and properties Minerals- Iron, calcium, phosphorus, iodine, selenium and zinc and their properties.

UNIT-IV:

Introduction to health- Definition and concept of health; Major nutritional deficiency Diseases: Protein Energy Malnutrition; Life style related diseases- hypertension, diabetes mellitus, and obesity- their causes and prevention through dietary or lifestyle modifications. Social health problems- smoking, alcoholism, drug dependence and Acquired Immuno Deficiency Syndrome (AIDS); Common ailments- cold, cough, fevers, diarrhoea, constipation: their causes and dietary treatment.

UNIT-V:

Food hygiene, Potable water- sources and methods of purification, Food and Water Borne Infections.

PRACTICAL

1. To detect adulteration in a) Ghee b) Sugars c) Tea leaves and d) Turmeric.
2. To determine absorbed oil content in fried foods.
3. Estimation of lactose in milk.
4. Ascorbic acid estimation in food by titrimetry.
5. Estimation of calcium in foods by titrimetry.

6. Preparation of temporary mounts of various stored grain pests.
7. Project- Undertake computer aided diet analysis and nutrition counselling for different age groups. OR Identify nutrient rich sources of foods, their seasonal availability and price; study of Nutrition labelling on selected foods.

Recommended Books

1. Bamji MS, Rao NP and Reddy V (2009) Text Book of Human Nutrition. Oxford & IBH Publishing Co. Pvt Ltd.
2. Jain P et al. (2007) Poshan vaswasthya ke mool siddhant (Hindi). 1st Ed. Academic Pratibha.
3. Lakra P and Singh MD (2008) Text book of Nutrition and Health. 1st Edition. Academic Excellence.
4. Manay MS, Shadaksharaswamy (1998) Food-Facts and Principles. New Age International (P) Ltd.
5. Mohanty PK (2000) Illustrated Dictionary of Biology. Kalyani Publishers, Ludhiana.
6. Mudambi SR and Rajagopal MV (2007) Fundamentals of Foods, Nutrition and Diet Therapy. 5th Edition. New Age International Publishers.
7. Srilakshmi B (2002) Nutrition Science. New Age International (P) Ltd.
8. Srilakshmi B (2007) Food Science. 4th Edition. New Age International (P) Ltd.
9. Swaminathan M (1986) Handbook of Foods and Nutrition. 5th Edition. BAPPCO.
10. Wardlaw GM, Hampl JS (2007) Perspectives in Nutrition. 7th Edition. McGraw Hill.

GE-4: BIOTECHNOLOGY: MICROBES TO ANIMALS

(Credits:6, Theory-4,
Practical-2) Lectures:
60 (Theory:40,
Practical:20) Max.
Marks:100 (Theory:70,
Practical:30)

UNIT-I: Introduction

Concept and scope of Biotechnology; Importance of biotechnology and Application of biotechnology.

UNIT-II: Techniques in Gene Manipulation

Restriction and modifying enzymes, Cloning vectors and Expression vectors, Transformation techniques, Identification of recombinants, Construction and screening of DNA libraries; Molecular analysis of DNA, RNA and proteins (i.e., Southern, Northern and Western blotting), DNA sequencing (Sanger's method and automation), Polymerase Chain Reaction, Microarrays, DNA fingerprinting and RAPD.

UNIT-III: Microbes in Biotechnology

Growth kinetics of microbes, Applications of microbes in industry (Concept of primary and secondary metabolites, Fermentation/Bioreactors, Downstream processing), Bioremediation and Biosensing.

UNIT-IV: Transgenic Animal

Production of transgenic animals: Retroviral method, DNA microinjection method, embryonic stem cell method, nuclear transplantation; Applications of transgenic animals; Knockout mice; Transgenic livestock and Transgenic fish.

UNIT-V: Biotechnology and Human Welfare

Animal cell technology: Concept of expressing cloned genes in mammalian cells, Recombinant DNA in health (Recombinant insulin and human growth hormone), Production of recombinant vaccines, Gene therapy: in vitro, in-vivo and ex-vivo. Ethical issues concerning: Transgenesis, Bio safety and Intellectual Property Rights.

PRACTICAL

1. Isolation of genomic DNA from E. coli and analyze it using agarose gel electrophoresis.
2. Isolation of plasmid DNA (pUC 18/19) and analyse it using agarose gel electrophoresis.
3. Transformation of E. coli (pUC 18/19) and calculation of transformation efficiency.
4. Restriction digestion of lambda (λ) DNA using EcoR1 and Hind III.
5. DNA ligation (lambda DNA EcoR1/Hind III digested).
6. Construction of restriction digestion maps from data provided.
7. Study of Southern blot hybridization and PCR; Analysis of DNA fingerprinting (Dry Lab).
8. Project on Animal Cell Culture.

Recommended Books

1. Beauchamp TI and Childress JF (2008) Principles of Biomedical Ethics. 6th Edition. Oxford University Press, USA.
2. Brown TA (1998) Molecular Biology Labfax II: Gene Cloning and DNA Analysis. 2nd Edition. Academic Press, USA.
3. Glick BR and Pasternak JJ and Patten CL (2009) Molecular Biotechnology-Principles and Applications of Recombinant DNA. 4th Edition. ASM press, Washington, USA.
4. Griffiths AJF, Miller JH, Suzuki DT, Lewontin RC and Gelbart WM (2009) An Introduction to Genetic Analysis. 9th Edition. W.H. Freeman and Co., USA.
5. Snustad DP and Simmons MJ (2009) Principles of Genetics. 5th Edition, John Wiley and Sons Inc., USA.
6. Watson JD, Myers RM, Caudy A and Witkowski JK (2007) Recombinant DNA-Genes and Genomes- A Short Course. 3rd Edition, Freeman and Co., USA.

	Skill Development
	Employability
	Entrepreneurship
	All the three
	Skill Development and Employability
	Skill Development and Entrepreneurship
	Employability and Entrepreneurship

SYLLABUS FOR B.COM HONS.						
B.Com. Hons. (CBCS) for the Academic Year 2016-17						
	Course Structure	Category	Marks			Credits
	Semester I		Theory	Practical /Internal	Total	
BCH-1.1	Environmental Science	AECC-1	80	20 (I)	100	4
BCH-1.2	Financial Accounting	Core -1	80	20 (I)	100	6
BCH-1.3	Business Law	Core -2	80	20 (I)	100	6
BCH-1.4	Micro Economics	GE-1	80	20 (I)	100	6
Total			320	80	400	22
	Semester-II					
BCH-2.1	English Communication	AECC-2	80	20 (I)	100	4
BCH-2.2	Corporate Accounting	Core -3	80	20 (I)	100	6
BCH-2.3	Corporate Laws	Core -4	80	20 (I)	100	6
BCH-2.4	Macro Economics	GE-2	80	20 (I)	100	6
Total			400	100	400	26
	Semester III					
BCH-3.1	Human Resource Management	Core-5	80	20 (I)	100	6
BCH-3.2	Income-tax Law and Practice	Core -6	80	20 (I)	100	6
BCH-3.3	Management Principles and Application	Core -7	80	20 (I)	100	6
BCH-3.4	Business Statistics	GE-3	80	20 (I)	100	6
BCH-3.5	E-Commerce(Compulsory)	SEC-2	80	20 (I)	100	4
Total			400	100	500	28
	Semester IV					
BCH-4.1	Cost and Management Accounting	Core -8	80	20 (I)	100	6
BCH-4.2	Business Mathematics	Core -9	80	20 (I)	100	6

BCH-4.3	Computer Applications in Business	Core -10	80	20 (I)	100	6
BCH-4.4	Indian Economy - Performance and Policies	GE-4	80	20 (I)	100	6
BCH-4.5	Entrepreneurship(Compulsory)	SEC-3	80	20 (I)	100	4
	Total		400	100	500	28

	Course Structure		Category	Theory	Practical / Internal	Total	Credits
	Semester V						
BCH-5.1	Principles of Marketing		Core -11	80	20 (I)	100	6
BCH-5.2	Fundamentals of Financial Management		Core -12	80	20 (I)	100	6
BCH-5.3	DSE-1 (Any one of the following)		DSE-1	80	20 (I)	100	6
	A. Accounting and Finance	Financial Markets , Institution and Services					
	B. Banking and Insurance	Indian Banking and Insurance System					
	C. Financial Markets	Indian Financial System					
BCH-5.4	DSE-2 (Any one of the following)		DSE-2	80	20 (I)	100	6
	A. Accounting and Finance	Financial Statement Analysis and Reporting					
	B. Banking and Insurance	Merchant Banking and Financial Services					
	C. Financial Markets	Financial Institutions and Services					
	Total			320	80	400	24
	Semester VI						
BCH-6.1	Auditing and Corporate Governance		Core -13	80	20 (I)	100	6
BCH-6.2	Indirect Tax Law		Core-14	80	20 (I)	100	6
BCH-6.3	DSE-3 (Any one of the following)		DSE-3	80	20 (I)	100	6
	A. Accounting and Finance	Corporate Tax Planning					
	B. Banking and Insurance	Fundamentals of Investment					
	C. Financial Markets	Financial Market Operations					
BCH-6.4	Business Research Methods and Project Work*		DSE-4	50	50(I)	100	6
	Total			290	110	400	24

Grand Total				2600 (Min)	148 (Min)
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B.Com. (Hons.): Semester - I
**Paper BCH-1.1: Environmental
Science**

Duration: 3 hrs.

Marks: 100 (80+20)

Lectures: 65

Objectives: To provide information on environmental science, its resources and Management.

Contents:

Unit - I

The Environment: The Atmosphere, Hydrosphere, Lithosphere, Biosphere, Ecology, Ecosystem, Biogeochemical Cycle (Carbon Cycle, Nitrogen Cycle).

Unit – II

Environment Pollution: Air Pollution, Water Pollution, Soil Pollution, Noise Pollution, Thermal Pollution, Radiation Pollution, Natural Disasters and their Management.

Unit – III

Population Ecology: Individuals, Species, Pollution, Community, Control Methods of Population, Urbanization and its effects on Society, Communicable Diseases and its Transmission, Non-Communicable Diseases.

Unit- IV

Environmental Movements in India: Grass root Environmental movements in India, Role of women, Environmental Movements in Odisha, State Pollution Control Board, Central Pollution Control Board.

Unit – V

Natural Resources: Conservation of Natural Resources, Management and Conservation of Wildlife, Soil Erosion and Conservation, Environmental Laws: Water Act, 1974, Air Act, 1981, The Wildlife (Protection) Act, 1972, Environment Protection, 1986.

Learning Outcomes: After completion of this paper, students would be able to analyze the ways in which the natural environment and the society impact the establishment and continuation of business. Along with that, they would also gain knowledge about the ways and means of managing the natural resources for the benefit of both i.e. the business and the society thereby creating a win-win situation.

BOOKS FOR REFERENCE:

- ✓ *Text Book of Environmental Studies, D.K.Asthana, DrMeeraAsthana, S.Chand*
- ✓ *Environmental Studies – Sanjay Ku. Batra / KanchanBatra/ H.K.Kaur / Parul Pant – Taxmann Pub.*
- ✓ *Principles of Environmental Studies–P. C. Manoharachary & P. J. Reddy B. S. Pub., 2004*
- ✓ *Introduction to an Environmental Science–Y. Anjaneyulu, B. S. Pub. 2004.*
- ✓ *Ecology–Subramanyam & Sambamurty, Narosa Pub. House, 2000.*
- ✓ *A Text Book in Environmental Science–V. Subramaniam, Narosa Pub. House, 2000*
- ✓ *Managing Industrial Pollution –S. C. Bhatia, Mac Millan, 2003.*
- ✓ *Man and Environment–Dash and Mishra, Mac Millan*
- ✓ *Environment and Society–Mishra and Dash, Mac Millan*
- ✓ *Text Book of Environmental Science–Panigrahi and Sahu, Sadgranth Mandir.*
- ✓ *Environment and Ecology, De and De, S.Chand*
- ✓ *Environmental Management, G.N.Pandey, Vikash Publishing*

B.Com. (Hons.): Semester - I **Paper BCH 1.2: Financial** **Accounting**

Duration: 3 hrs.

Marks: 100 (80+20)

Lectures: 65

Objectives: The objective of this paper is to help students to acquire conceptual knowledge of financial accounting and to impart skills for recording various kinds of business transactions.

Contents

Unit 1. (a) Theoretical Framework

- i. Accounting as the language of business and an information system, the users of financial accounting information and their needs. Qualitative characteristics of accounting information. Functions, advantages and limitations of accounting. Branches of accounting. Bases of accounting; cash basis and accrual basis.
- ii. The nature of financial accounting principles – Basic concepts and conventions: entity, money measurement, going concern, cost, realization, accruals, periodicity, consistency, prudence (conservatism), materiality and full disclosures and Accounting Equation.

(b) Accounting Process

From recording of business transactions to the preparation of trial balance including adjustments: journal, sub-division of journal, ledger accounts, trial balance

Unit 2. Business Income

- i. Measurement of business income-Net income: the accounting period, the continuity

doctrine and matching concept. Objectives of measurement and revenue recognition.

ii. Depreciation Accounting: The accounting concept of depreciation. Factors in the measurement of depreciation. Methods of computing depreciation: straight line method and

diminishing balance method; Disposal of depreciable assets-change of method. Salient features of Accounting Standard 6 (AS- 6) issued by ICAI

iii. Inventory Accounting: Meaning. Significance of inventory valuation. Inventory Record Systems: periodic and perpetual. Methods: FIFO, LIFO and Weighted Average. Salient features of Accounting Standard 2 (AS- 2) issued by ICAI

Unit 3. Final Accounts

Capital and revenue expenditures and receipts: general introduction only. Preparation of financial statements of Sole Trade and Partnership Business with adjustments

Unit 4. Hire Purchase and Installment Systems and Accounting for Branch & Department

- i. Concepts of operating and financial lease (theory only)
- ii. Departmental Accounting and Branch Accounting including foreign branch (Theory and Problem)

Unit 5. Accounting for Partnership Firm

Accounting of Admission of partner, Retirement and Death of partner and Dissolution of the Partnership Firm Including Insolvency of partners

Learning Outcomes: The course structure of this paper would equip the students to get in-depth knowledge of financial accounting along with its practical application thereby giving an opportunity to gain easy access to this competitive business world.

Suggested Readings:

1. Anthony, R.N. Hawkins, and Merchant, *Accounting: Text and Cases*. McGraw-Hill Education.
2. Bal Ranjan Kumar, *Financial Accounting* – S. Chand
3. Bansal.K.M - *Financial Accounting* – Taxman Publication
4. Deepak Sehgal, *Financial Accounting* – Vikash Publication
5. Horngren, *Introduction to Financial Accounting*, Pearson Education.
6. Monga, J.R. *Financial Accounting: Concepts and Applications*. Mayoor Paper Backs, New Delhi.
7. Shukla, M.C., T.S. Grewal and S.C.Gupta. *Advanced Accounts. Vol.-I*. S. Chand & Co., New Delhi.
8. Maheshwari, S.N. and. S. K. Maheshwari. *Financial Accounting*. Vikas Publishing House, New Delhi.
9. Sehgal, Ashok, and Deepak Sehgal. *Advanced Accounting. Part –I*.Taxmann Applied Services, New Delhi.
10. Bhushan Kumar Goyal and HN Tiwari, *Financial Accounting*, International Book House
11. Goldwin, Alderman and Sanyal, *Financial Accounting*, Cengage Learning.
12. Tulsian, P.C. *Financial Accounting*, **S. Chand**.
8. Jain, S.P. and K.L. Narang. *Financial Accounting*, Kalyani Publishers, New Delhi

9. Gupta, Nirmal. *Financial Accounting*, Sahitya Bhawan, Agra.

10. *Compendium of Statements and Standards of Accounting*. The Institute of Chartered Accountants of India, New Delhi

B.Com. (Hons.):
Semester - I Paper BCH
1.3: Business Law

Duration: 3 hrs.

Marks: 100 (80+20)

Lectures: 65

Objective: The objective of the course is to impart basic knowledge of the important business laws along with relevant case laws.

Contents:

Unit I: The Indian Contract Act, 1872: General Principle of Law of Contract

- a) Contract – meaning, characteristics and kinds
- b) Essentials of valid contract - Offer and acceptance, consideration, contractual capacity, free consent, legality of objects.
- c) Void agreements
- d) Discharge of contract – modes of discharge including breach and its remedies.
- e) Contingent contracts
- f) Quasi - contracts

Unit II: The Indian Contract Act, 1872: Specific Contracts

- a) Contract of Indemnity and Guarantee
- b) Contract of Bailment
- c) Contract of Agency

Unit III: The Sale of Goods Act, 1930

- a) Contract of sale, meaning and difference between sale and agreement to sell.
- b) Conditions and warranties
- c) Transfer of ownership in goods including sale by non-owners
- d) Performance of contract of sale
- e) Unpaid seller – meaning and rights of an unpaid seller against the goods and the buyer.

Unit IV: Partnership Laws

The Partnership Act, 1932

- a. Nature and Characteristics of Partnership
- b. Registration of Firms
- c. Types of Partners
- d. Rights and Duties of Partners
- e. Implied Authority of a Partner
- f. Incoming and outgoing Partners
- g. Mode of Dissolution of Partnership

Unit V: The Negotiable Instruments Act 1881

- a) Meaning and Characteristics of Negotiable Instruments : Promissory Note, Bill of Exchange, Cheque

- b) Holder and Holder in due Course, Privileges of Holder in Due Course.
- c) Negotiation: Types of Endorsements

- d) Crossing of Cheque
- e) Bouncing of Cheque

Learning Outcomes: The students would be able to deal with the legal aspect of different business situations.

Suggested Readings:

1. Arora Sushma – Business Law – Taxmann Publication
2. Kuchhal, M.C. and Vivek Kuchhal, *Business Law*, Vikas Publishing House, New Delhi.
3. Tulsian, P.C, Business Law, S.Chand
4. Gogna P.P.S, Business & Industrial Law, S.Chand
5. Singh, Avtar, *Business Law*, Eastern Book Company, Lucknow.
6. Maheshwari & Maheshwari, *Business Law*, National Publishing House, New Delhi.
7. Chadha, P. R., *Business Law* Galgotia Publishing Company, New Delhi.
8. Aggarwal S K, Business Law, Galgotia Publishers Company, New Delhi.
9. GoyalBhushan Kumar and Jain Kinneri, Business Laws, International Book House
10. Ravinder Kumar, Legal Aspects of Business, Cengage Learning

B.Com. (Hons.): Semester - I Paper BCH-1.4: Micro Economics

Duration: 3 hrs.

Marks: 100 (80+20)

Lectures: 65

Objective: Objective of the course is to acquaint the students with the concepts of micro-economics dealing with consumer behaviour. The course also makes the student understand the supply side of the market through the production and cost behaviour of firms.

Contents:

Unit I: Demand and Consumer Behaviour

Concepts of revenue: Marginal and Average: Revenue under conditions of Perfect and imperfect competition, Elasticity of demand: price, income and cross. Consumer Behaviour: Indifference curve analysis of consumer behavior; Consumer's equilibrium, Price elasticity and price consumption curve, income consumption curve and Engel curve, price change and income and substitution effects.

Unit II: Production and Cost

Production iso-quants, marginal rate of technical substitution, economic region of production, optimal combination of resources, the expansion path, returns to scale using iso-quants
Cost of Production: Social and private costs of production, long run and short run costs of production.

Unit III: Perfect Competition

Perfect competition: Assumptions, Equilibrium of the firm and the industry in the short and the long-run, including industry's long run supply curve. Measuring producer surplus under perfect competition

Unit IV: Monopoly

Monopoly: Monopoly short run and long run equilibrium. Shifts in demand curve and the absence of the supply curve. Measurement of monopoly power and the rule of thumb for pricing, Horizontal and vertical integration of firms

Unit V: Imperfect Competition

Monopolistic Competition and Oligopoly: Monopolistic competition price and output decision-equilibrium. Monopolistic Competition and economic efficiency Oligopoly and Interdependence

Learning Outcomes: The students would be able to apply tools of consumer behaviour and firm theory to business situations.

Suggested Readings:

1. Ahuja, H.L, Micro Economics, S.Chand
2. Dwivedi, D.N. Micro Economics, Vikash Publication
3. Mehta P.K, Singh M. – Micro Economics – Taxmann Publication
4. Pindyck, R.S., D. L. Rubinfeld and P. L. Mehta; *Microeconomics*, Pearson Education.
5. N. Gregory Mankiw, Principles of Micro Economics, Cengage Learning
6. Browning, E.K. and J.M. Browning; *Microeconomic Theory and Applications*, Kalyani Publishers, New Delhi.
7. Gould, J.P. and E.P. Lazear; *Microeconomic Theory*, All India Traveller Bookseller, New Delhi.
8. Lipsey, R.G. and K.A. Chrystal; *Economics*, Oxford University Press.
9. Maddala G.S. and E. Miller; *Microeconomics: Theory and Applications*, McGraw-Hill International.
10. Salvatore, D. *Schaum's Outline of Theory and Problems of Microeconomic Theory*, McGraw-Hill, International Edition.
11. Bilas, Richard A. *Microeconomic Theory: A Graphical Analysis*, McGraw-Hill Book Co. Kogakusha Co. Ltd.
12. Amit Sachdeva, *Micro Economics*, KusumLata Publishers.

B.Com. (Hons.): Semester - II

Paper BCH-2.1: English Communication

Skill Enhancement Compulsory Course for Commerce

Duration: 3hrs.

Marks: 100 (80+20)

Lectures: 65

Paper: 1

The purpose of this course is twofold: to train students in communication skills and to help develop in them a facility for communicative English.

Since language it is which binds society together and serves as a crucial medium of interaction as well as interchange of ideas and thoughts, it is important that students develop a capacity for clear and effective communication, spoken and written, at a relatively young age. The need has become even more urgent in an era of globalization and the increasing social and cultural diversity that comes with it.

English, being a global language par excellence, it is important that any course in communication is tied to an English proficiency programme. The present course will seek to create academic and social English competencies in speaking, listening, arguing, enunciation, reading, writing and interpreting, grammar and usage, vocabulary, syntax, and rhetorical patterns.

Students, at the end of the course, should be able to unlock the communicator in them by using English appropriately and with confidence for further studies or in professional spheres where English is the indispensable tool of communication.

Unit 1

[20]

Introduction

1. What is communication?

2. Types of communication

- Horizontal
- Vertical
- Interpersonal
- Grapevine

3. Uses of Communication

Prescribed Reading: Chapter 1 *Applying Communication Theory for Professional Life: A Practical Introduction* by Dainton and Zelle

<http://tsime.uz.ac.zw/claroline/backends/download.php?url=L0ludHJvX3RvX2NvbW11bmljYXRpb25fVGh1b3J5LnBkZg%3D%3D&cidReset=true&cidReq=MBA563>

Unit-2

[20]

Language of Communication

1. Verbal: spoken and written

2. Non-verbal

- Proxemics
- Kinesics
- Haptics
- Chronemics

- Paralinguistics

3. Barriers to communication

4. Communicative English

Unit-3

[20]

Reading Comprehension

- Locate and remember the most important points in the reading
- Interpret and evaluate events, ideas, and information
- Read “between the lines” to understand underlying meanings
- Connect information to what they already know

Unit 4

Writing

[20]

1. Expanding an Idea
2. Writing a Memo
3. Report Writing
4. Creative Writing
5. News Story
6. Setting in Creative Writing
7. Writing a Business Letter
8. Letters to the Editor
9. Précis Writing
10. CV & Resume Writing
11. Dialog writing
12. Covering Letter
13. Writing Formal Email
14. Elements of Story Writing
15. Note Making
16. Information Transfer
17. Interviewing for news papers

Unit-5

[20]

Language functions in listening and conversation

1. Discussion on a given topic in pairs
2. Speaking on a given topic individually
3. Group Discussion
4. Interview
5. Dialogue

(Practice to be given using speaking activities from the prescribed textbook)

Grammar and Usage

1. Simple and Compound Sentences
2. Complex Sentences
3. Noun Clause
4. Adjective Clause
5. Adverb Clause
6. The Conditionals in English
7. The Second Conditional
8. The Third Conditional
9. Words and their features
10. Phrasal Verbs
11. Collocation
12. Using Modals
13. Use of Passives
14. Use of Prepositions
15. Subject-verb Agreement
16. Sentence as a system
17. Common Errors in English Usage

Examination pattern

Each reading and writing question will invite a 200 word response.

Midterm test

[20 marks]

Unit 1 (preferably short questions on types and uses of

communication) Total

20 marks

Final Semester Examination

Unit 2

One long question with choice
Two short notes with choice

01x 10 qns= 10 marks
02x 05 qns= 10 marks

Unit 3

Reading: 04 questions
(2 prose and 2 poetry questions)

04 x 05 qns= 20 marks

Unit 4

Writing: 02 questions

02x 10 qns = 20 marks

Unit 5

Grammar & Usage

02x10 qns = 20 marks

Total

= 80 marks

Grammar questions must be set in contexts; not as isolated sentences as used for practice in the prescribed textbook.

Book Prescribed:

Vistas and Visions: An Anthology of Prose and Poetry. (Ed.) Kalyani Samantray, Himansu S.

Texts to be studied

Prose

- The Last Leaf
- Ecology and Society
- How Wealth Accumulates and Men Decay
- The Open Window

B.Com. (Hons.): Semester - II

Paper BCH-2.2: Corporate Accounting

Duration: 3 hrs.

Marks: 100(80+20)

Lectures: 65

Objectives: To help the students to acquire the conceptual knowledge of the corporate accounting and to learn the techniques of preparing the financial statements.

Contents:

Unit 1. Accounting for Share Capital & Debentures

Issue of shares, forfeiture and reissue of forfeited shares- concept & process of book building, Issue of rights and bonus shares; Buy back of shares, Redemption of preference shares. Issue and Redemption of Debentures

Unit 2 Final Accounts

Preparation of profit and loss account and balance sheet of corporate entities (excluding calculation of managerial remuneration) Disposal of company profits

Unit 3. Valuation of Goodwill and Valuation of Shares

Concepts and calculation - simple problem only

Unit 4 Amalgamation of Companies

Concepts and accounting treatment as per Accounting Standard: 14 (ICAI) (excluding intercompany holdings). Internal reconstruction: concepts and Accounting treatment excluding scheme of reconstruction

Unit 5 Liquidation of Company

Meaning of liquidation, modes of winding up, consequences of winding up, statement of affairs, liquidator's final statement of account, list 'B' contributories

Learning Outcomes: This paper can provide conceptual clarity about the techniques to prepare financial statements of companies along with accounting treatment of various situations viz. floating of shares, amalgamation and liquidation of companies.

Suggested Readings:

1. Monga, J.R. *Fundamentals of Corporate Accounting*. Mayur Paper Backs, New Delhi.
2. Tulsian, P.C, *Corporate Accounting*, S. Chand
3. Shukla, M.C., T.S. Grewal, and S.C. Gupta. *Advanced Accounts*. Vol.-II. S. Chand & Co., New Delhi.
4. Maheshwari, S.N. and S. K. Maheshwari. *Corporate Accounting*. Vikas Publishing House, New Delhi.
5. Sehgal, Ashok and Deepak Sehgal. *Corporate Accounting*. Taxman Publication, New Delhi.
6. Gupta, Nirmal. *Corporate Accounting*. Sahitya Bhawan, Agra.
7. Jain, S.P. and K.L. Narang. *Corporate Accounting*. Kalyani Publishers, New Delhi.
8. Compendium of Statements and Standards of Accounting. The Institute of Chartered Accountants of India, New Delhi.

9. Bhushan Kumar Goyal, *Fundamentals of Corporate Accounting*, International Book House

B.Com. (Hons.): Semester

- II Paper BCH-2.3:

Corporate Laws

Duration: 3 hrs.

Marks: 100 (80+20)

Lectures: 65

Objectives: *The objective of the course is to impart basic knowledge of the provisions of the Companies Act, 2013 and the Depositories Act, 1996. Case studies involving issues in corporate laws are required to be discussed.*

Contents:

UNIT I Introduction

Administration of Company Law [including National Company Law Tribunal (NCLT), National Company Law Appellate Tribunal (NCLAT), Special Courts]; Characteristics of a company; types of companies including one person company, small company, dormant company and producer company; association not for profit; formation of company, on-line filing of documents, promoters, their legal position. **(As per companies Act, 2013)**

UNIT II Documents

Memorandum of association, articles of association, GDR; book building; issue, allotment and forfeiture of share, transmission of shares, buyback and provisions regarding buyback; issue of bonus shares**(As per companies Act, 2013)**

UNIT III Management

Classification of directors, women directors, independent director, disqualifications, director identity number (DIN); appointment; Legal positions, powers and duties; removal of directors; managing director, meetings of shareholders and board; types of meeting, meeting through video conferencing, e-voting. Audit Committee, Nomination and Remuneration Committee, Stakeholders Relationship Committee, Corporate Social Responsibility Committee. **(As per companies Act, 2013)**

UNIT IV Dividends, Accounts, Audit–

Provisions relating to payment of Dividend, Provisions relating to Books of Account, Provisions relating to Audit, Auditors' Appointment, Rotation of Auditors, Auditors' Report.

Winding Up - Concept and modes of Winding Up.

Insider Trading, Whistle Blowing – Insider trading; meaning & legal provisions; Whistle blowing: Concept and Mechanism.

UNIT V Depositories Law:

The Depositories Act 1996 – Definitions; rights and obligations of depositories; participants issuers and beneficial owners; inquiry and inspections, penalty

Learning Outcomes: *Students would acquire knowledge about the legal framework and the ways and means to deal with the legal aspect of different situations of corporate sector.*

Suggested Readings:

1. Arora & Banshal, Corporate Law – Vikash Publication
2. Gogna, P.P.S – Company Law, S. Chand
3. MC Kuchhal *Corporate Laws*, Shri Mahaveer Book Depot. (Publishers).
4. GK Kapoor & Sanjay Dhamija, *Company Law*, Bharat Law House.
5. Reena Chadha and Sumant Chadha, *Corporate Laws*, Scholar Tech Press.
6. Gowar, LCB, *Principles of Modern company Law*, Stevens & Sons, London.
7. Ramaiya, *A Guide to Companies Act*, LexisNexis, Wadhwa and Butters worth.
8. *A Compendium of Companies Act 2013, along with Rules*, by Taxmann Publications.
9. Avtar Singh, *Introduction to company Law*, Eastern Book Company

B.Com. (Hons.): Semester - II Paper BCH-2.4: Macro Economics

Duration: 3 hrs.

Marks: 100(80+20)

Lectures: 65

Objectives: *The course aims at providing the student with knowledge of basic concepts of the macro economics. The modern tools of macro-economic analysis are discussed and the policy framework is elaborated, including the open economy.*

Contents:

Unit I

Introduction – concepts and variables of macro-economics, income, expenditure and the circular flow, components of expenditure. Static macro economic analysis short and the long run – determination of supply, determination of demand, and conditions of equilibrium

Unit II

Economy in the short run – IS–LM framework, fiscal and monetary policy, determination of aggregate demand, shifts in aggregate demand, aggregate supply in the short and long run, and aggregate demand- aggregate supply analysis.

Unit III

Inflation, causes of rising and falling inflation, inflation and interest rates, social costs of inflation. Unemployment – natural rate of unemployment, frictional and wait unemployment. The trade-off between inflation and unemployment

Unit IV

Open economy – flows of goods and capital, saving and investment in a small and a large open economy, exchange rates, Mundell – Fleming model with fixed and flexible prices in a small open economy with fixed and with flexible exchange rates, interest-rate differentials case of a large economy.

Unit V

Behavioral Foundations - Investment –determinants of business fixed investment, effect of tax, determinants of residential investment and inventory investment. Demand for Money – Portfolio and transactions theories of demand for real balances, interest and income elasticity of demand for real balances, Supply of money.

Learning Outcomes: Students would be able to apply the modern tools of macro-economic analysis so as to minimize the adverse impact of macro-economic factors on business.

Suggested Readings

1. Ahuja H.L – Macro Economics – S.Chand
2. Mankiw, N. Gregory. Principles *Macroeconomics*. Cengage Learning
3. Dornbusch, Rudiger, and Stanley. Fischer, *Macroeconomics*. McGraw-Hill.
4. Dornbusch, Rudiger., Stanley. Fischer and Richard Startz, *Macroeconomics*. Irwin/McGraw-Hill.
5. Deepashree, *Macro Economics*, Scholar Tech. New Delhi.
6. Barro, Robert, J. *Macroeconomics*, MIT Press, Cambridge MA.
7. Burda, Michael, and Wyplosz. *Macroeconomics A European Text*. Oxford University Press, Oxford.
8. Vaish – Macro Economics – Vikash Publication
9. Salvatore, Dominick. *International Economics*. John Wiley & Sons Singapore.
8. Branson, William H. *Macroeconomic Theory and Policy*. HarperCollins India Pvt. Ltd.

B.Com. (Hons.): Semester - II

Paper BCH-2.5: Computerized Accounting

Duration: 3 hrs.

Marks: 100(80+20)

Lectures: 65

Objectives: To help the students to understand accounting as an information system for the generation of accounting information and preparation of accounting reports.

Contents:

Unit I – Introduction to Computer and Accounting Information System

Introduction to Computer (Elements, Capabilities, Limitations of Computer System), Introduction to Operating software, utility software and application software, Introduction to Accounting Information System (AIS) as a part of MIS

Unit II Overview of Computerized Accounting System

Introduction: Application in Accounting; Features of Computerized Accounting System, Structure

of CAS, Software Packages: Generic, Specific; Tailored.

Unit III Accounting Application of Electronic Spreadsheet

Concept of electronic Spread-sheet, Features offered by electronic spread-sheet; Application in generating accounting information – Bank reconciliation statement; asset accounting; loan, repayment of loan schedule, ratio analysis, Data representation – graphs, charts and diagrams.

Unit IV Using Computerized Accounting System

Computerised Accounting Systems: Computerized Accounts by using any popular accounting software: Creating a Company; Configure and Features settings; Creating Accounting Ledgers and Groups; Creating Stock Items and Groups; Vouchers Entry; Generating Reports - Cash Book, Ledger Accounts, Trial Balance, Profit and Loss Account, Balance Sheet, Funds Flow Statement, Cash Flow Statement Selecting and shutting a Company; Backup and Restore data of a Company

Unit V Database Management System (DBMS)

Concept and features of DBMS; DBMS in Business Application; Generating Accounting Information – Payroll.

Learning Outcome: After reading this subject the students will be able to define a computerized accounting system; distinguish between a manual and computerized accounting system; highlight the advantages and limitations of computerized accounting system and state the sourcing of a computerized accounting system.

Suggested Readings

1. Nanda Dhameja, Financial Accounting for Managerial Competitiveness – S.Chand
2. Maheswari S.N. - Introduction to Accounting – Vikash Publication

B.Com. (Hons.): Semester - III

Paper BCH-3.1: Human Resource Management

Duration: 3 hrs.

Marks: 100(80+20)

Lectures: 65

Objective: The objective of the course is to acquaint students with the techniques and principles to manage human resource of an organization.

Contents:

Unit I:

Human Resource Management: Concept and Functions, Role, Status and competencies of HR Manager, HR Policies, Evolution of HRM. Emerging Challenges of Human Resource Management;

workforce diversity, empowerment, Downsizing; VRS; Human Resource Information System;

Unit II

Acquisition of Human Resource: Human Resource Planning- Quantitative and Qualitative dimensions; job analysis – job description and job specification; Recruitment – Concept and sources; Selection – Concept and process; test and interview; placement induction.

Unit III

Training and Development; Concept and Importance; Identifying Training and Development Needs; Designing Training Programmes; Role Specific and Competency Based Training; Evaluating Training Effectiveness; Training Process Outsourcing; Management Development; Career Development.

Unit IV

Performance appraisal; nature and objectives; Modern Techniques of performance appraisal; potential appraisal and employee counseling; job changes - transfers and promotions. Compensation: concept and policies; job evaluation; methods of wage payments and incentive plans; fringe benefits; performance linked compensation.

Unit V

Maintenance: employee health and safety; employee welfare; social security; Employer Employee relations- an overview. Grievance handling and redressal Industrial Disputes causes and settlement machinery.

Learning Outcomes: This paper can enhance the capability of the students to manage the most important assets of organization i.e. human beings which is much needed to ensure growth of that organization.

Suggested Readings:

1. Bohlander and Snell, Principles of *Human Resource Management*, Cengage Learning
2. Chhabra, T.N. *Essentials of Human Resource Management*. Sun India Publication New Delhi.
3. DeCenzo, D.A. and S.P. Robbins, "*Personnel/Human Resource Management*", Prentice Hall of India, New Delhi.
4. Khanka S.S. *Human Resource Management*. S Chand.
5. Rao V.S.P - *Human Resource Management*. Vikash Publication
6. SanghiSeema, *Human Resource Management* – Vikash Publication
7. Ivancevich, John M. *Human Resource Management*. McGraw Hill.
8. Wreather and Davis. *Human Resource Management*. Pearson Education.
9. Robert L. Mathis and John H. Jackson. *Human Resource Management*. Cengage Learning.

B.Com. (Hons.): Semester - III

Paper BCH-3.2: Income Tax Law and Practice

Duration: 3 hrs.

Marks: 100(80+20)

Lectures: 65

Objective: To provide basic knowledge and equip students with the application of principles and provisions of Income Tax Act 1961.

Contents:

Unit I

Basic concept: Income, agricultural income, person, assessee, assessment year, previous year, gross total income, total income, Maximum marginal rate of tax. Permanent Account Number (PAN), Residential status; Scope of total income on the basis of residential Status Exempted income under section 10

Unit II Computation of income under different heads

- Salaries
- Income from house property

Unit III Computation of income under different heads

- Profits and gains of business or profession
- Capital gains
- Income from other sources

Unit IV Total income and tax computation

Income of other persons included in assessee's total income- Aggregation of income and set-off and carry forward of losses Deductions from gross total income, Rebates and reliefs

- Computation of total income of individuals and firms
- Tax liability of an individual and firm
- Five leading cases of Supreme Court

Unit V Preparation of return of income:

- Manually On-line filing of Returns of Income & TDS.
- Provision & Procedures of Compulsory On-Line filing of returns for specified assesses.

Learning Outcomes: This paper would provide the understanding of various provisions of Income Tax Act as well as equip the students to make practical applications of the provisions for taxation purpose.

Suggested readings:

1. Singhania, Vinod K. and Monica Singhania. *Students' Guide to Income Tax, University Edition*. Taxmann Publications Pvt. Ltd., New Delhi.
2. Ahuja, Girish and Ravi Gupta. *Systematic Approach to Income Tax*. Bharat Law House, Delhi.
3. Pagare, Dinkar. *Law and Practice of Income Tax*. Sultan Chand and Sons, New Delhi.
4. Lal, B.B. *Income Tax Law and Practice*. Konark Publications, New Delhi.

Journals

1. *Income Tax Reports*. Company Law Institute of India Pvt. Ltd., Chennai.
2. *Taxman*. Taxman Allied Services Pvt. Ltd., New Delhi.
3. *Current Tax Reporter*. Current Tax Reporter, Jodhpur.

Software

1. Dr. Vinod Kumar Singhania, *e-filing of Income Tax Returns and Computation of Tax*, Taxmann Publication Pvt. Ltd, New Delhi. Latest version
2. Excel Utility available at incometaxindiaefiling.gov.in

B.Com. (Hons.): Semester - III

Paper BCH-3.3: Management Principles & Applications

Duration: 3 hrs.

Marks: 100(80+20)

Lectures: 65

Objective: The objective of the course is to provide the student with an understanding of basic management concepts, principles and practices.

Unit 1: Introduction

Concept: Need for Study, Managerial Functions – An overview; Co-ordination: Essence of Managership, Evolution of the Management Thought, Classical Approach – Taylor, Fayol, Neo-Classical and Human Relations Approaches – Mayo, Hawthorne Experiments, Behavioural Approach, Systems Approach, Contingency Approach – Lawrence & Lorsch, MBO - Peter F. Drucker

Unit 2: Planning

- a. Types of Plan – An overview to highlight the differences b. Strategic planning – Concept, process, Importance and limitations c. Environmental Analysis and diagnosis (Internal and external environment) –Definition, Importance and Techniques (SWOT/TOWS/WOTS- UP, BCG Matrix, Competitor Analysis), Business environment; Concept and Components d. Decision-making – concept, importance

Unit 3: Organising

Concept and process of organising – An overview, Span of management, Different types of authority (line, staff and functional), Decentralisation, Delegation of authority Formal and Informal Structure; Principles of Organising; Network Organisation Structure

Unit 4: Staffing and Leading

a. *Staffing*: Concept of staffing, staffing process b. *Motivation*: Concept, Importance, extrinsic and intrinsic motivation; Major Motivation theories - Maslow's Need-Hierarchy Theory; Herzberg's Two-factor Theory, Vroom's Expectation Theory. c. *Leadership*: Concept, Importance, Major theories of Leadership (Likert's scale theory, Blake and Mouten's Managerial Grid theory) d. *Communication*: Concept, purpose, process; Oral and written communication; Formal and informal communication networks, Barriers to communication, Overcoming barriers to communication.

Unit 5: Control

a. *Control*: Concept, Process, Limitations, Principles of Effective Control, Major Techniques of control - Ratio Analysis, ROI, Budgetary Control, EVA, PERT/CPM.
b. Emerging issues in Management

Learning Outcomes: Students would be able to make use of different management principles in the course of decision making in different forms of business organizations.

Suggested Readings:

1. Chandan J.S – *Management Concepts of Strategy* – Vikash Publication
2. Pillai RSN – *Principles & Practice of Management* – S. Chand
3. Harold Koontz and Heinz Weihrich, *Essentials of Management: An International and Leadership Perspective*, McGraw Hill Education.
4. Stephen P Robbins and Madhushree Nanda Agrawal, *Fundamentals of Management: Essential Concepts and Applications*, Pearson Education.
5. George Terry, *Principles of Management*, Richard D. Irwin
6. Newman, Summer, and Gilbert, *Management*, PHI
7. James H. Donnelly, *Fundamentals of Management*, Pearson Education.
8. B.P. Singh and A.K.Singh, *Essentials of Management*, Excel Books
9. Griffin, *Management Principles and Application*, Cengage Learning
10. Robert Kreitner, *Management Theory and Application*, Cengage Learning
11. TN Chhabra, *Management Concepts and Practice*, DhanpatRai & Co. (Pvt. Ltd.), New Delhi
12. Peter F Drucker, *Practice of Management*, Mercury Books, London
13. Gupta R.N - *Principles & Practice of Management* – S. Chand

B.Com. (Hons.): Semester - III Paper 3.4: Business Statistics

Duration: 3 hrs.

Marks: 100 (80+20)

Lectures: 65

Objective: *The objective of this course is to familiarize students with the basic statistical tools used for managerial decision-making.*

Contents:

Unit 1 Statistical Data and Descriptive Statistics

Nature and Classification of data: univariate, bivariate and multivariate data; time-series and cross-sectional data

Measures of Central Tendency

a) Mathematical averages including arithmetic mean, geometric mean and harmonic mean.

Properties and applications.

b) Positional Averages

Mode and Median (and other partition values including quartiles, deciles, and percentiles)

(including graphic determination)

Unit 2

Measures of Variation: absolute and relative. Range, quartile deviation, mean deviation, standard deviation, and their coefficients, Properties of standard deviation/variance Skewness: Meaning, Measurement using Karl Pearson and Bowley's measures; Concept of Kurtosis

Probability and Probability Distributions

Theory of Probability: Approaches to the calculation of probability, Calculation of event probabilities. Addition and multiplication laws of probability (Proof not required) Conditional probability and Bayes' Theorem (Proof not required)

Unit 3 Simple Correlation and Regression Analysis

Correlation Analysis: Meaning of Correlation: simple, multiple and partial; linear and non-linear, Correlation and Causation, Scatter diagram, Pearson's co-efficient of correlation; calculation and properties (proofs not required). Correlation and Probable error; Rank Correlation

Regression Analysis: Principle of least squares and regression lines, Regression equations and estimation; Properties of regression coefficients; Relationship between Correlation and Regression coefficients; Standard Error of Estimate

Unit 4 Index Numbers

Meaning and uses of index numbers: Construction of index numbers: fixed and chain base: univariate and composite. Aggregative and average of relatives – simple and weighted

Tests of adequacy of index numbers, Base shifting, splicing and deflating. Problems in the construction of index numbers

Construction of consumer price indices, important share price indices

Unit 5 Time Series Analysis

Components of time series, Additive and multiplicative models Trend analysis, Fitting of trend line using principle of least squares – linear, second degree parabola and exponential. Conversion of annual linear trend equation to quarterly/monthly basis and vice-versa; Moving averages Seasonal variations- Calculation of Seasonal Indices using Simple averages, Ratio-to-trend, and Ratio-to-moving averages methods. Uses of Seasonal Indices

Learning Outcomes: Students would be armed with the knowledge of using different statistical tools very much required in the decision making process in any business as well as business research.

Suggested Readings:

1. Sharma J K, Fundamentals of Business Statistics – Vikash Publication
2. Levin, Richard, David S. Rubin, Rastogi, and Siddiqui. *Statistics for Management*. 7th Edition. Pearson Education.
3. Berenson and Levine. *Basic Business Statistics: Concepts and Applications*. Pearson Education.
4. Siegel Andrew F. *Practical Business Statistics*. McGraw Hill.
5. Hazarika P. Business Statistics – S. Chand
6. Vohra N. D., *Business Statistics*, McGraw Hill.
7. Spiegel M.D. *Theory and Problems of Statistics*. Schaum's Outlines Series. McGraw Hill Publishing Co.
8. Gupta, S.P., and Archana Gupta. *Statistical Methods*. Sultan Chand and Sons, New Delhi.
9. Gupta, S.C. *Fundamentals of Statistics*. Himalaya Publishing House.
10. Arora – Business Statistics – S.Chand

B.Com. (Hons.): Semester - III Paper 3.5: E- Commerce

Duration: 3 hrs.

Marks: 100 (80+20)

Lectures: 65

Objectives: To enable the student to become familiar with the mechanism for conducting business transactions through electronic means.

Contents

Unit-1

Unit 1: Introduction: Meaning, nature, concepts, advantages and reasons for transacting online, categories of E-Commerce, Supply Chain Management, Customer Relations Management

Unit 2:

Planning Online-Business: Nature and dynamics of the internet, pure online vs. brick and click business; assessing requirement for an online business designing, developing and deploying the system, one to one enterprise.

Unit 3 Technology for Online-Business:

Internet, IT Infrastructure, Middle ware contents: Text and Integrating E-business applications.

Unit 4: Mechanism of making payment through internet:

Online-payment mechanism; Electronic Payment systems; payment Gateways; Visitors to website; tools for promoting websites; Plastic Money: Debit Card, Credit Card;

Unit 5: Applications in E-Commerce:

E-commerce applications in manufacturing, Wholesale, retail and service sector.

Security and Legal Aspects of E-Commerce:

Threats in E-Commerce, Security of Clients and Service-Provider; Cyber Law - Information Technology Act 2000: An overview of major provisions

Learning Outcomes: This paper would enhance the technical skills of the students to get into the business ventures using electronic means thereby providing the opportunity to gain access to a larger customer base.

Suggested Readings:

1. Pandey U.S – E.Commerce& Mobile Commerce Technology – S. Chand

B.Com. (Hons.): Semester – IV

Paper BCH- 4.1: COST AND MANAGEMENT ACCOUNTING

Duration: 3 hrs.

Marks: 100 (80 + 20)

Lectures: 65

Objective: To acquaint the students with basic concepts used in cost accounting, various methods involved in cost ascertainment.

CONTENTS:

Unit 1: Introduction

Meaning, objectives and advantages of cost accounting; Difference between cost accounting and financial accounting; Cost concepts and classifications; Elements of cost

Materials: Material/inventory control- concept and techniques, Accounting and control of purchases, storage and issue of materials. Methods of pricing of materials issues – FIFO, LIFO and Average

Unit 2: Labour and Overhead

Labour: Accounting and Control of labour cost. Time keeping and time booking. Concept and treatment of idle time, over time, labour turnover and fringe benefits. Methods of wage payment and the Incentive schemes- Halsey, Rowan, Taylor's Differential piece wage.

Overhead: Classification, allocation, apportionment and absorption of overhead. Under- and over-absorption

Unit 3: Methods of Costing

Methods of Costing: Unit costing, Job costing, Contract Costing, Process costing (excluding process losses, valuation of work in progress, joint and by-products)

Unit 4: Budgeting and Standard Costing

Budgeting and budgetary control: Concept of budget and budgetary control, objectives, merits, and limitations, Budget administration, Functional budgets, Fixed and flexible budgets, Zero base budget

Standard costing and variance analysis: Meaning of standard cost and standard costing: advantages, limitations and applications, Variance analysis – material, labour and overhead

Unit 5: Marginal Costing

Absorption versus variable costing: Distinctive features and income determination. Cost-Volume-Profit Analysis: Break-even analysis-algebraic and graphic methods. Contribution, Margin of safety and Angle of incidence

Learning Outcome: After the completion of this paper, the students will be able to have confidence in managing cost issues and also to keep a check on cost control and taking managerial decisions.

Suggested Reading:

1. Horngreen, Charles T., George Foster and Srikant M. Dattar. *Cost Accounting: A Managerial Emphasis*. Prentice Hall of India Ltd., New Delhi.
2. Horngreen, Charles T., Gary L. Sundem. *Introduction to Management Accounting*. Prentice Hall.
3. Jain, S.P. and K.L. Narang. *Cost Accounting: Principles and Methods*. Kalyani Publishers, Jalandhar.
4. Lal, Jawahar. *Cost Accounting*. Tata McGraw Hill Publishing Co., New Delhi.
5. Nigam, B.M. Lall and I.C. Jain. *Cost Accounting: Principles and Practice*. Prentice Hall of India, New Delhi.
6. Arora, M.N. *Cost Accounting – Principles and Practice*. Vikas Publishing House, New Delhi.
7. Maheshwari, S.N. and S.N. Mittal. *Cost Accounting: Theory and Problems*. Shri Mahabir Book Depot, New Delhi.
8. Singh, S. K. and Gupta Lovleen. *Management Accounting – Theory and Practice*. Pinnacle Publishing House.
9. Ustry, Milton E. and Lawrence H. Hammer. *Cost Accounting: Planning and Control*. South Western Publishing Co.

10. Barfield, Jesset T., Cecily A. Raibarn and Michael R. Kinney. *Cost Accounting: Traditions and Innovations*. Thomson Learning.

11. Lucey, T. Costing. ELST, London.
12. Garrison H., Ray and Eric W. Noreen. *Managerial Accounting*. McGraw Hill.
13. Drury, Colin. *Management and Cost Accounting*. Cengage Learning.
14. Lal, Jawahar. *Advanced Management Accounting Text and Cases*. S. Chand & Co., New Delhi.
15. Khan, M.Y. and P.K. Jain. *Management Accounting*. Tata McGraw Hill, Publishing Co., New Delhi.
16. Hansen, *Managerial Accounting*, Cengage Learning

B.Com. (Hons.): Semester - IV

Paper BCH-4.2: BUSINESS MATHEMATICS

Duration: 3 hrs.

Marks: 100 (80 + 20)

(Lectures: 65)

Objective: The objective of this course is to familiarize the students with the basic mathematical tools with emphasis on applications to business and economic situations.

Contents:

Unit 1. Matrices and Determinant

Algebra of matrices, Inverse of a matrix, Matrix Operation – Business Application Solution of system of linear equations (having unique solution and involving not more than three variables) using matrix inversion Method and Cremer's Rule.

Unit 2. Calculus I

Mathematical functions and their types- linear, quadratic, polynomial, exponential, logarithmic and logistic function. Concepts of limit, and continuity of a function, Concept and rules of differentiation, Maxima and Minima involving second order

Unit 3. Calculus II

Integration: Standard forms, Methods of integration – by substitution, by parts and by use of partial fractions, definite integration, finding areas in simple cases

Unit 4. Mathematics of Finance

Compounding and discounting of a sum using different types of rates. Types of annuities, like ordinary, due, deferred, continuous, perpetual, and their future and present values using different types of rates of interest, Depreciation of Assets. (*General annuities to be excluded*)

Unit 5. Linear Programming

Formulation of linear programming problems (LPP): Graphical solution to LPPs. Cases of unique and multiple optimal solutions, Unbounded solutions and infeasibility, and redundant constraints, Solution to LPPs using Simplex method – maximization and minimization cases.

Learning Outcome: After reading this subject the students will be able to understand basic concepts in the areas of business calculus and financial mathematics and to connect acquired knowledge with practical problems in economic practice.

Suggested Readings:

1. Arora P.N. Business Mathematics – S.Chand
2. Anthony, M. and N. Biggs. *Mathematics for Economics and Finance*. Cambridge University Press.
3. Arora S.R & Gupta K. – Business Mathematics – Taxmann Publication
4. Ayres, Frank Jr. *Theory and Problems of Mathematics of Finance*. Schaum's Outlines Series. McGraw Hill Publishing Co.
5. Budnick, P. *Applied Mathematics*. McGraw Hill Publishing Co.
6. Dowling, E.T. *Mathematics for Economics*, Schaum's Outlines Series. McGraw Hill Publishing Co.
7. Mizrahi and John Sullivan. *Mathematics for Business and Social Sciences*. Wiley and Sons.
8. Zamirudeen & Bhambri – Business Statistics – Vikash Publication
9. Wikes, F.M. *Mathematics for Business, Finance and Economics*. Thomson Learning.
10. Prasad, Bindra and P.K. Mittal. *Fundamentals of Business Mathematics*. Har-Anand Publications.
11. Thukral, J.K. *Mathematics for Business Studies*. Mayur Publications.
12. Vohra, N.D. *Quantitative Techniques in Management*. Tata McGraw Hill Publishing Company.
13. Soni, R.S. *Business Mathematics*. Pitambar Publishing House.
14. Singh J. K. *Business Mathematics*. Himalaya Publishing House
15. Hazarika P. Business Mathematics – S.Chand

B.Com. (Hons.): Semester - IV

Paper – BCH 4.3: COMPUTER APPLICATIONS IN BUSINESS

Duration: 3 hrs.
65)

Marks: 100(80+20)

(Lectures:

Objectives: To provide computer skills and knowledge for commerce students and to enhance the student understands of usefulness of information technology tools for business operations.

Contents:

Unit 1. Word Processing

Introduction to word Processing, Word processing concepts, Use of Templates, Working with word document: (Opening an existing document/creating a new document, Saving, Selecting text, Editing text, Finding and replacing text, Closing, Formatting, Checking and correcting spellings)Bullets and numbering, Tabs, Paragraph Formatting, Indent, Page Formatting, Header and footer, Mail Merge including linking with Access Database, Tables: Formatting the table, Inserting filling and formatting a table Creating Documents in the areas: Mail Merge including linking with Access Database, Handling Tables, Inserting Pictures and Video

Unit 2. Preparing Presentations:

Basics of presentations: Slides, Fonts, Drawing, Editing; Inserting: Tables, Images, texts, Symbols, Media; Design; Transition; Animation; and Slideshow

Unit 3. Spreadsheet and its Business Applications

Spreadsheet concepts, Creating a work book, Saving a work book, Editing a workbook, Inserting, deleting work sheets, Entering data in a cell, Formula Copying, Moving data from selected cells, Handling operators in formula, Rearranging Worksheet, Project involving multiple spreadsheets, Organizing Charts and graphs, Printing worksheet, Generally used Spread sheet functions: Mathematical, Statistical, Financial, Logical, Date and Time, Lookup and reference, Text functions.

Unit 4. Creating spreadsheet in the following areas:

Loan & Lease statement ;Ratio Analysis ;Payroll statements ;Capital Budgeting ;Depreciation Accounting; Graphical representation of data; Frequency distribution and its statistical parameters Correlation and Regression

Unit 5. Database Management System

Creating Data Tables, Editing a Database using Forms, Performing queries, Generating Reports Creating DBMS in the areas of Accounting, Employees, Suppliers and Customer

Learning Outcome: The completion of this paper will enhance students' computer abilities and skills to compete with the present technology driven business market.

NOTE:

- There shall be a practical examination of 100 Marks (Practical-80 Marks, Viva-10 Marks and Work Book- 10 Marks) and duration of Examination shall be 3 Hrs.
- Teaching arrangement need to be made in the computer Lab
- There shall be four lectures per class and 4 Practical Lab periods per batch to be thought in computer Lab.

Suggested Readings:

1. Saxena& Chopra – Computer Application in Management – Vikash Publication
2. Nagpal – Computer Fundamental – S.Chand

B.Com. (Hons.): Semester - IV

Paper BCH 4.4: INDIAN ECONOMY – PERFORMANCE AND POLICIES

Duration: 3 hrs.

Marks: 100(80+20)

Lectures: 65

Objective: This course seeks to enable the student to grasp the major economic problems in India and their solution.

Contents:

Unit 1: Basic Issues in Economic Development:

Concept and Measure of Development and Underdevelopment; Human Development

Unit 2: Basic Features of the Indian Economy at Independence:

Composition of national income and occupational structure, the agrarian scene and industrial structure

Unit 3: Policy Regimes:

- a) The evolution of planning and import substituting industrialization, (b) Economic reform and liberalization

Unit 4: Growth, Development and Structural Change:

- a) The experience of Growth, Development and Structural Change in different phases of growth and policy regimes across sectors and regions.
- b) The Institutional Framework: Patterns of assets ownership in agriculture and industry; Policies for restructuring agrarian relations and for regulating concentration of economic power;
- c) Changes in policy perspectives on the role of institutional framework after 1991.
- d) Growth and Distribution; Unemployment and Poverty; Human Development; Environmental concerns.
- e) Demographic Constraints: Interaction between population change and economic development.

Unit 5: Sectoral Trends and Issues:

- a) Agriculture: Agrarian growth and performance in different phases of policy regimes i.e. pre green revolution and the two phases of green revolution; Factors influencing productivity and growth; the role of technology and institutions; price policy, the public distribution system and food security.
- b) Industry and Services: Phases of Industrializations – the rate and pattern of industrial growth across alternative policy regimes; Public sector – its role, performance and reforms; The small scale sector; Role of Foreign capital.
- c) The Financial Sector: Structure, Performance and Reforms. Foreign Trade and balance of Payments: Structural Changes and Performance of India's Foreign Trade and Balance of Payments; Trade Policy Debate; Export policies and performance; Macro Economic Stabilization and Structural Adjustment; India and the WTO.

Learning Outcome: After the completion of this paper, the student will able to identify the key performance indicators and policies of the present economic environment of the country.

Readings:

1. Gaurav Dutt and KPM Sundarum, *Indian Economy*, S. Chand & Company.
2. Gopalji, Suman & Anisha Bakhri – *Indian Economy*, Vikash Publication
3. Mishra and Puri, *Indian Economics*, Himalaya Publishing House
4. Deepashree, "*Indian Economy, Performance and Polices*", Scholar Tech. New Delhi
5. Bettelheim. Charles *India Independent*. Chapters 1, 2 and 3.
6. Bhagwati, J. and Desai, P. *India: Planning for industrialization*, OUP, Ch 2.
7. Patnaik, Prabhat. *Some Indian Debates on Planning*. T. J. Byres (ed.). *The Indian Economy: Major Debates since Independence*, OUP.
8. Ahluwalia, MontekS. *State-level Performance under Economic Reforms in India* in A. O. Krueger. (ed.). *Economic Policy Reforms and the Indian Economy*, The University of Chicago Press.

9. Nagaraj, R. *Indian Economy since 1980: Vitrious Growth or Polarisation?* Economic and Political Weekly. pp. 2831-39.
10. Ray, S. K. *Land Systems and its Reforms In India. Sections II & III*, Indian Journal of Agricultural Economics. Vol. 51. Nos. 1 & 2.
11. Visaria, Pravin. *Demographic Aspects of Development: The Indian Experience*. Indian Journal of Social Sciences. Vol. 6. No. 3.
12. Dreze, Jean and Amartya Sen. *Economic Development and Social Opportunity*. Ch. 2. OUP.
13. Vaidyanathan, A. *India's Agricultural Development Policy*. Economic and Political Weekly.
14. Sawant, S. D. and C. V. Achuthan. *Agricultural Growth across Crops and Regions: Emerging Trends and Patterns*. Economic and Political Weekly. Vol. 30 A2-A13.
15. Krishnaji, N. *Agricultural Price Policy: A Survey with Reference to Indian Foodgrain Economy*. Economic and Political Weekly. Vol. 25. No. 26.
16. Chaudhuri, Sudip. *Debates on Industrialisation*. in T.J. Byres (ed.). *The Indian Economy: Major Debates since Independence*, OUP.
17. Chandra, Nirmal K. *Growth of Foreign Capital and its Importance in Indian Manufacturing*. Economic and Political Weekly. Vol. 26. No. 11.
18. Khanna, Sushil. *Financial Reforms and Industrial Sector in India*. Economic and Political Weekly. Vol. 34. No. 45.
19. Vaidyanathan, A. *Poverty and Development Policy*. Economic and Political Weekly.
20. Deaton, A and Jean Dreze. *Poverty and Inequality in India*. Economic and Political Weekly.
21. Planning Commission, *Task Force on Employment Opportunities*. Ch 1 and 2
22. Uma Kapila (ed), "*Indian Economy since Independence*", Relevant articles.
23. Rangarajan, C. and N. Jadhav. *Issues in Financial Sector Reform*. BimalJalan. (ed). *The Indian Economy*. Oxford University Press, New Delhi.
24. Chakravarty, Sukhamoy. *Development Planning – The Indian Experience*. Oxford University Press, Delhi.

B.Com. (Hons.): Semester - IV

Paper BCH 4.5: Entrepreneurship

Duration: 3 hrs.

Marks: 100 (80+20)

Lectures: 65

Objective: The purpose of the paper is to orient the learner toward entrepreneurship as a career option and creative thinking and behavior for effectiveness at work and in life.

Contents:

Unit 1

Meaning, elements, determinants and importance of entrepreneurship and creative behavior
 Entrepreneurship and creative response to the society' problems and at work, Dimensions of entrepreneurship: intra-preneurship, techno-preneurship, cultural entrepreneurship, international entrepreneurship, net-preneurship, eco-preneurship, and social entrepreneurship.

Unit 2

Entrepreneurship and Micro, Small and Medium Enterprises:

Concept of business groups and role of business houses and family business in India, The contemporary role models in Indian business: their values, business philosophy and behavioral orientations. Conflict in family business and its resolution

Unit 3

Public and private system of stimulation, support and sustainability of entrepreneurship, Requirement, availability and access to finance, marketing assistance, technology, and industrial accommodation, Role of industries/entrepreneur's associations and self-help groups. The concept, role and functions of business incubators, angel investors, venture capital and private equity fund.

Unit 4

Sources of business ideas and tests of feasibility:

Significance of writing the business plan/ project proposal, Contents of business plan/ project proposal. Designing business processes, location, layout, operation, planning & control; preparation of project report (various aspects of the project report such as size of investment, nature of product, market potential may be covered). Project submission/ presentation and appraisal thereof by external agencies, such as financial/non-financial institutions

Unit 5

Mobilizing resources for start-up, Accommodation and utilities, Preliminary contracts with the vendors, suppliers, bankers, principal customers; Contract management: Basic start-up problems.

Learning outcome: After the completion of this paper, student will have the entrepreneurial temper with conceptual input and practical insight as how to be an entrepreneur.

Suggested Readings:

1. SS Khanka, Entrepreneurial Development, S. Chand & Co, Delhi.
2. Kuratko and Rao, *Entrepreneurship: A South Asian Perspective*, Cengage Learning.
3. Rao, V.S.P – Business Entrepreneurship & Management – Vikash Publication
4. Desai, Vasant. *Dynamics of Entrepreneurial Development and Management*. Mumbai, Himalaya Publishing House.
5. Dollinger, Mare J. *Entrepreneurship: Strategies and Resources*. Illinois, Irwin.
6. Holt, David H. *Entrepreneurship: New Venture Creation*. Prentice-Hall of India, New Delhi.
7. Jain, Arun Kumar. *Competitive Excellence: Critical Success Factors*. New Delhi: Viva Books Limited. ISBN-81-7649-272-8.
6. Panda, ShibaCharan. *Entrepreneurship Development*. New Delhi, Anmol Publications. (Latest Editions)
7. Plsek, Paul E. *Creativity, Innovation and Quality*. (Eastern Economic Edition), New Delhi: Prentice-Hall of India. ISBN-81-203-1690-8.
8. SIDBI Reports on Small Scale Industries Sector.
9. Singh, Nagendra P. *Emerging Trends in Entrepreneurship Development*. New Delhi: ASEED.

B.Com. (Hons.): Semester - IV

Paper BCH 4.6: Personal Selling and Salesmanship (Optional-II)

Duration: 3 hrs.

Marks: 100 (80+20)

Lectures: 65

Objective: The purpose of this course is to familiarize the students with the fundamentals of personal selling and the selling process. They will be able to understand selling as a career and what it takes to be a successful salesman

Unit 1:

Introduction to Personal Selling: Nature and importance of personal selling, myths of selling, Difference between Personal Selling, Salesmanship and Sales Management, Characteristics of a good salesman, types of selling situations, types of salespersons, Career opportunities in selling, Measures for making selling an attractive career.

Unit- II

Buying Motives: Concept of motivation, Maslow's theory of need hierarchy; Dynamic nature of motivation; Buying motives and their uses in personal selling

Unit- III

Selling Process: Prospecting and qualifying; Pre-approach; Approach; Presentation

Unit- IV

and demonstration; handling of objections; Closing the sale; Post sales activities.

Sales Reports: reports and documents; sales manual, Order Book, Cash Memo; Tour Diary, Daily and Periodical Reports; Ethical aspects of Selling.

Unit V

Advertising: Meaning, Importance and Features, Modes of advertisements and their respective merits and demerits.

Learning outcome: After the completion of this paper, the students will able to identify an understand the psychology of selling and different factors that shape the buying behaviour of customers.

Suggested Readings:

1. Davar R.S – Salesmanship and Publicity – Vikash Publication
2. Sahu P.K & Rout K.C – Salesmanship & Sales Management – S.Chand
3. *Spiro, Stanton, and Rich, Management of the Sales force*, McGraw Hill.
4. Rusell, F. A. Beach and Richard H. Buskirk, *Selling: Principles and Practices*, McGraw Hill
5. Futrell, Charles, *Sales Management: Behaviour, Practices and Cases*, The Dryden Press.
6. Still, Richard R., Edward W. Cundiff and Norman A. P. Govoni, *Sales Management: Decision*
7. *Strategies and Cases*, Prentice Hall of India Ltd., New Delhi,
8. Johnson, Kurtz and Schueing, *Sales Management*, McGraw Hill
9. KapoorNeeru, *Advertising and personal Selling*, Pinnacle, New Delhi.

B.Com. (Hons.): Semester – V

Paper BCH 5.1: PRINCIPLES OF MARKETING

Duration: 3 hrs.

Marks: 100(80+20)

Lectures: 65

Objective: *The objective of this course is to provide basic knowledge of concepts, principles, tools and techniques of marketing.*

Contents:

Unit-1

Introduction: Nature, scope and importance marketing; Evolution of marketing concepts; Marketing mix, Marketing environment.

Consumer Behavior – An Overview: Consumer buying process; Factors influencing consumer buying decisions.

Unit-2

Market Selection: Market segmentation – concept, importance and bases; Target market selection; Positioning concept, importance and bases; Product differentiation vs. market segmentation;

Product: Meaning and importance. Product classifications; Concept of product mix; Branding, packaging and labeling; Product-Support; Product life-cycle; New Product Development

Unit-3

Pricing: Significance, Factors affecting price of a product; Pricing Policies and strategies;

Promotion: Nature and importance of promotion; Communication process; Types of promotion: advertising, personal selling, public relations & sales promotion, and their distinctive characteristics; Promotion mix and factors affecting promotion mix decisions.

Unit-4

Distribution: Channels of distribution - meaning and importance; Types of distribution channels; Wholesaling and retailing; Factors affecting choice of distribution channel; Physical Distribution.

Retailing: Types of retailing – store based and non-store based retailing, chain stores, specialty stores, supermarkets, retail vending machines, mail order houses, retail cooperatives; Management of retailing operations: an overview; Retailing in India: changing scenario.

Unit-5

Rural marketing: Growing Importance; Distinguishing characteristics of rural markets; Understanding rural consumers and rural markets; Marketing mix planning for rural markets.

Recent developments in marketing: Social marketing, on line marketing, direct marketing, services marketing, green marketing,

Learning outcome: After the completion of this paper, the students will be able to identify marketing components and fit them in the value chain along with the various marketing strategies.

Suggested Readings:

1. Kotler, Philip, Gary Armstrong, Prafulla Agnihotri and Ahsan UIHaque. *Principles of Marketing*. 13th edition. Pearson Education.
2. Mahajan & Mahajan – Principles of Marketing – Vikash Publication.
3. Michael, J. Etzel, Bruce J. Walker, William J. Stanton and Ajay Pandit. *Marketing Concepts and Cases*. (Special Indian Edition).
4. Rudani R.B – *Basics of Marketing Management* – S. Chand
5. McCarthy, E. Jerome., and William D. Perreault. *Basic Marketing*. Richard D. Irwin.
6. Lamb, Charles W., Joseph F. Hair, Dheeraj Sharma and Carl McDaniel. *Marketing: A South Asian Perspective*. Cengage Learning.
7. Pride, William M., and D.C. Ferrell. *Marketing: Planning, Implementation & Control*. Cengage Learning.
8. Majaro, Simon. *The Essence of Marketing*. Prentice Hall, New Delhi.
9. Zikmund William G. and Michael D'Amico. *Marketing; Creating and Keeping Customers in an E-Commerce World*. Thomson Learning.
10. Chhabra, T.N., and S. K. Grover. *Marketing Management*. Fourth Edition. Dhanpat Rai & Company.
11. The Consumer Protection Act 1986.
12. Iacobucci and Kapoor, *Marketing Management: A South Asian Perspective*. Cengage Learning.
13. Arun Kumar – Marketing management – Vikash Publication

B.Com. (Hons.): Semester – V

Paper BCH 5.2: FUNDAMENTALS OF FINANCIAL MANAGEMENT

Duration: 3 hrs.

Marks: 100(80+20)

Lectures: 65

Objective: To familiarize the students with the principles and practices of financial management.

Contents:

Unit-1

Introduction to Financial Management: Scope and objective, Time value of money, Risk and return, Valuation of securities – Bonds and Equities

Unit-2

Long Term Investment Decisions: The Capital Budgeting Process, Cash flow Estimation, Payback Period Method, Accounting Rate of Return, Net Present Value (NPV), Net Terminal Value, Internal Rate of Return (IRR), Profitability Index

Unit-3

Financing Decisions: Sources of long-term financing, Estimation of components of cost of capital. Methods for Calculating cost of equity capital, Cost of Retained Earnings, Cost of Debt and Cost of

Preference Capital, Weighted Average cost of capital (WACC) and Marginal cost of capital. Capital structure –Theories of Capital Structure (Net Income, Net Operating Income, MM Hypothesis, Traditional Approach). Operating and financial leverage, Determinants of capital

structure

Unit-4

Dividend Decisions: Theories for Relevance and irrelevance of dividend decision for corporate valuation. Cash and stock dividends, Dividend policies in practice

Unit-5

Working Capital Decisions: Concepts of working capital, the risk-return trade off, sources of short-term finance, working capital estimation, cash management, receivables management, Inventory management and payables management

Learning Outcome: After the completion of this paper, students will be able to understand finance in a better way along with giving them insight to practical management of long and short finance for real business houses.

Suggested Readings

1. Bhalla V.K – Financial Management – S.Chand
2. Horne, J.C. Van and Wackowich. *Fundamentals of Financial Management*. 9thed. New Delhi Prentice Hall of India.
3. Johnson, R.W. *Financial Management*. Boston Allyn and Bacon.
4. Joy, O.M. *Introduction to Financial Management*. Homewood: Irwin.
5. Khan and Jain. *Financial Management text and problems*. 2nd ed. Tata McGraw Hill New Delhi.
6. Pandey, I.M. *Financial Management*. Vikas Publications.
7. Chandra, P. *Financial Management- Theory and Practice*. (Tata McGraw Hill).
8. Rustagi, R.P. *Fundamentals of Financial Management*. Taxmann Publication Pvt. Ltd.
8. Singh, J.K. *Financial Management- text and Problems*. 2nd Ed. DhanpatRai and Company, Delhi.
9. Singh, Surender and Kaur, Rajeev. *Fundamentals of Financial Management*. Book Bank International.
10. Brigham and Houston, *Fundamentals of Financial Management*, 13th Ed., Cengage Learning

B.Com. (Hons.): Semester – V

Paper BCH-DSE 5.3(A): Financial Markets, Institutions and Services

Duration: 3 hrs.

Marks: 100(80+20)

Lectures:

65

Objective: To provide the student a basic knowledge of financial markets and institutions and to familiarize them with major financial services in India.

Contents

Unit-1

An Introduction to Financial System, its Components – financial markets and institutions, financial intermediation, Flow of funds matrix, financial system and economic development, an overview of Indian financial system

Unit-2

Financial Markets: Money market – functions, organization and instruments. Role of central bank in money market; Indian money market – An overview

Capital Markets – functions, organization and instruments. Indian debt market; Indian equity market – primary and secondary markets; Role of stock exchanges in India

Unit-3

Financial Institutions: Commercial banking – introduction, its role in project finance and working capital finance, Development Financial institutions (DFIs) – An overview and role in Indian economy, Life and non-life insurance companies in India; Mutual Funds – Introduction and their role in capital market development. Non-banking financial companies (NBFCs)

Unit-4

Overview of financial services industry: Merchant banking – pre and post issue management, underwriting. Regulatory framework relating to merchant banking in India

Unit-5

Leasing and Hire–purchase: Consumer and housing finance; Venture capital; Factoring services, bank guarantees and letter of credit; Credit rating; Counseling.

Learning Outcome: After the completion of this paper, the student will acquire financial literacy skill particularly by giving information about the financial system, markets, services and regulatory bodies in India.

Suggested Readings:

1. Bhole, L.M. *Financial Markets and Institutions*. Tata McGraw-Hill Publishing Company.
2. Pandian P. – *Financial Service and Markets*. Vikas Publishing House.
3. Dhanekar. *Pricing of Securities*. New Delhi: Bharat Publishing House.
4. Nibasaiya Sapna – *Indian Financial System* – S.Chand
5. Prasanna, Chandra. *Financial Management: Theory and Practice*. Tata McGraw Hill \ Publishing Company Ltd., New Delhi.
6. Simha, S.L.N. *Development Banking in India*. Madras: Institute of Financial Management and Research
7. Khan and Jain. *Financial Services*. 2nd ed. Tata McGraw Hill
8. Singh, J.K. *Venture Capital Financing in India*. Dhanpat Rai and Company, New Delhi.
9. Annual Reports of Major Financial Institutions in India

B.Com. (Hons.): Semester – V

Paper BCH-DSE 5.3 (B): BANKING AND INSURANCE SYSTEM

Duration: 3 hrs.

Marks: 100(80+20)

Lectures: 65

Objectives: To enable the students to acquire knowledge about basics of banking and insurance.

Unit-1

Concept of Bank and Banking: Historical Evolution of Banking: Origin and Development of Banking - Structure of Banking in India – Banks and Economic Development – Functions of Commercial banks (conventional and innovative functions) – Central Bank – RBI – functions – Emerging trends in Banking.

Unit-2

Types of Customers and Account holders: Procedure and practice in opening and operating the accounts of customers - individuals including minors - joint account holders - Partnership firms - joint stock companies - executors and trustees - clubs and associations

Unit-3

Introduction to insurance: Purpose and need of insurance, insurance as a social security tool - insurance and economic development - Principles of insurance - various kinds of insurance - life, marine, fire, medical, general insurance - features.

Unit-4

Life Insurance - Law relating to life Insurance; General Principles of Life Insurance Contract; Proposal and policy; assignment and nomination; title and claims; General Insurance - Law relating to general insurance; different types of general insurance; general insurance Vs life insurance – Insurance business in India.

Unit-5

Fundamentals of Agency Law: Definition of an agent; Agents regulations; Insurance intermediaries; Agents' compensation. Procedure for Becoming an Agent: Pre-requisite for obtaining a license; Duration of license; Cancellation of license; Revocation or suspension/termination of agent appointment; Code of conduct; Unfair practices. Functions of the Agent: Proposal form and other forms for grant of cover; Financial and medical underwriting; Material information; Nomination and assignment; Procedure regarding settlement of policy claims.

Learning Outcome: After the completion of this paper, the student will acquired practical knowledge of working mechanism of banking and insurance industries in India.

Reference Books:

1. Mishra S. *Banking Law and Practice – S Chand*
2. Sheldon H.P :*Practice and Law of Banking.*
3. Bedi. H.L :*Theory and Practice of Banking.*
4. Maheshwari. S.N. :*Banking Law and Practice.*
5. Shekar. K.C :*Banking Theory Law and Practice.*
6. Pannandikar&Mithami': *Banking in India.*
7. Radhaswamy&Vasudevan: *Text Book of Banking.*
8. Indian Institute of Bankers (Pub) *Commercial Banking Vol-I/Vol-II (part I&II) Vol- III.*
9. Varshaney: *Banking Law and Practice.*
10. Dr. P. Periasamy: *Principles and Practice of Insurance*
11. Himalaya Publishing House, Delhi.
12. Inderjit Singh, RakeshKatyal& Sanjay Arora: *Insurance Principles and Practices*
13. Kalyani Publishers, Chennai.
14. M.N. Mishra: *Insurance Principles and Practice, S. Chand & Company Ltd, Delhi.*
15. G. Krishnaswamy : *Principles & Practice of Life Insurance*
16. Kothari &Bahl : *Principles and Pratices of Insurance.*
17. Prasad – *Banking Insurance – Vikash Publication*

B.Com. (Hons.): Semester – V

Paper 5.3BCH-DSE 5.3 (C): INDIAN FINANCIAL SYSTEM

Duration: 3 hrs.

Marks: 100(80+20)

Lectures: 65

Objectives: *To enable the students to understand the basic knowledge about the structure, organization and working of financial system in India.*

Unit-1

Financial System: Meaning and Significance-Functions of the financial system -Financial Assets- Financial markets- Classification-Financial instruments-weakness of Indian Financial System.

Unit-2

Money market: Definition-Features-Objectives-Features of a developed money market-Importance of Money market-Composition of Money market-Operations and Participants-Money market Instruments-features of Indian money market-Recent developments.

Unit-3

Primary, Secondary and Capital Markets: New issue market-meaning-functions-methods floating new issue - intermediaries in the new issue market-merchants bankers and their functions -Recent trends in new issue market - Stock Exchanges-Functions-Structure of stock exchanges-BSE-NSE- listing of securities-Advantages of listing-methods of trading in stock exchanges-on line trading-stock indices

Unit-4

Financial Institutions: commercial banks- development financial institutions- Nonbanking financial corporation's-Mutual Funds, insurance companies – Objectives and functions (only a brief outline).

Unit-5

Regulatory Institutions: RBI – Role and Functions. The Securities and Exchange Board of India-objectives-function-powers-SEBI guidelines for primary and secondary market

Learning Outcome: After completion of this paper, the student will be able to understand the structure and role of financial system, financial intermediaries and regulators in the Indian economy.

Reference Books:

1. Kohn, Meir: *Financial Institutions and Markets*, Tata McGraw Hill.
2. Bhole L.M: *Financial Institutions and Markets*, Tata McGraw Hill.

3. Desai, Vasantha: *The Indian Financial System*, Himalaya Publishing House.
4. Machiraju.R.H: *Indian Financial System*, Vikas Publishing House.

5. Khan M.Y: *Indian Financial System*, Tata McGraw Hill.
6. Varshney, P.N., & D K Mittal, D.K.: *Indian Financial System*, Sulthan Chand & Sons
7. Gordon E. &Natarajan K.: *Financial Markets & Services*, Himalaya Publishing House.
8. Pathak, V. Bharati: *Indian Financial System*, Pearson Education.

B.Com. (Hons.): Semester – V

Paper BCH-DSE 5.4 (A): FINANCIAL STATEMENT ANALYSIS & REPORTING

Duration: 3 hrs.

Marks: 100 (80+20)

Lectures: 65

Objectives: To enable the students to understand the basic knowledge about the financial statement analysis and reporting for economic decision making.

Unit-1

Introduction Concepts of financial statements – Nature of financial statements – Objectives of financial statements – Different types of financial statements: income statement, balance sheet, statement of retained earnings, fund flow statement, cash flow statement, schedules – Limitations of financial statements.

Unit-2

Analysis & Interpretation of Financial Statements: Traditional Approaches Vs. Modern Approaches to financial statement analysis – Classification of financial statement analysis: based on modus operandi and based on materials used – Techniques of financial statement analysis: Comparative Statements, Common-size Statements, Trend Ratios and Ratio Analysis – Problems encountered in financial statement analysis.

Unit-3

Ratio Analysis: Classification of ratios – Ratio formation – Ratio interpretation – Practical methods of ratio analysis: Time Series (intra firm) Analysis, Cross Sectional (inter firm) Analysis, Residual Analysis and Multivariate Analysis.

Unit-4

Multivariate Ratio Analysis: Concept, objectives, uses and limitations – Univariate analysis Vs. Multivariate ratio analysis – Application of statistical tools in financial statement analysis.

Unit-5

Corporate Reporting: Cash Flow statement Analysis (AS 3) and Statutory and Non Statutory Reports, Integrated Reporting

Learning Outcome: After the completion of this paper, the students will be able to prepare the end result of a business houses by preparation through financial statement analysis and reporting.

Suggested Readings:

1. Foster, G.: Financial Statement Analysis, Englewood Cliffs, NJ, Prentice Hall.
2. Sahaf M.A – Management Accounting – Principles & Practice – Vikash Publication
3. Foulke, R.A.: Practical Financial Statement Analysis, New York, McGraw-Hill.
4. Hendriksen, E.S.: Accounting Theory, New Delhi, Khosla Publishing House.
5. Kaveri, V.S.: Financial Ratios as Predictors of Borrowers' Health, New Delhi, Sultan Chand.
6. Lev, B.: Financial Statement Analysis – A New Approach, Englewood Cliffs, NJ, Prentice Hall.
7. Maheswari, S.N.: Management Accounting & Financial Control, New Delhi, Sultan Chand.
8. Myer, J.N.: Financial Statement Analysis, NJ, Prentice Hall. 8. Porwal, L.S.: Accounting Theory – An Introduction, New Delhi, Tata-McGraw-Hill

B.Com. (Hons.): Semester – V

Paper 5.4 (B): MERCHANT BANKING AND FINANCIAL SERVICES

Duration: 3 hrs.

Marks: 100 (80+20)

Lectures: 65

Objectives: *To enable the students to understand the basic knowledge about the financial services available in India.*

Unit-1

Merchant Banking: Nature and scope of Merchant Banking - Regulation of Merchant Banking Activity - overview of current Indian Merchant Banking scene - structure of Merchant Banking industry - primary Markets in India and Abroad - professional Ethics and code of conduct - current Development

Unit-2

Financial Services: Meaning and Definition, Role of Financial Services in a financial system. Leasing: Meaning and features. Introduction to equipment leasing: Types of Leases, Evolution of Indian Leasing Industry. Legal Aspects of Leasing: present Legislative Framework. Hire purchase: concept and characteristics of Hire purchase. Difference between hire purchase and leasing

Unit-3

Factoring: concept, nature and scope of Factoring - Forms of Factoring - Factoring vis-à-vis Bills Discounting - Factoring vis-à-vis credit Insurance Factoring vis-à-vis Forfeiting- Evaluation of a Factor - Evaluation of Factoring - Factoring in India current Developments.

Unit-4

Securitization / Mortgages: Meaning, nature and scope of securitization, securitization as a Funding Mechanism, securitization of Residential Real Estate - whole Loans - Mortgages - Graduated-payment. **Depository:** Meaning, Evolution, Merits and Demerits of Depository. **Process of Dematerialization and Dematerialization,** Brief description of NSDL and CDSL

Unit-5

Security Brokerage: Meaning of Brokerage, types of brokers. Difference between broker and jobber, SEBI Regulations relating to brokerage business in India.

Learning Outcome: After the completion of this course, the student will be able to understand the structure and function of mercantile banking and various financial services available in the present business world.

Suggested Readings:

1. M.Y.Khan, Financial Services, Tata McGraw-Hill, 11th Edition, 2008
2. Gopal C.R – Management Financial Service – S.Chand
3. NaliniPravaTripathy, Financial Services, PHI Learning, 2008
4. Machiraju, Indian Financial System, Vikas Publishing House, 2nd Edition, 2002.
5. J.C.Verma, A Manual of Merchant Banking, Bharath Publishing House, New Delhi.
6. Varshney P.N. & Mittal D.K., Indian Financial System, Sultan Chand & Sons, New Delhi.
7. Sasidharan, Financial Services and System, Tata Mcgraw Hill, New Delhi, 1st Edition, 2008.
8. Website of SEBI

B.Com. (Hons.): Semester – V

Paper 5.4 (C): FINANCIAL INSTITUTIONS AND SERVICES

Duration: 3 hrs.

Marks: 100 (80+20)

Lectures: 65

Objectives: *To enable the students to understand the financial institutions operating in India and services provided by them.*

Unit-1

Basic Theoretical Framework: The financial system and its technology; The factors affecting the stability of the financial system; Development finance vs. universal banking; Financial intermediaries and Financial Innovation; RBI-Central Banking.

Unit-2

Financial Institutions: A brief historical perspective. An update on the performance of IDBI, ICICI, IFCI and SFCs, LIC & GIC. The banking Institutions: Commercial banks - the public and the private sectors - structure and comparative performance. The problems of competition; interest rates, spreads, and NPAs. Bank capital - adequacy norms and capital market support.

Unit-3

Non-banking financial institutions: Evolution, control by RBI and SEBI. A perspective on future role, Unit Trust of India and Mutual Funds, Reserve bank of India Framework for/Regulation of Bank Credit . Commercial paper: Features and advantages, Framework of Indian CP Market, effective cost/interest yield.

Unit-4

Financial services: Asset/fund based Financial services - lease finance, consumer credit and hire purchase finance, factoring definition, functions, advantages, evaluation and forfeiting, bills discounting, housing finance, venture capital financing. Fee-based / Advisory services: Stock broking, credit rating.

Unit-5

Operations: Financial Assets/ Instruments Rights issues, issue of Debentures, issue of Equity shares - pre-issue activity, post-issue activities. The regulatory framework: SEBI and Regulation of Primary and Secondary Markets, Company Law provisions.

Learning Outcome: *After completion of this paper, the students will be able to understand the role and benefits of financial institution and services.*

Book References

1. M.Y.Khan, Financial Services, Tata McGraw-Hill, New Delhi, 2004.
2. Harsh V.Verma, Marketing of Services, Global Business Press, 2002
3. Sames L .Heskett, Managing In the Service Economy, Harvard Business School Press, Boston, 2001.
4. M.Y.Khan, Indian Financial System, 4/eTataMcGraw-Hill, New Delhi, 2004
5. Frank.J.Fabozzi& Franco Modigliani, Foundations of Financial Markets and Institutions, 3/e, Pearson Education Asia, 2002.
6. H.R Machiraju, Indian Financial Systems, Vikas Publishing House Pvt. Ltd.2002.
7. Meir Kohn, Financial Institutions and Markets, Tata McGraw-Hill, New Delhi, 2003.
8. Pathak: Indian Financial Systems Pearson Education
9. NibasaiyaSapna – Indian Financial System – S. Chand

B.Com. (Hons.): Semester - VI

Paper BCH 6.1: AUDITING AND CORPORATE GOVERNANCE

Duration: 3 hrs.

Marks: 100 (80+20)

Lectures: 65

Objective: *To provide knowledge of auditing principles, procedures and techniques in accordance with current legal requirements and professional standards and to give an overview of the principles of Corporate Governance and Corporate Social Responsibility*

Unit-1

Auditing: Introduction, Meaning, Objects, Basic Principles and Techniques; Classification of Audit, Audit Planning, Internal Control – Internal Check and Internal Audit; Audit Procedure – Vouching and verification of Assets & Liabilities

Unit-2

Audit of Limited Companies: Company Auditor- Qualifications and disqualifications, Appointment, Rotation, Removal, Remuneration, Rights and Duties Auditor's Report-Contents and Types. Liabilities of Statutory Auditors under the Companies Act 2013

Unit-3

Special Areas of Audit: Special features of Cost audit, Tax audit, and Management audit; Recent Trends in Auditing: Basic considerations of audit in EDP Environment; Standard on Auditing(SA); Relevant Case Studies/Problems;

Unit-4

Corporate Governance: Conceptual framework of Corporate Governance, Corporate Governance Reforms. Major Corporate Scandals in India and Abroad: Common Governance Problems Noticed in various Corporate Failures. Codes & Standards on Corporate Governance

Unit-5

Corporate Social Responsibility (CSR): Strategic Planning and Corporate Social Responsibility; Corporate Philanthropy, Meaning of CSR, CSR and CR, CSR and Corporate Sustainability, CSR and Business Ethics, CSR and Corporate Governance, Environmental Aspect of CSR, CSR provision under the Companies Act 2013, CSR Committees

Learning Outcome: At the end of the paper student will have detail knowledge about principles and techniques of audit in accordance with current legal requirement and as per the guidelines of different statutory authorities.

Suggested Readings:

1. Gupta, Kamal and Ashok Arora. *Fundamentals of Auditing*. Tata Mc-Graw Hill Publishing Co. Ltd., New Delhi.
2. Gadada Siddheswar T & Rachchh Gunvantrai – Introduction to Auditing – Vikash
3. Jha, Aruna. *Auditing*. Taxmann.
4. Tandon, B. N., S. Sudharsanam and S. Sundharabahu. *A Handbook of Practical Auditing*. S. Chand and Co. Ltd., New Delhi.
5. Ghatalia, S.V. *Practical Auditing*. Allied Publishers Private Ltd., New Delhi.
6. Singh, A. K. and Gupta Lovleen. *Auditing Theory and Practice*. Galgotia Publishing Company.
7. Alvin Arens and James Loebbecke, *Auditing: an Integrated Approach*
7. Ravinder Kumar and Virender Sharma, *Auditing Principles and Practice*, PHI Learning
Christine A Mallin, *Corporate Governance (Indian Edition)*, Oxford University Press, New Delhi.
8. Bob Tricker, *Corporate Governance-Principles, Policies, and Practice* (Indian Edition), Oxford University Press, New Delhi.
9. The Companies Act 2013 (Relevant Sections)
10. MC Kuchhal *Corporate Laws*, Shri Mahaveer Book Depot. (Publishers). (Relevant Chapters)
11. Relevant Publications of ICAI on *Auditing* (CARO).
12. Khanka – Business Ethics & Corporate Governance – Vikash Publication

B. Com.: Semester VI

Paper BCH 6.2: INDIRECT TAXES

Duration: 3 hrs.

Marks: 100 (80+20)

Lectures: 65

Objective: To provide basic knowledge and equip students with application of principles and provisions of Service Tax, VAT, Central Excise, and Customs Laws.

Contents:

Unit-1

Service tax – concepts and general principles, Charge of service tax and taxable services, Valuation of taxable services, Payment of service tax and filing of returns, Penalties, CENVAT Credit.

Unit-2

VAT – concepts and general principles, Calculation of VAT Liability including input Tax Credits, Small Dealers and Composition Scheme, VAT Procedures

Unit-3

Central Excise Law in brief – Goods, Excisable goods, Manufacture and Manufacturer, Valuation, CENVAT, Basic procedures, Export, SSI, Job Work

Unit-4

Basic concepts of customs law, Territorial waters, high seas, Types of custom duties – Basic, Countervailing & Anti- Dumping Duty, Safeguard Duty, Valuation, Customs Procedures, Import and Export Procedures, Baggage, Exemptions

Unit V

Emerging Issues in Indirect Taxes: Goods and Services Tax (GST) – Scope of GST, Modalities of GST

Learning outcome: After completion of this paper, the students will have an insight to the taxation on production and distribution of goods and provision of services along taxation mechanism of international trade.

Suggested Readings:

1. Singhania Vinod K. and Monica Singhania, *Students' Guide to Indirect Taxes*, Taxmann Publications Pvt. Ltd., Delhi.
2. V.S. Datey. *Indirect Tax Law and practice*, Taxmann Publications Pvt. Ltd., Delhi, Latest edition.
3. Sanjeev Kumar. *Systematic Approach to Indirect Taxes*, Latest edition.
4. S. S. Gupta. *Service Tax -How to meet your obligation* Taxmann Publications Pvt. Ltd., Delhi, Latest edition.

5. GrishAhuja& Dr. Ravi Gupta, Indirect Taxes, Flair Publication Pvt. Ltd.

B.Com. (Hons.): Semester - VI
Paper BCH-DSE 6.3 (A): CORPORATE TAX PLANNING

Duration: 3 hrs.

Marks: 100 (80+20)

Lectures: 65

Objective: To provide Basic knowledge of corporate tax planning and its impact on decision-making.

Contents:

Unit-1

Tax planning, tax management, tax evasion, tax avoidance, corporate tax in India, Types of companies, Residential status of companies and tax incidence, Tax liability and minimum alternate tax, Tax on distributed profits

Unit-2

Tax planning with reference to setting up of a new business; Locational aspect, nature of business, form of organization; Tax planning with reference to financial management decision; Capital structure, dividend including deemed dividend and bonus shares; Tax planning with reference to sale of scientific research assets

Unit-3

Tax planning with reference to specific management decisions; Make or buy; own or lease; repair or replace; Tax planning with reference to employees' remuneration; Tax planning with reference to receipt of insurance compensation; Tax planning with reference to distribution of assets at the time of liquidation.

Unit-4

Special provisions relating to non-residents; double taxation relief; Provisions regulating transfer pricing; Advance rulings; Advance pricing agreement

Unit-5

Tax planning with reference to business restructuring: - Amalgamation, Demerger, Slump sale, Conversion of sole proprietary concern/partnership firm into company, Conversion of company into LLP, Transfer of assets between holding and subsidiary companies.

Learning outcome: After learning the subject, the students will be able to understand the taxation of the corporate house.

Suggested Readings:

1. Singhania, Vinod K. and Monica Singhania. *Corporate Tax Planning*. Taxmann Publications Pvt. Ltd., New Delhi.
2. Ahuja, Girish. and Ravi Gupta. *Corporate Tax Planning and Management*. Bharat Law House, Delhi.

3. Acharya, Shuklendra and M.G. Gurha. *Tax Planning under Direct Taxes*. Modern Law Publication, Allahabad.
4. Mittal, D.P. *Law of Transfer Pricing*. Taxmann Publications Pvt. Ltd., New Delhi.
5. IAS – 12 and AS – 22.

B.Com. (Hons.): Semester - VI

Paper BCH-DSE 6.4: BUSINESS RESEARCH METHODS AND PROJECT WORK

Duration: 3 hrs.

Marks: 100(50+50)

Lectures: 65

Objective: *This course aims at providing the general understanding of business research and the methods of business research. The course will impart learning about how to collect, analyze, present and interpret data.*

Section A: Business Research Methods

50 Marks

Unit-1

Introduction: Meaning of research; Scope of Business Research; Purpose of Research –Exploration, Description, Explanation; Unit of Analysis – Individual, Organization, Groups, and Data Series; Conception, Construct, Attributes, Variables, and Hypotheses.

Unit-2

Research Process: An Overview; Problem Identification and Definition; Selection of Basic Research Methods- Field Study, Laboratory Study, Survey Method, Observational Method Existing Data Based Research, Longitudinal Studies, Panel Studies

Unit-3

Measurement: Definition; Designing and writing items; Uni-dimensional and Multi-dimensional scales; Measurement Scales- Nominal, Ordinal, Interval, Ratio; Ratings and Ranking Scale, Thurstone, Likert and Semantic Differential scaling, Paired Comparison; Sampling –Steps, Types, Sample Size Decision; Secondary data sources

Hypothesis Testing: Tests concerning means and proportions; ANOVA, Chi-square test and other Non-parametric tests; Testing the assumptions of Classical Normal Linear Regression.

Section B – Project Report

Marks

50

Unit-4

Report Preparation: Meaning, types and layout of research report; Steps in report writing; Citations, Bibliography and Annexure in report; JEL Classification

Note:

1. There shall be a written examination of 50% Marks on the basis of Unit I to III.
2. The student will write a project report under the supervision of a faculty member assigned by the college/institution based on field work. The Project Report carries 50% Marks and will be evaluated by University appointed examiners.

Learning Outcome: After completion of this paper, the students will be able to assess and apply a range of research method on a practical project.

Suggested Readings:

1. Chawla Deepak – Research Methodology – Vikash Publication
2. Upagade&Shende – Research Methodology – S.Chand

B.Com. (Hons.): Semester - VI
Paper 6.4 (B): FUNDAMENTALS OF INVESTMENT

Duration: 3 hrs.

Marks: 100 (80+20)

Lectures: 65

Objective: To familiarize the students with different investment alternatives, introduce them to the framework of their analysis and valuation and highlight the role of investor protection.

Contents

Unit-I:

The Investment Environment - The investment decision process, Types of Investments – Commodities, Real Estate and Financial Assets, the Indian securities market, the market participants and trading of securities, security market indices, sources of financial information, Concept of return and risk, Impact of Taxes and Inflation on return.

Unit-II:

Fixed Income Securities - Bond features, types of bonds, estimating bond yields, Bond Valuation types of bond risks, default risk and credit rating.

Unit-III:

Approaches to Equity Analysis: Introductions to Fundamental Analysis, Technical Analysis and Efficient Market Hypothesis, dividend capitalization models, and price-earnings multiple approach to equity valuation.

Unit-IV:

Portfolio Analysis and Financial Derivatives: (a) Portfolio and Diversification, Portfolio Risk and Return. (b) Mutual Funds. (c) Introduction to Financial Derivatives, Financial Derivatives Markets in India.

Unit-V:

Investor Protection – Role of SEBI and stock exchanges in investor protection; Investor grievances and their redressal system, insider trading, investors' awareness and activism.

Learning outcome: After completion of this paper, this paper will educate the students about various aspect of investment in detail along with understandability of stock market operation, focusing on need for common investor protection.

Suggested Readings

1. Bhalla – Fundamentals of Investment – S.Chand
2. Pandian P. – Security Analysis & Portfolio Management – Vikash Publication

3. Jones, C.P., *“Investments Analysis and Management”*, Wiley, 8thed.

4. Prasanna, Chandra., *“Investment Analysis and Portfolio Management”*, Tata McGraw Hill.
5. Rustogi, R.P., *Fundamentals of Investment*, Sultan Chand & Sons, New Delhi.
6. Vohra, N.D., and B.R. Bagri, *“Futures and Options”*, McGraw Hill Publishing
7. Mayo, *An Introduction to Investment*, Cengage Learning.

B.Com. (Hons.): Semester - VI
Paper 6.4 (C): FINANCIAL MARKET OPERATIONS

Duration: 3 hrs.

Marks: 100 (80+20)

Lectures: 65

Objective: This course aims at acquainting the students with the working of Financial Markets in India.

Unit-1

An overview of financial markets in India: Money Markets: Indian money markets composition and structure; (a) Acceptance houses, (b) Discount houses, and (c) Call money markets; Recent trends in India money markets.

Unit-2

Capital Market: Security market – (a) New issue market. (b) Secondary market: Functions and role of stock exchange: listing procedure and legal requirements: Public Issue – pricing and marketing: Stock exchanges – National Stock Exchange and over-the-counter exchanges.

Unit-3

Securities Contract and Regulations Act: Main provisions. Investors Protections: Grievances concerning stock exchange dealing and their removal: Grievances cells in stock exchanges: SEBI: Company Law Board: Press: Remedy through courts.

Unit-4

Functionaries on Stock Exchanges: Brokers, Sub brokers, market makers, jobbers, and NRIS.

Unit-4

Financial Services: Concept, functions, and types. Financial Services: Meaning and Definition, Role of Financial Services in a financial system. Leasing: Meaning and features. Introduction to equipment leasing: Types of Leases, Evolution of Indian Leasing Industry. Legal Aspects of Leasing: present Legislative Framework. Hire purchase: concept and characteristics of Hire purchase. Difference between hire purchase and leasing, SEBI guidelines: Credit rating

Learning Outcome: After completion of this paper, the student will be able to understand the nature and role of the main financial markets within the domestic and global environment.

Suggested Readings:

1. Chandler M. V. and Goldfeld S. M: Economics of Money and Banking: Harper and Row, New York.
2. Vaish M.C – Monetary Theory – Vikash Publication
3. Gupta Suraj B: Monetary Economics: S. Chand and Co., New Delhi
4. Gupta Suraj B: Monetary Planning in India: Oxford, Delhi.
5. Bhole I. M.: financial Markets and Instructional: Tata

**UTKAL UNIVERSITY COURSES OF STUDIES,
REGULATIONS & SYLLABUS FOR THE
MASTER OF ARTS IN
SOCIAL WORK
(2016 - 2017)**

**Nayagarh Autonomous College
Nayagarh**

**COLOUR SCHEME OF MAPPING THE SYLLABI FOR
ENTREPRENEURSHIP, EMPLOYABILITY AND SKILL
DEVELOPMENT**

	Skill Development
	Employability
	Entrepreneurship
	All the three
	Skill Development and Employability
	Skill Development and Entrepreneurship
	Employability and Entrepreneurship

**UTKAL UNIVERSITY REGULATION
For the
M.A. in SOCIAL WORK (MSW) EXAMINATIONS
(Semester Scheme)**

REGULATIONS

1. Introduction:

1.1. The two year post graduate degree course leading to the Master of Arts in Social Work (MSW) of Utkal University shall be spread over a period of two academic years. Each academic year comprises of two semesters namely the Odd and Even Semester.

1.2. A candidate for the Master of Social Work shall be required to pass the following

examinations.

- End Semester Examination – I
- End Semester Examination – II
- End Semester Examination – III
- End Semester Examination – IV
- Internal Assessment for Fieldwork in semesters I – IV
- External Examination for Fieldwork in semesters I – IV
- Internal Assessment for Dissertation in semester IV
- External Examination for Dissertation in semester IV

- 1.3. A candidate shall be eligible to appear for the oncoming semester courses subsequent to the first semester University examinations respectively irrespective of declaration of the results in the previous semester but.
- 1.4. Candidate who fails in the odd semester examinations shall be eligible to appear for the examination in which s/he has failed in the next odd semester and vice versa.
- 1.5. Students who have failed in a semester or are desirous to improve their performance will be allowed a single chance in the subsequent semester examination of the following year. Thus in no case the course completion will go beyond three years.

- 1.6. A candidate for the Master of Arts in Social Work Examination shall be required to enroll himself / herself under these conditions as a student in one of the colleges affiliated to this University.

2. Admission Criteria:

- 2.1. Any person who has passed the Under Graduate Degree in any subject with a minimum of 50% marks (General candidates) and 45% marks (SC/ST/OBC candidates) from an examination conducted by a recognized University is eligible to be admitted to the 1st Semester of this course. Students from SC/ST/OBC background have to apply with valid caste certificate.

3. Duration:

- 3.1 Odd semester shall be from July to December (I and III Semesters).
- 3.2 Even semester shall be from January to June (II and IV).
- 3.3 There shall be not less than 90 working days for each semester. This excludes the days for the conduct of University end semester examinations and other holidays.
- 3.4 A student would be required to complete the course within a maximum of three (Ref. 1.5 above) academic years from the date of admission.

4. Course:

Each course is well designed under lectures / tutorials / fieldwork / seminar / assignments / report writing so that it achieves the goals of effective teaching and learning needs of the students.

5. Contents in the Courses of Study:

- 5.1 The Master of Social Work programme of study consists of a number of contents. The term 'course' is applied to indicate a logical part of the subject matter of the programme and is invariably equivalent to the subject matter of a 'Paper' in the conventional sense. The following are the various categories of courses suggested for the Master of Social Work programme.
- 5.2 There are six Foundation papers.
- 5.3 Core compulsory papers comprise of twenty two courses. These are compulsory for all students.

- 5.4 There are eleven elective courses spread over two semesters III and IV. Out of the given electives student can choose any two of his or her interest for study in the respective semester.

6. Attendance:

Students must have 75% of attendance in each theory paper and 100% attendance in fieldwork and in related assignments. This is mandatory for appearing in the examination.

7. Examinations:

- 7.1 There shall be examinations at the end of each semester.
- 7.2 Examination for odd semesters shall be conducted in the month of November – December.
- 7.3 Examination for the even semesters shall be held in the month of May – June.
- 7.4 A candidate who does not pass the examination in any of the papers shall be permitted to appear in such failed papers in the subsequent examination to be held either in November – December or May – June as the case may be.

8. Pass Marks and Classification of Successful Candidates

- 8.1 Aggregate marks for passing the examination of the Degree of Master of Arts in Social Work (MSW) shall be the sum total of the aggregate of all the four semester Examinations taken together.
- 8.2.1 Divisions will be awarded on the basis of Utkal University Regulations for the M.A. Examination.
- 8.2.2 A candidate to be considered as Pass has to secure a minimum of 50% marks in the Field Work. Each of the field-work components namely Observation Visits, Concurrent Field Work in Community and Agency settings, Rural Camp and Block Placement has to be compulsorily completed to be considered as Pass.
- 8.3.a If a candidate is marked absent in a sitting(s) of an examination, such a candidate shall have to reappear in that paper (s) of the course in order to be considered as having completed the course.

.b If a candidate does not complete the requisite field-work days in a semester and does not appear for Field Work evaluation, Field Work Seminar and Viva Voce then he/she will be considered as not having completed the course and thereby ineligible to receive the M.A. degree.

8.3.b A candidate failing to secure a minimum of 30% in any Compulsory and a minimum of 50% in the Practical (Field Work - Ist, IInd & IIIrd & IVth) either in the First, Second, Third or Final examination of this University may be allowed to appear in those papers in not more than one chance (examination) immediately following that examination for which he/she was registered, in order to clear the back paper(s) on the payment of prescribed fees.

COURSE STRUCTURE UNDER THE SEMESTER SYSTEM – MSW

Semester – I

Paper	Course Code	Course Title	Credit	Total Instruction Hours	Marks
01	SWFC – 01	Foundations of Social Work: History, Philosophy, Ethics, and Theories in Social Work	4	60	100
02	SWFC – 02	Social Science Concepts I: social structure, social institutions and social change	4	60	100
03	SWFC – 03	Social Science Concepts II: Political Judicial and Economic System,	4	60	100
04	SWFC – 04	Social Science Concepts III: Poverty, Inequality and Social Exclusion	4	60	100
05	SWFC – 05	Social Science Concepts IV: Psychological Concepts, Human Behavior and Relationships	4	60	100
06	SWFC – 06	Orientation Visit Group Lab Concurrent Field Work	8	120	200
TOTAL			28	420	700

Semester – II

Paper	Course Code	Course Title	Credit	Total Instruction Hours	Marks
07	SWCP - 01	Working with Individuals	2	30	50
08	SWCP - 02	Working with Groups	2	30	50
09	SWCP - 03	Working with Communities	4	60	100
10	SWCP - 04	A Human Rights Approach to Social Work Practice	4	60	100
11	SWCP - 05	Social Welfare Administration	4	60	100
12	SWCP - 06	Social Work Research and Statistics	4	60	100
13	SWCP - 07	Concurrent Field Work + Rural Camp	8	120	200
TOTAL			28	420	700

Semester – III

Paper	Course Code	Course Title	Credit	Total Instruction Hours	Marks
14	SWCP - 08	Child Protection and Child Rights	4	60	100
15	SWCP - 09	Social Work with Women: Issues of gender and development	4	60	100
16	SWCP - 10	Ethnic Sensitive Social Work Practice in India	4	60	100
17	SWCP - 11	Rights of persons with Disabilities and their Rehabilitation.	4	60	100
18	SWCP - 12	Community Health and Social Workers	4	60	100
19	SWCP - 13	Social Management	4	60	100
20	SWCP - 14	Concurrent Field Work	8	140	200
21	SWEP – 01 SWEP – 02 SWEP – 03 SWEP - 04 SWEP - 05 SWEP - 06 (Any One)	School Social Work Working with Women Working with Alcoholics and Substance Abusers Correctional Social Work Counseling in Social Work Social Work with the Elderly	2	30	50
TOTAL			34	530	850

Semester – IV

Paper	Course Code	Course Title	Credit	Total Instruction Hours	Marks
22	SWCP - 15	Development Theories and Strategies: Issues Challenges and Responses	4	60	100
23	SWCP - 16	Social Work Practice in Rural Areas	4	60	100
24	SWCP - 17	Social Work Practice in Urban Areas: Migration, Unorganized Labour and Livelihoods	4	60	100
25	SWCP - 18	Social Policy, Planning and Implementation	4	60	100
26	SWCP - 19	Development Communication	4	60	100
27	SWCP - 20	Sustainable Agriculture	4	60	100
28	SWCP - 21	Dissertation: Research Project	4	70	100
29	SWCP - 22	Concurrent Field Work + Block Placement	2	340	100
30	SWEP - 07 SWEP - 08 SWEP - 09 SWEP – 10 SWEP – 11 (Any One)	Entrepreneurship Development NGO Management Project Management Disaster Management People Centred Advocacy.	2	30	50
TOTAL			34	740	850

Examination Question Paper Pattern:

There shall be three types of questions – Essay / Descriptive, Short Answer & Objective.

Distribution of Marks for courses carrying 100 Marks:

Five Essay type questions carrying 12 Marks each

(Out of a choice of seven) (Answer in 700 – 1000 Words) 5 x 12 Marks = 60
Marks

Four short type questions carrying 6 Marks each

(Out of a choice of six) (Answer in 150 – 200 Words) 4 x 6 Marks = 24
Marks

Eight objective type questions carrying 2 Marks each

(Out of a choice of ten) (Answer in one or two sentences) 8 x 2 Marks = 16
Marks

Social Work Practice (Fieldwork):

Fieldwork is an integral component of the course of Master of Social Work. A student shall have to undertake his/her fieldwork for 20 hours in every week in the semester. Students shall do the fieldwork under the guidance of a faculty supervisor. Fieldwork is mandatory for all students of social work.

Field Work Schedule:

Sl. No.	Semester	Field Practicum Component	Duration	Credits
1	SWFC - 06 MSW(I)	1. Observation Visit	10 Organizations	2
		2. Concurrent Fieldwork (Community Placement)	20 hrs/week (16 hrs in the field + 4 hrs report writing)	6
2	SWCP- 07	1. Concurrent Fieldwork (Community Placemen)	20 hrs/week (16 hrs in the field +	6

	MSW (II)		4hrs report writing).	
		2. Rural Camp	10 days	2
3	SWCP- 14 MSW (III)	1. Concurrent Fieldwork (Agency Placement)	20 hrs/week (16 hrs in the field + 4hrs report writing).	8
4	SWCP- 22 MSW (IV)	1. Concurrent Fieldwork (Agency Placement)	20 hrs/week (16hrs in the field + 4 hrs report writing).	2
		2. Block Placement	One Month before the end of the semester	2

Evaluation of Fieldwork: Regulation of Fieldwork:

At the end of each semester, the Chairman of the Board of studies shall call for the submission of the Field Work Attendance Record of the students, Field Work Report files of the students, the Fortnightly Reports on the students and the Self Evaluation Report of the students. This is to facilitate the external examiners to mark the performance.

Fieldwork carries 200 marks in Semester1, 2&3 and 100 marks in Semester 4. It is divided into internal and external.

The internal evaluation carries 50% marks and it shall be evaluated by the Faculty Supervisor on the basis of field-work records, practical fieldwork and reports.

The external carry 50% marks and it shall be evaluated by the external examiners on the basis of fieldwork seminar and practical knowledge gained by the student. The external examiner shall be any person authorized by the Chairman of the Board of studies for Social Work of Utkal University.

The minimum pass mark in the fieldwork shall be 50% in both the internal and the external examinations taken together in each semester. Both these marks together will comprise the university mark for field-work.

Field Work Assessment: [SL. No. 1 and 2 will be evaluated internally. Sl. No.3, 4 & 5 will be evaluated by an external examiner appointed by the Utkal University]

Sl. No.	Criteria for Assessment	Weightage In %
1	Field Work Reports	25%
2	Fortnightly Reports by Faculty	25%
3	Self-Evaluation Report by student	25%
4	Field Work Seminar	15%
5	Viva Voce	10%
	Total	100%

Evaluation of the Dissertation:

Students to practice Social Work Research Methodology shall submit a Dissertation in any area of their interest by working on a research project under the supervision of a faculty supervisor.

Total marks assigned for project work shall be 100. This total mark is distributed equally among internal and external evaluations. The internal marks of 50 and external marks of 50 shall be calculated in the basis of the Objective, Methodology, Analysis, Findings, Presentation and Viva-Voce. It is mandatory that it be the original work of the student.

HARD CASE RULE

The Hard Case Rule mentioned on the item No.5.2.4 (I,II,&III) in the correction ship No-1222 of Utkal University as amendments to the Regulation governing 2 Years Degree Course (Master of Arts, Science, Commerce Examinations) effective for the students admitted to such courses during the Academic 2002-2003 and 2003-2004,

shall be applicable to all the Compulsory and theory papers of Ist, IInd Year Examinations while computing the Final result of Master of Social Work Examinations. In case of any new regulation added to the Hard Case Rule by the University for 2 year Degree Course (Master of Arts, Science, Commerce Examinations) shall be applicable to the 2 years Degree Course of Master of Social Work.

REGULATION FOR FIELD-WORK

Introduction:

The student of the M.A in Social Work through field work practice is supposed to be committed to the people and social institutions in which they are placed. They are expected to serve individuals, families and communities through effective practice guided by qualified field-work supervisors (with MSW degrees) and by the social-work faculty in each college affiliated to this university.

Goals of Field Work:

1. To critically assess their own roles in field-work by conducting themselves ethically and professionally and by utilizing supervision & self-reflection.
2. To develop knowledge, skills and values required to engage in quality practice with individuals, families, groups, organizations and communities.
3. To demonstrate their ability to engage practically in problem solving as change agents in a variety of settings.
4. To demonstrate knowledge and ability to apply social theories and theories of human behavior and conceptual frameworks to assess, intervene and evaluate social work practice in the individuals, families and groups.
5. To recognize and understand various forms of discrimination and oppression as they apply to members of diverse groups and communities and advocate for social and economic justice for individuals, families, groups and communities.

Semester – I:

Observation Visits: 10 social work / welfare agencies have to be compulsorily visited. In each observation visit to an agency of community organization the student must be exposed to different field Situations. This observation visit will provide an opportunity to have an exposure and orientation to the services being offered by various Organisations/ Social institutions/ Agencies and open communities such as slums / rural settings as a response to community member's needs.

Understanding the Community: To understand the dynamics of the communities specifically the slum and the rural setting. This would imply comprehending the Socio-Cultural dynamics, economic and health status, being familiar with the problems of the communities, their causes, and observing how the people respond to such situations.

Semester – II:

Work with Individuals: Students shall be placed in slums or villages. They need to identify any issue affecting an individual and apply the principles and process of social case work. Similarly two separate case work should be done. The report should reflect learning derived from these two case work.

Work with Groups: Students shall be placed in slums or villages. They need to identify groups, study them well and carefully identify dysfunction if any in them and apply the principles and process of social group work.

Students may also start new groups such as Self Help Groups, children groups, Youth Clubs, integrated groups for person with disabilities, widows groups, senior citizens, adolescent girls group, study groups and etc. The purpose of this group formation is to learn group interaction, goal setting and group dynamics. The students should demonstrate principles and processes of group work. The reports should reflect on the learning derived out of it.

Community Organisation: Students shall be placed in a slum or village in a team of 4. Students shall be trained to demonstrate the skills and process of community organization. Each team shall identify a community issue along with the participation of the people and organize a programme that aims at resolving the community issue. The purpose of this fieldwork is to ensure students learning on community organization through demonstration and also for the students to learn to work in a team.

Rural Camp: All students shall compulsorily participate in a rural camp. This camp provides ample opportunity to learn about the community through experiences of living with them. It is to be a continuous 10 days camp and students and teachers are expected to stay in the rural area for all the 10 days continuously.

Semester – III:

Understanding Formation and Management of Social Welfare Agencies: Each student shall be linked with an agency promoting social welfare. These agencies may be either Governmental or Non-Governmental or Privately managed Corporate houses. Reports of students should reflect on their learning related to the above mentioned areas. Daily Report, Consolidated fieldwork report should be submitted by every student individually. Students will work under a Faculty Supervisor and Agency Supervisor.

- To provide an opportunity to work with social welfare agencies.
- To understand the agency as an organization, its structure, functions, activities sources of funding and management.

Semester – IV:

Students shall be directed to learn about the formation, legal formalities, taxation related formalities, project formulation, resources mobilization techniques, project management, Documentation, POSDCORB, Evaluation, Need Analysis, Problem Tree Analysis, Logical Frame Analysis and so on.

- To develop an understanding of the problem and opportunities in an organisational setting.
- To develop an understanding of the problems and opportunities of the organisation and the methods they adopt to respond to their environment.

Block Placement (On the Job Training): The students of Social Work will be assigned an agency. This agency setting should be located anywhere within or out of the State. Students will work in the agency and obtain on the job training experience. This training lasts for a continuous 25 days prior to the semester examination. It is compulsory for all.

Course Title: HISTORY, PHILOSOPHY, ETHICS AND THEORIES IN SOCIAL WORK

Course Code: SWFC – 01

Level: MSW (I)

Objectives:

- To understand the historical development of the philosophy of Social Work and its emergence as a profession.
- To understand the ethical and value base of Social Work.
- To bring clarity to the basic concepts of Social Work.
- To briefly introduce Social Theory relevant to Social Work practice.

Unit I: History and Evolution of Social Work Practice

History of Social Welfare in the West (UK and USA): The Elizabethan Poor Law (1601), Charity Organisation Society (1869) Settlement House Movement, The Poor Law Commission of (1905), Beveridge Report (1941); The development of Social Work as a profession; Development of the definition of Social Work; (From Charity to Human Rights and Social Justice); History of Social Work education in India: YMCA School of Social Work Lucknow, TISS Mumbai, Delhi School of Social Work

New Delhi; Voluntary Social Work in India.

Unit II: Philosophy of Social Work and Social Work Ethics

The Traditional religious doctrine of Charity; Scientific Naturalism; Liberalism; Scientific Charity; The ideological base of the Welfare state. (with specific reference to the Indian Constitution); Gandhian ideals in Social Work Practice in India; Ambedkar's ideals in Social Work Practice in India; Professional Code of Ethics: IFSW and IASSW code of Ethics; The meta-ethical dimension of Social Work Ethics; Ethical Dilemmas in specific contexts.

Unit III: Basic Concepts in Social Work

Social Work: Concepts, Definitions, Objectives & Functions, and Methods; Contributions of Social Sciences to Social Work; Traditional Social Work and

Radical Social Work; Social Service and Social Welfare Service; Social Welfare and Social Security; Social Reform and Social Justice ; Human Rights and Human Development; Social Inclusion & Empowerment; Social Change and Social Development; Social Action and Social Movements

Unit IV: Theories relevant to Social Work Practice

Social Welfare Theory: Emile Durkheim, Herbert Spencer and Max Weber; Social Justice Theory: Distributive and Retributive Justice, Rawls Theory of Justice, Nozick's Theory of Social Justice; Radical and Marxist perspective in Social Work: L. Althusser; Anti-discriminatory and Anti-oppressive Perspective; Communication Theory: J. Habermas, Erving Goffman; Critical Theory: J. Adorno; Structure Theory: Anthony Giddens & P. Bourdieu; The Ecological Perspective; The Generalist Perspective.

Reading List:

- Beilharz, Peter (Ed) (1991): Social Theory: A Guide to Central Thinkers.
- Elliot, Anthony (Ed) (2010): The Routledge Companion to Social Theory.
- Payne, Malcolm(1997), Modern Social Work Theory and Social Work Practice.
- Mulally, Robert P. (1993), structural Social Work: Ideology, Theory and Practice.
- Reamer, G.G.(2013), Social Work Values and Ethics.
- Hugman, Richard and Smith, David(Ed)(1995) Ethical Issues in Social Work.
- Tnattner, Walter I. (1998) From Poor law to Welfare State: A History of Social Welfare in America.
- Reisch, Michael (2002), The Road not Taken: A History of Radical Social Work in the United States.
- Zastow, C(2009) Introduction to Social Work and Social Welfare: Empowering People.
- Pierson, John(), Understanding Social Work: History and Context.
- Hering.S and Waaldijk (Eds); History of Social Work in Europe(1900-1960)
- Basanquet, Helen Dendy, Social Work in London, 1869-1912; A History of the Charity Organization Society.
- Queen, S.A, Social Work in the Light of History.

Course Title: SOCIAL SCIENCE CONCEPTS - I: SOCIAL STRUCTURE, SOCIAL INSTITUTIONS AND SOCIAL CHANGE

Course Code: SWFC – 02

Level: MSW (I)

Objectives:

- This introductory course seeks to familiarize the students with Sociology as a social science and the basic concepts necessary in understanding the social and cultural processes. It is organized in such a way that even students without previous exposure to sociology could acquire an interest in the subject and follow it. Understand the role of individual in the society and importance of various social Institutions and their impact. Get a scientific insight about the social structure, stratification and issues related to caste & class. Develop clarity about social issues and challenges in the social work field.

Unit – I: Basic Concepts

- Sociological Concepts: Society, Community, Association and Institution, social organisation.
- Social Group: Meaning, Types: Primary, Secondary, In-group - Out-group, formal and informal group, pressure group and reference group.
- Tradition: Little Tradition and Great Tradition, Parochialisation and Universalization.

Unit - II: Social structure and culture

- Concept of Social Structure and function.
- Social stratification: varna, caste, class, occupation, tribe and gender.
- Social Interaction and Social Processes: Associative and Dissociative Social Processes
- Culture: definition and types, norms & values, patterns of culture, culture and personality.

Unit - III: Social institutions and Socialisation

- Marriage and Family: Characteristics, types and functions, Rules of Marriage.

- Kinship: Meaning, Definition, Types, Functions.
- Social Process: Socialisation, Acculturation, Enculturation, Assimilation, Resocialisation, Anticipatory, Adult socialisation and agency of socialisation.
- Status and Role: Multiple Roles, Role Set, Status Set, Role Conflict.

Unit – IV: Social change and Mobility

- Concepts, processes and theories of social change,
- Meaning and nature of Social change,
- Factors of social change: Sanskritisation, Westernisation, Modernisation, Orthogenetic and Heterogenetic factors of social change; Social Mobility: Horizontal & Vertical,

Reading List:

- Abraham Francis, Contemporary Sociology, Oxford University Press, 2006.
- Ahuja Ram, Indian Social System, Rawat Publication, Jaipur, 1993
- Ahuja Ram, Social Problems in India, Rawat Publication, Jaipur, 1997
- Ahuja Ram, Society in India, Rawat Publication, New Delhi, 2010
- Kuppaswamy, Social Change in India, 1998
- Beteille, Andre, *Sociology: Essays on Approaches and Method*, New Delhi: OUP, 2002
- Bose, N.K. 1967, Culture and Society in India, Bombay: Asia Publishing House.
- Bottomore, T.B.: *Sociology: A Guide to Problems and Literature*, Blackie and Sons, Bombay, 1986.
- Desai, A.R. (Ed), *Rural Sociology in India*, Popular Praakashan, 2008
- Dube S C, *Indian Society*. New Delhi: NBT 1995
- Dube, S.C. 1995, *Indian Village* (London : Routledge)
- Dumont L, *Homo Hierarchicus : The Caste System and its Implications*, Chicago University Press, 1970
- Gupta Dipankar (ed). *Social Stratification*, New Delhi: Oxford University Press, 1991

- Jodhka, S.S. (ed), *Village Society*, New Delhu: Orient BlackSwan, 2012
- Karve, Irawati, 1961 : *Hindu Society : An Interpretation*(Poona : Deccan-College)
- Kothari, Rajni, *Caste in Indian Politics in Manoranjan Mohanty* (ed.) Class, Caste, Gender: Readings in Indian Government and Politics, New Delhi, Sage. 2004
- Maclver & Page, *Society, Introductory Analysis*, MacMillan, Delhi, 2001.
- Madan & Majumdar, *An Introduction to Social anthropology*, Mayur, 1999.
- Madan, Vandana. *Village in India*, India: OUP, 2003.
- Mandelbaum David,G, *Society in India*, Popular Prakashan, 2008
- Mukherjee Ramakrishna, *Sociology of Indian Sociology*, Allied Publishers, 1979
- Satish Deshpande, "*Contemporary India A Sociological View*", Viking Publishers, New Delhi, 2003.
- Singer Milton, B, *When a Great Tradition Modernises. An Anthrapological Approach to Indian Civilization*, Praeger Publishers, 1972
- Srinivas, M.N, *Caste and its New Avatar*, Penguin, 1996
- Srinivas, M.N. 1963: *Social Change in Modern India* (California, Berkeley: University of California Press).
- Srinivas, M.N. *Caste in Modern India and Other Essays*, Bombay Asia Publishing House, 1962
- Uberoi, Petricia, *Family Kinship and marriage in India*, OUP, 2005

Course Title: SOCIAL SCIENCE CONCEPTS II: POLITICAL JUDICIAL AND ECONOMIC SYSTEM

Course Code: SWFC - 03

Level: MSW (I)

Objectives:

1. To impart knowledge about the political institutions that regulate people's life and promote their interests.
2. To Understand the basic economic concepts, principles, theories & its application in social work profession.
3. To Understand and analyze economic problems on social work perspective.

Unit - I: System of Governance

- Indian Constitution: Objective(Preamble) Characteristic Features and Amendment Process, Fundamental Rights, Fundamental Duties and Directive Principles of State Policy.
- Indian Political System: Parliamentary Democracy, Federalism and Issue of State Autonomy, Coalition Government and Role of Bureaucracy in Administration.
- India- A Welfare State: Social Policy and Social Legislation, Increasing Partnership between Government Agencies and Private Voluntary Organization.
- Judiciary: Judicial Review, Judicial activism and P.I.L.

Unit – II: Social structure and Democratic Process

- Features of Indian Democracy: Multiparty System, Role of National Parties, Regional Parties and Pressure Groups.
- Grassroots Democracy: Panchayati Raj System and Empowerment
- Issues Concerning Religion, Language, Caste, Problem of Gender, Illiteracy and Reservation.
- Institutions: Bureaucracy, National Planning, Election and Participation.
- Socio-Political Movements: Peasant Movement, Trade Union Movement, Tribal Movement, Women's Movement, and Dalit Movement

Unit – III: Development Economic

- Development Economics: Meaning Nature and Significance, Contemporary Development, Problems: Poverty and Inequality.
Economic Systems: Capitalism, Socialism, Mixed Economy – Definitions, Features, Advantages and Disadvantages.
- Rural and Urban economy: Nature and structure of rural economy; rural financial structure-formal and informal; Regional Rural Banks Policy and Planning concerning development of rural area.
Urban economic growth: State and local policies; and urban poverty-policy responses.

Unit – IV: Indian Economy and Financial Institutions

- Indian economy: Nature and Characteristics
Inflation and Over population: Meaning, magnitude, causes and consequences;
Programmes for alleviation of poverty and unemployment.

- Economic Planning and Reforms: Rationale, Features and Objectives; Globalization, Privatization and Liberalization and their impact on Agriculture and Marginalized sections of India.
Meaning and concept of Free trade, Special Economic Zone and its impact on Indian social concerns.
- Financial Institutions: National and International Financial Institutions and their Role in Social Welfare- World Bank, International Monetary Fund (IMF), Reserve Bank of India (RBI), World Economic Forum, NABARD, Commercial Banks; Role of Non Bank Financial Institutions; and National and International Funding agency for social development.

Reading List:

- Kashyap Subhash(ed), 1993, Perspective on the Constitution, Shipra Publication, Delhi.
- Basu D. D., 1992, Introduction to the Constitution of India, Prentice Hall of India Pct. Ltd., New Delhi.
- Kaushik Sushila, 1993, Women and Panchayati Raj, Har Anand publication, New Delhi.
- Kulkarni P.D, Social Policy and Social Development in India.
- Reed Elaw, Social Welfare Administration.
- ND Kumble, Ashish, Deprived Castes and Their Struggle for quality, Publishing House, New Delhi.
- Murthy(ED),Planning for Change- Council for Social Development , Aspects of Social Development.
- Setty Krishna, K.R. Chaitanya, Fundamental Rights and Socio Economic Justice in the Constitution, Publishing House, Allahabad.
- Singh M.P. and Roy Himanshu, Indian Political System, Structures, Policies, Development, 1995, Jnanada Prakashan (P & D), New Delhi.
- Misra & Puri : Advanced economic theory
- Mitchell A Seligson & John T Passé Smith, Development & Underdevelopment- The political economy of global inequality
- Agarwal A.N., Indian economy- Problems of development & planning
- A Vaidyanathan : India's economic reforms & development
- Patel Surendra J: Indian economy towards the 21st century

- Lekhi R.K.: The Economics of Development and Planning
- Dhar P.K.: Indian Economy: Its Growing Dimensions
- Datt Rudra & KPM Sundharam: (2004), Indian Economics Theory: S, Chand & Co New Delhi.
- K.G Karmakar, Rural Credit And Self Help Groups: Microfinance Needs and Concepts in India: Sage publication.
- Thakur S.N., (1988): Economic theory of profile of Indian Economy: Deep & Deep Publication, New Delhi.

Course Title: SOCIAL SCIENCE CONCEPTS III: POVERTY, INEQUALITY AND SOCIAL EXCLUSION

Course Code: SWFC – 04

Level: MSW (I)

Objectives:

- To develop clarity and understanding on the various perspectives about the concept of poverty, Inequality and social exclusion.
- To discuss policy interventions that aim to reduce poverty, inequality and exclusion.

Unit – I: Understanding Poverty

- Concept of Poverty, Different types of poverty: relative, absolute, material and social; culture of poverty, theories of poverty; Deprivation.
- Poverty Measurement: Indicators of poverty, PQLI, HDI, Poverty lines.
- Anti-poverty programmes in India.

Unit – II: Understanding Inequality

- Equality, inequality, capability, post-industrial structuralism, norm of structural exclusion, inequality and globalization;
- Bases of inequality in India: religion, caste, ethnicity, gender, disability, merit, region, language, culture, migrants.
- Diversity & Inequality: Socio-cultural and geological analysis

Unit – III: Understanding Social Exclusion

- Definitions and Concepts, Evolution of the concept of Social Exclusion; Dimensions of Social Exclusion, Theories of Social Exclusion;
- Social Exclusion and the role of: Religion, Race, Caste, Ethnicity; Gender; and Disability.
- Relationship of Social Exclusion and Discrimination

UNIT – IV:

- Social policy response to combat Poverty. Inequality and Social Exclusion in India.
- The role of social work in addressing issues of poverty, inequality and social exclusion.

Reading List:

- Sen, Amartya 2000 Social Exclusion: Concept, Application and Scrutiny. Social Development Papers NO.1. Asian Development Bank.
- Sen, Amartya "Poverty as Capability Deprivation," chapter 4 in Development as Freedom, OUP, 2000.
- Sullivan, Elizabeth 2002 Social Exclusion, Social Identity and Social Capital: Reuniting the Global, the Local and the Personal. De Montfort University, UK.
- Silver, Hilary and S.M. Miller 2003 Social Exclusion: The European Approach to Social Disadvantage. Indicators.2.2: 1-17.
- Haan, Arjan de 2001 Social Exclusion: Enriching the Understanding of Deprivation. Institute of Development Studies and Poverty Research Unit, University of Sussex. Sussex. UK
- O'Brien, D, Joanna Wilkes, Arjan de Haan, Simon Maxwell Poverty and Social Exclusion in North and South. Institute of Development Studies and Poverty Research Unit, University of Sussex. Sussex. UK.
- Kabeer, Naila 2006 Social Exclusion and the MDGs. The Challenge of 'Durable Inequalities' in the Asian Context. Institute of Development Studies and Overseas Development Studies Institute.
- Beall, Jo 2002 Globalization and Social Exclusion in Cities: Framing the Debate with Lessons from Africa and Asia. Development Studies Institute, LSEP, London.
- Chebolu, Radha Mohan 2007 Corporate Quotas: The Myth Action'. Pravartak. 2:2: 159-165.
- Saith, Ruhi 2001 Social Exclusion: The Concept and Application to Developing Countries. QEH Working Paper Series -72.
- Loury, G.C 2000 Social Exclusion and Ethnic Groups: The Challenge to Economics. Annual World Bank Conference on Development Economics 1999. The International Bank for Reconstruction and Development! The World Bank.

- Jenkins, Robert 2006 Social Exclusion of Scheduled Caste Children from Primary Education in India; UNICEF India. New Delhi.
- Sen, Amartya 1992 Inequality Re-examined, New Delhi Oxford University Press.
- Byrne, David 1999 Social Exclusion. Buckingham: Open University Press.

Course Title: SOCIAL SCIENCE CONCEPTS IV: PSYCHOLOGICAL CONCEPTS, HUMAN BEHAVIOUR AND RELATIONSHIPS

Course Code: SWFC – 05

Level: MSW (I)

Objectives:

- To understand the concept of human behavior
- To understand the basic concepts and factors of human behavior
- To understand the relevance of psychology in social work
- To understand the concept of personality and its application in social work education

UNIT – I: Nature and Scope of Psychology

Meaning and definition of psychology – Schools of psychology: Structural, Functional and Behaviourist, Importance of psychology in social work practice, Factors influencing Human Behaviour-Heredity, Environment and Self

UNIT – II: Human growth and development

Human growth and development: Meaning and principles; Social, Emotional, Cognitive and Physical Stages in Life Span approach from Conception to Old Age: characteristics, needs, tasks and problems at each stage.

UNIT – III: Personality

Meaning of personality, Theories of personality: Trait and Type theories; important concepts of the contributions of Freud, Jung, Adler, Maslow and Ericson: factors influencing personality Development Psychological Processes in Behaviour: Perception, Emotion, Motivation, Attitude; Processes of Adjustment: Concept and Factors; Coping Mechanism, Defence Mechanism

UNIT – IV: Theories of Human Development

Psychoanalytic theory: Psycho-sexual theory by Freud, Psycho-social theory by Erickson.

Behavioural theory: Classical conditioning by I P Pavlov, Operant.

Humanistic theory: Abraham Maslow and Carl Rogers, Alfred Adler. Cognitive theory: Jean Piaget's theory

Reading List:

Davidoff.L.L.: Introduction to Psychology, Auckland; McGraw Hill Inc:1881

Morgan, C.T.& King, R.A:Introduction to psychology New York.

Weix;J.R& Schopler J: McGraw Hill;7th Ed.,1986.

Munn,N.A.:psychology-The fundamentals of human Behaviour;London;

Hurlock E. B: Developmental psychology, New Delhi, Tata Mcgraw Hill 5th Ed.1971

Rayner, Eric: Human Development, London; George Allen and Unwin, 1978.

Sareswathi T.S, Dutta R: Development psychology in India, Delhi; Sage publications, 1987.

Kuppusamy B: An Introduction to social Psychology; Bombay; Media Promoters and pub.Pvt.Ltd., 1980.

Coleman, J.C: Abnormal Psychology and Modern Life

Fair-weather George W.: Social Psychology Treating in Mental Illness, Sydney, John Wiley and Sons

Course Title: WORKING WITH INDIVIDUALS

Course Code: SWCP – 01

Level: MSW (II)

Objectives:

- To develop theoretical knowledge and understanding about working with individuals
- To critically examine the application of social case work method in human

personality and development.

Unit - I: Basics of Case Work

Social Case Work: nature, assumptions, values and principles. Components of social case work: person, place, problem & process. History of social case work.

Unit – II: Client Worker Relationship

Need and importance of Relationship: nature and ways to establish. Psychoanalytical theory. Ego - functions and defense mechanisms. Concept of Human needs, stress, social role and adaptation

Unit – III: Process of Case Work

Process of social case work- study, assessment, goal formation, planning, treatment, evaluation, termination. Techniques of social case work: interviewing, support, encouragement, clarification, correcting perception, reality orientation; resource mobilization, home visit, interpretation, topical shift, logical reasoning, crisis intervention, burnout. Transference and Counter-Transference and its use in case work. Supportive techniques. Referral: its use in social case work. Recording: types and format.

Unit – IV: Models of Case Work

Models of social case Work practice: Problem solving, Psycho- social, Task oriented. Rational Emotive Therapy in social case work. Discussion on role of case worker from the records in school, family and marriage settings. Presentations and discussions on cases and practical questions.

Readings List:

Banarjee, G.R. TISS Series 23. Papers on Social Work: An Indian Perspective; Tata Institute of Social Sciences, Mumbai. TISS(Series 23).

Batra, Sushma & Marlin Taber, 1996. Social strains of Globalization in India, Mittal Publication, New Delhi.

Biestek, F.P. 1970. The Case Work Relationship: London: Unwin University Books, Impression.

Bogo, Mario, 2006-07. Social Work Practice: Concepts, Processes and Interviewing. Columbia University Press-2006. Indian Reprint by Rawat Publication : New Delhi,2007.

Friedlander, W.A. 1964. Concepts and Methods of Social "Work, New Delhi: Prentice Hall of India Pvt. Ltd.

Fisher, J, 1978. Effective Case Work Practice: An Effective Approach, New York McGraw Hill Book Co.

Florence, H., 1964. Case Work: A Psycho social therapy, Random House, New York.

Farard, M.L. & N.K. Hunnybun, 1962 The Case Work's use of relationship London, Tavistock. Pub.

Goldstein, H., 1970. Social Work Practice: A Unitary Approach, Carolina: Univ. of S. Carolina Press.

Grace, Methew, 1992. Introduction to School Case Work, Tata Institute of Social Sciences, Mumbai.

Hamilton, G., 1946. Principles of Social Case recording, New York: Columbia University Press.

Himilton, Gordon, 1959. Theory & Practice of Social Case Work, New York: Columbia University Press, VI Ed.

Husband. E.(ed) New Developments in Social Case Work Reading in Social Work, Vol. III, London: Georque Allen & unwin Ltd.

Mishra, P.D., 1985. Samajik Vijyaktik Sewa Karya (Hindi) Uttar Pradesh Hindi Sansthan, Lucknow.

Perlman, 1957 Social Case Work-A Problem solving Process, Chicago: The University of Chicago Press, V Impression.

Pathak, S.H. 1966. Records in Social Case Work, Delhi School of Social Work, Delhi.

Pinkus, Helen, 1971. Case Records for Teaching Purposes, Faculty as social Work, M.S. University, Baroda.

Roberts R.W. Nee, R.H. 1972 Theories of Social Case Work, the Uni. Of Chicago Press, Chicago, London.

Reid, W.K. & Anne W. Shyne, 1969 Brief and Extended Case Work: New York: Columbia Uni. Press.

Scott Briar and Henry Miller, 1971 Problems and issues in social Case Work: Columbia University Press, New York.

Timmis, N., 1964. Social Case Work: Principles and Practice, London; Rout ledge and Kegan Paul.

Timmis, N., 1972. Recording in Social Work, London, Rout ledge & Kegan Paul.

Terner, F (Ed) 1974. Social Work Treatment, New York: The Free Press.

Upadhyay, R.K. 1991. Samajik Vijyaktik Karya (Hindi) Haryana Sahitaya Academy, Chandigarh.

Upadhyay, R.K. 1993. Indian Philosophical Concepts in Clinical Social work, Kurukshetra Press, Kurukshetra.

Upadhyay, R.K. 2003. Social Case Work, Rawat publications, New Delhi, Jaipur.

Course Title: WORKING WITH GROUPS

Course Code: SWCP – 02

Level: MSW (II)

Objectives:

- To understand theoretical knowledge of social group work.
- To understand group work as an instrument of change/development in individual in groups.
- To understand the relevance of group work in different settings.

Unit – I: Social Group Work:

Definition, objectives and scope - Models of Social Group Work- Historical Development of Group Work, Principles of Group Work, Values, Significance, Limitation of social group work practice in India.

Social Groups and Development: Definition, Characteristics, Types of Groups and Functions of a Group - Basic Human Needs met by Groups at Different Stages of Group Development - Group Process : Bond, Acceptance, Isolation, Rejection, Sub- Group Formation, Withdrawal, Behaviour Contagion, Conflict and Control.

Unit – II: Approaches to the Practices of Group Work:

Group Therapy, Group Psychotherapy, Use of Home Visits and Collateral Contacts. Leadership: Concepts, Definition, Characteristics, Functions, Qualities of Leader, Types and Theories of Leadership, Training for Leadership - Sociometry and Sociogram - Group Work Supervision: Meaning, Purpose and Functions. Skills of social group worker.

Unit – III: Group Work Programme Planning:

Meaning and Definition of Programme, Principles and Process of Programme Planning and the place of Agency in Programme Planning - Programme Laboratory: Values and Techniques (Games, Singing, Dancing, Dramatics, Street play, Puppetry, Group Discussions, Excursion, Psychodrama, Socio drama, Role play, and Brain Storming); Rural Camp: Planning, Organizing, Executing, Evaluating and Reporting.

Unit – IV: Group Work Recording:

Meaning, Purpose, Principles, types of group work recording; Steps and Criteria for Good Group Work. Application of Group Work Methods in Different Settings: Community Settings, Medical and Psychiatric Settings, De-Addiction Centres, Correctional Institutions, Schools, Industries, Physically Handicapped and Aged Homes.

Reading List:

Alissi, A.S.1990 Perspectives on Social Group Work Practice: A Book of Readings, New York, The Free Press.

Balgopal, P.R. and Vassil. Groups in social Work- An Ecological Perspective, New York, Macmillan Publishing Co. Inc.

Bhatt, P.M.1970 Records of Group Work Practice in India, faculty of Social Work, M.S. University, Baroda.

Brandler S & Roman CP 1999 Group work, Skills and Strategies for Effective Interventions, New York. The Haworth Press.

Brandler S & Roman CP 1991. Group work, Skills and Strategies for Effective Interventions, New York. The Haworth Press.

Garland, J.A.(Ed) 1992. Group Work Reaching Out: People, Places and Power, New York, The Haworth Press.

Garwin, C 1987. Contemporary Group Work, New York Prentice- Hall Inc.

Golpelwar, Banmala, 2007 social Group Work, Indian Institute of Youth welfare, Nagpur.

Kemp, C.G. 1970. Perspectives on the Group Process, Boston: Houghton Mifflin C.

Klein, A.F.1970. Social Work Through Group Process,: School of Social Welfare- Albany: State University of New York.

Konopka, G 1963. Social Group Work: A Helping Process, Englewood Cliff, NJ Prentice Hall, Inc.

Kurland, R & Salmon, R 1998. Teaching a Methods Course in Social Work with Groups Alexandria: Council on Social Work Education.

Middleman, R, R 1968. The Non- Verbal Methods in Working with Groups.

Northen, H 1969. Social Work with Groups, New York: Columbia University Press.

Pepell, C.P & Rothman B. Social Work with Groups, New York: The Haworth Press.

Sundel, M, Glasser, P sari, Individual change Through Small R., Vinter, 1985 Groups. The Free Press.

Samuel, T. Gladhing 1999. Group Work: A Counseling Specility, Simon& Schaster, NJ Printice Hall Inc.

Siddiqui H.Y.2005. Group Work, theories and Practice, Rawat Publication New Delhi.

Toseland RW 1998. An introduction to Group Work Prectice, New York Macmillan Publication Co.

Trecker, Harleigh B 1990. Social Group Work: Principles and Practice, New York: Association Press.

Wilson, G. Ryland, G 1949. Social Group Work Practice, Boston: Houghton Mifflin, Co

Course Title: WORKING WITH COMMUNITIES

Course Code: SWCP– 03

Level: MSW (II)

Objectives:

- To provide theoretical and conceptual understanding of community organization as a method in social work.
- To practice and critically examine the steps and process of community organization in various community setting.

Unit – I: Community and Community Organisation

Community: Concept, characteristics, types and functions. Understanding of community organisation practice: Definition, values, ethics and principles; Historical development of community organisation practice; Community organization as a method of social work intervention; Role and skills of Community Organizer

Unit – II: Models and Strategies of Community Organization

Models and Strategies of Community Organization - Locality Development Model - Social Planning Model - Social Action Model - Select methods of public interest mobilization, litigation, protests and demonstrations, Dealing with authorities, Public Relations, Planning, Monitoring and Evaluation - Roles in different models attributes and attitude.

Unit – III: Community Organization Practice in the Context of Various Settings

Health, Education, Residential institutions, Livelihood and work, Natural resource management, Sustainable development, Working with tribal and Dalit populations, in rural and urban communities, Displaced population and rehabilitation, Community organization in disaster preparedness and response, Peace building and national integration .

Unit – IV: Social Action

Social work and social action, History of social action in India, Radical or emancipatory social work; Rights based approach, Different forms of protest, various contributions to the theory of social action (Lees, Saul Alinsky, Paulo Friere, Mahatma Gandhi's (Sarvodaya and Siddique) Strategies for social action from various social movements.

Reading List:

- Gangrade, K. D. 1971. Community Organization in India, Mumbai; Parkashan, 1971.
- Karamer, R.M. & Spech, H. Reading in Community Organization Practice-Hall Inc. Englewood Cliffs, 1983.
- Murphy C. G.: Community Organization Practice, Boston; Houghton Mifflin Co. Ross, 1954
- Patil, S.H. Community Dominance & Political Modernization; Mittal Publication; New Delhi; 2002.
- Rashmi Dewas & R. Community Participation & Empowerment in Primary Education; Mittal Publication New Delhi; 2003.
- Sengupta, P.K.; Community Organization Process in India, Kiran Publishers, 1976.
- Selgen, S. Empowerment & Social Development Issues in Community Participation; Mittal Publication: New Delhi; 2005.
- Speech, H & Karmer: R.M; 1969 Reading in Community; Englewood Cliffs: Prentice Hall.
- Surya Rao: Under Development with community initiative retrospect & prospect: mittal Publication: New Delhi, 2000.

- Zastrow Charles: 1978. Introduction to social Welfare Institution Social Problems, services & Current Issues (Social work Community Practices Part-3 Chapter-10) Ontario: The Dorsey Press.
- Butcher H. 2007: Critical community Practice.
- Kothari M 2006: Development and Social Action, Rawat Publication, New Delhi.
- Grundy M : Community Work, Rawat Publication, New Delhi,
- Siddiqui. H.V., Social Action in India.

Course Title: A HUMAN RIGHTS APPROACH TO SOCIAL WORK PRACTICE

Course Code: SWCP – 04

Level: MSW (II)

Objectives:

- To understand Human Rights and engage in critical self-reflection and correction for professional development.
- To recognize the extent to which a culture's structures and values may oppress, marginalize, exclude and enhance power and privilege.
- To engage in processes that advance social and economic justice.
- To critically analyse how the intersection of Human Rights Values with Social Work influences practice

UNIT I: Introduction to Human Rights

- Historical evolution and normative framework of the Universal Human Rights System: The UN Charter, Universal Declaration of Human Rights, the ICCPR and ICESCR.
- The generations of Rights
- UN vs National perspectives: Issues of cultural relativism: Rights and Duties, Rights of Indigenous Peoples and Rights of the Scheduled Tribes, Racial discrimination and Caste based discrimination, Right to Self-determination.

UNIT II: Human Rights in the Indian Constitution: Interpretation and Application

- The Preamble, the Fundamental Rights and the Directive Principles of State Policy;
- Special provisions for vulnerable groups: Scheduled Castes, Scheduled Tribes, Women, Religious, cultural and linguistic minorities.

- Role of the Judiciary in responding to Human Rights issues in India: The case of Niyamgiri, Reservations to OBCs, Women's issues, etc
- Role of the National Commissions on: Human Rights, Women, Scheduled Castes, Scheduled Tribes, Minorities, Backward Classes.
- Role of Human Rights NGOs.

UNIT III: Monitoring Human Rights

- Who monitors human Rights?: Social Work Professionals, Medical Professionals, the Police, Lawyers and Judges;
- How to monitor? : prisons, trials, hospitals, cemeteries, vulnerable groups;
- How to investigate? : practical steps on gathering evidence;
- How to report? : How to write a report, How to take a statement, How to collate evidence;
- Commissions of Enquiry; the NHRC
- International and National Reporting and Complaints Procedure.

UNIT IV: Human Rights in Social Work Practice

- The elements of the Human Rights approach and its value to Social Work: Respecting principles of Equality and non-Discrimination; incorporating the Gender perspective.
- The Right to Development: Application to International Agencies and NGOs; ensuring participation of service users; accountability of service providers and empowerment of all stakeholders.
- Applying Human Rights approach to Advocacy in the context of Social Work: Legislation; funds to respond to identified social needs; follow-up; public campaigns; networking.

Reading List:

- Youth for Human Rights (2010). What are human rights?
<http://www.youthforhumanrights.org/what-are-human-rights.html>
- Ife, J. (2001). Local and global practice: Relocating social work as a human rights profession in the new global order. *European Journal of Social Work*, 4(1), 5-15.

- United Nations. (1948). The Universal Declaration of Human Rights. Retrieved from <http://www.un.org/en/documents/udhr/>
- United Nations. (1994). Human rights and social work: A manual for schools of social work
 - and the social work profession. Geneva: United Nations Centre for Human Rights.
- Ife, J. (2012). Human Rights and Social Work: Towards Rights based Practice, CUP: London.
- Reichert, E. (2011). Social Work and human Rights: A Foundation for policy and practice, Columbia University Press.
- Lundy, Colleen (2011). Social Work, Social Justice and Human Rights: A Structural Approach to Practice. University of Toronto Press.
- Mullaly, Bob. () Challenging Oppression and Confronting Privilege, OUP.
- Wronka, Joseph. M. () Human Rights and Social Justice: Social Action and Service for the Helping and Health Professions, Sage publications.
- Hokenstad, Healy, M. and Segal, Uma A (2013). Learning to Teach, Teaching to Learn.

Course Title: SOCIAL WELFARE ADMINISTRATION

Course Code: SWCP – 05

Level: MSW (II)

Objectives:

- To have conceptual clarity about social welfare Administration.
- To understand the principles, structure and functioning of the social welfare Administration system in India.
- To understand the role of voluntary agencies/NGOs in social welfare administration.

Unit – I: Concept: Administration

- Evolution, Meaning Nature, Bureaucratic Human Relations, Philosophy of Social

Welfare Administration, Distinction between Welfare Administration and Public Administration.

- Structure of Social Welfare Administration in India: Departmental Administration in the Government of India; Ministry of Social Justice and Empowerment; Ministry of Women & child Development; Ministry of Rural Development; etc.

Unit – II: Principles and Techniques

- Planning: meaning and process.
- Organizing: Meaning, types of organizational structure, Delegation and Decentralization, Personnel Policy of the organization.
- Staffing: Recruitment and selection process, Terms and conditions of service Probation, confirmation, promotion, Human Relations in Social Welfare Agencies,
- Budgeting: Formulation, controlling mechanism, Problems of budgeting in welfare agencies.
- Commitment of Personnel.

Unit – III: Voluntary Agencies/NGOs

- Voluntary agencies/NGOs in Social Welfare: mandate, role and functioning.
- Administrative structure of voluntary Agencies/NGOs: General Body, Board of Management / Executive Committee, Directors, Secretary Policy formulation, Fund raising, public relations, challenges.
- Voluntary Organizations in the Welfare Section: Helpage India, Child Relief and you, Spastic Society of Northern India, etc.

Unit – IV: Institutions of Social Welfare

- Structure & functions of Central Social Welfare Board.
- State Social Welfare Advisory Board.
- Rehabilitation Council of India
- National Commission for Scheduled Tribes, National Commission for Scheduled Castes, National Commission for Minorities, etc.
- National Institute of Social Defense.

- National Institute of Public Cooperation & Child Development (NIPCCED) etc.
- Welfare Schemes of the various departments of the government of Odisha and the Department for SC,ST, OBC and Minorities Development.

Reading List:

- Choudhry Paul, Social Welfare Administration
- Sharma Urmila & Sharma S K: Public Administration, Atlantic Publishers and Distributors New Delhi.
- Arora Ramesh K. and Goyal rajni, 1995, Indian Public Administration Institutions and Issues: Viswa Prakashan, New Delhi.
- Ramachandran Padma, 1996, Public Administration in India: National Book Trust New Delhi.

Course Title: SOCIAL WORK RESEARCH AND STATISTICS

Course Code: SWCP-06

Level: MSW (II)

Objectives:

- To develop understanding about the components involved in the social work research methodology.
- To improve the ability to link between practice, research, theory and their role in enriching one another.
- To make students understand the importance of statistical tools and techniques and help them to arrive at better research conclusion.

Methods of Social Work Research

Unit-I

Social Work Research: Meaning and Objective. Ethical, Political and cultural context of Social Work research. Social Work research fields: professional practices research, contextual research, system research, trend research, community based participatory research. Qualitative vs. Quantitative research. Research process:

Feasibility issues influencing the research process. Research problems, questions, variables and hypotheses: Conceptualisation and operationalization. Critiquing knowledge bases and reviewing the literature.

Unit-II

Research Design: Matching design to purpose. Designs for evaluating policies, programs & practices: Single Subject Design, Case studies, Survey design, Experimental and Quasi experimental design. Finding research subjects: Sampling: Probability and non probability sampling. Sources of data and data collection techniques: Observation, Interview, Questionnaire, Focus Group Discussion, Brain storming, Delphi method and Projective techniques. Writing research abstract and research report: components of research report.

Methods of Data Analysis

Unit-III

Qualitative Analysis: Thematic analysis, Content analysis, Triangulation, *Phenomenology, and Hermeneutical Analysis*. Quantitative Analysis: Choosing and Understanding Statistical Tests: Levels of Measurement, Descriptive Statistics- Measures of Central Tendency: Mean Median and Mode, Measures of Dispersion: Standard deviation and variances.

Unit-IV

Inferential Statistics and Hypothesis Testing: Correlation and regression analysis, hypothesis testing and test of significance. Bi-variate Statistics: t-tests, ANOVA and Chi Square. Introduction to SPSS for analyzing quantified data. Critical Reflections in Data Analysis: looking for anomalies, discussing findings, analyzing limitations and biases of the study and considering future directions for research.

Reading List:

Anderson, J. Durston H. S & Pooram (1992) Thesis and Assignment Writing; Wiley Eastern Ltd, New Delhi.

Baper, L.T. (1998) Doing Social Research, McGraw Hill, Singapore.

Bryman, Alan & Duncan Cramer (1990) Qualitative data analysis for Social Scientists, Rutledge, London.

Denzin, K Norman & Lincoln, S Yuonna., (1998), Collecting and Interpreting Qualitative Materials, Sage publications, New Delhi.

Denzin, K Norman & Lincoln, S Yuonna.(2000), Hand book of qualitative research, Sage publications, Thousand Oaks.

Gupta, S. P (1992) Elementary Statistical methods sultan chand & sons, New Delhi.

Goode & Hatt (1981) Methods in Social Research, McGraw Hill, New Delhi.

Laldas, D.K (2000) Practice of Social Research, Rawat, Jaipur.

Nachmias & Nachmias (1981) Research methods in the Social Sciences; St. Martin"s press, New York.

Richard, G., et al, (2003) Scaling Procedure –issues and applications, Sage, Thousand Oaks.

Rubin & Bobbie (1993) Research Methods for Social Work, Brooks/Cole publishing Company, California.

Fundamentals of Research Methodology and Statistics by Y. K Singh , New Age International

C.R.Kothari, Research Methodology.

Mukarji Nath Ravindra, Social Research and Statistics, Vivek Prakashan, Delhi.

Kapoor B.K. & Gupta, S.C., Fundamental of Statistics, S. Chand Publication, New Delhi.

Ramchandran, P. Social Work Research And Statistics, Bombay : Allied Publishers

Gupta, S.P, Statistical Methods, Sultan Chand & Sons

Swain A.K.P.C, A First Course in Statistics With Applications, Kalyani Publishers

Patri, D., Statistical Methods, Kalyani Publishers

Bhatnagar, O.P. Reserach Methods And Measurements In Behavioral And Social Sciences, New Delhi, Agri Cole Publishing Academy

Dwivedi R.S. Research Methods in Behavioral Sciences. Delhi, Macmillan

D'cruz, Jones, Social Work Research

Ahuja Ram, Research Methods

SPSS for Social Scientists By Robert L. Miller, Ciaran Action, Deirdie A. Fullerton And John Maltby.

The SPSS Book: A Student Guide To The Statistical Package For The Social Sciences By Matthew J Zagumny

SPSS For Windows Step-By-Step: A Simple Guide And Reference By Paul Mallery And Darren George

Discovering Statistics Using SPSS by Andy Field

Drake, Brett, and Melissa Jonson-Reid. 2007. *Social work research methods: From conceptualization to dissemination*. Boston: Allyn and Bacon.

Grinnell, Richard M., and Yvonne A. Unrau, eds. 2007. *Social work research and evaluation: Quantitative and qualitative approaches*. 8th ed. New York: Oxford Univ. Press.

Rubin, Allen, and Earl R. Babbie. 2007. *Essential research methods for social work*. Belmont, CA: Thomson Brooks Cole.

Rubin, Allen, and Earl R. Babbie. *Research Methods for Social Work*. 6th ed. Belmont, CA: Thomson Brooks Cole, 2008.

Light, R. J., and D. B. Pillemer. 1984. *Summing up: The science of reviewing research*. Cambridge, MA: Harvard Univ. Press.

Course Title: CHILD PROTECTION AND CHILD RIGHTS

Course Code: SWCP – 08

Level: MSW (III)

Objectives:

- To understand the situation of children in India
- To understand the national & international efforts for child welfare
- To know the child related laws.
- To know the programmes & services for child welfare
- To understand & acquire the skills for working with children

Unit – I: Child Rights

Concept of Child Welfare and Child Rights; Demographic profile of the child in India, UN convention on the Rights of the Child, National Policy for Children(1974), National Policy on Education(1986), National Nutrition Policy (1993), National Charter for Children (2004), National Plan of Action for Children (2005) Changing trends in child welfare and protection services.

Unit - II: Problems of the Child and the response of Social Work

Social Work with: Street children, destitute, delinquent, abandoned, orphaned, child with disabilities, sexually abused child, child labour, child trafficking, children affected by natural calamity, HIV/AIDS affected and infected children, child prostitute, children in

poverty, the girl child, truant children, runaway children.

Health Problems: Causes of infant mortality and morbidity; Common childhood diseases; Development delay; Child Nutrition; Nutritional problems: PEM, Micro-nutrient deficiencies disorders, Mineral and vitamin deficiencies, Nutritional guidelines on infant and young child feeding.

Unit – III: Legal Provisions for child protection

The Constitution of India: Articles 14,15,15 (3),19 910 9a0, 21,21 (a),23,24,39(e),39(f); The Indian Penal Code, 1860: Feticide (Section 315 and 316), Infanticide (section 315), Abatement of Suicide (section 305), Exposure and Abandonment (section 317), kidnapping and Abduction (section 360 to 369),Procurement of Minor Girls (section 366-A), Selling of girls for Prostitution (section 372,373), Rape (Section 376), Unnatural sex(section 377); The Pre-natal diagnostic Techniques (Regulation and Prevention of Misuse) Act, 1994; The Juvenile Justice (Care and Protection of Children) Act, 2000; The Immoral Traffic (Prevention) Act, 1956; Child Labour (Prohibition and Regulation) Act, 1986; The Prohibition of child Marriage Act, 2006; The Commission for the Protection of child Rights Act, 2005; Protection of Children Against Sexual Offences Act,2012.

Unit - IV: Social work practice with children

Child guidance clinics; School social work; Child counselling; Life skills training; Child help lines; Adoption services; International and national NGOs working with children: UNICEF, CARE, CRY, SOS-Children's Villages.

Reading List:

- Banerjee, B. G. (1987) Child Development and Socialisation, New Delhi : Deep & Deep Publication
- Baroocha, Pramila Pandit (1999) Hand book on Child, New Delhi : Concept Publishing Com.
- Bhalla, M. M. (1985) Studies in Child Care, Delhi : Published by NIPCCD
- Bhangana. Vinita (2005) Adoption in India.
- Chaturvedi, T. N. (1979) Administration for Child Welfare, Admin, New Delhi : Indian Institute of Pub.
- Choudhari, D. Paul (1980) Child Welfare / Development, Delhi : Atma Ram & Sons.
- Deshpabhu, Rashmi (2001) Child Development & Nutrition Management, Jaipur : Book Enclave
- Ghathia, Joseph (1999) Child Prostitution in India, New Delhi : Concept Publishing Company
- Hugh, Jolly (1981) Diseases of Children, Oxford, London, Edinburgh : The English Language book society and Blackwell Scientific Publications

- Hurlock, Elizabeth B. (1968) Child Development, New Delhi : Tata McGraw Hill Pub; Com; Ltd.
- Rani, Asha (1986) Children in Different situations in India- A Review, TISSS.
- UNICEF, State of Worlds Children Annual Report
- Venkatesan S.(2004) Children with Developmental Disabilities.

Course TITLE: SOCIAL WORK WITH WOMEN: ISSUES OF GENDER AND DEVELOPMENT

Course Code: SWCP – 09

Level: MSW (III)

Objectives

- Develop an ability among students to analyze the position of women in rural and tribal society and the role of the social worker thereof.
- To develop an understanding of problems specific to women.
- To be introduced to legislative protection of women.
- To understand the concept of gender in various areas of social work practice.

UNIT-I: Construction of Gender

- Socio-Cultural Concepts: Gender, Sex, Patriarchy, Masculinity and Feminism.
- Women and Society: Status of Women in Indian society (Urban, Rural, Tribal and Dalits):
- Role of Women in Socio- Economic life: Family, Marriage, Religion, Caste, Tribe, Economy, Health and Education, Environment , Women and Media

UNIT-II: Issues and Challenges of Women in India and Odisha

- Problems of Women: Dowry, Domestic Violence, Crime against Women, Immoral Trafficking, Prostitution etc.
- Maternal Health Issues: Maternal Morbidity, Maternal Mortality, Infant Mortality, Female foeticide, Women's reproductive health and rights; and Changing concepts of Motherhood: Surrogate motherhood; Family Planning: Objectives and methods.
- Community based mental health programmes with a focus on mental health needs of women.

UNIT-III: State and Women

- Social Legislation for Women : Property Rights Act under the Hindu Succession Act,1956(Sect 6,14,15,16), Property Rights of Muslim Law, Dowry Prohibition Act,1961, Family Courts 1984, The Pre-conception and Pre-natal Diagnostic Techniques(Prohibition of Sex Selection) Act 1994, The

Protection of Women from Domestic Violence Act,2005, The Indecent Representation of Women(Prohibition)Act, 1986

- Social Policies regarding Women: National Health Policy, National Education Policies,
- Provisions, Schemes and Programmes for women empowerment.

UNIT-IV: Women's Development and Social Work

- Concept of engendering Social Work and the role of the Social Worker.
- Applications of Social Work methods for Women empowerment and Development.
- Political Empowerment of Women: Participation of Women in National Movements; Women in National and Regional politics, Panchayati Raj Institutions and Urban Local bodies.

Reading List:

- Brook E and Davis, Ann (1985) Women, The family and Social Work, London.
- Samanta, R.K (2005) Empowering Rural Women and Issues, Opportunities and Approaches, B.R world of books
- Saxena,S(2005) Crimes against Women and Protective laws, Deep and Deep Publications, Pvt.Ltd. New-Delhi
- Paul chowdhry, D Women welfare and Development(A Source Book) Inter-India Publication, New-Delhi 1991
- Agarwal Sushila, Status of Women, Print well Publisher, New-delhi.
- Bodra Gomati, Empowerment of Tribal Women
- Baig, Tara Ali Women In India, Ministry of information and Broadcasting, Govt. Of India Publication Division, New Delhi
- Agrawal Bina, Gender And Legal Rights in Landed Property in India, Kali for Women.
- Bhargava V. Durvar, Mental Health from a Gender Perspective, Sage publication.
- Gore,M.S: Urbanisation & family Change, popular Prakashan, Bombay, 1986.
- Agarwal, R.K. Hindu Law-central Law Agency, Allahabad.
- Adhikari, A.K and Pramanik: Gender inequality and Women's empowerment, Abhijeet Publication,2006
- Sikligar, P.C:Empowerment of Tribal Women, Jaipur Mangal Deep Publications,2006.

Course Title: ETHNIC SENSITIVE SOCIAL WORK PRACTICE IN INDIA

Course Code: SWCP - 10

Level: MSW (III)

Objectives:

- To tune Social Work Practice to the values and dispositions related to the social background of the client and the behavior of the larger social system, to work towards social justice and human liberation.

UNIT – I: What is Ethnic Sensitive Practice (ESP) in Social Work?

- Definition, conceptual formulation and perspectives on ethnic sensitive practice.
- Assumptions and principles for ethnic-sensitive practice.
- The layers of understanding in ethnic sensitive practice.
- Ethnic sensitive practice with displaced populations, migrants, families, communities, students, etc.

UNIT – II: The Ethnic Scenario in India

- The Schedule Tribes (ST), particularly vulnerable tribal groups (PVTGs) and Denotified Tribes: Demographic profile, their education, health, employment and economic status.
- The Scheduled Castes (SC) and other Backward Castes (OBC): Demographic profile, their education, health, employment and economic status.
- An analysis of the caste system, and the practice of untouchability.
- Ethnic based discrimination in India with respect to public services, government schemes and employment programmes etc.
- An analysis of industrialization, urbanization, liberalization, privatization, globalization, development projects and their impact on STs and SCs land alienation, loss of forest rights, displacement, socio-cultural loss, poverty and impoverishment, indebtedness, psychological issues.

UNIT – III: Constitutional Safeguards Legal Provisions and Policies

- The Preamble, The Directive principles of state policy ensuring social safeguards: Articles 17,23,24,25,(2)(b); Economic safeguards: Articles 46, 23, 24, 244, 275(I), fifth schedule, sixth schedule; Education and cultural safeguards: Articles 15 (4), 29 (i), 350 A; Political safeguards: Articles 164 (I), 330, 332, 334, 371 A, 371 B, 371 C, 371 C, 371 F, 371 G, 371 H. Service Safeguards; Article 16 (4), 16(4a), 335, 320 (4); To ensure these safeguards Articles 338 and 338A provide for two statutory commissions: The National commission for Scheduled Castes and the National Commission for Scheduled Tribes.
- Protective Legislations: The Protection of Civil Rights (PCR) Act 1955; The Scheduled Castes and Scheduled Tribes (Prevention of Atrocities): POA Act, 1989; The Orissa Scheduled Areas Transfer of immovable property (by ST) Regulation (1956); The Orissa Land Reforms Act (1960)
- Schemes of the Ministry of social justice and empowerment; Scheduled Caste Sub Plan (SCSP) and Schedule Tribe Sub Plan (STSP) introduced since the sixth Five Year Plan.

UNIT – IV: Strategies for Social Workers to Work for Social Justice and Rights

- Identifying the sources and dynamics of injustice, discrimination and oppression.
- Adopting the layers of understanding in ESP in all fields of social work practice.
- Adopting 'radical' change oriented methods such as: advocating human rights, affirming core social work values, affirming politics of social justice and human liberation, facilitating critical consciousness, participatory-democratic egalitarian social movements.

Reading List:

- Denove.W and Schlesinger E.G, (1999) Ethnic-Sensitive Social Work Practice.
- Yil. David. G, (1998), Confronting Injustice and Oppression.
- Thorat S.K. (2009) Dalits in India: Search for a Common Destiny.
- Thorat S.K. and Newman Kathernic S., (2010) Blocked by Caste: Economic Discrimination and Social Exclusion in Modern India.
- Constitution of India

- Website of Ministry of Social Justice and Empowerment, Government of India.
- Munshi. Indra, (2007) Adivasi Life Stories: Contexts, Constraints, Choices, Rawat Publication.
- Jain, P.C. 1991. Social Movements among Tribals, New Delhi: Rawat Publications.
- Singh K.S. (ed.). Tribal Movements in India, Vol. I & II;
- Singh, J.P. & Vyas. M.N. Tribal Development: Past Efforts and New Challenges.
- Alinsky Saul, Rules for Radicals. Vintage Books Edition, 1972
- VirginiusXaxa (2003), "Tribes in India," The Oxford India Companion to Sociology and Social Anthropology, (Ed) Veena Das, New Delhi: Oxford University Press,
- Baviskar, Amita. 1997. "Tribal Politics and the Discourses of Environmentalism," Contributions to Indian Sociology, Volume 31, Number 2.
- Abbi, Anvita. 2102. Chapter 13, "Declining Adivasi Knowledge Systems and Killing of Linguistic Diversity," Social Exclusion and Adverse Inclusion: Development and Deprivation of Adivasis In India, (Editors) Dev Nathan and VirginiusXaxa, Oxford University Press, 2012.
- Jean Dreze, Meera Samson and Satyajit Singh. 1997. Chapter 2, "Resettlement Politics and Tribal Interests," Dam and the Nation: Displacement and Resettlement in the Narmada Valley. New Delhi: Oxford University Press.
- Dev, Nathan. 2012. Chapter 17, "Displacement and Reconstruction of Livelihoods," and Chapter 18, "Community Representatives" Views on Development Processes," Social Exclusion and Adverse Inclusion: Development and Deprivation of Adivasis in India, (Editors) Dev Nathan and VirginiusXaxa, Oxford University Press, 2012.
- Xaxa, Virginius. 2008 "Protective Discrimination: Why the Scheduled Tribes Lag Behind the Scheduled Castes," State, Society and Tribes, New Delhi: Pearson Education.

Course Title: RIGHTS OF PERSONS WITH DISABILITIES AND THEIR REHABILITATION

Course Code: SWCP – 11

Level: MSW (III)

Objectives:

- To facilitate basic understanding about person living with disability
- To disseminate information about the variety of policies and programmes targeting to include persons with disabilities.
- To develop understanding on the possible rehabilitation measures.
- To develop insight into the workable models of interventions for inclusion of persons with disabilities.

UNIT – I: Understanding Disability

- Definition, types, magnitude and causes of disabilities.
- Approaches towards disability; medical, psychological, economic-vocational, socio-political, human rights and capabilities.
- Examining the impact of disability on the quality of life of persons with disabilities in the context of their family, society and environment.
- Issues related to their daily living, education, sexuality, integration, employment, interpersonal relationships, marriage and the need for social work intervention.

UNIT – II: Role of the Social Worker in the Rehabilitation and Inclusion of the Disabled

- Assessment treatment and rehabilitation of persons with disabilities through a multi-disciplinary team including the social worker.
- Inclusion of persons with disabilities in schools and educational institutions.
- Skill development and vocational rehabilitation of persons with disabilities.
- Equality of opportunity and treatment in employment and occupation of persons with disabilities.

UNIT – III: International Initiatives and National Legislations and Policies for the Empowerment of persons with disabilities

- UN Initiatives: UN convention on the rights of persons with disabilities 2006; Un standard rules on the equalization of opportunities for persons with disabilities (1993); and Darter Framework for Action.
- ILO Initiatives for enhancing support to vulnerable groups including the disabled: Global employment agenda(2003); Declaration on social justice for fair globalization 92008); Global jobs pact (2009); ILO code of practice on managing disability in the workplace (2002)
- National Legislations: Rehabilitation Council of India Act, 1992; Persons with disabilities (equal opportunities, Protection of rights and full participation Act, 1995; National Trust for Welfare of Persons with Autism, Cerebral Palsy, Mental Retardation and Multiple Disability Act, 1999; The Rights of Persons with Disabilities Bill, 2011.
- National Policies:
 - National Policy for Persons with Disabilities (2006): Physical rehabilitation, Educational rehabilitation and Economic rehabilitation.
 - Guidelines for: Issue of disability certificates; evaluation of various disabilities and procedure for certification; space standards for barrier free built environment for disabled and elderly persons.
 - Identified posts for persons with disabilities -2007.

UNIT – IV: Role of Social Work

- Intervention strategies at individual level: counselling, building support groups, assertiveness training;
- Intervention strategies at family level: Parent counselling, parent training and family crisis intervention.
- Intervention strategies at community level: Community education, community based rehabilitation
- Intervention strategies at policy making level: Advocacy in legislative and policy making bodies; research and influencing public opinion.

Reading List:

- Ministry of Social Justice and Empowerment;
<http://www.socialjusticenic.in/policies/acts3.php>

- Bhumali.Anil,(2009) Rights of disabled women and children in India, serials publications, New Delhi.
- Hans. Asha and patri.A (2003) Women Disability and Identity sage, New Delhi
- Mukhrjee, Manjumohan(2006) Problems of Disabled People, Associated Publishes, India.
- Kanna. G.N. (2001), Disability Studies in India-Retrospect's and prospects Gyan Publishing house, New Delhi.
- Buckup, s. (2009), The Piece of exclusion; The economic consequences of excluding people with disabilities from the world of work. Employment sector working paper No. 43 (genevaILO)
- O'Reilly, A. (2007) The right to decent work of persons with disabilities (geneva ILO)
- Davis, Lennard. J. (1999) The Disability Studies Reader, Routage, NY
- Shapiro, Joseph P. (1993) No Pity: People with Disabilities Forging a New civil Rights Movements.

Course Title: COMMUNITY HEALTH AND SOCIAL WORKERS

Course Code: SWCP – 12

Level: MSW (III)

Objectives:

- To understand the basic concepts related to Health and its importance.
- Identify and understand the changing health needs of ever-changing community and organize relevant effective interventions for amelioration of health problem.
- To develop students' appreciation and a commitment to healthy and socially just ways of living.
- To develop student's knowledge and understanding about ways of enhancing personal and community health and wellbeing.

UNIT – I: Concepts of Health & Nutrition

- Definition & type (Physical & Mental) of health and its dimensions; appreciation of health as relative concept; determinants of health, changing concepts of health.
- Characteristics of agent, host and environmental factors in health and disease.
- Health situation in India and Odisha-especially the demography, mortality and morbidity profile and the existing health facilities in health services.
- Mental Health- concept, community based mental health programmes.
- Nutrition- definition, concept, balance diet nutritive values and food items.
- Genetically Engineered and modified foods.

- Nutritional Assessment and monitoring.

UNIT – II Epidemiology

- Epidemiology: definition, concepts and its role in health and disease, public health-concept & importance
- Definition of the terms used in describing disease, transmission and control.
- Epidemiology of specific diseases: Communicable and non-communicable diseases, symptoms causes and prevention of disease caused by virus: measles, chickenpox, polio, & leprosy, disease caused by bacteria: diphtheria, typhoid, tuberculosis, plague, dengue, hepatitis. disease caused by parasites: Malaria, scabies, intestinal worms. Preventive & Social Medicine: concept, meaning, programmes for controlling communicable diseases.

UNIT – III Environmental Health

- Awareness of the concept of safe and wholesome water.
- Awareness of the requirements of a sanitary source of water.
- Understanding the methods of purification of water on small scale with stress on chlorination of water.
- Disposal of solid waste, liquid waste, both in the context of urban and rural conditions in the country.
- Problems in the disposal of refuse, sullage and sewage.
- Role of social worker in environmental health.

UNIT – IV Community Health and Role of Social Work

- Primary Health Care Services: organizations & functions
- Medical Social Work: meaning nature & scope
- Health Care in Rural and Urban areas of Odisha:
- Role & Functions of Social Worker in hospital setting and community health: individual, family and community level; communication tools and techniques.

Reading List:

- Park J. E. and Park K.: Textbook of Preventive and social Medicine Banarasi Das Bharat Publishers, Jabalpur.
- Bedi, Yash Pal (1979) Social Preventive Medicine, Atma Ram and Sons; New Delhi.
- VHAI – State of India's Health.
- Shah. Ghanshyam (1997) Public Health and Urban Development, Sage; New Delhi.

- Werne. David (1994) where there is no Doctor, VHAJ.
- Sinha. A.K, (ed) (1997) Human Health and Environment, Vol. I & II, APH Publishers: New Delhi.
- John Webb (2002) Medical Social Work: The Reference Book, Trafferd Publishing.
- Gehlert, Sarah and Browne. Teri (Ed) (2011) Handbook of Health Social Work Wiley Publication.

Course Title: SOCIAL MANAGEMENT

Course Code: SWCP – 13

Level: MSW (III)

Objectives:

- To understand the eco system of communities and their market landscape to help community based organizations engage with a market based economy.
- To help build the capability needs of communities towards self reliance through sustainable community enterprises.
- To help gain fundamental principles of Management.

Unit I: Understanding the community and deciphering the market

- The village social structure: relationship between social groups, communication patterns, processes of exclusion and inclusion, culture and Social value base.
- Identifying community resources: social capital, natural resources, common- property resources, education, health & employment status.
- Institutions in the community: Social institutions, formal community based institutions for eg: clubs, SHGs, village Council, etc; PRI; Administrative Structure from Block to District level; Educational Institutions; Health and Medical Institutions
- The local market economy: Money Lenders, Small & Large traders, entrepreneurs, corporations and companies; key factors of Local Market Economy: Market Boundaries; Market Values; Market Values Chains.
- Need Assessment and mapping of village resources, producers and institutions study of the community.

Unit II: Operations and Marketing Management

- Operations Management in the context of community based enterprises- organizations: product design, process selection and design, capacity decisions, location and layout decisions, sowing, transformation and storage, quality of inputs and finished products, material handling and logistics.
- Farm, Forest and Livestock resources and their conversion to products: process & risks involved. Tools for process mapping and mapping a supply chain.
- Agricultural Products: Types and issues, value addition, pricing and distribution; Agricultural Product Buyers: Retail and Wholesaler, Consumers, Customers and key buyer characteristics.
- Key aspects of sales, marketing and planning; Negotiation and selling techniques.

Unit III: Accounting and Finance

- Accounting: Need, Meaning and objectives; role of an accountant; uses of accounting information; Origin and analysis of business transactions; accounting equation.
- Financial Statements: Balance sheet, Income statement; Recording business transactions: Double entry system, the T-accounts, principles and conventions of accounting, journal entries.
- Books of accounts: Cash book, ledger, sales register, etc; posting of transactions in books
- Trial balance: closing and balancing of accounts; locating and correcting errors; preparation of balance.
- Bank transactions and bank reconciliation: need for reconciliation, causes of difference in passbook and cash book balance, procedure for bank reconciliation statement.
- Distribution of profit: determination of distributable surplus; basis of distribution.

Unit IV: Planning and Budgeting

- Levels of Planning: Village level, cluster level community enterprise / organization level
- Planning for distribution of responsibilities among community based leaders / coordinators / facilitators.
- Planning for Product basket, their local value addition for greater shelf-life and for sale in local markets.
- Planning for marketing.
- Developing proposals considering resources, cost and time budget.
- Planning for Resource Generation: Internal resource generation and from external institutions Government Departments, Banks, Public and Private, NGOs and INGOs
- Planning for improving technical capabilities.

- Planning for allied services like Health, Education, etc.

Reading List:

- Implementing Community Enterprise system for Sustainability of Agricultural Communities: A Manual, Nayak, Amar KJR (2012)
- A Proposal for Holistic Development at a GP Level for Long Term sustainability of Small and Marginal Farmers/Producers in the GP. Amar KJR Nayak (2011)
- Ongoing Programmes & Schemes of the State Government and the Central Government, Rabindra Kumar Gouda (2012)

Course Title: SOCIAL WORK IN SCHOOLS

Course Code: SWEP – 01

Level: MSW III

Objectives:

- To understand the Rights of the Child in the context of schools.
- To acquire necessary understanding and skills to work with children in schools.

UNIT I: Conceptual framework for Social Work Practice in Schools

- Conceptual Perspectives: Social Learning Theory, General Systems Theory, Ecological Perspective
- Models of intervention: Traditional Clinical Model, The School Change model, The Community School Model, Social Interaction Model, School-Community- Pupil Relations Model

UNIT II: Context of Social Work Practice in Schools: Legislations and Policies

- UN Rights of the Child, Commission for Protection of Child Rights Act, 2005
- Constitution of India, Article 21 A, National Policy on Education (1986), National Curriculum Framework for School Education (2000), Right to Education Act (2009)
- Constitutional provisions for the education of SC, ST and religious, cultural and

linguistic minorities, policies and programmes of the Government.

- Inclusive Education policies in the V Year Plans, Integrated Education for Disabled Children (IEDC), District primary Education Programme (DPEP), Sarva Shiksha Abhijan (SSA)

UNIT III: Social Justice Issues in School

- Dealing with stereotype, bias and discrimination;
- Intervention for the vulnerable populations i.e., Challenged children, SC, ST and minority;
- Dealing with the 'Achievement gap' i.e, difference in performance between students of vulnerable and privileged backgrounds.

UNIT IV: The Role of the Social Worker

- Services to students: Dealing with social or behavioural problems (Depression, Truancy, Aggression, Trauma, Substance Abuse, Sexual Activity), poor attendance, drop-out, poor performance, offences against children.
- Services to teachers: Teacher support groups, teacher training, teaching stress;
- Services to families: Providing parent support, consultation, parenting skill classes, family programming; organizing financial support for vulnerable families;
- Services to the community: Community outreach, community involvement, village Education Councils.

Reading List:

- Allen- Meares, P., Washington, R. O., & Welsh, B. L. (1996). Social Work Services in schools. 2nd ed. Boston: Allyn & Bacon.
- Dupper. David, (2003). School Social Work: Skills and Intervention for Effective Practice, John Wiley and Sons, NJ.
- Bye. Lynn and Alvarez. Michelle (2006). School Social Work: Theory to Practice, Cengage Learning.
- Germaine. Carel B and Bloom Martin (2008). Human Behaviour in the Social Environment: An Ecological View. Columbia University Press, New York.
- Greene. Roberta R,(2010) Human Behavior Theory and Social Work Practice (Modern Applications of Social Work), Transaction Publishers, New Brunswick, New Jersey.
- Journal of School Social Work(JSSW), Chennai, India.

- NCPCR, Protection of Children against Corporal Punishment in Schools and Institutions,
- http://www.ncpcr.gov.in/Reports/Protection_of_Children_against_Corporal_Punishment_in_Schools_and_Institutions_December_2008.pdf
- NCERT (2000). *Assessment of Needs for Inclusive Education: Report of the First Regional Workshop for SAARC Countries*. New Delhi: NCERT
- Mohapatra, C. S. (2004). *Disability Management in India: Challenges & Commitments*. New Delhi: National Institute for the Mentally Handicapped (NIMH) and the Indian Institute of Public Administration.
- Mishra, A. (2000). "India: Special Education", in C.R. Reynolds, and F.E. Janzen (eds), *Encyclopedia of Special Education: A Reference for the Education of the Handicapped and other Exceptional Children and Adults*, 2e. USA: John Wiley and Sons
- Ministry of Social Justice and Empowerment of India. *Annual Report* (latest), New Delhi: GOI
- Ministry of Human Resources Development (MHRD). *Annual Report* (latest). New Delhi: GOI
- Ministry of Human Resources Development (2000). *Sarva Shiksha Abhiyan : Framework for Implementation*, Department of Elementary Education & Literacy, New Delhi; GOI
- Five Year Plans: <http://www.planningcommission.nic.in/plans/planrel/fiveYr/7th/vol2/7v2ch10.html>.
- Department of Education (1986). *National Policy on Education*, 1986. New Delhi: MHRD, GOI
- Department of Education (2000). *Sarva Shiksha Abhiyan: A Programme for Universal Elementary Education*. New Delhi: MHRD, GOI.

Course Title: WORKING WITH WOMEN

Course Code: SWEP – 02

Level: MSW III

Objectives

- Develop an ability among students to analyze the position of women in rural and tribal society
- Acquire understanding on problems relating to women

- Develop in them a critical understanding about the schemes related to women

Unit-1

Status of women in rural and tribal community - in the context of family

marriage, religion and economy. Sexual division of labor its impact on health, education, illiteracy, adjustment, malnutrition, early marriages.

Unit-2

Problems relating to women – dowry, domestic violence, crimes against women, female feticide, child prostitution, exploitation and abuse of domestic female lab our.

Unit-3

Women in local self government with special reference to women in decision making. Impact of 73 amendment, development schemes and women's situations, case studies of DRDA, ICDS, SHGs.

Unit -4

Role of media in projecting the images of women, women in the media- print media, radio, films, television, and advertisement and publicity, Media and self employed women

Reading List:

- Paul chowdhry, D. Women welfare and development (A source book) ; Inter-India Publication, New Delhi -1991
- Sushila Agarwal , Status Of Women Printwell publishers, Jaipur, 1988
- Pandit, S.K. Women in Society, Rawat Publications, New Delhi 1998
- Brook E and Davis, Ann (1985) Women, The family and Social Work, London.
- Samanta, R.K (2005) Empowering Rural Women and Issues, Opportunities and Approaches, B.R world of books
- Saxena, S(2005) Crimes against Women and Protective laws, Deep and Deep Publications, Pvt.Ltd. New-Delhi
- Paul chowdhry, D Women welafarae and Development(A Source Book) Inter-India Publication, New-Delhi 1991
- Agarwal Sushila, Status of Women, Print well Publisher, New-delhi.
- Bodra Gomati, Empowerment of Tribal Women
- Baig, Tara Ali Women In India, Ministry of information and Broadcasting, Govt. Of India Publication Division, New Delhi
- Agrawal Bina, Gender And Legal Rights in Landed Property in India, Kali for

Women.

- Bhargava V. Durvar, Mental Health from a Gender Perspective, Sage publication.
- Gore, M.S: Urbanisation & family Change, popular Prakashan, Bombay, 1986.
- Agarwal, R.K. Hindu Law-central Law Agency, Allahabad.
- Adhikari, A.K and Pramanik: Gender inequality and Women's empowerment, Abhijeet Publication, 2006
- Sikligar, P.C: Empowerment of Tribal Women, Jaipur Mangal Deep Publications, 2006.

Course Title: Working with Alcoholics and Substance Abusers

Course Code: SWEP – 03

Level: MSW (III)

Objectives:

- To facilitate basic understanding about substance abuse
- To disseminate information about addiction to alcohol.
- To develop understanding about the role of social worker in rehabilitation.
- To develop insight into the role of counseling among alcoholics and substance abusers.

UNIT – I: Basics on Substance Abuse

- Substance abuse and dependence: Meaning, Definition, nature and extent of the problem in India and Odisha.
- Types of Addictive Substances: Natural, Synthetic, Narcotics, Stimulants and depressants.
- Symptoms, short term and long term impact of substance abuse.

UNIT – II: Addiction to Alcohol

- Alcohol dependence and Alcoholism: Causes, symptoms, long-term and short-term effects.
- Impact of Alcoholism on Individual, Community and Family.
- Concept of social drinking, alcoholic and relapse.

- Phases of alcohol addiction.
- Social and economic implications of addiction.
- Alcoholism among Youth-causes and remedies.

UNIT – III: Role of Social Workers in rehabilitation

- Role of Social Worker in Preventive, curative and Rehabilitative services for substance abusers.
- Multidisciplinary Approach services for substance abusers.
- Legislation Provisions and Government programmes to control drug abuse in India.

UNIT – IV: Role of counseling

- Concepts of counselling and its association with addiction; approaches to counseling: Psychoanalytical, client centred therapy. Indigenous approaches of help and self help: Yoga, Meditation, Attitude and Values, Counselling as an treatment method for substance abusers.

Reading List:

- Chopra, R.N. and Chopra, F.C., 1965: Drug Addiction with Special Reference to India, New Delhi Council of Scientific and Industrial Research.
- National Institute of Social Defence, Govt. of India, 1992: Drug Abuse.
- Single, Eric. Et. Al, 2003: International Guidelines for Estimating the Costs of Substance Abuse and Addiction.
- Delaney and Eisen Berg, 1973: The counseling Process.
- Singh, Chandra Paul, 2000 Alcohol and Drug Dependence Among Industrial Worker, Delhi Shipra Publications.
- Kaur, Ravneet and Gulati, J.k., 2007: Drug Abuse: Trends and issues, International Marketing Conference on Marketing & Society, IIMK.
- Ahuja, R, College Youth and Drug Abuse: A Sociological Study of Nature and Incidence of Drug Abuse among College and University Students, University of Rjasthan Jaipur

- Gupta, R. Punjab a drugged State, Meditrack.
- Chopra, L.C. and R.N., Chopra 1957,; The use of Cannabis Drugs in Inda. Bulletin on narcotics (United Nations Publication)
- Mohan, D.A.K. Pravakar and P.N. Sharma: Prevalence and pattern of drug abuse among Delhi University students, Indian Journal of Medical Research.
- Ropar, C 2006: Social Use, abuse and addiction-site of the author University of Tekas, Austin.
- Horgan C. Substance abuse: The Nation's number one health Problem, Princeton NJ; The Robert Wood Johnson Foundation.

Course Title: CORRECTIONAL SOCIAL WORK

Course Code: SWEP – 04

Level: MSW (III)

Objectives:

- To understand crime and delinquency as a social problem.
- To study and understand the basic elements of correctional methods and approaches.
- To gain knowledge of legal provisions.
- To study and identify the practices of non-institutional services.
- To acquire skills of correctional social work and understand the role of professional social workers in correctional institutions.

Unit- 1: Crime in the context of Social problem

- Crime: Concept, Theories of Causation, Classification of crime and approaches to deal with crime and criminals.
- Crime in India and Odisha: crime against women, crime against children, Atrocities against Scheduled Castes and Scheduled tribes; Emerging patterns and trends.
- Juvenile Delinquency: Concept, Demography, Theories of causation and approaches to delinquency prevention.

Unit- 2: Criminology and Criminal Justice System

- Concept of criminology; Social, Psychological and Legal approaches
- Courts and correctional administration. Hierarchy of courts functions and powers. Lok Adalats, Lokayukta, Legal Aid, Functions of Law Commission. Analysis of the Criminal Justice System: Police, Judiciary, Prisons and Correctional Services.

Unit -3: Correctional Administration and Services

- Institutional services: Prison, observation homes, special homes, beggar homes, rescue homes, short-stay homes, protective homes, half-way homes, de-addiction centers.
- Community based corrections and non-institutional services: Early diversion and de-institutionalization, probation and parole, adoption, foster care, child guidance centers, family counselling, crisis intervention, after-care rehabilitation and reintegration of offenders; community po.

Unit- 4: Correctional Social Work

- Definition, history, philosophy: Retribution, Restitution, General Deterrence, Special Deterrence Incapitation, Just Desserts ,objectives, methods and approaches of contemporary correctional social work: Probation and Parole, Alternative to Capital Punishment.
- Correctional Social Work in India; role of professional social workers in correctional institution, crime prevention and rehabilitation of offenders: supervision, surveillance and counselling; skills unique to correctional social work; limitations of correctional social work.

Reading List:

- Gupta, M.C. & K. Chockalingam, J. Guha Roy (2001) Child Victims of Crime: Problems and Perspectives. New Delhi, Gyan Publishing house.
- Ahuja Ram. (1996) Youth and Crime. Jaipur, Rawat Publications.
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- Dabir, Neela & Nigudjar, Mohua. (2005) Children in Conflict with Law. Mumbai, TISS.
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- Ahuja, Ram. (2000) Criminology, Rawat Publication, New Delhi
- Siegal, Larry J. (2000) Criminology, Wadsworth Thomson Learning, New Delhi
- Schmalleger, Frank. (1999) Criminology Today: An Integrative Introduction 2nd edition, Prentice Hall, New Delhi
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- Chakrabarti, N. K. [Ed.] (1997) Administration of Criminal Justice (Vol.1.). New Delhi. Deep and Deep Publications.
- Robert M Carter, Daniel Glaser, Leslie T Wilkins, (1985) Correctional Institutions, Harper & Row Publishers Inc.
- Siddique, A. (1983) Criminology, Lucknow, Eastern Book Co.
- Smykla, J. Community based Corrections.
- Bartollas Clemens, (1985) Correctional Treatment: Theory and Practice, Prentice hall, New Jersey
- Panakal, J. J & Gokhale, S. D. (1989) Crime and Corrections in India, Mumbai, TISS

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Course Title: COUNSELLING IN SOCIAL WORK

Course Code: SWEP – 05

Level: MSW (III)

Objectives:

- To develop a holistic understanding of counseling as a tool for help
- To acquire knowledge of various approaches, their theoretical under-pinning for goals, values, process and techniques
- To develop skills of application to real life situations
- To develop ability to recognize and synthesize attitudes and values the enhance investment of self in the counselor's role

- To develop ability to use the tools/scales in various settings

Unit – I:

Introduction to Counseling: Meaning, Definition, Need and importance of counseling and professional counseling. Basic principles of Counseling: Participation, Individualization, Confidentiality, communication, acceptance, self confidence, self awareness and other principles governing the counseling relationship. Components of effective counseling: Personality of the counselor's skills – Role and functions of the counselors in schools, industries, family, hospital and rehabilitation institution

Unit – II:

Types of counseling – Individual and group Counseling, Family Counseling, Marital Counseling, Student Counseling and Industrial Counseling, E-Counseling: concept, conditions and importance of E-counseling; Techniques of group counseling, strategies and structure – barriers to effective counseling sessions; Counseling evaluation.

Unit – III:

Theories of counseling: Psychoanalytic, Adlerian, Client centered, Behavioural, Rational emotive, Reality, Gestalt, Transactional analysis and eclectic Theories.

Unit – IV:

Counseling process, Interview and its significance in counseling – Use of observation in counseling and understanding of emotions in counseling. Transference and counter transference. The following standardized tests must be practiced in counseling settings. Personality, intelligence, interpersonal relations, stress, anger, self esteem, anxiety, assertiveness, depression, adjustment, mental health and family intensive. Counseling in different settings: HIV/AIDS counseling, Alcohol and Substance dependence counseling and Trauma counseling.

Reading List:

- Burnett. J. : Counseling with young people
- Fred Machinery : Counseling for personal Adjustment
- Shestroi Everlett, Brammer M. Lawrence : The dynamics of counseling process.
- Tpbbert, E.L. Introduction to counseling

- Colin Fertham, Controversis in psycho therapy and counseling, Sage publications, New Delhi, 1999.
- Kathryn Geldard & David Geldard, Counseling Children, A practical Introduction, Sage publication, New Delhi, 1997.
- Fullmer, D.W. & Bernard H.W: Counseling content and process
- Harms E & Schreiber : Handbook of counseling Techniques
- Kennedt. E : On becoming a counselor – A basic Guides for non-professional counselors, Macmillan, New Delhi.
- Development theories of E.B. Harlock and Robert kegan Psychological theory(Eric Erickson, Need Hierarchy (Maslow's) Cognitive theory (Jean Piaget)

Course Title: SOCIAL WORK WITH THE ELDERLY

Course Code: SWEP – 06

Level: MSW (III)

Objectives:

- To study the basic characteristics about the elderly population
- To understand the development tasks associated with the elderly population.
- To know the various services provided at institution dealing with the elderly.
- To link social work methods in promoting welfare among the elderly.

UNIT – I: Basics about elderly

Gerontology – Definition and scope. Status of Elders in India & Odisha:- Demographic, social, cultural and economic aspects. Needs and problems of elders. Role of elders in family. Issues of Elderly in health, occupation, income retirement planning, property rights, gender issues and family supports. Constitutional guaranteed rights and policy on older persons.

UNIT – II: Developmental tasks

Developmental tasks in elderly: Issues in health care, changes in family structure, coping with aging process, challenges due to changing physiological, economic, safety, status

in the family and other issues, Healthy aging, quality of life, coping with demise of the life partner, bereavement, resolving one's death, and any other.

UNIT – III: Developmental services for the elderly

Institutional care settings for elderly: General hospitals, geriatric wards, home based care, homes for the aged, nursing homes, Day care centres, hobby centres, elder helpline, facilities for homeless elderly. Constitutional guaranteed rights and National policies on older persons. Role of National and International agencies providing developmental services to elders.

UNIT – IV: Social Work Interventions for the elderly

- Role of Social Worker in providing the legal and governmental welfare services to elders.
- Social Work intervention through Social Case Work, Social Group Work, Community Organisation and Social Welfare administration.

Reading List:

- Bali . P. Arun, 2001 Care of the Elderly in India. Shimla, Indian Institute of Advanced Studies.
- Chatterjee, S.C., Patna, Discourses on aging and Dying. New Delhi, and K.P., Charian, V. 2008., Sage Publications
- Dandekar, Kumudini. 1996 The Elderly In India, New Delhi, Sage Publications.
- Desai, Murli and Raju, Gerontological Social Work in India – Some Siva (Ed.) 2000. issues and Perspectives. Delhi, BR Publishing House,.
- Dey, A. B (Ed.) 2003 Ageing in India: Situation Analysis and Planning for the Future. New Delhi / WHO and AIIMS.
- Emmatty, Leena. M. 2008 An insight into Dementia Care in India. New Delhi, Sage Publications.
- Hurlock, Elizabeth. 1981 Developmental Psychology. 5th Edition. New Delhi, Tata McGraw Hill Publications.
- Khan M.Z. 1989 Voluntary Welfare Services for the Aged, Dept. of Social Work, New Delhi, Jamia Milia Islamia.

- Rajan, Irudaya.S., India's Elderly, New Delhi, Sage Publications. 1999.

JOURNALS.

- Indian Journal of Gerontology, C-207, Manu Marg, Tilak Nagar, Jaipur.
- R & D Journal of Helpage India . C-14, Qutab Institutional Area, New Delhi.

Course Title: DEVELOPMENT THEORIES AND STRATEGIES: ISSUES CHALLENGES AND RESPONSES

Course Code: SWCP –15

Level: MSW (IV)

Objectives:

- To be acquainted with the development discourse.
- To gain a critical understanding of the theories, models and approaches to development.
- The role of the state and the response of non-state actors to development.

Unit – I: What is Development?

- The concepts of: development, growth, human development, social development and sustainable development.
- Core values of development; Measuring development: per capita income, PQLI, choice and access, HDI, seer's criteria.
- Development and colonialism: continuity and divergence; persistence of global inequalities and dominance.

Unit - II: Theories and Models of Development

- Modernization Theory;
- Dependency Theory;
- Neoliberalism;
- Developmental State;
- Post Development

Unit - III: Theories and Approaches to Development

- Human Development;
- Capabilities Approach;

- Women, Gender and Development: WID, WAD, GAD.
- Participatory Development;
- Good Governance;
- Institutional Turn

Unit - IV: The Role of NGOs and Civil Societies and Social Movements in Development

- The failure of state-market-international aid institutions.
- NGO's and new-liberalism; Relationship of NGOs with INGOs; NGOs and the State; NGOs and the gap between theory and praxis.
- The role of Civil society in development and its relationship with the state in the Indian Context.
- The challenge of social movement to development in India.
- The Social worker as scholar- activist-practitioner.

Reading List:

- Cohen, Michael and Robert Shenton. 1995. "The Invention of Development." Pp. 27-43 in Jonathan Crush(ed), Power of Development. London and New York: Routledge.
- Esteva, Gustavo. 1991. "Development." Pp. 1-23 in Wolfgang Sachs (ed), The Development Dictionary. London: Zed Books
- Rist, Gilbert. 2002. "Definitions of Development." Pp. 8-24 in The History of Development: From Western Origins to Global Faith. London and New York: Zed Books.
- Seers, Dudley. 1972. "What are we trying to Measure?" Journal of Development Studies 8(3):21-36
- Myrdal, Gunnar. 1974. "What is Development?" Journal of Economic Issues 8(4):729-736.
- Wallerstein, I. 1984. "The Development of the Concept of Development." Sociological Theory 2:102-116
- Kothari, Uma. 2005. "From colonial administration to development studies: a post-colonial critique of the history of development studies," Pp. 47-66 in Uma Kothari (ed), A Radical History of Development Studies: Individuals, Institutions and

Ideologies. London: Zed Books

- Cooke, Bill. 2003. "A new continuity with colonial administration: participation in development management." *Third World Quarterly* 24(1):47-61
- Deutsch, Karl. 1961. "Social Mobilization and Political Development." *The American Political Science Review* 55(3):493-514.
- Lerner, Daniel. 1958. *The Passing of Traditional Society: Modernizing the Middle East*. New York: The Free Press.
- Levy, Marion. 1965. "Patterns (Structures) of Modernization and Political Development." *Annals of the American Academy of Political and Social Science* 358:29-40.
- Bernstein, Henry. 1971. "Modernization Theory and the Sociological Study of Development," *Journal of Development Studies* 7(2):141-60.
- Eisenstadt, S. N. 1974. "Studies of Modernization and Sociological Theory." *History and Theory* 13(3):225-252.
- Huntington, Samuel. 1971. "The Change to Change: Modernization, Development and Politics." *Comparative Politics* 3(3):283-322.
- Tipps, D. C. 1973. "Modernization Theory and the Comparative Study of Societies: A Critical Perspective." *Comparative Studies in Society and History* 15(2):199-226
- Amin, Samir. 1972. "Underdevelopment and dependence in Black Africa: Origins and Contemporary Forms," *Journal of Modern African Studies*. 10(4): 503-524.
- Cardoso, Fernando Enrique. 1972. "Dependency and development in Latin America." *New Left Review* 74(July/August):83-95.
- Frank, Andre Gunder. 1969. "The development of underdevelopment" *Monthly Review* 18(4):17-31.
- Chilcote, Ronald H. 1974. "Dependency: A Critical Synthesis of the Literature." *Latin American Perspectives* 1(1):4-29.
- Friedmann, H. and J Wayne. 1977. "Dependency Theory: A Critique." *Canadian*

Journal of Sociology. Vol. 2, No. 4.

- Frank, Andre Gunder. 1974. "Dependence is Dead, Long Live Dependence and the Class Struggle: An Answer To Critics." *Latin American Perspectives*. 1(1):87-106.
- Smith, Tony. 1979. "The Underdevelopment of Development Literature: The Case of Dependency Theory." *World Politics*. 31(2):247-288.
- Harvey, David. 2005. *A Brief History of Neoliberalism*. Oxford: Oxford University Press. (Read pages 1-6.)
- Lal, Deepak. 1985. "The misconceptions of 'development economics'." *Finance and Development* 22(2):10-13.
- Peet, Richard. 2003. "Globalism and Neoliberalism." Pp. 1-23 in *Unholy Trinity: The IMF, World Bank and*
- WTO. London and New York: Zed Book
- Evans, Peter. 1995. *Embedded Autonomy: States and Industrial Transformation*. Princeton, NJ: Princeton University Press. (Read pages 3-127, 227-250.)
- Amsden, Alice. 1989. *Asia's Next Giant: South Korea and Late Industrialization*. New York: Oxford University Press.
- Wade, Robert. 1990. *Governing the Market: Economic Theory and the Role of Government in Taiwan's Industrialization*. Princeton, NJ: Princeton University Press.
- Ó Riain, Seán. 2000. "The flexible developmental state: globalization, information technology and the 'Celtic Tiger'." *Politics and Society* 28(2):157-193.
- Ferguson, James. 1994. *The Anti-Politics Machine: Development, Depoliticization, and Bureaucratic Power in Lesotho*. Minneapolis, MN: University of Minnesota Press
- Nederveen Pieterse, Jan. 2000. "After Post-Development." *Third World Quarterly* 21(2):175-91
- Haq, Mahbubul. 1998. "The Human Development Paradigm" and "The Advent of the Human Development
- Report." Pp. 13-45 in *Reflections on Human Development*. Delhi: Oxford University Press.

- United Nations Development Programme. 2010. Human Development Report 2010: 20 years on: Pushing the frontiers of human development. New York: UNDP and Oxford University Press.
- Sen, Amartya. 1999. Development as Freedom. New York: Anchor Books
- Kabeer, Naila. 1994. Reversed Realities: Gender Hierarchies in Development Thought. London: Verso. (Read pages 1-68.)
- Rathgeber, Eva. 1990. "WID, WAD, GAD: Trends in Research and Practice." The Journal of Developing Areas 24:489-502
- Cleaver, Frances. 2001. "Paradoxes of Participation: Questioning Participatory Approaches to Development."
- Journal of International Development 11:597-612.
- Hickey, Sam and Giles Mohan. 2005. "Relocating Participation within a Radical Politics of Development."
- Development and Change 36(2):237-262.
- Mohan, Giles and Kristian Stokke. 2000. "Participatory development and empowerment: the dangers of localism."
- Third World Quarterly 21(2):266-280
- Abrahamsen, Rita. 2000. Disciplining Democracy: Development Discourse and Good Governance in Africa.
- London: Zed Books.
- Andrews, Matt. 2008. "The Good Governance Agenda: Beyond Indicators Without Theory." Oxford Development Studies. 36(4):379-407.
- Evans, Peter. 2004. "Development as Institutional Change: The Pitfalls of Monocropping and the Potentials of Deliberation." Studies in Comparative International Development 38(4):30-52.
- Hyden, Goran. 2008. "Institutions, power and policy outcomes in Africa." Discussion Paper No. 2, Africa
- Power and Politics Programme (APPP), London.

- Portes, Alejandro. 2006. "Institutions and Development: A Conceptual Reanalysis." *Population and Development Review* 32(2):233-262.
- Dill, Brian. 2010. "Community-Based Organizations (CBOs) and Norms of Participation in Tanzania: Working
- Against the Grain." *African Studies Review*
- Evans, Peter. 2005. "The Challenges of the 'Institutional Turn': Interdisciplinary Opportunities in Development Theory." Pp. 90-116 in Victor Nee and Richard Swedberg (eds), *The Economic Sociology of Capitalist Institutions*.
- Princeton, NJ: Princeton University Press
- Raka Ray, Mary Fainsod Katzenstein (ed) 2005. *Social Movements in India: Poverty, Power, and Politics*, Rowman and Littlefield Publishers Inc.
- Shah, Ghanshyam (2004) *Social Movements in India; A review of literature*, Sage, India.
- Srivastava, S.K. (1988) *Social Movements for Development*, South Asia Books
- Rajagopal (2007) *International Law from Below: Development, Social Movements and Third World Resistance*, CUP

Course Title: SOCIAL WORK PRACTICE IN RURAL AREAS

Course Code: SWCP – 16

Level: MSW (IV)

Objectives

- To understand the issues faced by social workers in rural areas.
- To understand the skills necessary to practice in rural settings.
- To be acquainted with government plans and programmes for rural development in Odisha.

Unit – I: Rural Community Characteristics

Resources: natural resource, human resource, economic resources; Demography; Social structure; power structure; Political structure; Structure of rural economy; Governance structure; Presence of industries and external agencies; Indigenous knowledge systems; Needs of Rural communities: poverty landlessness, indebtedness, unemployment, migration, ill health, illiteracy, social exclusion, discrimination,

agriculture, forests.

Challenges to Rural Communities: Urbanization; deteriorating agriculture; changing land use SEZ; corporatization of agriculture and marginalization of small land holders; issues arising out of globalization.

Unit - II: Rural Development

Concept: nature, scope and significance; Approaches to Rural Development: Rural reconstruction approach, community development approach, sectoral development approach, area-specific and target group-oriented approach, economic development with social justice approach: Integrated rural development approach.

Rural local self government: Origin and development of the Panchayati Raj system in India; Salient features of 73rd Constitutional Amendment; Issues of Panchayati Raj: reservation, financial management, participation of political parties; Panchayati Raj institutions in Odisha- structure and functions. Five Year Plans and Rural Development Programmes. Poverty alleviation programmes in rural areas- MGNREGA, NRLM etc. Role of NABARD in Rural Development.

Unit - III: The Tribal Development Issue

Concept of Tribes, Indigenous peoples and Aborigines; Situational Analysis of Scheduled Tribes in Odisha: land, food security, employment/livelihood, displacement, migration, human development indices.

Scheduled Areas: Issues and Governance; Overview from Panchsheel, Tribal Sub- Plan and Special Component Plan; Other Significant Acts regarding Forest Rights, Resettlement and Rehabilitation.

Unit - IV: Response of Social Work

Building sustainable communities: identifying strengths, weaknesses and threats; Generalist Model of Social Work Practice: work with individuals, families, systems, clusters at the communities level; Cultural Competency: understanding the value system, diversity, cultivating sensitivity, gaining trust and building relationships; Advocating Social Justice: working with the oppressed and marginalized, reducing stereotypes/discrimination based on gender, caste, ethnic background; Political advocacy: analysing policies and programmes, working for reform of polices, increasing access and better service delivery of public services.

Reading List:

- Dubey, S.C. 1995. India's Changing Villages;

- Ganguli, B.N. 1973. Gandhi's Social Philosophy. Delhi: Vikas Publishing House;
- Gore, M.S. 1993. The Social Context of Ideology: Ambedkar's Social & Political Thought. New Delhi: Sage
- Kumar, Girish 2006, Local Democracy in India: Interpreting Decentralization, Sage Publications;
- Prasad, B. 2003. Rural Development: Concept, Approach and Strategy
- Sainath, P. One Hundred years of Drought
- Pandey, A.K. 1997. Tribal Society in India, New Delhi. Manak Publishing Ltd
- Agrawal, A.N. 2001. Indian Economy; Nature, Problems and Progress, Vikas Biraj Prakash, New Delhi
- Chamber. Robert, 1983, Rural Development: Putting the last First, Harlow, Longman.
- Datt and Sundaram, 2002, Indian Economy, S.Chand and Co, New Delhi.
- Desai, A.R., 1995 Rural Sociology in India, ISAE, Bombay
- Dube, S.C., 1965 India's changing Villages, RKP, London
- Dubashi, P.R., 2000 Rural development Administration in India, Mumbai.
- Riley John. M, 1995. Stakeholders in Rural Development, Sage: New Delhi
- Sachinanda and Purendu, 2001, 2001, Fifty years of Rural Development in India, Firma KLM Pvt. Ltd, Kolkata.

Course Title: SOCIAL WORK PRACTICE IN URBAN AREAS: MIGRATION, UNORGANISED LABOUR AND LIVELIHOODS

Course Code: SWCP-17

Level: MSW (IV)

Objectives:

- Sensitize the students to the need and problems of urban communities;
- Develop a critical understanding among the students about the programmes of urban development

Unit - I:

Urban Communities - Features and characterization; Concept of Urban, Urbanism
Urbanization – concept, causes and factors responsible for Urbanization; Urbanization
in India – Historical development, Characteristics of clusters town, city, metropolis,
suburbs, Satellite town, etc, Classification of cities. Growth of Urban settlement.

Urbanization and its impact on socio – economic development. Urbanization and
structure of Caste. Concept of Slums Dwellers, Pavement Dwellers and Refugees, their
characteristics and Problems. Changing Face of Urban communities: Infrastructural
development, Growing heterogeneity, merging of fringe villages, the “global city” and
socio-cultural and economic implications. Issues, Implications and Challenges

Unit - II:

Urban Problems – Congestion and overcrowding, Housing and slums, Environment
pollution, lack of inadequate civic amenities, etc. - causes, magnitude, impact, etc.,
Measures for alleviating these problems.

Urban Development – Meaning, need, scope and Historical evolution; planning policy
and programmes viz; slum clearance and slum improvement, Housing and Urban
development corporation; Major urban development authorities in Odisha. Urban
Community Development Programmes.

Unit – III:

Urban Informal sector Organised and Unorganised labour: Unorganised labour issues:
Migrant workers, Debt Bondage and child labour, Wage Structure and Components of
Wages of the unorganised labour, International and national labour scenario - ILO, WTO,
Privatization and role of the State: Social Security Programmes for the unorganised
labour.

Concept of Migration and characteristic of Migrants, Impact of Migration, Pattern of
Migration to cities in India.

Unit - IV:

Concept and scope of livelihood, caste and traditional livelihoods; natural resource crisis
and its impact on the livelihood of people: ecological, socio-cultural and economic
dimensions; Gender, caste and age implications on livelihood. Urban poverty and
livelihood issues; Social Work with urban communities – recent developments and future

perspectives.

Reading List:

- Aziz Abdul: Urban Poor and Urban Informal Sector, Ashish Publishing House, New Delhi, 1984.
- Bharadwai, R.K: Urban Development in India, National Book Trust, New Delhi, 1962.
- Bose Ashish: Studies in India's Urbanization (1901 to 1971), Tata McGraw Hill, New Delhi, 1973.
- Cullingworth, J.B: Problems of Urban Society, Vol 1 The Social Framework of Planning, London – George Allen and Unwin Ltd, 1973.
- Desai A.R and Pillai, S.D.(Eds): Slums and Urbanization, Popular Prakashan, Bombay.
- Diddee, Jaymala and Rangaswamy, Vimla (Eds): Urbanization – Trends Perspectives and Challenges, Rawat Publications, Jaipur 1993.
- Gangrade, K.D.: Community Organization in India, Popular Prakashan, Bombay, 1971.

Course Title: SOCIAL POLICY, PLANNING AND IMPLEMENTATION

Course Code: SWCP -18

Level: MSW (IV)

Objectives:

- Gain knowledge of policy analysis and the policy formulation process.
- Acquire skills in critical analysis of social policies and development plans.
- Develop an understanding of social policy in the perspective of national goals as stated in the Constitution, particularly with reference to fundamental right; and the directive principles of state policy.
- Critically understand the concept, content and process of social development.
- Develop the capacity to identify linkages among social needs, problems development issues and policies.
- Locate strategies and skills necessary for social development and reinforce

values of social justice, gender justice and equality.

Unit - I: Social Policy and Constitution: Concept of social policy, sectoral policies and social services- Relationship between social policy and social development-Values underlying social policy and planning based on the Constitutional provisions(i.e. the Directive Principles of State Policy and Fundamental Rights) and the Human Rights- Different models of social policy and their applicability to the Indian situation.

Unit - II: Sectoral Social Policies in India: Evolution of social policy in India in a historical perspective- Different sectoral policies and their implementation, e.g. Policies concerning education, health, social welfare, women, children, welfare of backward classes, social security, housing, youth, population and family welfare, environment and ecology, urban and rural development, tribal development and poverty alleviation.

Unit - III: Social Planning: Concept of social planning- Scope of social planning- the popular restricted view as planning for social services and the wider view as inclusive of all sectoral planning to achieve the goals fo social development-Indian planning in a historical perspective- The constitutional position of planning in India. The legal status of the planning commission- Coordination between centre and state, need for decentralization- Pancyati Raj, people participation.

Unit - IV: Social Policy Implementation and Social Work:

- Role of social policy in the Indian Development process: land reforms, PDS, employment, education, reservations.
- The social policy implementing structure in India; the lack of an integrated approach or convergence of development schemes and programmes.
- Role of social workers in social policy implementation.
- Do social workers have a major impact on social policy Implementation?

Reading List:

- Bagci, A.K. 1982 Political Economy of Underdevelopment, Cambridge; Cambridge University Press.
- Bandyopadhyay, D.1997 “People’s Participation in Planning: Kerala Experiment”,

Economic and Political Weekly, Sept. 24, 2450-54.

- Bhanti, R. 1993 Social Policy and Development in Rajasthan, Udaipur: Himnashu Publication.
- Bujmer, M,et.al., 1989 The Goals of Social Policy, London: UnwinHyman.
- Chakraborty,S.1987 Development Planning- Indian Experience, Oxford: Claredon Press.
- Dandekar, V.M. 1994 “ Role of Economic Planning in India in the 1990s & Beyond”, Economic and Political Weekly, Vol.29,No.24,1457-1464.
- Desai, V.1988 Rural Development (Vol.I) Mumbai: Himalaya Publishing House.
- Dimitto, D.M. 1991 Social Welfare: Politics and Public Policy, New Jersey: Prentice-Hall.
- Ganapathy, R.S. and Others 1985 Public policy and Policy Analysis In India, Delhi: Sage Publications.
- Ghosh, A. 1992 Planning In India: The Challenge for the Nineties, New Delhi: Sage Publications.
- Government of India Five Year Plan Documents (latest), New Delhi.
- Gupta, S.P. 1993 “ Planning and Liberalization”, Economic and Political Weekly, Vol.28 No.43, Oct.23,2349-2355.
- Jacob, K.K. 1992 Social Development Perspectives Hebsur, R.K. (Ed.) Social Intervention For Justice, Bombay: TISS.
- Huttman, E.D. 1981 Introduction to Social Policy, New York: McGraw-Hill.
- International Labour Office. 1973 Multinational Enterprises and Social Policy, Geneva, ILO.
- Jones, K.Et.al.,1983 Issues in Social Policy, London: ROutledge & Kegan paul.
- Joshi, P.C. 1976 Land Reform in India Kahn, A.E. 1973 Social Policy and Social Services, New York: Random House.
- Kulkarni, P.D, 1979 Social Policy and Social Development in India, Madras: Association of Schools of Social Work in India.
- Kulkarni, P.D.1952 Social Policy in India, New York: McGraW- Hill Book

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- Kulkarni, P.D. 1975 Social Policy in India, Bombay, Tata Institute of Social Sciences.
- Leonard, P. 1997 Postmodern Welfare: Reconstructing an Emancipatory Project, London: Sage.
- Lindblom, C.E. 1980 The Policy-making Process, New Jersey; Prentice-Hall.
- Livingstone, A. 1969 Social Policy in Developing Countries, London: Routledge & Kegan Paul.
- Madison, B. Q. 1980 The Meaning of Social Policy, London: Croom Helm.
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- Macpherson, S. 1982 Social Policy in the Third World, New York: John Wiley and Sons.
- Mathur, K. Bjorkman Top Policy Makers in India, New Delhi: Concept Publishing Co.
- Meadows, D.H. 1972 The Limits to Growth, New York: University Books.
- Mishra, R. 1977 Society and Social Policy, London: Macmillan Ltd.
- Mukherjee, N. 1993 Participatory Rural Appraisal; Methodology and Applications, New Delhi: Concept Publishers.
- Mundle, S. 1993 participatory Rural Appraisal: Methodology and Applications, New Delhi: Concept Publishers.
- Milliard, M. and Spicker. 1998 Social Policy in a Changing Society, London: Routledge.
- Philips, D.R. and Health and Development, London: Routledge and Verhasselt Yola (Eds) 1994 Kegan Paul.
- Rao, D.B. (Ed.) 1998 World Summit for Social Development Rao, V. "Social Policy: The Means and Ends Question" Indian Journal of Public Administration, Vol.50 No.1 Jan.-March, 1994.
- Rao, V. and Mander, H. An Agenda for Caring: Intervention for the Marginalized, New Delhi: VHAJ.
- Rastogi, P.N. 1992 Policy Analysis and Problem-Solving for Social Systems, New

Delhi: Sage Publications.

- Roychaudhury, T. 1982 The Cambridge Economic History of India, Vol.I&II, New Delhi: Cambridge University.
- Roy, Sumit 1997 “Globalisation, Structural Change and Poverty”, Economic and Political Weekly, Aug. 16-23, 2117-2132.
- Sachs, W. 3997 Development Dictionary Singh, R.R. (Ed.) 1995 Whither Social Development? New Delhi: ASSWI.
- Singh, Y 1972 Modernization of Indian Tradition, Delhi: Thomas Press. Spicker, Paul 1998 Principles of Social Welfare: An Introduction to Thinking About the Welfare State, London:Routledge. The Probe Team. 1999 Public Report on Basic Education in India New Association with Centre for Delhi: Oxford University Press. Development Economics
- Upadhyay, S.B. 1992 Urban Planning, Jaipur: Printwell. UNDP Human Development Reports, Oxford University Press.
- Vyasulu, V. Vani, B.P. 1997 “Development and Deprivation in Karnataka”, Economic and Political Weekly, Nov. 15 2970-2974.
- Weimer. D.L. and Policy Analysis: Concepts and Practice, New Vining, A.R. 1994 Jersey: Prentice-Hall.
- World Bank World Development Reports (Annual), Oxford University Press.
- Yadav, C.S. (Ed) 1986) Urban Planning and Policies- Part A, New Delhi: Concept Publishing Co. Encyclopedia of Social Sciences Encyclopedia of Social Work.
- De Haan, Anjan (20130 “The Social Policies of Emerging Economics: Growth and Welfare in China and India” IPC-JG working Paper No.110. Brasilia, International Policy Centre for Inclusive Growth.

Recommended Journals/Periodicals

- Alternatives; Development and Change; Economic and Political Weekly.

Course Title: DEVELOPMENT COMMUNICATION

Course Code: SWCP - 19

Level: MSW (IV)

Objectives :

- To study the basic issues in Communication.
- To learn about various channels of Communication
- To understand the channels of mass communication reaching to rural audience.

Unit : I

Development: meaning, concept, process and models of development – theories – origin – approaches to development, problems and issues in development, characteristics of developing societies, development dichotomies, gap between developed and developing societies. Development issues on national and regional and local level.

Unit : II

Development communication : meaning – concept – definition – philosophy – process – theories – role of media in development communication – strategies in development communication – social cultural and economic barriers – case studies and experience – development communication policy – strategies and action plans – democratic decentralization.

Unit : III

Communication with Individual Group, Traditional Communication: Streets play, Puppetry show & Folk media, Rural communication messages Development support communication: population and family welfare – health- education and society – environment and development – problems faced in development support communication.

Unit : IV

Writing development messages for rural audience: specific requirements of media writing with special reference to rural press, radio and television. Problems of Rural

Journalism, Farm Journals, Rural Press, Press Conference, Radio rural Forum, Role of Community Radio in Rural Communication.

Reading List:

Fernandes, Walter : Development with People, Indian Social Institute, New Delhi, 1988.

Jayaweera N. & Amunugama S. : Rethinking Development Communication, AMIC, Singapore, 1988.

Kumar, Keval J. : Communication and Development : Communication Research Trends, Vol. 9, No.3, 1988.

Hoogvelt Ankie : The Third World in Global Development, Macmillan, London, 1982.

Hornik, Robert C : Development Communication : Information Agriculture and Nutrition in Third World, Longman, London/NY , 1988.

Melkote Srinivas : Communication for Development in the Third World – Theory and Practice, Prentice – Hall, New Delhi, 1991.

Sondhi, Krishan : Communication, Growth and Public Policy Breakthrough, New Delhi, 1983.

Schramm, Wilbur : Mass Media and National Development, Stanford UP, Stanford, 1964.

Course Title: SUSTAINABLE AGRICULTURE

Course Code: SWCP - 20

Level: MSW (IV)

Objectives:

- To Understand the Indian Agricultural Policy and the Crisis in Agriculture.
- To be acquainted with sustainable agricultural practices.
- To effectively respond to the problem of food and nutritional security at the level of the farmer/community.

Unit-I: Principles & Policy for Sustainable Agriculture

Social Work in Rural-Agro ecological Communities;

History & Evolution of Agricultural Practices;

Principles of Sustainable Agriculture;

Policy & Practice of Sustainable Agriculture;

Principles of Industrial Agriculture;

Policy & Practice of Industrial Agriculture.

Unit-II: Soil Health & Water Management Soil Health:

On Farm Biomass;

Cattle Dung;

Earth Worm;

Soil Health Enhancement Techniques;

Organic Carbon Measurement.

Water Management:

In-situ water conservation;

Methods to reduce flow of rain water;

Mulching;

Moisture Management.

Unit-III: Seeds & Cropping Pattern Seeds:

Seed in the context of a micro-ecosystem;

Significance of Diversity in Seed;

Types of Seeds;

Politics of Seed Control;

Techniques of preserving seeds with Farming Communities.

Cropping Pattern:

Multiple cropping patterns & Soil Health;

Soil-climate & cropping patterns;

Cropping Patterns as enhancing photosynthesis process.

Unit-IV: Integration & Ecological Agriculture

Integration of Agriculture:

Interrelated Activities of Agriculture;

Stages of Integration;

Processes of Integration;

Programs available for Integration.

Ecological Agriculture:

Principles of Ecological Agriculture;

Transition from Integrated Agriculture to Ecological Agriculture.

Reading List:

Randhawa M.S, A History of Agriculture in India, Vol. I, II, III & IV, ICAR.

Asian Agri-History Foundation (1999), Krishi Parashara, ISRISAT.

Subramaniam. C (1995) Hand of Destiny: The Green Revolution (Vol.2) Bharatiya Vidya Bhavan.

Shina Vandana, The Violence of the Green Revolution.

Roy. B. C, Chattopadhyay, G.N, And Tirado.R; Subsidising Food Crisis.
www.greenpeaceindia.org.

Howard. Albert, An Agricultural Testament, Other India Press.

Howard. Albert & Wad. Yeshwant D, The Waste Products of Agriculture- Their utilization as humus.

Howard. Albert and Berry. Wendell (1945), Soil and Health,
<http://www.journeytoforever.org/>

Fukuoka. M. (2009) The One Straw Revolution, OIB

Fukuoka. M. (1996). The Road Back to Nature: Regaining the Paradise Lost, OIB.

Dabholkar. S. A. (2001) Plenty for All, OIB.

Save. Bhasker, The Great Agricultural Challenge, OIB.

Green Foundation, Janadharya Seed Savers.

Green Foundation, Seed to Food.

Alvares. Claude (2009), The Organic Farming Sourcebook, Other India Press.

Course Title: DISSERTATION**Course Code: SWCP - 21****Level: MSW (IV)****Dissertation**

The student has to prepare and submit a dissertation under the guidance of a faculty. The student should exhibit ability to review relevant literature formulate a research question, choose appropriate methodology, develop data collection tools, analyze and interpret data and prepare the research report. The length of the dissertation excluding contents and Bibliography should not exceed ten thousand words.

Evaluation Criteria

Sl. No.	Item		Weightage
1	Choice of Topic Review of relevant literature	Scope, Research Potential Comprehension, quality, quantity	10
2	Objective and Hypothesis/Question	Relevance, clarity, relation to topic Research Design/Methodology Appropriateness, selection of variables sample and description	20
3	Tools Used	Appropriateness, use	10
4	Data analysis and interpretation	Scheme, Application of Statistical techniques, use of tables and figures relating findings to objectives and literatures, discussion on findings	20
5	Summary	Synthesis of findings Implications	10
6	Report Presentation	Cauterization, chapter size, structuring of paragraphs vocabulary, clarity, coherence, Bibliography	10
7	Viva-voce	Ability to explain the research process & defend research work	20
Total			100

Course Title: ENTREPRENEURSHIP

Course SWEP - 07

Level: MSW (IV)

Objectives

- To familiarize Social Work students to entrepreneurship
- To give them basic skills and competencies to encourage entrepreneurship through their Social Work practices.

Unit – I : What is Entrepreneurship?

Entrepreneurship- conceptual issues; Entrepreneurship and Development: Entrepreneurship motivating factors, competencies, performance and reward. Status of entrepreneurs in India, problems and concerns of entrepreneurs

Unit – II : How to be an Entrepreneurship?

Opportunity scouting and idea generation: creativity and innovation; the process of setting up a small business: Preliminary screening and detailed study of the feasibility of the business idea: financing/non-financing support agencies; Schemes of assistance from government and non-governmental agencies, policies/programs and procedures and the available schemes

Unit-III : Management Roles of an Entrepreneur

Management roles and functions in a small business; Designing and re-designing business process, location, layout, operations, planning and control. Issues of quality, productivity and environment; Managing business growth; Issues in marketing sales and distribution. Consortium marketing; competitive bidding/tender marketing negotiating with principal customers. Marketing Assistance, Subsidies and other Fiscal and monetary Incentives. National state level and grass-root level financial and non-financial institutions in support of small business development.

Unit – IV : Accounting

Principles of double-entry book-keeping: Journal entries, cash-book, pass book, and Bank Reconciliation Statement ledger account trail balance and preparation of final accounts: Trading and Profit and Loss Account; Balance-sheet. Brief introduction to Single-Entry system of record keeping. Sources of risk/venture capital, fixed capital, working capital and a basic awareness of financial services such as leasing and factoring

Reading list:

Sivakama Sundari, S. Entrepreneurship Development of Rural Women (Vol.I) Asian and Pacific for Transfer of technology, New Delhi.

Heggade, O.D. Developing rural women entrepreneurship, Mohit publications, New Delhi

Santhawali, A.Y. Entrepreneurship Development – Publications, Jaipur.

Bhide, Amar V. The Origin and Evolution of New Business, Oxford University Press, New York, 2000

Dollinger M.J., 'Entrepreneurship strategies and Resources', 3rd edition, Pearson Education, New Delhi 2006

Desai, Vasant Dr. (2004) Management of small scale enterprises New Delhi: Himalaya Publishing Company

Taneja, Gupta, Entrepreneur Development New Venture Creation: 2nd edition Galgotia Publishing Company

Holt, David H., Entrepreneurship: Strategies and Resources, Illinois , Irwin, 1955.

Panda, Shiba Charan, Entrepreneurship Development, New Delhi, Anmol Publications

Patel, V.G., The Seven Business Crises and How to Beat Them, Tata-Mcgraw, New Delhi, 1995

SIDBI Report on Small Scale Industries Sector[latest edition]

Verma, J.C., and Gurpal Singh, Small Business and Industry-A Handbook for Entrepreneurs, Sage, New Delhi, 2002

Course Title: NGO MANAGEMENT**Course Code: SWEP – 08****Level: MSW (IV)****Objectives:**

- To understand the role of NGOs in society
- To gain clarity about the operating environment of NGOs
- To understand the issues involved in the internal management of NGOs

Unit I: Introduction to NGOs

Definitions, History, Roles in Society; Description of the NGO sector; Theoretical Perspectives on Organization and Management of NGOs.

Unit II: The legality of NGOs in India

Societies Registration Act, 1860, Indian Trust Act, 1882, Cooperative Societies Act, 1912, Company Act, 1956 (Some Relevant Part), FCRA: Foreign Contribution Regulatory Act, Income tax Act 1961, Income Tax Exemption: Under Sections 11 and 12, Rebate under Sections 80G and 35AC of Income Tax Act.

Unit – III: The operating environment of NGOs

Understanding the environment in which NGOs function: Economic, Political, Socio-Cultural and Ideological macro level forces that influence NGOs, Globalization and Foreign aid system. Principal Players and their Relationships: Governments, Markets, NGOs, Donors; Importance of partnerships.

Unit – IV: Internal Management of NGOs

Governance structure, Vision and Mission; Internal management needs of a NGO; strategies/plans for action; Managing Resources: Human and Financial; Measuring performance, participation, evaluation; Accountability to multiple stakeholders; Ethical issues faced by NGO managers; Scaling up and sustainability of NGOs; creating a learning environment

Reading List:

Lewis, David. 2007. The Management of Non-Governmental Development Organizations, second edition. New York: Routledge.

Edwards, M. and Fowler, A. (2003) The Earthscan Reader on NGO Management. London: Earthscan Publications, Ltd.

Salamon, L.M. 1994. The Rise of the Nonprofit Sector. *Foreign Affairs* 74 (3): pp. 109–122

Lewis, D. 2007. *Advocacy and Service Delivery: Managing the Main NGO Activities in The Management of Non-governmental Development Organizations, Second Edition*

Fowler, A. 1997. *Understanding International Development in Striking a Balance: A Guide to Enhancing the Effectiveness of Non-governmental Organizations in International Development* London: Earthscan Publications, Ltd.,

Course Title: PROJECT MANAGEMENT

Course Code: SWEP – 09

Level: MSW (IV)

Objectives:

- To understand the fundamentals of Project management and how to initiate, plan, execute and close a project.

Unit - I: Fundamentals of Project Management

What is a Project? Definition, meaning, principles and types; What is project management? meaning, coverage and scope; Who is the project manager?; Project phases and knowledge areas. Planning and its importance; who should be involved in planning?

Unit - II: Initiating Projects and Project Identification

How to get a project started; Setting a mandate, finding a project sponsor and creating a project team: team dynamics and running meetings.

Project Identification: Needs assessment: listening, interviewing, focus group discussions, community mapping; Capacity assessment: human, social, natural, physical, economic, cultural

Unit - III: Planning and Executing Projects

Work Breakdown Schedule (WBS), Project estimating and scheduling techniques-sequencing tasks, identifying the path of the project, considering resources; Risk planning methods; Cost planning; Communications plan; final project plan.

Team management; identifying and involving all stakeholders, user groups, interest groups, beneficiaries, decision makers; Primary and Secondary stakeholders; levels of participation;

Unit - IV: Closing a Project

Closing of a successful project; stakeholder acceptance; writing a final report; Techniques of identifying lessons learned and their analysis; acknowledging successes and failures; and identifying areas for further projects.

Reading List:

Verzuh, Eric. The Fast Forward MBA in Project Management. Published by John Wiley and Sons, Inc.

Project Management Body of Knowledge, 5th Edition. Published by Project Management Institute (PMI)

Blackman, Rachel. 2003. Project Cycle Management. UK: Tearfund.

Preskill, Hallie and Russ-Eft, Darlene. 2005. Building Evaluation Capacity. London: Sage Publications.

Capezio, Peter. 2000. Powerful Planning Skills. Mumbai: Jaico Publishing House.

Smith, Steve. 2002. Plan to Win. New Delhi: Kogan Page India Pvt. Ltd.

Dale, Reidar. 2001. Evaluation Frameworks for Development Programmes and Projects. New Delhi: Sage Publications.

Loehle, Craig. 2000. Thinking Strategically. New Delhi: Foundation Books.

Padaki, Vijay. 1995. Development Intervention and Programme Evaluation. New Delhi: Sage Publications.

Course Title: CLIMATE CHANGE, DISASTER MANAGEMENT AND REHABILITATION

Course Code: SWEP –

10 Level: MSW (IV)

Objectives:

- To understand the challenges of Climate change
- To gain a comprehensive understanding of the Disaster Management Cycle.
- To get acquainted with Disaster Management Policies and Laws in India.

Unit I:

- **Climate Change:** Concept, nature and severity of climate change. Causes of climate change. Impact of climate change: globally in general and Odisha in particular. Greenhouse effect, climate change and disaster.
- **Disaster Management:** Definition, Types of disaster (natural and manmade disaster) mining disaster, tropical cyclone, storms, floods, lightning, forest fire, tsunami and earthquakes.

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Unit II:

- **Concepts associated with Climate Change and Disasters:** air pollution

and acid rain, ozone depletion, bio-diversity extinction, de-forestation and loss of biological diversity, land degradation, deserts and desertification, groundwater over exploitation, dryness and wildfires, population growth and explosion, habitat related problems.

- **Social Systems, Ecological Networks and Disasters:** a socio-political ecology of disasters, nature of human communities, community as an ecological network.

Unit III:

- **Disaster Management Cycle:** Disaster phase, Response phase, Recovery phase, Risk reduction phase, Preparedness phase.
- **The Process of Disaster Management:** mitigation, preparedness, response and recovery.
- **Majors Disasters in Odisha:** Flood, cyclone, drought, tsunami, etc
- **Disaster Management Programs and System in India:** Nation Disaster Management Act (2005), National Policy on Disaster Management (2009), Disaster Management in the Xth Five Year Plan onwards, different bodies National Disaster Management Agency (NDMA), State Disaster management Agency (SDMA), National Disaster Response Force (NDRF), National Institute of Disaster Management (NIDM), India Disaster Resource Network (IDRN). Community based disaster management and community based disaster management practices (case studies), The role of INGOs and NGOs.
- **Disaster Warning and Evacuation:** Factors influencing evacuation and some policy considerations, media and other sources of information, Phases of evacuation: Preparation, Decision

Unit IV:

- **Environmental Legislation and Regulations associated with Disaster Management:** Environment Policy of the Government of India: Five Year Plans, Environment Protection Act (1986),The Environment (Sitting for Industrial Projects) Rules (1999), The Indian Forest Act (1927 and Amendment 1984), The Indian Forest (Conservation) Act (1981), Coastal Regulation Zone Notification (1991).
- **Rehabilitation:** Need for rehabilitation, Government and Non-government programs for rehabilitation, role of NGOs for rehabilitation programmes, Critical review of programmes, Role of Social Work in minimizing the effects of disaster.

Reading List:

Anandha Kumar K.J and Ajinder Walia (2013) India Disaster Report, NIDM: New

Delhi.

Gupta. Anil K et, al (Ed) (2014). Training Module Mainstreaming Climate Change Adaptation and Disaster Risk Reduction into District Level Development Plans, NIDM : New Delhi.

Satendra and Kaushik. D (2013) Forest Fire Disaster Management NIDM: New Delhi.

Vogelbacher (2013) Flood Disaster Risk Management NIDM: New Delhi.

Kaushik. A.D. (2012) Flood Risk Mitigation and Management: A Training of Trainers Module, NIDM: New Delhi.

Course Title: People-Centered Advocacy

Course Code: SWEP – 11

Level: MSW (IV)

Objectives:

1. To acquire conceptual clarity and theoretical knowledge about linkages between state, civil society and market, governance and social policy processes
2. To acquire conceptual clarity about Social Advocacy as a method for bringing about social change to achieve equality and social justice goals enshrined in the Constitution using non-violent methods
3. To become aware of the democratic institutions, actors and the processes of democratic decision making
4. To acquire necessary skills for strategy planning to engage in Social Advocacy
5. To internalize values and attitudes necessary for working at micro, meso and macro levels and with diverse individuals and groups by following the Constitutional and democratic processes

Unit 1: Understanding People Centred Advocacy

- Politics in Social Advocacy and its role in democratic decision making
- Advocacy vis-à-vis Social Revolution and Social Action
- Relevance and importance of people centered advocacy and rights based approaches in India
- Power, politics and public arguments
- Personal and institutional benefits of Social Advocacy

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Unit 2: Role of Information, Networking and the Media in Advocacy

- Power of Information in People Centered Advocacy

- Identifying incidents, collecting information and framing issues
- Mobilizing support and importance of coalitions
- Role of organization and campaign strategies
- Building favorable public opinion and putting pressure on decision makers
- Understanding the politics of media and its role in consensus and conflict creation
- Developing material for the media and its diverse audience
- Exploring alternate media for pro-people advocacy

Unit 3: Advocacy with the Legislature and Executive

- Understanding channels between legislators and advocacy groups
- Knowing the actors within and outside legislative bodies
- Role of bureaucracy in policy making, operationalization and implementation.
- Finding policy hooks and political angles. Understanding phases of policy making
- Implications of transparency and accountability vis-à-vis elected representatives and the bureaucracy
- Practical tips and strategies for advocating with legislatures and the bureaucracy

Unit 4: Advocating with the Judiciary and with the reference to the International framework.

- Understanding central and state laws and function of various courts in India
- Role of Information and PILs in Judicial Advocacy
- Post 2015 agenda, post MDG frameworks
- Making post 2015 matter for socially excluded groups in India

Reading List








NCAS.resource material and documented case stories on People Centred Advocacy

Academic Year
2017-18

UTKAL UNIVERSITY

REGULATIONS & SYLLABUS UNDER GRADUATE PROGRAMME IN BACHELOR OF ARTS

(HONOURS & PASS)- CBCS PATTERN Effective for Admission Batch: 2017 - 2018
(Applicable to Autonomous Colleges)

 Skill Development
 Employability
 Entrepreneurship
 All the three
 Skill Development and Employability
 Skill Development and Entrepreneurship
 Employability and Entrepreneurship

SYLLABUS FOR B.A. (HONORS) ECONOMICS UNDER CHOICE BASED CREDIT SYSTEM OF UTKAL UNIVERSITY, BHUBANESWAR

Course Structure for B.A. (Honours) Economics

There are a total of fourteen economics core courses that students are required to take across six semesters. All the core courses are compulsory. In addition to core courses in economics, a student of B.A. (Honours) Economics will choose four Discipline Specific Elective (DSE) Courses. The DSE Courses are offered in the fifth and sixth semesters and two such courses will be selected by a student from a set of courses specified for each of these semesters (Groups I and II in the attached table). It is recommended that each college should offer at least three DSE Courses in the fifth and sixth semesters to allow the students some minimal element of choice.

Contact Hours: Each course has 5 lectures and 1 tutorial (per group) per week. The size of a tutorial group is 8-10 students.

Note on Course Readings: The nature of several of the courses is such that only selected readings can be specified in advance. Reading lists will be updated and topic-wise readings will be specified at regular intervals, ideally on an annual basis.

Course Structure for B.A. (Honours) Economics

Skill Enhancement Courses (SEC II)

1. Data Analysis and Computer Application
2. Financial Economics

Core Economics Course 1: INTRODUCTORY MICROECONOMICS

Course Description

This course is designed to expose the students to the basic principles of microeconomic theory. The emphasis will be on thinking like an economist and the course will illustrate how microeconomic concepts can be applied to analyze real-life situations.

Module 1: Exploring the subject matter of Economics

The Ten Principles of Economics: How people make decisions; Working of the economy as a whole; Thinking Like an Economist: The economist as Scientist – The scientific method: Observation, Theory and more observation; Role of assumptions; Economic Models; The economist as a policy advisor; Why economists disagree; Graphs in Economics

Module 2: Supply and Demand: How Markets Work, Markets and Welfare

The market forces of demand and supply – Markets and competition; The demand curve – Market vs individual demand curve; Shifts in demand curve; The supply curve – Market vs individual supply curve; Shifts in supply curve; Equilibrium between supply and demand and changes there in; Price elasticity of demand and its determinants; Computing price elasticity of demand; Income and cross elasticity of demand; The price elasticity of supply and its determinants; Computing price elasticity of supply; Consumer Surplus and Producer Surplus; Market efficiency and market failure.

Module 3: The Households

The Budget Constraint; Preferences – representing preferences with indifference curves; Properties of indifference curves; Two extreme examples of indifference curves; Optimisation – Equilibrium; Change in equilibrium due to changes in income, changes in price; Income and substitution effect; Derivation of demand curve; Three applications – Demand for giffen goods, wages and labour supply, Interest rate and household saving.

Module 4: The Firm and Market Structures

Cost concepts; Production and costs; The various measures of cost – Fixed and variable cost, average and marginal cost; Cost curves and their shapes; Costs in the short run and in the long run; Economies and diseconomies of scale. Firms in competitive markets – What is a competitive market; Profit maximisation and the competitive firm's supply curve; The marginal cost curve and the firm's supply decision; Firm's short-run decision to shut down; Firm's long-run decision to exit or enter a market; The supply curve in a competitive market – short run and long run; Monopoly - Why monopolies arise and public policy towards monopolies

Module 5: The Input Markets

The demand for labour – The production function and the marginal product of labour; Value of the marginal product of labour and demand for labour; Shifts in labour demand curve; The supply of labour – the trade-off between work and leisure; Shifts in the labour supply curve; Equilibrium in the labour market; Other factors of production: Land and capital; Linkages among factors of production.

Readings:

1. Principles of Economics, Gregory N Mankiw, 6e Cengage Learning India Private Limited,

New Delhi

2. William A McEachern and Simrit Kaur (2012): *Micro Econ: A South-Asian Perspective*, Cengage Learning India Private Limited, New Delhi.
3. Karl E. Case and Ray C. Fair (2007): *Principles of Economics*, 8th Edition, Pearson Education Inc.

Core Economics Course 2: MATHEMATICAL METHODS FOR ECONOMICS I

Course Description

This is the first of a compulsory two-course sequence. The objective of this sequence is to transmit the body of basic mathematics that enables the study of economic theory at the undergraduate level, specifically the courses on microeconomic theory, macroeconomic theory, statistics and econometrics set out in this syllabus. In this course, particular economic models are not the ends, but the means for illustrating the method of applying mathematical techniques to economic theory in general. The level of sophistication at which the material is to be taught is indicated by the contents of the prescribed textbook.

Module I: Preliminaries

Sets and set operations; relations; functions and their properties; Number systems

Module II: Functions of one real variable

Types of functions- constant, polynomial, rational, exponential, logarithmic; Graphs and graphs of functions; Limit and continuity of functions; Limit theorems

Module III: Derivative of a function

Rate of change and derivative; Derivative and slope of a curve; Continuity and differentiability of a function; Rules of differentiation for a function of one variable; Application- Relationship between total, average and marginal functions

Module IV: Functions of two or more independent variables

Partial differentiation techniques; Geometric interpretation of partial derivatives; Partial derivatives in Economics; Elasticity of a function – demand and cost elasticity, cross and partial elasticity

Module V: Matrices and Determinants

Matrices: concept, types, matrix algebra, transpose, inverse, rank; Determinants: concept, properties, solving problems using properties of determinants, solution to a system of equations - Cramer's rule and matrix inversion method.

Readings:

1. K. Sydsaeter and P. J. Hammond (2002): *Mathematics for Economic Analysis*. Pearson Educational Asia
2. A. C. Chiang and K. Wainwright (2005): *Fundamental Methods of Mathematical Economics*, McGraw Hill International Edition.
3. T. Yamane (2012): *Mathematics for Economists*, Prentice-Hall of India

Generic Elective I: Indian Economy

Course Description: This paper introduces the students to the essentials of Indian economy with an intention of understanding the basic feature of the Indian economy and its planning process. It also aids in developing an insight into the agricultural and industrial development of India. The students will understand the problems and policies relating to the agricultural and industrial sectors of India and current challenges of Indian economy.

Module I: Introduction to Indian Economy

Colonialism & British Rule: Exploitation and under-development in India; Basic features of India Economy; Indian Economy as a developing economy; Demographic trends in India - Size and growth of population, Occupational structure, Sex composition, Age structure and demographic dividend; Causes of population growth and population policy

Module II: Indian Agriculture

Role of agriculture in Indian Economy; Cause of low productivity, Green Revolution and Land Reforms, Agricultural Finance-Sources and Problems; Agricultural Marketing in India

Module III: Industrial Development in India

Role of Industrialisation in Indian Economy; Small Scale & Cottage Industries: Meaning, Role, Problems and Remedies; Industrial Policies of 1948, 1956, 1977 and 1991; Problems of Industrial Development in India; Industrial Sickness

Module IV: Service Sector in India

Growth & Contribution to GDP; Composition and relative importance of service sector; Factors determining growth of the sector; ICT and IT – Spread and Policy; Sustainability of services led growth

Module V: Current Challenges facing Indian Economy

Unemployment – Meaning; important employment Generation programmes, MGNREGS; Inequality in income distribution-Causes thereof; Government policy to check its growth

Basic Readings:

1. Kapila U. *Indian economy since Independence*. Academic Foundation, New Delhi
2. Misra, S. K. and Puri V. K. *Indian Economy — Its Development Experience*. Himalaya Publishing House, Mumbai
3. Dutt R. and Sundharam K. P. M. *Indian Economy*. S. Chand & Company Ltd., New Delhi.
4. Agarawala, A. N. *Indian Economy*, New Age Publications, New Delhi
5. Panagariya, Arvind (2008): *India: the Emerging Giant*, Oxford University Press, New York
6. Acharya, S. and Mohan, R. (Eds.) (2010): *India's Economy: Performance and Challenges*, Oxford University Press, New Delhi.
7. Ahluwalia, I. J. and Little, I. M. D. (Eds.) (1998): *India's Economic Reforms and Development: Essays for Manmohan Singh*, Oxford University Press, New Delhi.

Core Economics Course 3: INTRODUCTORY MACROECONOMICS

Course Description

This course aims to introduce the students to the basic concepts of Macroeconomics. Macroeconomics deals with the aggregate economy. This course discusses the preliminary concepts associated with the determination and measurement of aggregate macroeconomic variable like savings, investment, GDP, money, inflation, and the balance of payments.

Module I: Basic Concepts

Macro vs. Micro Economics; Why Study Macroeconomics? Limitations of Macroeconomics ; Stock and Flow variables, Equilibrium and Disequilibrium, Partial and General Equilibrium Statics – Comparative Statics and Dynamics ; National Income Concepts – GDP, GNP, NDP and NNP at market price and factor cost; Personal Income and Disposable personal Income; Real and Nominal GDP

Module II: Measurement of Macroeconomic Variables

Output, Income and Expenditure Approaches; Difficulties of Estimating National Income; National Income Identities in a simple 2- sector economy and with government and foreign trade sectors; Circular Flows of Income in 2, 3 and 4-sector economies; National Income and Economic Welfare ; Green Accounting.

Module III: Money

Evolution and Functions of Money, Quantity Theory of Money – Cash Transactions, Cash Balances and Keynesian Approaches, Value of Money and Index Number of Prices

Module IV: Inflation, Deflation, Depression and Stagflation

Inflation – Meaning, Causes, Costs and Anti-Inflationary Measures; Classical, Keynesian, Monetarist and Modern Theories of Inflation, Deflation- Meaning, Causes, Costs and Anti-Deflationary Measures, Depression and Stagflation; Inflation vs. Deflation

Module V: Determination of National Income

The Classical Approach - Say's Law, Theory of Determination of Income and Employment with and without saving and Investment; Basics of Aggregate Demand and Aggregate Supply and Consumption- Saving – Investment Functions, The Keynesian Approach – Basics of Aggregate Demand and Aggregate Supply and Consumption, Saving, Investment Functions; The Principle of Effective Demand; Income Determination in a Simple 2-Sector Model; Changes in Aggregate Demand and Income- The Simple Investment Multiplier; Income Determination in a 3-Sector Model with the Government Sector and Fiscal Multipliers

Readings:

1. N. Gregory Mankiw (2010): *Macroeconomics*, 7th edition, Cengage Learning India Private Limited, New Delhi
2. Richard T. Froyen (2005): *Macroeconomics*, 2nd Edition, Pearson Education Asia, New Delhi.
3. Errol D'Souza (2009): *Macroeconomics*, Pearson Education Asia, New Delhi.

Core Economics Course 4: MATHEMATICAL METHODS FOR ECONOMICS II

Course Description

This course is the second part of a compulsory two-course sequence. This part is to be taught in Semester II following the first part in Semester I. The objective of this sequence is to transmit the body of basic mathematics that enables the study of economic theory at the undergraduate level, specifically the courses on microeconomic theory, macroeconomic theory, statistics and econometrics set out in this Syllabus. In this course, particular economic models are not the ends, but the means for illustrating the method of applying mathematical techniques to economic theory in general. The level of sophistication at which the material is to be taught is indicated by the contents of the prescribed textbook.

Module I: Linear models:

Input- Output Model: Basic concepts and structure of Leontief's open and static Input-Output model; solution for equilibrium output in a three industry model; The closed model

Module II: Second and higher order derivatives:

Technique of higher order differentiation; Interpretation of second derivative; Second order derivative and curvature of a function; Concavity and convexity of functions; Points of inflection

Module III: Differentials and total derivatives:

Differentials and derivatives; Total differentials; Rules of differentials; Total derivatives; Derivatives of implicit functions

Module IV: Single and multivariable optimisation:

Optimum values and extreme values; Relative maximum and minimum; Necessary versus sufficient conditions - First and Second derivative tests; Economic applications thereof, First and second order condition for extremum of multivariable functions; Convex functions and convex sets

Module V: Optimisation with Equality Constraints:

Effects of a constraint; Finding stationary value – Lagrange-Multiplier method (Two variable single constraint case only): First and second order condition; The Bordered Hessian determinant.

Readings:

1. K. Sydsaeter and P. J. Hammond (2002): *Mathematics for Economic Analysis*. Pearson Educational Asia
2. A. C. Chiang and K. Wainwright (2005): *Fundamental Methods of Mathematical Economics*, McGraw Hill International Edition.
3. T. Yamane (2012): *Mathematics for Economists*, Prentice-Hall of India

Generic Elective II: Indian Economy II

Course Description: This paper is the part II of Indian economy deals with the external sector, financial markets in India, Indian Public Finances and Economic Reforms. This paper also troughs some light on current challenges of Indian Economy.

Module I: External Sector in India

Trends, Composition & Direction in exports from and imports of India; Problems of Balance of Payment: Causes of deficit in BoP & measures to correct it; Trade Policy- Export Promotion Vs Import Substitution; Foreign Trade Policy of India; WTO and India

Module II: Financial Markets in India

Commercial Banking in India- Nationalisation of Banks; Lead bank scheme and branch expansion; RBI - Functions, Monetary Policy; Development Banking- IFCI, IDBI, SIDBI and NABARD

Module III: Indian Public Finance

Public Expenditure-Growth and Composition, Causes of Growth of Public Expenditure in India: Tax Revenue of Central and State Governments; Concept of VAT; Deficit Financing in India- Revenue, Budget, Fiscal and Primary Deficits; Purpose and Effects of Deficit Financing; India's Fiscal Policy-Objectives

Module IV: Economic Reforms, Globalisation in India, Foreign Capital and MNCs

Genesis of Reforms, Macroeconomic Stabilisation, Structural Reforms, Appraisal
Globalisation and its impact on the Indian Economy; Foreign Capital-Need, Components; MNCs – Reasons for Growth and Appraisal

Module V: Current Challenges Facing Indian Economy

Inflation – Causes, Consequences and Anti-inflationary Policy; Poverty – Poverty line and Estimates, Major Poverty Alleviation Programmes; Environmental Degradation – Growth and Environment; Population Growth and Environment; Environment Policy

Basic Readings:

1. Kapila U. *Indian economy since Independence*. Academic Foundation, New Delhi
2. Misra, S. K. and Puri V. K. *Indian Economy — Its Development Experience*. Himalaya Publishing House, Mumbai
3. Dutt R. and Sundharam K. P. M. *Indian Economy*. S. Chand & Company Ltd., New Delhi.
4. Agarawala, A. N. *Indian Economy*, New Age Publications, New Delhi
5. Panagariya, Arvind (2008): **India: the Emerging Giant**, Oxford University Press, New York
6. Acharya, S. and Mohan, R. (Eds.) (2010): **India's Economy: Performance and Challenges**, Oxford University Press, New Delhi.
7. Ahluwalia, I. J. and Little, I. M. D. (Eds.) (1998): **India's Economic Reforms and Development: Essays for Manmohan Singh**, Oxford University Press, New Delhi.

Core Economics Course 5: MICROECONOMICS I

Course Description

The course is designed to provide a sound training in microeconomic theory to formally analyze the behaviour of individual agents. Since students are already familiar with the quantitative techniques in the previous semesters, mathematical tools are used to facilitate understanding of the basic concepts; this course looks at the behaviour of the consumer and the producer and also covers the behaviour of a competitive firm.

Module I: Consumer Theory I

The market – Constructing a model; Optimisation and equilibrium; The demand curve and the supply curve; Market Equilibrium; The budget constraint and budget set; Changes in budget line; Effect of taxes, subsidy and rationing on budget set; Consumer Preferences – Indifference curves; Case of perfect substitutes, complements, neutrals, satiation, discrete goods; The marginal rate of substitution; Utility – Cardinal utility; Constructing a utility function; Marginal utility and MRS; Optimal choice and consumer demand; Estimating Utility Functions; Implications of the MRS condition; Choosing taxes; Demand – Normal and inferior goods; Income Offer Curve and Engel Curve; Ordinary goods and Giffen goods; The Offer Curve and the demand Curve; The inverse demand function.

Module II: Consumer Theory II

Slutsky Equation – The Substitution and Income Effects; Sign of Substitution Effect; The Total Change in Demand; Rates of Change; The Law of Demand; Another Substitution Effect; Compensated Demand Curves; Consumer's Surplus – Demand for a discrete good; Constructing utility from demand; Other interpretations of consumer's surplus; Approximating continuous demand; Interpreting the change in consumer's surplus; Producer's surplus; Calculating gains and losses

Module III: Production Theory

Marginal Productivity, Isoquant Maps and the Rate of Technical Substitution, Production with One Variable Input (labour) and with Two-Variable Inputs, Returns to Scale, Four Simple Production Function (Linear, Fixed Proportions, Cobb-Duglas, CES), Technical Progress

Module IV: Cost Functions

Definition of Costs, Cost Functions and its Properties, Shift in Cost Curves, Cost in the Short-Run and Long-Run, Long-Run versus Short-Run Cost Curves, Production with Two Outputs – Economies of Scope

Module V: Profit Maximisation

The Nature and Behaviour of Firms, Profit Maximization, Marginal Revenue, Short-Run Supply by Price-Taking Firm, Profit Functions and its Properties

Readings:

1. C. Snyder and W. Nicholson (2012): Microeconomic Theory: Basic Principles and Extensions, 11th Edition, Cengage Learning, Delhi, India.
2. R. S. Pindyck, D. N. Rubinfeld and P. L. Meheta (2009): Microeconomics, 7th Edition, Pearson, New Delhi.

3. H. R. Varian (2010): *Intermediate Microeconomics: A Modern Approach*, 8th Edition, W.W. Norton and Company/Affiliated East-West Press (India). The workbook by Varian and Bergstrom may be used for problems

Core Economics Course 6: MACROECONOMICS I

Course Description

This course introduces the students to formal modelling of a macro-economy in terms of analytical tools. It discusses various alternative theories of output and employment determination in a closed economy in the short run as well as medium run, and the role of policy in this context. It also introduces the students to various theoretical issues related to an open economy.

Module I: Consumption Function

Consumption – Income Relationship, Propensities to Consume and the Fundamental Psychological Law of Consumption; Implications of Keynesian Consumption Function; Factors Influencing Consumption Function; Measures to Raise Consumption Function; Absolute, Relative, Permanent and Life – Cycle Hypotheses

Module II: Investment Function

Autonomous and Induced Investment, Residential Investment and Inventory Investment, Determinants of Business Fixed Investment, Decision to Invest and MEC, Accelerator and MEI Theories of Investment.

Module III: Demand for and Supply of Money

Demand for Money – Classical, Neoclassical and Keynesian Approaches, The Keynesian Liquidity Trap and its Implications, Supply of Money – Classical and Keynesian Approaches, The Theory of Money Supply Determination and Money Multiplier, Measures of Money Supply in India

Module IV: Aggregate Demand and Aggregate Supply

Derivation of Aggregate Demand and Aggregate Supply Curves in the IS-LM Framework; Nature and Shape of IS and LM curves; Interaction of IS and LM curves and Determination of Employment, Output, Prices and Investment; Changes in IS and LM curves and their Implications for Equilibrium

Module V: Inflation, Unemployment and Expectations, and Trade Cycles

Inflation – Unemployment Trade off and the Phillips Curve – Short run and Long run Analysis; Adaptive and Rational Expectations; The Policy Ineffectiveness Debate; Meaning and Characteristics of Trade Cycles; Hawtrey's Monetary Theory, Hayek's Over-investment Theory and Keynes' views on Trade Cycles

Readings:

1. N. Gregory Mankiw (2010): *Macroeconomics*, 7th edition, Cengage Learning India Private Limited, New Delhi
2. Richard T. Froyen (2005): *Macroeconomics*, 2nd Edition, Pearson Education Asia, New Delhi.

3. Errol D'Souza (2009): *Macroeconomics*, Pearson Education Asia, New Delhi.

Core Economics Course 7: STATISTICAL METHODS FOR ECONOMICS

Course Description

This is a course on statistical methods for economics. It begins with some basic concepts and terminology that are fundamental to statistical analysis and inference. It is followed by a study and measure of relationship between variables, which are the core of economic analysis. This is followed by a basic discussion on index numbers and time series. The paper finally develops the notion of probability, followed by probability distributions of discrete and continuous random variables and introduces the most frequently used theoretical distribution, the Normal distribution.

Module I: Data Collection and measures of central tendency and dispersion

Basic concepts: population and sample, parameter and statistic; Data Collection: primary and secondary data, methods of collection of primary data; Presentation of Data: frequency distribution; cumulative frequency; graphic and diagrammatic representation of data; Measures of Central Tendency: mean, median, mode, geometric mean, harmonic mean, their relative merits and demerits; Measures of Dispersion: absolute and relative - range, mean deviation, standard deviation, coefficient of variation, quartile deviation, their merits and demerits; Measures of skewness and kurtosis.

Module II: Correlation Analysis

Correlation: scatter diagram, sample correlation coefficient - Karl Pearson's correlation coefficient and its properties, probable error of correlation coefficient, Spearman's rank correlation coefficient, partial and multiple correlation.

Module III: Regression Analysis

Two variable linear regression analysis - estimation of regression lines (Least square method) and regression coefficients - their interpretation and properties, standard error of estimate

Module IV: Time Series and Index Number

Time Series: definition and components, measurement of trend- free hand method, methods of semi-average, moving average and method of least squares (equations of first and second degree only), measurement of seasonal component; Index Numbers: Concept, price relative, quantity relative and value relative; Laspeyer's and Fisher's index, family budget method, problems in construction and limitations of index numbers, test for ideal index number.

Module V: Probability theory

Probability: Basic concepts, addition and multiplication rules, conditional probability; Random variables and their probability distribution; Mathematical expectations; Theoretical Distribution: normal distribution - Properties and uses, problems using area under standard normal curve

Recommended books:

- 1 Jay L. Devore (2010): *Probability and Statistics for Engineering and the Sciences*, Cengage learning, 2010.

2. S. C. Gupta (): *Fundamentals of Statistics*, Himalaya Publishing House, Delhi
3. Murray R. Spiegel (): *Theory & Problems of Statistics*, Schaum's publishing Series.

Core Economics Course 8: MICROECONOMICS II

Course Description

This course is a sequel to Microeconomics I. The emphasis will be on giving conceptual clarity to the student coupled with the use of mathematical tools and reasoning. It covers Market, general equilibrium and welfare, imperfect markets and topics under information economics.

Module I: Firm Supply and Equilibrium

Market Environments; Pure competition ; Supply decision of a competitive firm and Exceptions; Inverse Supply Function; Profits and Producer's Surplus; Long Run Supply Curve of a Firm; Long Run Average Costs; Short Run and Long Run Industry Supply; Industry Equilibrium in Short and Long Run; Meaning of Zero Profits; Economic Rent.

Module II: General equilibrium, efficiency and welfare

The Edgeworth Box; Trade; Pareto Efficient Allocations; Existence of equilibrium and efficiency; The Welfare Theorems and their implications; The Firm; Production and the Welfare Theorems ; Production possibilities, comparative advantage and Pareto efficiency

Module III: Monopoly

Barriers to Entry, Profit Maximization and Output Choice, Monopoly and resource Allocation, Monopoly, Product Quality and Durability, Price Discrimination, Second Degree Price Discrimination through Price Schedules, Regulation of Monopoly, Dynamic Vies of Monopoly

Module IV: Oligopoly

Oligopoly – Choosing a strategy; Quantity leadership – Problems of the follower and the leader; Price leadership; Comparing quantity leadership and price leadership; Simultaneous Quantity Setting; Example of Cournot Equilibrium; Simultaneous Price Setting; Collusion

Module V: Game Theory

The Payoff Matrix of a Game; Nash Equilibrium; Mixed Strategies ;The Prisoner's Dilemma; Repeated Games; Enforcing a cartel; Sequential Games; A Game of entry deterrence.

Readings:

1. C. Snyder and W. Nicholson (2012): *Microeconomic Theory: Basic Principles and Extensions*, 11th Edition, Cengage Learning, Delhi, India.
2. R. S. Pindyck, D. N. Rubinfeld and P. L. Meheta (2009): *Microeconomics*, 7th Edition, Pearson, New Delhi.
3. H. R. Varian (2010): *Intermediate Microeconomics: A Modern Approach*, 8th Edition, W.W. Norton and Company/Affiliated East-West Press (India). The workbook by Varian and Bergstrom may be used for problems.

Core Economics Course 9: MACROECONOMICS II

Course Description

This course is a sequel to Macroeconomics I. In this course, the students are introduced to the long run dynamic issues like growth and technical progress. It also provides the micro-foundations to the various aggregative concepts used in the previous course.

Module I: Financial Markets and Reforms

Features of Financial Markets, Functions of Financial Markets, Banks and Financial Markets, Adverse Selection and Moral Hazard, Risk and Supply of Credit, The Determination of Banks Asset Portfolio, Financial Repression and Major Financial Sector Reforms in India, Lessons from the Global Financial Crisis and the Policy Response in India

Module II: Open Economy Macroeconomics

Balance of payments- Concept, Equilibrium and Disequilibrium, Measures to Correct Disequilibrium, Determination of Foreign Exchange Rate- the PPP Theory and its Implications, Fixed vs. Flexible Exchange Rates, The Short-run open economy Model, the basic Mundell-Fleming Model. International Financial Markets

Module III: Modelling Economic Growth

The Basic Harrod- Domar Model, Joan Robinson and the Golden Rule of Capital Accumulation, The Basic Solow Model, Theory of Endogenous Growth – the Rudimentary A-K Model

Module IV: Macroeconomic Policy

The Goals of Macroeconomic Policy and of Policy Makers, The Budget and Automatic Fiscal Stabilisers, The Doctrine of Balanced Budget and Keynesian Objections; Concepts of Budget, Revenue and Fiscal Deficits, Fiscal Policy: Objectives and Limits to Discretionary Policy, The Crowding –Out Hypothesis and the Crowding – in Controversy Meaning, Scope and Objectives of Monetary Policy, Instruments of Monetary Policy, the Transmission Mechanism of Monetary Policy, Rules vs. Discretion in Monetary Policy, Implications of Targeting the Interest Rate, Limits to Monetary Policy

Module V: Schools of Macroeconomic Thought and the Fundamentals of Macroeconomic Theory and Policy

Classics, Keynes, Monetarists, New Classicals and New Keynesians: (i) Keynes vs. the Classics – Aggregate Demand and Aggregate Supply, Underemployment Equilibrium and Wage Price Flexibility, (ii) Monetarists and Friedman’s Reformulation of Quantity Theory, Fiscal and Monetary Policy: Monetarists vs. Keynesians, (iii) The New Classical View of Macroeconomics and the Keynesian Counter critique, (iv) The New Keynesian Economics with reference to the Basic Features of Real Business Cycle Models, the Sticky Price Model.

Readings:

1. N. Gregory Mankiw (2010): *Macroeconomics*, 7th edition, Cengage Learning India Private Limited, New Delhi
2. Richard T. Froyen (2005): *Macroeconomics*, 2nd Edition, Pearson Education Asia, New Delhi.
3. Errol D’Souza (2009): *Macroeconomics*, Pearson Education Asia, New Delhi.

Core Economics Course 10: Public Economics

Course Description

Public economics is the study of government policy from the points of view of economic efficiency and equity. The paper deals with the nature of government intervention and its implications for allocation, distribution and stabilization. Inherently, this study involves a formal analysis of government taxation and expenditures. The subject encompasses a host of topics including public goods, market failures and externalities.

Module I: Introduction to public finance

Public Finance: meaning and scope, distinction between public and private finance; public good versus private good; Principle of maximum social advantage; Market failure and role of government;

Module II: Public Expenditure

Meaning, classification, principles, cannons and effects, causes of growth of public expenditure, Wagner's law of increasing state activities, Peacock-Wiseman hypotheses

Module III: Public Revenue

Sources of Public Revenue; Taxation - meaning, cannons and classification of taxes, impact and incidence of taxes, division of tax burden, the benefit and ability to pay approaches, taxable capacity, effects of taxation, characteristics of a good tax system, major trends in tax revenue of central and state governments in India

Module III: Public Budget

Public Budget: kinds of budget, economic and functional classification of the budget; Balanced and unbalanced budget; Balanced budget multiplier; Budget as an instrument of economic policy.

Module V: Public Debt

Sources, effects, debt burden – Classical, Ricardian and other views, shifting - intergenerational equity, methods of debt redemption, debt management, tax versus debt;

Readings:

1. J. Hindriks and G. Myles (2006): *Intermediate Public Economics*, MIT Press.
2. R. A. Musgrave and P. B. Musgrave (1989): *Public Finance in Theory and Practices*. McGraw Hill
3. B. P. Herber (1975): *Modern Public Finance*.
4. B. Mishra (1978): *Public Finance*, Macmillan India limited.

Core Economics Course 11: INDIAN ECONOMY I

Course Description

Using appropriate analytical frameworks, this course reviews major trends in economic indicators and policy debates in India in the post-Independence period, with particular emphasis on paradigm shifts and turning points. Given the rapid changes taking place in India, the reading list will have to be updated annually.

Module I: Basic Characteristics of Indian Economy as a Developing Economy

Indian Economy in the Pre-British Period; The Structure and Organisation of Villages and Towns; Industries and Handicrafts in Pre-British India; Colonialism; Economic Consequences of British Rule; Decline of Handicrafts and Progressive Ruralisation; The Land System and Commercialisation of Agriculture; Industrial Transition; Colonial Exploitation and Impacts – Underdevelopment; Colonisation and Modernisation; State Policies and Economic Underdevelopment; The Current State of Indian Economy

Module II: Population and Human Development

Population Growth and Economic Development – size, growth and future of population; Causes of rapid population growth; Population and economic development; Population policy; Demographic issues – Sex and Age Composition of population; Demographic Dividend; Urbanisation and Migration; Human Resource Development – Indicators and importance of Human Resource Development; Education policy; Health and nutrition.

Module III: National Income in India – The Growth Story and Regional Disparities

Trends in national and per capita income; Changes in sectoral composition of national income; Regional disparities in Growth and Income; Savings and Investment and Economic Growth – The Linkage

Module IV: Economic Planning in India

Rationale, Features, Objectives, Strategies, Achievements and Assessment of Planning in India; Eleventh Five Year Plan – Objectives, Targets and Achievements; Twelfth Five Year Plan – Vision and Strategy; From Planning to NITI – Transforming India's Development Agenda.

Module V: Current Challenges

Poverty – Estimation and Trends, Poverty Alleviation Programs – MGNREGA, NRLM, SJSRY; Inequality – Measures and trends in India; Unemployment – Nature, Estimates, Trends, Causes and Employment Policy

Readings:

1. Indian Economy, VK Puri and SK Misra, Himalaya Publishing House, 31st Revised Edition
2. Indian Economy Datt and Sundharam, Gaurav Datt and Ashwani Mahajan, S Chand Publications, 7th Revised Edition
3. Indian Economy Since Independence, ed by Uma Kapila, Academic Foundation, Revised Nineteenth Edition 2008-09
4. The New Oxford Economics Companion to India, ed by K Basu and A Maertens, Oxford University Press, 2012
5. Economic Survey of India 2015-16, Ministry of Finance, GoI

6. NITI Ayog document- (Feb 8, 2015)

Core Economics Course 12: DEVELOPMENT ECONOMICS I

Course Description

This is the first part of a two-part course on economic development. The course begins with a discussion of alternative conceptions of development and their justification. It then proceeds to aggregate models of growth and cross-national comparisons of the growth experience that can help evaluate these models. The axiomatic basis for inequality measurement is used to develop measures of inequality and connections between growth and inequality are explored. The course ends by linking political institutions to growth and inequality by discussing the role of the state in economic development and the informational and incentive problems that affect state governance.

Module 1: Study of economic development:

Development Economics as a subject; economic growth and economic development; characteristics of underdeveloped countries – vicious cycle of poverty and cumulative causation; obstacles to economic development; measures of economic development – national and per capita income, basic needs approach, capabilities approach, three core values of development, PQLI, HDI, HPI, MDPI, GDI; capital formation and economic development

Module 2: Theories of Economic Growth and Development

Classical theory, Marxian theory; Schumpeterian theory; Rostow's stages of economic growth; Solow model and convergence with population growth and technical progress

Module 3: Poverty, Inequality and Development:

Concepts of poverty and inequality; Measuring poverty; Measuring Inequality – Lorenz curve and Kuznets' inverted U hypothesis; Growth, poverty and inequality; Economic characteristics of poverty groups (rural poverty, women and poverty, indigenous population and poverty); Policy options – some basic considerations

Module 4: Institutions and economic development:

Role of institutions in economic development; Characteristics of good institutions and quality of institutions; The pre-requisites of a sound institutional structure; Different measures of institutions – aggregate governance index, property rights and risk of expropriation; The role of democracy in economic development; Role of state; Role of markets and market failure; Institutional and cultural requirements for operation of effective private markets; Market facilitating conditions; Limitations of markets in LDCs; Corruption and economic development – tackling the problem of corruption

Module 5: Agriculture, Industry and Economic Development:

Role of agriculture; Transforming traditional agriculture; Barriers to agricultural development; Role of industrialization; Interdependence between agriculture and industries – A model of complementarities between agriculture and industry; terms of trade between agriculture and industry; functioning of markets in agrarian societies; interlinked agrarian markets

Readings:

1. Debraj Ray (2009): *Development Economics*, Oxford University Press.
2. Partha Dasgupta (2007): *Economics, A Very Short Introduction*, Oxford University Press.
3. Abhijit Banerjee, Roland Benabou and Dilip Mookerjee (2006): *Understanding Poverty*, Oxford University Press.
4. Amartya Sen (2000): *Development as Freedom*, OUP.
5. Daron Acemoglu and James Robinson (2006): *Economic Origins of Dictatorship and Democracy*, Cambridge University Press.
6. Robert Putnam (1994): *Making Democracy Work: Civic Traditions in Modern Italy*, Princeton University Press.
7. Todaro, Michael P and Stephen C Smith (2006): *Economic Development*, 8th Edition, Pearson
8. Thirlwall, A P (2011): *Economics of Development*, 9th Edition, Palgrave Macmillan

Core Economics Course 13: INDIAN ECONOMY II

Course Description

This course examines sector-specific policies and their impact in shaping trends in key economic indicators in India. It highlights major policy debates and evaluates the Indian empirical evidence. Given the rapid changes taking place in the country, the reading list will have to be updated annually.

Model I: Agricultural Development in India

Indian Agriculture: nature, importance, trends in agricultural production and productivity, factors determining production, land reforms, new agricultural strategies and green revolution, rural credit; Agricultural marketing and warehousing.

Module II: Industrial Development in India

Trends in industrial output and productivities; Industrial Policies of 1948, 1956, 1977 and 1991; Industrial Licensing Policies – MRTP Act, FERA and FEMA; Growth and problems of SSIs, Industrial sickness; Industrial finance; Industrial labour

Module III: Tertiary Sector and HRD

Tertiary Sector: growth and contribution of service sector to GDP of India, share of services in employment; Human development – concept, evolution, measurement; HRD: indication, importance, education in India, Indian educational policy; Health and Nutrition.

Module IV: External Sector

Foreign Trade: role, composition and direction of India's foreign trade, trends of export and import in India, export promotion versus import substitution; Balance of Payments of India; India's Trade Policies; Foreign Capital – FDI, Aid and MNCs.

Module IV: Indian Economy and Environment

Environmental Policies in India: The Environment (Protection) Act 1986, The Environment (Protection) Rules 1986, The National Forest Policy 1988, Policy statement for Abatement of Pollution 1992, National Conservation Strategy and Policy Statement on Environment and Development 1992, The National Environment Appellate Authority Act 1997, National Environmental Policy 2006; Global deal with Climate Change: Introduction, Intergovernmental Panel for Climate Change (IPCC), Impact of Climate Change on India, Global Response on Climate Change, Possible Role of India

Readings:

1. U. Kapila (2010): *Indian economy since Independence*. Academic Foundation, New Delhi
2. S. K. Misra and V. K. Puri (Latest Year): *Indian Economy — Its Development Experience*, Himalaya Publishing House, Mumbai
3. S. Chakraborty (): *Development Planning: The Indian Experience*. Clarendon Press.
4. R. Dutt and K. P. M, Sundharam (Latest Year): *Indian Economy*, S. Chand & Company Ltd., New Delhi.
5. A. Panagariya (2008): *India: the Emerging Giant*, Oxford University Press, New York
6. S. Acharya and R. Mohan (Eds.) (2010): *India's Economy: Performance and Challenges*, Oxford University Press, New Delhi.
7. I. J. Ahluwalia and I. M. D. Little (Eds.) (1998): *India's Economic Reforms and Development: Essays for Manmohan Singh*, Oxford University Press, New Delhi.

Core Economics Course 14: DEVELOPMENT ECONOMICS II**Course Description**

This is the second module of the economic development sequence. It begins with basic demographic concepts and their evolution during the process of development. The structure of markets and contracts is linked to the particular problems of enforcement experienced in poor countries. The governance of communities and organizations is studied and this is then linked to questions of sustainable growth. The course ends with reflections on the role of globalization and increased international dependence on the process of development.

Module 1: Population and Development

Demographic concepts : birth and death rates, age structure, fertility and its determinants, the Malthusian population trap and the microeconomic household theory of fertility; costs and benefits of population growth and the model of low level equilibrium trap; the seven negative consequences of population growth; the concept of optimum population; rural-urban migration – the Harris Todaro migration model and policy implications

Module 2: Dualism and economic development

Dualism – geographic, social and technological; the theory of cumulative causation; the regional inequalities in the context of economic development; the inverted U relationship; international inequality and the centre periphery thesis; dependency, exploitation and unequal exchange; the dualistic development thesis and its implications

Module 3: Environment and Development

Basic issues of environment and development – population, resources and the environment; poverty, economic growth, rural development, urban development and the environment; simple model of environment and economic activity; environmental degradation and externalities; common property resources, public goods and the free-rider problem; renewable and non-renewable resources; environmental values and their measurement; concept of sustainable development; basics of climate change

Module 4: Financing Economic Development

Saving, capital formation and economic development; rural financial intermediaries, micro credit and economic development; financial liberalisation, financial inclusion and economic

development; taxation, public borrowing and economic development; inflation, saving and growth – the Keynesian approach; foreign finance, investment and aid – controversies and opportunities; private foreign investment and private portfolio investment; growing role of non-governmental organisations

Module 5: Globalisation, international trade and economic development:

Trade and economic development; export led growth; trade liberalisation and growth of exports; terms of trade and economic growth – the Prebisch Singer Hypothesis; trade strategies for development – import substitution vs export promotion; international commodity agreements; trade vs aid.

Readings

1. Debraj Ray (2009): *Development Economics*, Oxford University Press.
2. Partha Dasgupta (2007): *Economics, A Very Short Introduction*, Oxford University Press.
3. Abhijit Banerjee, Roland Benabou and Dilip Mookerjee (2006): *Understanding Poverty*, Oxford University Press.
4. Thomas Schelling (1978): *Micromotives and Macrobehavior*, W. W. Norton.
5. Albert O. Hirschman (1970): *Exit, Voice and Loyalty: Responses to Decline in Firms, Organizations and States*, Harvard University Press.
6. Elinor Ostrom (1990): *Governing the Commons: The Evolution of Institutions for Collective Action*, Cambridge University Press.
7. Dani Rodrik (2011): *The Globalization Paradox: Why Global Markets, States and Democracy Can't Coexist*, Oxford University Press.
8. Michael D. Bordo, Alan M. Taylor and Jeffrey G. Williamson (ed.) (2003): *Globalization in Historical Perspective*, University of Chicago Press.
9. Todaro, Michael P and Stephen C Smith (2006): *Economic Development*, 8th Edition, Pearson
10. Thirlwall, A P (2011): *Economics of Development*, 9th Edition, Palgrave Macmillan

DSE Group I
DSEG 1.1: Economic History of India 1857-1947

Course Description

This course analyses key aspects of Indian economic development during the second half of British colonial rule. In doing so, it investigates the place of the Indian economy in the wider colonial context, and the mechanisms that linked economic development in India to the compulsions of colonial rule. This course links directly to the course on India's economic development after independence in 1947.

Module I: Introduction: Colonial India: Background and Introduction

Overview of colonial economy

Module II: Macro Trends

National Income; population; occupational structure

Module III: Agriculture

Agrarian structure and land relations; agricultural markets and institutions – credit, commerce and technology; trends in performance and productivity; famines

Module IV: Railways and Industry

Railways; the de-industrialisation debate; evolution of entrepreneurial and industrial structure; nature of industrialisation in the interwar period; constraints to industrial breakthrough; labor relations

Module V: Economy and State in the Imperial Context

The imperial priorities and the Indian economy; drain of wealth; international trade, capital flows and the colonial economy – changes and continuities; government and fiscal policy

Readings:

1. Lakshmi Subramanian, *"History of India 1707-1857"*, Orient Blackswan, 2010, Chapter 4.
2. Sumit Guha, 1991, Mortality decline in early 20th century India', *Indian Economic and Social History Review (IESHR)*, pp 371-74 and 385-87.
3. Tirthankar Roy, *The Economic History of India 1857-1947*, Oxford University Press, 3rd edition, 2011.
4. J. Krishnamurty, *Occupational Structure*, Dharma Kumar (editor), The Cambridge Economic History of India, Vol. II, (henceforth referred to as CEHI), 2005, Chapter 5.
5. Irfan Habib, *Indian Economy 1858-1914*, A People's History of India, Vol.28, Tulika, 2006.
6. Ira Klein, 1984, —When Rains Fail: Famine relief and mortality in British India||, *IESHR* 21.
7. Jean Dreze, *Famine Prevention in India in Dreze and Sen (eds.) Political Economy of Hunger*, WIDER Studies in Development Economics, 1990, pp.13-35
8. John Hurd, *Railways*, CEHI, Chapter 8, pp.737-761.
9. Rajat Ray (ed.), *Entrepreneurship and Industry in India*, 1994.
10. AK Bagchi, —Deindustrialization in India in the nineteenth century: Some theoretical implications, *Journal of Development Studies*, 1976.
11. MD Morris, *Emergence of an Industrial Labour Force in India*, OUP 1965, Chapter 11,

Summary and Conclusions.

12. K.N. Chaudhuri, *Foreign Trade and Balance of Payments*, CEHI, Chapter 10.
13. B.R. Tomlison, 1975, *India and the British Empire 1880-1935*, IESHR, Vol.XII.
14. Dharma Kumar, *The Fiscal System*, CEHI, Chapter 12.
15. Basudev Chatterjee, *Trade, Tariffs and Empire*, OUP 1992, Epilogue.

DSEG 1.2 INTRODUCTORY ECONOMETRICS

Course Description

This course provides a comprehensive introduction to basic econometric concepts and techniques. It covers statistical concepts of hypothesis testing, estimation and diagnostic testing of simple and multiple regression models. The course also covers the consequences of and tests for misspecification of regression models.

Module I: Introduction

Definition, Nature and scope of econometrics; Theoretical Probability Distributions: Normal distribution; chi-square, t- and F-distributions and their uses

Module II: Sampling

Basic concepts of sampling: Probability and non-probability sampling; Types of sampling. Theory of Estimation: Estimation of parameters; properties of estimators – small sample and asymptotic properties; point and interval estimation

Module III: Hypothesis Testing

Testing of hypotheses: defining statistical hypotheses; Simple and composite hypotheses; Null and alternative hypothesis; Type I and Type II errors, Critical region; Neyman-Pearson lemma; Power of a test.

Module IV: Linear Regression Analysis

Two variable linear regression model – Assumptions; Least square estimates, Variance and co- variance between Least square estimates; BLUE properties; Standard errors of estimates; Co- efficient of determination; Inference in a two variable linear regression model; ANOVA; Forecasting.

Module V: Violation of Classical Assumptions

Heteroscedasticity, multicollinearity and auto-correlation: Meaning, consequences, tests and remedies.

Reading List:

1. Johnston (1991), "Econometric Methods", Mc Graw Hill Book Co
2. Koutsoyiannis, A, (1992) "Introduction to Econometrics" OUP
3. Dougherty, C. (1992) "Introduction to Econometrics" OUP.
4. Kmenta, J (1997); "Elements of Econometrics", University of Michigan Press
5. Gujarati, D & Sangeetha (2007); "Basic Econometrics", Mc Graw Hill Book Co.

DSEG 1.3: Odisha Economy

Course Description

Using appropriate analytical frameworks, this course reviews major trends in economic indicators and policy debates in Odisha in pre- and post-Independence period, with particular emphasis on paradigm shifts and turning points. Given the rapid changes taking place in Odisha, the reading list will have to be updated annually.

Module I: Odisha Economy before 1947

Orissa's Economy in the Nineteenth Century: Benevolence or Exploitation, Forces of Nature, Animal Power, The Company Steps in, Public Works and Public Health, Education, Disintegration of Village Economy, New Social Environment, Changing Position of Social Classes, The Moneylenders, The Borrowers, Money-flows from Village to Metropolis, Pauperization of Peasantry, The Wage Earners, Demographic Changes, Profiting from Rural Adversity; Diarchy in 1919 and Separation of Provincial Finances from Central Government in 1937; Emergence of Federal Finance (Ref.: Das 1976a and 1976b, GoO 2016).

Module II: Macro Economy of Odisha

A macro glance of Odisha economy: aggregate income, broad sectoral decomposition, performance of districts, employment, child labour and bonded labour, employment programmes, consumption expenditure, cost of living; Odisha State public finances (Chapter 14 and 15 of Ref 1; & Chapter 2 and 9 of Ref 2)

Module III: Agriculture Sector Development in Odisha

Agriculture: land ownership and land tenure, agricultural wages and rural unemployment, production and productivity of major crops, agricultural inputs, agricultural policy; Animal Husbandry; Fisheries (Chapter 1 to 3 of Ref 1; & Chapter 3 of Ref 2)

Module IV: Industry, Infrastructure and Environment

Industry: Investment, industrial policy, and the growth of large industries, mining and quarrying; Construction; tertiary sector: tourism, transport and power; Water Resources, Forest Resources (Chapter 4 to 8 of Ref 1; & Chapter 4 & 5 of Ref 2)

Module V: Social Sector in Odisha

Poverty: income poverty and inequality; health sector: outcomes, infrastructure, finance, public health, NRHM; education: Literacy, Primary education, secondary education, higher education, SSA; human development (Chapter 9 to 13 of Ref 1; & Chapter 7 & 8 of Ref 2)

Reading List:

1. Nayak, P., Panda, S. C., Pattanaik, P. K. (2016): **The Economy of Odisha: A Profile**, Oxford University Press, New Delhi
2. GoO (2012): **Odisha Economic Survey 2015-16**, Planning and Convergence Department, Directorate of Economics and Statistics, Government of Odisha, Bhubaneswar
3. GoO (2004): *Human Development Report 2004 Orissa*, Planning and Coordination Department, Government of Odisha, Bhubaneswar
4. Mahapatro, S. B. (1980): Inter-Industry Wage Differentials in Orissa: An Empirical

- Analysis, *Indian Journal of Industrial Relations*, 15(4): 525-536.
5. Vyasulu, V. and Arun, A. V. (1997): Industrialisation in Orissa: Trends and Structure, *Economic and Political Weekly*, 32(22): M46-M53.
 6. Das, Binod S. (1976a): Orissa's Economy in the Nineteenth Century, *Social Scientist*, 4(11): 32-46.
 7. Das, Binod S. (1976b): Orissa's Economy in the Nineteenth Century: Part Two, *Social Scientist*, 4(12): 38-50.
 8. GoO (2016): Commemorative Volume on 80 Years Odisha Budget: Since 1936-37, CEFT-XIMB and Department of Finance, Government of Odisha
 9. Mohanti, K. K. and Padhi, S. (1995): Employment Situation of Tribal Population in Orissa: 1981 Census Data, *Economic and Political Weekly*, 30(29): 1879-1882.
 10. Nair, K. R. G. (1993): New Economic Policy and Development of Backward Regions: A Note on Orissa, *Economic and Political Weekly*, 28(19): 939-941.
 11. Mohanty, B. (1993): Orissa Famine of 1866: Demographic and Economic Consequences, *Economic and Political Weekly*, 28(1/2): 55-66.
 12. Haan, A. de and Dubey, A. (2005): Poverty, Disparities, or the Development of Underdevelopment in Orissa, *Economic and Political Weekly*, 40(22/23): 2321-2329.
 13. Samal, K. C. (1998): Poverty Alleviation after Post-Liberalisation: Study of a Tribal Block in Orissa, *Economic and Political Weekly*, 33(28): 1846-1851
 14. Nayak, P. and Chatterjee, B. (1986): Disguised Unemployment in Agriculture: A Case Study of Rural Orissa, *Indian Journal of Industrial Relations*, 21(3): 310-334.

DSEG 1.4: Research Methodology

Course Description

The course is to develop a research orientation among the students and to acquaint them with fundamentals of research methods. Specifically, the course aims at introducing them to the basic concepts used in research and to scientific social research methods and their approach. It includes discussions on sampling techniques, research designs and techniques of analysis.

Module I: Basics of Research

Introduction to Research: Meaning, Objectives, Motivation, Types, Approaches, Significance, Research Process, Criteria of Good Research; Qualities of a Good Researcher, Research as a Career

Module II: Research Problem

Defining the Research Problem: What is a Research Problem? Selecting the Problem, Necessity of Defining the Problem, Technique Involved in Defining a Problem; Research Design: Meaning, Need, Features of a Good Design, Important Concepts Relating to Research Design, Different Research Designs, Basic Principles of Experimental Designs

Module III: Measurement and Scaling Technique

Measurement in Research, Measurement Scales, Sources of Error in Measurement, Tests of Sound Measurement, Techniques of Measurement Tools, Scaling and Important Scaling Technique

Module IV: Problems in Research

Research Ethics: codes and ethics, permissions to research, responsibilities, confidentiality, feedback, participatory research; Research Proposal and literature review: research proposal, review of literature, levels of analysis, using the library and internet, abstracting, word processing, plagiarism

Module V: Actions in Research

English in report writing: words, sentences, paragraph, writing style; The Report: improving quality, sections, drawing conclusions, evaluation checklists, persistence; Common Citation Styles

Basic Readings

1. Kothari, C. R. (2004): **Research Methodology: Methods and Techniques**, New Age International Private Limited Publishers, New Delhi.
2. Guthrie, G. (2010): **Basic Research Methods**, Sage Publications India Private Limited, New Delhi.
3. Monippally, M. M. (2010): **Academic Writing: A Guide for Management Students and Researchers**, Response Books (Sage), New Delhi, Pp. 196-217

Additional Readings

1. Young, P. V. (1996): **Scientific Social Survey and Research**, PHI Learning Private Limited, New Delhi
2. Dooley, D. (2008): **Social Research Methods**, Prentice-Hall of India Private Limited, New Delhi

DSE Group II

DSEG 2.1: Environmental Economics

Course Description

This course introduces the students to the basics of environmental economics to understand the fundamentals of environmental concerns and develop insights into valuation of environment.

Module I: Economy and Environment

Nature and Scope of Environmental Economics- historical development, early economic paradigms, post- war economics and environmentalism; Environment and Economy interaction; Environment as a public good- National versus global public goods, Market failure, Externalities and the environment; The nexus involving environment, development and poverty.

Module II: The Economics of Pollution and Climate change

The optimal level of pollution, Pollution as externality, alternative definitions of pollution; The market Approach to optimal pollution, Property rights and market bargain theorems, Coase theorem; Taxation, Subsidies and optimal pollution; Pollution permit trading; Climate change – concept, causes, effects and management; Climate change and Agriculture

Module III: Valuation of Environmental damage

Methods and difficulties of environmental valuation, Economic value, Total economic value, Option value, Existence value; Direct and Indirect Valuation of Environmental Goods: The hedonic price approach, Contingent valuation, Travel cost approach; Willingness to pay vs. Willingness to accept.

Module IV: Environmental Pollution and Regulation in India

Causes and effects of water pollution, air pollution, noise pollution, soil pollution, Prevention and control of environmental degradation, Mechanism for environmental regulation in India- Environmental policy and legislations

Module V: Natural Resources and Sustainable Development

Environment and sustainable development, Concept and indicators of sustainable development, Resource scarcity, Renewable and exhaustible resources, Optimal use of renewable resources – fishery and forest, Tragedy of commons, People's Participation in the management of common property resources

Reading List:

1. Bhattacharya, R. N. (2002): Environmental Economics: An Indian Perspectives, OUP, New Delhi
2. Shankar, U. (Ed.) (2001): Environmental Economics, OUP, New Delhi.
3. Dayal, V. and Chopra, K. (2009): Handbook of Environmental Economics in India, OUP, New Delhi
4. Bromley, D.W (Ed)(1995); Handbook of Environmental Economics, Blackwell, London
5. Fisher, A.C(1981); Resource and Environmental Economics, Cambridge University Press
6. Helfand, G and P. Berck (2011); The Economics of the Environment, PHI Learning Private Limited, New Delhi
7. Hemple Lamont, C (1998); Environmental Economics – the Global Challenge First East West Press
8. Hussen, A.M (1999); Principles of Environmental Economics, Routledge, London
9. Kolstad, C.D (1999); Environmental Economics Oxford University Press, New Delhi
10. Pearce, D.W and R.K Turner (1948); Economics of Natural Resources and the Environment, Harvester Wheatsheaf
11. Perman R.M. and J. McGilvary (1996); Natural Resources and Environmental Economics, Longman, London
12. Tietenberg. T (1994); Environmental Economics Policy, Harper Collings, New York
13. The Economics of Climate Change: The Stern Review by Great Britain Treasury, Cambridge University Press

DSEG 2.2: International Economics

Course Description

This course introduces the students to international trade and finance to understand the theories of international trade and develop insights into trade policy and balance of payments. The course also develops insight into international financial system and the trade policy of India.

Module I: Importance of Trade and Trade Theories

Importance of the study of International Economics; Inter-regional and international trade; Need for a separate theory of international trade; Theories of Trade- absolute advantage, comparative advantage and opportunity cost; Heckscher-Ohlin theory of trade — its main features, assumptions and limitations

Module II: Trade and Economic Growth

Concepts of terms of trade and their importance; Doctrine reciprocal demand – Offer curve techniques; Gains from trade— their measurement and distribution; International Trade and Growth: Small and Open country cases; Tariffs and quotas – their impact in partial equilibrium analysis; Free trade and policy of tariffs in relation to economic growth with special reference to India

Module III: Exchange Rate

Concept and Types of Exchange Rate (bilateral vs trade-weighted exchange rate, cross exchange rate, spot, forward, futures), Demand for and Supply of foreign exchange, Exchange Rate Determination: Purchasing-Power Parity Theory, The Monetary Model of Exchange Rates, Asset or Portfolio Model of Exchange Rates. Fixed versus Flexible exchange rate

Module IV: Balance of Trade and Payments

Concepts and components of balance of trade and balance of payments; Equilibrium and disequilibrium in balance of payments; Consequences of disequilibrium in balance of payments; Various measures to correct deficit in BoPs; Foreign trade multiplier- Concept and implications; Present balance of payment position of India – Need for and rationale of trade reforms in India including partial and full convertibility of rupee; recent export and import policies in India

Module V: International Economic Institutions

Functions of IMF, World Bank, WTO and Asian Development Bank — Their achievements and failures; Their Role from the point of view of India; Forms of economic cooperation; Reforms for the emergence of international monetary system and trading blocs at the global level

Reading List:

1. Krugman Paul R. and Obstfeld Maurice. *International Economics*, Pearson Education
2. Salvatore Dominick. *International Economics*, Wile India.
3. Sodersten Bo and Reed J. *International Economics*, McMillan Publisher
4. Carbaugh Robert. *International Economics*, South-Western College Publication.
5. Gandolfo Giancarlo. *International Trade Theory and Policy*, Springer Publication
6. Gandolfo Giancarlo. *International Finance and Open-Economy Macro Economics*, Springer Publication
7. Copeland Laurence. *Exchange Rates and International Finance*, Addison Wesley, Publication.
8. Kanan, P. B. (1994): *The International Economy*, Cambridge University Press, London.
9. Kindleberger, C. P. (1973): *International Economics*, R.D. Irwin, Homewood.

DSEG 2.3: Economics of Agriculture

Course description

This course introduces the students to significance of agriculture in the Indian economy and helps to understand the role agriculture in economic development. It is designed to develop insights into changing agricultural practices in India and assess the significance of agriculture in the era of liberalisation.

Module I

Role of Agriculture in Economic Development, Economic growth – sectoral changes and agriculture, agriculture in rural development, farm and non-farm employment issues, inter-linkages between agriculture and industry; empirical evidence of inter-dependence between agriculture and industry

Module II

Traditional Agriculture: characteristics; Schultz's hypothesis – its criticisms; Mechanization of Indian Agriculture; Case for and against farm mechanization; Green revolution and trends of mechanization in India

Module III

Agricultural price policy for a developing economy – objectives and effectiveness of agricultural price policy, elements of agricultural price policy, features of an ideal agricultural price policy, agricultural price policy in India and public distribution system

Agricultural marketing – need and criteria for assessing efficiency, agricultural marketing system in India, development of a national agricultural marketing platform

Module IV

Risk and uncertainty in agriculture – difference between risk and uncertainty, types of uncertainty in agriculture, measures for mitigating risk and uncertainty in agriculture, new agricultural insurance scheme of India

Rural credit in India, importance and estimates, agencies for rural credit, review of progress of institutional finance in rural India since independence

Module V

Agriculture in Indian Planning, Globalization and Indian agriculture, Case for and against privatization of agriculture, WTO and India's trade in agricultural commodities

Reading List:

1. Ghatak, S and K. Ingerscent (1984), Agricultural and Economic Development, Select Books, New Delhi.
2. Rudra, A (1982), Indian Agricultural Economics: Myths and Realities, Allied Publishers, New Delhi.
3. Sony, R. N. (2006), Leading Issues in Agricultural Economics, Vishal Publishing, Jalandhar.
4. Tyagi, B. P. (1998), Agricultural Economics and Rural Development, J. P. Nath Publishing, Meerut.
5. Sadhu, A N and A Singh (2008), Fundamentals of Agricultural Economics, Himalaya Publishing House, Mumbai.
6. Lekhi, R K and Joginder Singh (2008), Agricultural Economics, Kalyani Publishers, Ludhiana.

SEC II: Data Analysis and Computer Application (Option I)

Course Description:

The purpose of this course is to introduce basic computer skills to students at UG level in non technical subjects. After completion of this course, the students are expected to acquire some basic knowledge about computers and to develop some basic skills in using computers for data storage, compilation, analysis and presentation.

Module I: Introduction to computer and Basic data types

Introduction to computer- Characteristics and Basic Applications of Computer, Components of Computer System, Central Processing Unit (CPU), VDU, Keyboard and Mouse, Other input/output Devices, Memory, concepts of Hardware and Software, Classifications of computers; Representation of data/Information concepts of data processing, Basic data types, Storage of data/Information as files, operating system and The User Interface (windows, Linux), Windows Setting- Control Panels, Accessories (windows)

Module II: Basic Word Processing

Introduction to Word Processing, Opening Word Processing Package, Opening and closing documents, Using a Document/Help Wizard, Text Creation and Manipulation, Formatting the Text, Handling Multiple Documents, Table Manipulation, Printing, saving documents in different formats

Module III: Spreadsheets and Basic Data Analysis

Spread Sheet, Elements of Electronics Spread Sheet, Application/usage of Electronic Spread Sheet, Manipulation of cells, Formulas and functions; Spread sheets for Small accountings- maintaining invoices/budgets, basic practical data analysis works (Maintaining daily and monthly sales reports)

Module IV: Basic Computer Communication and Internet

Basic of Computer networks- LAN and WAN, Internet, Service on Internet; WWW and Web Browsers, Web Browsing software, Surfing the Internet, Chatting on Internet, Email-Basic of electronic mail, Using Emails, Document handling in Email.

Module V: Basic Presentations

Basics- Difference between presentation and document, Using Power Point, Creation of Presentation, Preparation of Slides, Selection of type of Slides, Importing text from word documents, Providing aesthetics- Slide Designs, Slide Manipulation and Slide Show, Presentation of the Slides

Reading List:

1. C.S. French "Data Processing and Information Technology", BPB Publications 1998
2. P.K Sinha, Computer Fundamentals, BPB Publications, 1992
3. Guy Hart-Davis "The ABCs of Microsoft Office 97 Professional edition", BPB Publications, 1998
4. Karl Schwartz, "Microsoft Windows 98 Training Guide", 1998

Course Description

This course intends to explain the ideas on financial system in India. It will help the students to enhance their knowledge on concepts like financial institutions, instruments and markets, their functioning and usage in real world.

Module I: Financial system

The structure of the financial system- Functions of the financial sector-Indicators of financial development; Financial System and Economic Development; financial inclusion: concept and its evolution; policy initiatives on financial inclusion.

Module II: Interest rate policy

Theories of interest rate determination-Level of interest rates-Long period and short period rates- Administered interest rates; Deregulation of interest rates; financial sector reforms in India.

Module III: Money market

Money Market: features; objectives; features of a developed and under developed money market; importance of money market; composition of money market: organized and unorganized; money market institutions and instruments; features and problems of Indian money market.

Module IV: Capital Market

Capital market: composition; Primary and secondary market for securities. Functions of new issue and secondary market; organizations of stock exchanges in India; defects in Indian stock exchange; SEBI; its objectives and functions

Module V: Non-Banking Financial Companies

Non-Banking Financial Companies: Hire purchase Companies-Venture Capital Companies. Insurance Sector: objectives, functions, life insurance and general insurance; IRDA and its role and functions in financial markets.

Basic Reading List

1. M.Y.Khan-Indian Financial System, Tata McGraw Hill, New Delhi.
2. L.M.Bhole: Financial institutions and Market, Tata McGraw hill, New Delhi.
3. Gorden & Natrajan: Financial Market and institutions, Himalaya Publishing house.

SYLLABUS FOR B.A. (HONORS) EDUCATION UNDER CHOICE BASED CREDIT SYSTEM OF UTKAL UNIVERSITY, BHUBANESWAR

CORE - 1

BASICS IN EDUCATION

INTRODUCTION:

The Philosophical foundation is a unique educational charity whose aim is to bring philosophy to schools and the wider community. Through doing philosophy in the classroom the primary concern is to improve the educational practices and provide opportunities for the disadvantaged. Philosophical enquiry develops speaking and listening skills vital for literacy and emotional development, helps children who find it difficult to access other classes, and encourages critical and creative thinking essential in the 21st Century. And it will prepare students to apply knowledge, sensibility, skills and dispositions of philosophical inquiry, analysis, and interpretation to educational practices.

Course Objectives

- after completion of the paper, students shall be able to:
- explain the concept of education and its relationship with philosophy
- list areas of philosophy and narrate their educational implications.
- describe the contribution of Philosophy to the field of education.
- appreciate the contribution of various Indian Schools of Philosophy to the field of education.
- evaluate the impact of Western Philosophies on Indian Education.
- narrate the contribution of the Great Indian Thinkers.

Unit – 1 **Bases of Education**

- Meaning, Nature and purpose of Education
- Aims of Education: Education for individual development and education for social efficiency
- Functions of education

Unit – 2 **Philosophical foundations of education**

- Concept of Philosophy

- Inter dependence of philosophy and education
- Branches of philosophy and their educational implications –
Metaphysics, Epistemology and Axiology.

Unit – 3 Reflections of Indian schools of Philosophy on education

- Common characteristics of Indian Philosophy
- Sankhya and Vedanta as Philosophical systems
- Educational implications of Sankhya and Vedanta.

Unit – 4 - Western Schools of Philosophy and their educational implication.

- Idealism
- Naturalism
- Pragmatism

Unit – 5 Doctrines of Great Educators of East and West and their influence on the practices of school education with special reference to Aims and ideals of Education, Curriculum, method of teaching and the role of teacher.

- Gandhi
- Sri Aurobindo
- Rousseau
- Dewey

REFERENCES

- Agarwal, J.c. (2010), *Teacher and Education in a Developing society*, Delhi; Vikash Publishing house.
- Arulsarmy, S (2011), *Philosophical and sociological perspectives on Education*, New Delhi; Neelkamal Publications Pvt. Ltd.
- Bhatia K.K., (2011), *Philosophical and sociological foundations of Education*, New Delhi; Kalyani Publishers.
- Bigge, Morris, L. *Educational Philosophies for Teachers*. Columbus, USA: Charies
- Boston, USA: Allyn & Bacon.
- Brubacher, John. S. *Modern Philosophies of Education*. New York, USA: McGraw
- Butler J. Donald, *Four Philosophies and their practices in Education and Religion*.

- Chauhe, S.P. & Chaube, A (2009), *Foundation of education* , New Delhi; Vikash, Publishing house Pvt. Ltd.
- Dash, B.N. (2011) *Foundation of Education*, New Delhi; Kalyani Publishers.
- E. Merrill Publishing Co.
- Gutek, Gerald L. (2009). *New Perspectives on Philosophy and Education*. New
- Hill Book Company Inc.
- Janeja, V.R. (2012) *Educational Thought and Practice*, New Delhi, Sterling Publishers, Private Limited.
- Jersey, USA: Pearson
- Kneller, George F. *Introduction to Philosophy of Education*. New York, USA: John
- Mishra, Bhawna (2004), *Education Evolution Development and Philosophy*, New Delhi; Akausha Publishing House.
- Mohanty, Jagannatha (1991), *Foundation of Education*, Cuttack – 2, Takshashila.
- Nayak, B.K *Text Book of Foundation of Education*. Cuttack, Odisha: Kitab Mhal.
- New York, USA: Harper & Row.
- Ozman, Howard A., & Craver, Samuel M., *Philosophical Foundations of Education*.
- Premnath, *Bases of Educations*. Delhi, India: S. Chand and Co.
- Publishers.
- Ross, James S., *Ground Work of Educational Theory*. London, U.K: Oxford
- Rusk, Robert R., *Philosophical Bases of Education*, London, U.K: Oxford University of London Press Ltd.
- Safaya, R.N. & Shaida, B.D. (2010), *Modern Theory and Principles of Education*, New Delhi : Dhanpatrai Publishing Company Pvt. Ltd.
- Saiyadain, K.G. *Education and social order*. Bombay: Asia Publishing House.
- Taneja, V. R. (2000). *Educational Thought and Practice*. New Delhi: Sterling University of London Press Ltd.
- Wiley and Sons, Inc.
- Wingo, G. Max. *Philosophies of Education*. New Delhi: Sterling Publishers.

C1 Practical

Book Review

Each Student is required to review a Book / Journal / Educational Article and Write a report.

CORE – 2

EDUCATION AND SOCIETY

INTRODUCTION

Education is a sub-system of the society. The aims of education are determined by the aims of the society. The relationships between the two concepts i.e., education and society are so strong that it is not possible to separate them because what happens to one affects the other. It is impossible to think purposefully about many contemporary problems and issues of education without thinking about the society. Educational institutions are micro-societies, which reflect the entire society. The education system in any given society prepares the child for future life and instils in him those skills that will enable him to live a useful life and contribute to the development of the society. Education as a social phenomenon does not take place in a vacuum or isolation; it takes place in the society. This paper will deal with the functioning of education vis-a-vis the society. Education as a sub-system of society and how other sub-systems affect education will be discussed. Various agencies which are involved towards promotion of education will be discussed at length. Special emphasis is placed on issues relating to equality of educational opportunity with specific reference to the Scheduled Castes/Tribes and women. Special attention is also given how education plays an important role towards social change, national integration and international understanding in a diverse social context.

Course Objectives

After completion of this paper, students shall be able to:

- justify education as a social process and explain its function.
- describe the aims of education from sociological perspective.
- list various agencies of education and their function.
- justify education as a sub-system of society and how other sub-systems affect education;
- appreciate the importance of education for social change.

Unit – 1 **Education and society**

- **Society : Meaning and characteristics**

- **Types of society : Agricultural, Industrial, rural and urban**

- **Interrelationship between education and society**

- Views of Indian thinkers on Education and Society :

Radhakrishnan and Sri Aurobindo on Education

- Views of Western Thinkers on Education and Society: Dewey and Illich

Unit – 2 **Education and culture**

- Meaning and concept of culture

- Characteristics and types of culture

- Cultural lag and acculturation

- Cultural dimensions of Education

- Inter relationship between education, custom and value system.

Unit – 3 **Education, Social process and Institution**

- Education and socialization

- Education and social change

- Education and social mobility

- Role of Education for the development of the marginalised

- Education and Affirmative action

Unit – 4 **Education and Globalisation**

- Education, Growth and Development

- Globalisation and liberalization

- Educational system in Europe

- Educational system in SAARC countries

- Education in Global context

Unit – 5 **Education and state**

- Concept of Democracy

- Education in totalitarian and welfare state

- Interrelationship of state and education

- Role of education in Nation building

- State Control of Education and Autonomy in Education.

REFERENCES

- Abraham, M.F. (2008). *Contemporary Sociology*. New Delhi: Oxford University Press.
- Anand, C.L. et.al. (Ed.) (1983). *Teacher and Education in Emerging in Indian Society*. New Delhi: NCERT.
- Dewey, John (1973). *The School and Society*. Chicago: University of

Chicago Press.

- Mathur, S.S. (1966). *A Sociological Approach to Indian Education*. Vinod PustakMandir, Agra.
- Nayak, B.K. *Text Book of Foundation of Education*. Cuttack: Kitab Mahal.
- NCERT (1983). *Teacher and Education in Emerging Indian Society*. New Delhi.
- Ottaway, A.K.C. (1966). *Education and Society*. London: Routledge and Kegan Paul.

C2 Practical

Field Study

Each student is required to visit a school observe the school functioning and prepare a report

CORE – 3

THE LEARNER AND LEARNING PROCESS

INTRODUCTION:

Educational Psychology plays a pivotal role in understanding Children's unique character in teaching learning process. No child is alike from physical, psychological, and social point of view. So a classroom teacher must understand unique characteristics of children and the factors affecting children's learning. This course will enable the learners to understand the Children's innate potentialities and apply educational psychology in teaching learning process.

Course Objectives:

After completion of this paper, students shall be able to:

- establish relationship between education and psychology.
- understand various methods used to study individual behaviour.
- explain the application of educational psychology in teaching learning process.
- understand individual difference from intelligence, creativity, and personality point of view
- explain the concept of learning and factors affecting learning.
- reflect the contribution of various learning theories in teaching learning process.
- Explain different category of people from different Personality type and the type of adjustment.

Unit - 1 **Educational Psychology**

- Relationship between education and psychology

- Meaning, Nature and scope of educational psychology

- Relevance of educational psychology for teacher

- Methods of studying learner behaviour :

Survey, observation case study and experimental

Unit – 2 **Developmental psychology**

• Concept

• Difference between growth and development

- Principles of development
- Areas of development : Physical, social, emotional and intellectual during childhood and adolescence
- Piagetian stages of cognitive development

Unit – 3

Intelligence, creativity and individual difference

- Meaning and nature of intelligence
- Theories: Uni-factor, two-factor, multiple factor, Gardner's theory of Multiple Intelligence.
- Measurement of intelligence : individual and group tests, verbal, non- verbal and performance test.
- Individual difference: concept, nature factors and Role of Education
- Creativity : Meaning, Nature and Stages of creative thinking
Assessing and nurturing creativity.

Unit – 4

Learning and motivation

- Learning : Meaning nature and factor
- Theories of learning with experiment and educational implications: Trial and error with focus on laws of learning classical conditioning, operant conditioning and insightful learning and constructivist approach to learning.
- Motivation: concept, types and technique of motivation.

Unit – 5

Personality and Mental Health

- Personality: Meaning and nature
- Assessment: Subjective, objective and projective techniques.
- Mental Health: Concept, factor affecting mental health and role of teacher.
- Mental Health of teachers
- Adjustment mechanism

REFERNECES

- Aggarwal J.C (2010) Essentials of Educational Psychology, New Delhi, Vikas Publishing House Pvt. Ltd.
- Sharma R.N. (2010) Educational Psychology, Delhi, Surjeet Publications.
- Mangal S.K. (2008) Essentials of Educational Psychology, New Delhi, Prentice Hall of India Private Limited.
- Kuppuswamy B (2013) Advanced Educational Psychology, New Delhi,

Sterling Publishers Private Limited.

- Mathur S.S. (1962) Educational Psychology, Agra, Vinod Pustak Mandir.
- Kulshreshtha S.P. (2013) Educational Psychology, Meerut, R. Lall Book Depot.
- Bhatia & Bhatia (2004) A Text Book of Educational Psychology, Delhi, Doaba House Book Sellers & Publishers.
- Pandey Ram Shakal (2006), Advanced Educational Psychology, Meerut, R. Lall Book Depot.
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C3 Practical

Administration of Psychological Test

Each student is to administer a psychological test (Intelligence / creativity / personality test) and interpret the scores and prepare a report.

CORE – 4

PEDAGOGICAL SKILLS

INTRODUCTION

It is important to note that 'education' is not synonymous with 'school'. It has always been the case that a range of activities that are educational in nature can, indeed should, occur outside the school, even from the earliest age given the educative role of the parents. The Delors Commission Report on education for the 21st century proposed 'learning to live together' as one of the four pillars of education. It advocates learning to live together by developing an understanding of other people and an appreciation of interdependence – carrying out joint projects and learning to manage conflicts in a spirit of respect for the values of pluralism, mutual understanding and peace (UNESCO, 1996). The policy context in India and around the globe is moving towards recognition of the educational value of newer form of pedagogy in the 21st Century which will enable the children to develop critical reasoning power, justify their views, independent decision making power, expression of thoughts, and empathy to others' feelings. Recently NCERT (2005) and NCTE (2009) have changed their curriculum framework and accordingly revised their text books and teacher orientation process to empower the prospective teachers to cope up with emerging pedagogies and to promote higher order learning of the learners like, creative expression, authenticity, abstraction of ideas, and multiple thinking, etc. This paper is intended to give insight to the students on importance of pedagogy in education.

Course objectives

After completion of the course, the students shall be able to:

- explain the concept of pedagogy;
- differentiate pedagogy from other allied concepts;
- define different type of task of teaching
- establish relationship between teaching and learning;
- list out different approaches and methods of teaching;

Unit – 1 **Concept of teaching – learning**

- **Meaning and definitions of teaching**
- **Characteristics and importance of teaching**
- **Meaning and definition of learning.**

- Relationship between teaching and learning.

Unit – 2 Task of teaching

- Meaning and definition of teaching task
- Variables involved in a teaching task: Independent Dependent and intervening variable.
- Phases of teaching task : Pre-active, interactive and post – active phase.
- Level of teaching task: Memory Understanding and reflective level.
- Lesson plan design : The Herbartian steps, 5E Model ICON Design Model.

Unit – 3 Theories of teaching

- Meaning and Nature of Theory of teaching
- Types of Teaching Theories.
- Formal : Communication theory,
- Descriptive : Gagne’s hierarchical theory
- Normative: Theories of Mitra and Clarke

Unit – 4 Principles and Maxims of Teaching

- General principles teaching
- Psychological principles of teaching
- Maxims of teaching

Unit – 5 Approaches and Methods of Teaching

Inductive – Deductive, Analytic - synthetic,
Problem Solving and Project
method.

Shift in focus from teaching to learning –

constructivist approach Activity based and child centered

approach – concept and elements.

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C-4 Practical

Preparation of Lesson

Plan

Each student is to required develop five lesson plans in his/her method subject, (which he / she has to opt in 3rd Semester). The plan will be developed following Herbatian approach / 5E Model / Icon Design Model.

CORE - 5

TECHNOLOGY AND INNOVATIONS IN EDUCATION

INTRODUCTION

Educational technology (ET) is the efficient organization of any learning system adapting or adopting methods, processes, and products to serve identified educational goals (NCERT, 2006). This involves systematic identification of the goals of education, recognition of the diversity of learners' needs, the contexts in which learning will take place, and the range of provisions needed for each of these. Our schools should move from a predetermined set of outcomes and skill sets to one that enables students to develop explanatory reasoning and other higher-order skills. Educational technology is a powerful tool towards developing such reasoning and skills. It should enable students to access sources of knowledge, interpret them and create knowledge rather than be passive users. It should enable the teachers to promote flexible models of curriculum transaction. It should encourage to use flexible curriculum content and flexible models of evaluation as well. Present paper will give an exposure to students to understand the meaning, nature and scope of educational technology. They will be sufficiently oriented about nuances of communication and their implications in educational context. They will understand the underlying principles of instructional design. Students will develop the ability to prepare lesson plans based on constructivist approach. They will be oriented about the need and importance distance education in India.

Course Objectives

On completion of this course, the students will be able to:

- understand the meaning, nature and scope of educational technology
- explain with examples various approaches to educational technology
- describe systems approach and its application in educational context
- explain the concepts, principles, modes, process and barriers of communication and their implications in educational context
- explain the instructional design and its underlying principles
- describe different models of teaching and their use in effective classroom teaching

Unit – 1 **Educational Technology**

Meaning, nature and scope

Approaches to Educational Technology : Hardware, software and
system approach

Types of Educational Technology

Importance of Educational Technology for the teacher and the student.

Unit – 2

Communication Process

Meaning and nature

Process, components and

types Barriers of

communication

Study of Classroom Communication through flander's interaction analysis.

Unit – 3

Innovations in Educational Technology

Programmed instruction : Concept Basic principles and

applications Microteaching : Concept assumptions, phases
and applications.

Simulated Teaching : concept, procedure and applications

Personalized system of instruction : Concept, objectives, strategies and
applications

Unit – 4

Teaching Models

Concept attainment

model Advance

organizer model

Synetics model

Inductive model

Memory model

(These teaching models are to be discussed with reference to focus, syntax, social system, support system and application)

Unit – 5 **Classroom instructional Aids**

Projected and non projected

Aids ICT – enabled devices

Organisation of school teaching learning

Materials (TLM) Centre: Objective

Procedure

Planning

Applicatio

n

Types of Materials to be procured for teaching different school subjects.

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C5 Practical

Classroom Interaction Analysis

Each student is to observe one classroom interaction preferably in a school and prepare an observation matrix and write a report.

CORE - 6

PEDAGOGY OF SCHOOL SUBJECTS

(Each student is required to select any one of the following school subjects) **METHODS OF TEACHING ODIA**

Introduction

Mother-tongue plays a significant role in the education of a child. It has a great importance in the field of education. Therefore, mother tongue must be given an important and prominent place in the school curriculum. Method of teaching Odia will enable us to preserve and enrich our language and culture forever by developing Odia language skills among learners. The learners will also be equipped with the skills to prepare Odia lesson plans by using constructivist approach.

Learning Objectives and Expected Outcomes

On completion of the course the students shall be able to:

- describe the concept of Mother Tongue;
- explain the semantic peculiarity of Odia language
- justify the importance and objectives of teaching Mother Tongue (Odia) at Secondary Stage;
- describe various pedagogical approaches of language teaching.
- prepare subject specific lesson plan for improvement of language skills. plan and construct test to assess language skills and content areas.

Unit –1 Conceptual

Importance of mother tongue in the life and education of the child
Aims and objectives of teaching mother tongue at school level.

Place of mother tongue in the school curriculum.

Unit – 2 Methods and approaches

Direct Method

Discussion Method

Discussion cum appreciation

method Inductive and deductive

method

Unit – 3 Techniques of Teaching

Teaching of prose and

poetry Teaching of

Grammar Teaching of

composition

Unit – 4 Teaching Learning Materials for teaching Odia

Teaching learning materials : Purpose, Types and

Use Language Text Book : Importance, Purpose

Language Laboratory characteristics application

Unit – 5 Development of Lesson Plan

Preparation of Lesson Plan : Herbartian approach

5E Model

Icon Design Model

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METHOD OF TEACHING ENGLISH

INTRODUCTION

Language is always regarded as the means of communication. Among all the foreign languages English is worldwide accepted as the international language. It has been the window on the world through which we peep into the world to grasp international information on trade, education, health, politics etc. In this connection we need to strengthen our efficiency in English language to present ourselves in the market of education as a skilled person. Basically, in teaching and learning, English language deals with different modes of transaction, language skills. It enables a teacher to follow variety of methods of teaching of prose & poetry, grammar; and enables to prepare the lesson plan and scheme of lessons. As a student of education, one needs to learn role and anatomy of English language, methods of teaching and developing language skills, phonetics etc which are reflected in the course contents of this paper.

Learning Objectives and Expected Outcomes

On completion of course the students shall be able to:

- State the place of English language in India
- describe English as a second language in the multi lingual syllabus India
- List out different techniques of teaching
- Discuss different type of teaching learning materials in teaching English
- Prepare lesson plan in English

Unit – 1 Teaching / Learning English as a second language

- Importance of learning English as a second language
- Aims and objectives of teaching English
- Place of English in school curriculum

Unit – 2 Methods and approaches

- Translation and Direct methods
- Structural approach to teaching English
- Communicative approach to learning English

Unit – 3 Techniques of teaching

- Teaching prose and poetry
- Teaching grammar

- Teaching composition

Unit – 4 Teaching learning materials for teaching English

- Teaching aids : purpose types and use
- The English test book and work book
- The language laboratory
- Application of ICT in teaching English

Unit – 5 Developing a lesson plan for teaching English

- Herbartian approach
- 5 E Model
- ICON Design Model

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METHODS OF TEACHING MATHEMATICS

INTRODUCTION

Mathematics is closely linked not only with the daily life of the human society but also with scientific and technological world. Therefore, teaching of mathematics has formed, since the advent of education in human history, one of the three 'R's of learning. To be effective in teaching and creating a constructive learning situation, the teacher should not only have the content knowledge of mathematics, but also the pedagogical knowledge and its values in daily life of the human being. The pedagogical knowledge of mathematics will help the learner to effectively transact the mathematical concept and apply the effective strategy to assess the learner.

Course Objectives

On completion of the course the students shall be able to:

- explain the nature and scope of mathematics
- identify different types of proof in mathematics and their application to solving mathematical problems
- relate the mathematical concepts with other school subjects
- achieve the mastery over the methods, strategy and approaches for transacting the contents of mathematics
- develop mathematics achievement test and acquire of the scoring procedure
- analyze learners learning difficulties and develop remedial strategies to meet needs of slow learners and to develop enrichment materials for the advanced learners

Unit – 1 Importance and values of teaching mathematics

- Aims and objectives of teaching mathematics
- Relationship of mathematics with other school subjects.

Unit – 2 Mathematics curriculum and its organization at school stage.

- Principles of curriculum construction in Mathematics
- Principles of Arranging / organizing curriculum
- Pedagogical analysis of content in School Mathematics

Unit – 3 Methods of teaching mathematics

- Analytic and synthetic methods

- Inductive and deductive methods
- Project method

Unit – 4 Teaching learning Materials in Mathematics

- Teaching aids in mathematics : Purpose, types and use.
- Mathematics text book and workbook.
- Application of ICT in teaching mathematics.

Unit – 5 Developing lesson plan for teaching mathematics.

- Herbartian approach
- 5 E Model
- ICON Design Model.

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METHOD OF TEACHING HISTORY

INTRODUCTION

History occupies an important place in the school curriculum. Through History students will aware about the past events and developments. History creates linkage between present and past. Through the subject our students will respect our culture, traditions and heritage. History shows path to future.

COURSE OBJECTIVES:

On completion of the course, students shall be able to:

- explain the meaning and scope of History
- relate History with other school subjects
- explain the different approaches to organization of contents in History
- achieve mastery over different methods and approached for curriculum transaction
- List out the different types of teaching learning materials in history and explain their importance.
- Prepare Lesson plan in History

Unit – 1 History: Meaning, nature, scope, and importance

- Aims and objectives of teaching History at school level.
- Relationship of History with other school subject.

Unit – 2 The History curriculum

- Approaches to organization of contents in history curriculum: chronological, concentric, topical, regressive.
- Selection of content of History : Local, national and global perspectives.
- The History curriculum at school level in Odisha.

Unit – 3 Methods of Teaching History

- Lecture, story telling, narration-cum-discussion, dramatization, source method.
- Development of sense of time and space.

Unit – 4 Teaching learning material (TLM) in history

- Purpose, types and use
- Time line.

- ICT-enabled teaching aids in History.

Unit – 5

Preparation of Lesson Plan in History

- Herbartian Approach
- 5E Model
- ICON design model

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METHOD OF TEACHING SCIENCE

Introduction

The paper is meant for the students joining Masters Level with B.S background. The paper intends to develop an insight among the students regarding science as a distinct

discipline with its characteristics and method of inquiry. The MA (Education) students pursuing science would focus both a s physical and biological science and acquaint themselves with different methods and models of teaching. The methods, models and materials would be discussed with reference to the content of course prescribed for H.S.C examination in science. The students, on completion of course, are expected to develop scientific thinking, adapt methods and materials to the needs of students and conduct assignments in line with constructivist perspective.

Learning Objectives and Expected Outcomes

On completion of the course the students shall be able to

- gain insight on the meaning nature, scope and objective of science education.
- appreciate science as a dynamic body of knowledge
- appreciate the fact that every child possesses curiosity about his natural surroundings
- identify and relate everyday experiences with learning science
- appreciate various approaches of teaching learning of science
- employ various techniques for learning science
- use different activities like demonstration ,laboratory experiences, observation, exploration for learning of science
- facilitate development of scientific attitudes in learner
- Construct appropriate assessment tools for evaluating science learning

Unit – 1 Conceptual

- Meaning, nature and scope of General Science
- Aims and objectives of teaching science at school level.
- Correlation of science with other school subjects.
- Importance of science in the school curriculum

- Unit – 2 Methods and approaches**
- Observation method
 - Demonstration-cum-Discussion method
 - Project method
 - Heuristic method
 - Laboratory method
- Unit – 3 Science curriculum**
- Principles of curriculum construction in science
 - Organisation of curriculum in science
 - Pedagogical analysis of contents in science
- Unit – 4 Teaching learning materials (TLM) for teaching science**
- Purpose, type and use
 - Application of ICT in teaching science
 - The science laboratory : Purpose, Importance and utility
- Unit – 5 Development of Lesson plan for teaching Science**
- Herbartian Approach
 - 5 E Model
 - ICON Design model

REFERENCES

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METHOD OF TEACHING GEOGRAPHY

INTRODUCTION

Geography as a subject play a vital role in the school Curriculum for many people, Geography means knowing where places are and something of their characteristics is important for reading or the multiplication of tables for arithmetic, but Geography involves far more. Geography is the study of places on earth and their relationship with each other. Often the study of Geography begins with one's home community and expands as person gains greater experience. Thus Geography provides a conceptual link for children between home, school and the world beyond. Geographers study how people enteract with the environment and with each other from place to place and they classify the earth into regions. It helps us to be better citizen.

Course Objectives:

On completion of the course ,students shall be able to:

- explain the meaning and scope of Geography.
- relate Geography with other school subjects
- explain the different approaches of curriculum transaction in Geography.
- list out the different type of Teaching Learning Material (TLM) in Geography
- explain the principles of curriculum organization in Geography.
- Prepare lesson plan in teaching Geography.

Unit – 1 Conceptual

- Meaning, nature and scope of Geography
- Aims and objectives of teaching Geography at the school level.
- Correlation of Geography with other school subjects.
- Place of Geography in the school curriculum.

Unit – 2 Methods and approaches

- Direct observation and indirect observation
- Discussion method / Demonstration-cum-discussion method
- Project method
- Regional method
- Heuristic method

Unit – 3 Geography curriculum

- Principles of curriculum construction in Geography
- Organisation of curriculum in Geography
- Pedagogical Analysis of contents in Geography

Unit – 4 Teaching Learning Materials (TLM) for teaching

- Teaching Learning Materials : Purpose, type, & use
- Application of ICT in Teaching Geography
- Importance of Geography Room: Purpose, importance, utility
- Geography Text Book: Importance characteristics purpose and application.

Unit – 5 Development of Lesson Plan for teaching Geography

- Herbartian approach
- 5 E Model
- ICON Design Model

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C-6 Practical

School

Internship

Each student will deliver 5 (five) lesson in a school in his / her method subject opted in the 3rd Semester following Herbartian approach / 5E Model / Icon Design Model.

CORE – 7

STATISTICS IN EDUCATION

INTRODUCTION

The fundamental principles and techniques of statistics provide a firm foundation to all those who are pursuing courses in education, psychology and sociology. The role of statistics is essential for collection, analysis, grouping and interpreting the quantitative data. Research and innovations are very essential in the field of education for enrichment, progress and development of the knowledge society. A lot of surveys and research works are carried out in the field of education. Statistical methods help the researchers in carrying out these researches successfully. Therefore, the basic knowledge of statistical method is very vital for conducting any survey, research and project work. Students at undergraduate level must have to develop the basic knowledge of statistical methods used in education.

Course Objectives

After completion of this course students shall be able to:

- Describe the importance of statistics in field of education
- Convey the essential characteristics of a set of data by representing in tabular and graphical forms.
- Compute relevant measures of average and measures of variation
- Spell out the characteristics of normal probability of distribution
- Examine relationship between and among different types of variables of a research study

Unit – 1 **Concept of Statistics**

- Meaning, Definition and characteristics of statistics
- Kinds of statistics
- Types of Data
- Scales of Measurement
- Frequency Distribution

Unit – 2 **Graphical Representation of Data**

- Histogram
- Frequency Polygon
- Pie-Diagram

- Cumulative frequency graph
- Cumulative percentage curve / Ogive

Unit – 3

Measures of Central Tendency and Dispersion:

- Mean
- Median
- Mode
- Range
- Average Deviation
- Quartile Deviation
- Standard Deviation

Unit – 4

Measures of Correlation

- Concept of Correlation
- Linear and Non-linear correlation
- Rank difference method of correlation
- Product moment correlational method

Unit – 5

Inferential Statistics

- Normal Probability curve – Divergence from Normality
- Chi-square test
- t-test

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C-7 Practical

Statistical Analysis of Achievement Scores

Each student is required to collect the achievement scores of the students of a class at least 02(two) schools and make statistical analysis of the collected data and a report.

CORE – 8

CURRICULUM DEVELOPMENT & EDUCATIONAL GUIDANCE

INTRODUCTION

The organization of schooling and further education has long been associated with the idea of a curriculum. But what actually is curriculum, and how might it be conceptualized? We explore theory and practice of curriculum design and its relation to informal education. Curriculum theory and practice to some must sound like a dull but required course activity. Curriculum theory at its best is a challenging and exciting intellectual puzzle. It is a vibrant field full of contradictions, challenges, uncertainties and directions. Yet it is a critical field, the outcome of which does matter. When we teach, whether from preschool to high school; from children to adult, whether educating or training, what we do must make a difference. We cannot waste our audiences time with training that doesn't help, with educating that doesn't educate, or teaching that which may be irrelevant or even wrong. If a surgeon makes a mistake, his patient dies. If teachers, educators, professors, trainers make a mistake, we do not readily see the consequences, and indeed may never see the consequences. Ask yourself: Have you hurt anyone lately by giving misinformation? Did you really make a difference in your teaching, say yesterday? How do you know? Does the curriculum that you help design and deliver really do the job it is supposed to? This course deals with the theory and practice of curriculum design. Participants will want to ask "How do I do curriculum design?" "What are the theoretic underpinnings which inform the practical problems of making curriculum?" For this course, however, the underlying theoretical foundations which inform how and what one does will bias our discussions into particular directions. Students need Guidance in different ways and in various forms to solve their problem. Educational guidance is helpful for all categories of learner There are different services available to provide guidance to students . The present paper emphasizes the study of various concepts of guidance and counseling and its importance in teaching learning process.

Course Objectives:

On completion of this course, the students shall be able to:

- define and explain the concept of curriculum.
- list different types of curriculum with examples.
- suggest bases of curriculum such as, philosophical,

psychological and sociological.

- describe different considerations for curriculum planning;
- elucidate different process of curriculum development;
- explain the role of teacher in curriculum development.
- identify major issues and trends in curriculum;
- Explain National curricular Framework (2005)
- Explain different type of Guidance & Counselling
- List out different type of counseling services and the role of teacher in organizing those services

Unit – 1 Curriculum

- Meaning and importance
- Types of Curriculum: subject centered, learner centered, experience centered curriculum, Core curriculum, Local specific curriculum.
- Components of curriculum: Objectives, Content, Learning experience & Evaluation

Unit – 2 Bases of curriculum

- Philosophical, Sociological & Psychological bases of curriculum,
Principles of curriculum construction:
 - Principles of Activity centredness, Community centeredness
 - Integration, Relevance, Balance, Flexibility, Variety & Plurality, Forward looking, contextuality, ICT – enabled

Unit – 3 National Curricular Framework (NCF) 2005

- Guiding Principles
- Learning & knowledge
- Curricular areas, School Stages & Assessment

Unit – 4 Guidance and counseling

- Guidance: Meaning, Nature and scope
- Types of guidance : Educational, Vocational, & Personal
- Counseling : Meaning, nature & Scope
- Different types of counseling
- Techniques of counseling

Unit – 5 Organisation of Guidance services in school

- Placement service
- Occupational information service

- Pupil inventory service
- Follow up service
- Role of teacher in organizing guidance services in school

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C-8 Practical

Text Book

Review

Each student will review a school text book and write a detailed report.

CORE - 9

EDUCATIONAL ASSESSMENT & EVALUATION

INTRODUCTION

Assessment is considered to be one of the most crucial aspects of any teaching learning process, as it helps the teacher to record the growth of their students, planning for instructional strategy and most importantly helps to assess their own growth over the years. An effective method of assessment in the classroom helps to create conducive learning environment and a teacher must have to know different techniques of assessment which may improve students' learning. The key issues that involve in assessment are how to assess, when to assess, and what will be its implication on students learning. The paper outlines the above mentioned questions and different issues that involves in assessment.

Course Objectives

After completion of the course ,students shall be able to:

- describe the role of assessment in education.
- differentiate measurement, assessment and evaluation.
- establish the relationship among measurement, assessment and evaluation.
- explain different forms of assessment that aid student learning.
- use wide range of assessment tools and techniques and construct these appropriately.
- classify educational objectives in terms of specific behavioral form
- prepare a good achievement test on any school subject
- explain the characteristics of good measuring instruments.
- list out different type of assessment techniques

Unit – 1

Assessment & Evaluation in Education

- Understanding the meaning of Test, Measurement Evaluation and Assessment
- Scales of Measurement
- Types of measurement, Norm Referenced and Criterion Referenced
- Procedure of Evaluation: Placement, Formative, Diagnostic and Summative

- Concept of continuous and comprehensive evaluation (CCE).
- Unit – 2 Instructional Objectives**
- Taxonomy of Educational objectives with special reference to cognitive domain
 - Methods of stating instructional objectives: General instructional objectives and specific learning outcomes.
 - Relationship of Evaluation procedure with objectives.
 - Construction of objective based and objective type test items: Essay type, Objective type: principles of construction, Advantages and limitations.

Unit – 3 Techniques of Assessment

- Observation
- Interview
- Rating scale
- Checklist
- Project
- Concept Mapping

(Above techniques are to be discussed with reference to purpose, type, procedure of administration and application)

Unit – 4 Test construction

- Teacher made test vs. standardization
- General Principles of Test construction and standardization : Planning, Preparing, Tryingout & Evaluating.

Unit – 5 Characteristics of a Good Test

- Reliability - Concept and method
- Validity - Concept, type and methods of validation
- Objectivity - Concept, type and factors
- Usability - Concept and factors

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C-9 Practical

Construction of an achievement test

Each student will construct 50 objective based objective type test items along with a blue print

CORE – 10

INTRODUCTION TO EDUCATIONAL RESEARCH

INTRODUCTION

Research is a creative work undertaken systematically to increase the stock of knowledge, including knowledge of humanity, culture and society, and the use of this stock of knowledge to devise new applications. It is used to establish or confirm facts, reaffirm the results of previous work, solve new or existing problems, support theorems, or develop new theories. A research project may also be an expansion on past work in the field. The primary purposes of research are documentation, discovery, interpretation, or the research and development of methods and systems for the advancement of human knowledge. Approaches to research depend on epistemologies, which vary considerably both within and between humanities and sciences. In the present paper, students will be given an orientation about the nature, purpose, scope of research in education. A brief overview of different types of research in education will be given to the students. Students will be exposed to different methodology of research in education. Students can use appropriate tools and techniques for the collection of data and understand concept of sampling.

Course Objectives

On completion of this course the students shall be able to:

- Describe the nature, purpose, scope of research in education
- Identify types of research in education
- Explain the characteristic of qualitative, quantitative and mixed research
- Select and explain an appropriate method for a research study
- Select appropriate tools and techniques for the collection of data
- Describe the procedure of preparation of Research Report

Unit – 1 Introduction to Research

- Methods of Acquiring knowledge
- The Nature of science
- Meaning and characteristics of research
- Basic, Applied and action research
- The nature of educational research

Unit – 2 Types of studies in Educational Research

- Descriptive Research
- Experimental Research
- Qualitative Research
- Philosophical and Historical studies

Unit – 3 Research Design

- Identification of problem and formulation of Research question
- Hypothesis : Meaning and types
- Sampling : Concept and purpose
- Tools of data collection : Questionnaire, Rating scale, Attitude scale and checklist
- Techniques of data collection : Interview and observation

Unit – 4 Data Analysis and Interpretation

- Analysis of Quantitative Data (Descriptive statistical Measure)
- Analysis of Quantitative Data (inferential statistics based on parametric tests)
- Analysis of Quantitative Data (inferential statistics based on non-parametric tests)
- Analysis of Qualitative Data

Unit – 5 Research reports and application

- Writing proposal / synopsis
- Method of literature survey / Review
- Research Reports various components or structure
- Scheme of chapterization and Referencing

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C-10 Practical

Preparation of Project

proposal

Each student will prepare a project proposal.

CORE – 11

HISTORY OF EDUCATION IN INDIA

INTRODUCTION

In heritage of Indian education, you need to know the key words, *Heritage* and *Education*. The Indian heritage witnesses the most fabulous contributions in the field of education. It is believed that in the ancient days, education was imparted orally by the sages and the scholars and the information was passed on from one generation to the other. The Gurukuls were the traditional Hindu residential schools of learning which were typically in the teacher's house or a monastery. At the Gurukuls, the teacher imparted knowledge on various aspects of the religion, the scriptures, the philosophy, the literature, the warfare, the statecraft, the medicine astrology and the history. As the students of Education, you all need to learn the system of education starting from the ancient India till the today's globalised knowledge society through the hierarchy of time. The paper will develop a sense of appreciation and pride about the Indian Cultural and Educational heritage.

Course objectives

On completion of this course ,students shall be able to:

- narrate the concept of education in the context of Indian heritage.
- describe education in ancient India, particularly, Vedic Education, panishadic Education, and the Buddhist Education.
- critically examine the education system in Medieval India
- elaborate the role of teacher, school and community in preservation of Indian heritage and achievement of national goals.
- Evaluate the education system during British period with special emphasison the commissions and committees.
- Elaborate the status of education during post-independence period with special emphasis on the commissions and committees.

Unit – 1 **Education in Ancient India**

- Education during Vedic & Upanishadic period
- Education during Buddhist period
- Ancient seats of learning: Nalanda, Taxila, & Varanasi
- Achievements of Ancient India in different fields of knowledge

and enlightenment.

Unit – 2 Education in Medieval India

- Islamic Education in India: Aims, structure, curriculum, methods and educational institutions.
- Hindu Education: Aims, structure, curriculum, methods and educational institution.
- Impact of the interaction between the two systems of education.
- Evaluation of state patronage for education during the period.

Unit – 3 Education during early British period (up to 1885)

- Educational endeavours during the early British period (up to 1835)
- Adam's Report
- Macalay's Minute and Bentinck's Resolution. 1835
- Wood's Despatch 1854
- Hunter Commission Report 1882

Unit – 4 Education during later British period (1885-1947)

- National Education Movement
- Curzon's Education Policy
- Calcutta University (Sadler) Commission report 1917
- Basic Education 1937

Unit – 5 Education in Independent India

- Report of the University Education Commission 1948
- Report of the Secondary Education Commission 1952.
- Report of the Indian Education Commission 1966
(Reports of the commissions to be studied with reference to Aims, structure & Curriculum)
- NPE 1986 and the Revised NPE 1992.
 - Essence & the Role of Education
 - National System of Education
 - Reorganisation of Education at different stages.
- Report of NKC with regard to school & higher education

REFERENCES:

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C-11 Practical

Case Study

Each student will make a case study of an educational institution and prepare report.

CORE – 12

COMPARATIVE EDUCATION

INTRODUCTION

This paper is an introduction to a systematic study of comparative education, the analytical survey of foreign educational systems. Comparative education is relatively a young sub field in the very old discipline of pedagogy. Educational reforms are so intimately connected with politics, with problems of race, nationality, language and religious and social ideals that it becomes rather imperative to have a glimpse over the evolution of educational development of nations. This course is an attempt to combine the two purposes : an academic insight and a general introduction into comparative education as a study of contemporary solutions to various countries. It is widely recognized that this intending students of education should have some knowledge of foreign educational systems and their comparative merits. This paper also aims at the analytical study of education in all countries with a view to perfecting national systems with modification and changes, which the circumstances and local conditions would demand.

Course objectives

On completion of this course ,students shall be able to:

- Explain the scope of comparative education
- List out the factors of comparative education
- Compare the structure,curriculum and evaluation system of India with that of China, Japan,U.K and U.S.A

Unit – 1 **Definition and scope of Comparative Education**

- First pioneers of comparative education.
- Other subsequent comparative studies
- Approaches: statistical, psychological and historical
- National traditions and the definition of a nation.

Unit – 2 **Theory and Methods of comparative Education**

- Purpose of comparative education
- Area studies : Description and interpretation
- Comparative studies : Juxtaposition and comparison

Unit – 3 **Factors**

- The Racial factor
- The Linguistic factor
- Geographic and economic factor
- Religious factor

Unit – 4 Systems of Education

(Characteristic, structure, curriculum and evaluation system)

- U.K.
- U.S.A.

Unit – 5 Systems of Education

(Characteristic, Structure, Curriculum & Evaluation system)

- China
- Japan

REFERENCES

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Core-12 Practical

Term Paper

Each student is required to prepare a term paper on any topic of comparative education.

DISCIPLINE SPECIFIC ELECTIVE (DSE) – 1 ICT IN

EDUCATION

INTRODUCTION

Information and Communication Technology (ICT) now hold great potential for increasing the access to information as well as a means of promoting learning. ICT has tremendous potentiality in transforming classrooms into more engaging, collaborative and productive learning environments in which instructions can be customized to students' specific needs, interests and learning styles. It is also redefining the way educators teach as well as the way the students learn. The present paper is based on above assumptions. The paper will orient the learners about the need and importance of ICT in education. It will describe about the importance of open source software in education particularly, in developing country like, India. Students will be given an exposure about the various approaches and stages towards the use of ICT in education. Students are expected to develop reasonably good ICT skills in terms of use of various computer software and ICT tools.

Course Objectives

On completion of this course, the students shall be able to:

- explain the concept, nature and scope of ICT in education
- differentiate Web. 1.0 and Web 2.0
- describe the importance of open source software in education
- list and explain various approaches in adoption and use of ICT in education.
- list and explain various stages of ICT usages in general and pedagogical usages in particular in education.
- describe the needed teacher competencies for ICT usage in the classroom.
- ☐ demonstrate the use of various computer software such as Word-processing , Spreadsheets, and Presentation.

Unit – 1

Information & Communication Technology : Meaning and importance

- The ICT infrastructure : computers, telecommunication network, networking.
- Introduction to internet, the World Wide Web, e-mail, and social media.

- ICT potential for improving access, quality and inclusion in education

Unit – 2

E- learning : meaning and importance

E – learning methods and media :

Virtual learning environment

Virtual universities

Massive Open Online Course(MOOCs)

Webinars

Special internet forum / discussion

groups e-tutorials

Unit – 3

ICT Resources

- Open Educational Resources (OERs) purpose and importance
- e-Libraries, e-books, e-journals, Infflibnet
- Important website for education : NCERT, UGC, NCTE, MHRD, DHE, UNESCO, UNICEF, UIS (UNESCO Institute of Statistics) etc.
- Other learning resources: Encyclopedia, dictionaries, multimedia etc.

Unit – 4 ICT in class room

- Purpose and importance of ICT in class room
- ICT enabled curriculum : enhancing ICT use in the existing curriculum
- Full integration of ICT into curriculum
- Designing / Developing ICT integrated smart classrooms: hardware and software requirements, utilization procedures
- Developing multimedia and ICT based lessons.

Unit – 5

ICT for school improvement

- ICT for competency standards and professional development of teachers
- ICT for school administration
- ICT for student support services : admission libraries, guidance, maintenance of student records etc.
- ICT enabled assessment
- ICT for open and distance learning
- ICT for life long learning

REFERENCES

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DSE-1 Practical

Internet Search for Study Material

Each student is required to search internet, collect study materials related to any educational topic and write a report.

DISCIPLINE SPECIFIC ELECTIVE (DSE) – 2

SPECIAL EDUCATION

INTRODUCTION

Nature and nurture have a substantial role to play in growth and development of human beings. Nature and nurture apart, human organism is susceptible to damage through disease and injury. Disease, accident, genetic causes or any other reason, which inflicts the persons, causing loss or want of abilities, may not be equal in all cases. Accordingly the degree of abilities or lack of abilities varies. Deviations from average of physical and mental ability of human beings beyond limits resulting in substantial and appreciable difficulties in performing a function or in social adjustment process be perceived as disability. Some of the practitioners understand rehabilitation as a graded acquerntial individualized approach in which charity has given way to right so far as the empowerment of persons with disability is concerned. Education is the means to empower them. It has become a fundamental right of every child. The evolution of education of persons with disability has a history with the starting point in the 10th century in Europe and America. It has been realize that education of the persons with disability is very crucial for the development and independent leaving as far as possible. Education of the persons with disability has evolved as an essential responsibility of the government not only because of constitutional provisions but also with the UN mandates.

Course Objectives

On completion of this course, students shall be able to

- know about the concept, nature, objectives,types and historical perspective of special education
- explain the innovations and issues of special education
- elaborate the policies and programmes of special education
- able to identify different type of special category children
- understand various educational interventions meant for special children
- explain the role of resource teacher and special teacher

- Unit – 1** **Conceptual**
- Exceptional children : Concept and types
 - Inter relationship between impairment, disability and handicap.
 - Historical development of special education in India.
 - Issues and innovations in Education of Exceptional children: Mainstreaming, Labeling and De-institutionalisation.
- Unit – 2** **Policies and programmes in the Education of special children**
- Indian Education Commission (1964-66)
 - National Policy on Education (1986)
 - Report of Rama Murty Committee (1991)
 - Programme of Action (1992)
 - UN Conventions in Human Rights (1994)
- Unit – 3** **Education of the gifted and creative children**
- Concept
 - Characteristics
 - Identification
 - Educational provisions
 - Role of Teacher
- Unit – 4** **Education of the Educable Mentally Retarded**
- Concept
 - Characteristics
 - Methods of identification
 - Educational Provision
 - Role of Teacher
- Unit – 5** **Education of Children with Learning Disability**
- Concept
 - Characteristics
 - Methods of identification
 - Role of Special / Resource Teacher

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DSE-2 Practical

Case study of Special

Child

Each student is required to conduct a case study of a special child and write a report.

CORE – 13

EDUCATIONAL PLANNING, ADMINISTRATION AND MANAGEMENT

INTRODUCTION

Management is a universal phenomenon. Knowledge of management is indispensable for successful accomplishment of goals of an organization. Knowledge of management is required to ensure efficiency and better output of an organization and its functioning. As we know education plays a significant role in the socioeconomic development of the country, proper management of educational institutions requires managerial skills among all the people entrusted with the responsibilities of education. The paper deals with various concepts, principles and functions of educational management. It emphasizes on educational planning, finance and school management and focuses on trends in educational management. The paper will develop an interest towards the educational management.

Course Objectives

On completion of the course the students shall be able to:

- explain the concept, nature and scope of educational management
- describe the functions of educational management and administration
- list down various types of educational administration
- elaborate the principles of educational management
- elaborate the steps in planning
- explain different types of administration
- elaborate functions of state level educational bodies
- describe the sources of financing in education

Unit – 1 Educational Planning

- Meaning, Nature, Objective and scope
- Approaches: Social Demand, Cost benefit analysis and Manpower requirement
- Steps in Educational Planning : Diagnosis of Educational Development, Plan formulation, Plan implementation,

Monitoring and Evaluation.

- School Development Plan : Concept and Process

Unit – 2 Educational Administration

- Concept, Objectives and scope of educational administration
- Types : Totalitarian and Democratic
- Basic Functions of Administration : Planning, Organizing, Directing and Controlling.

Unit – 3 Educational administration in the state

- Administration of Education in Odisha: Structure and Functions.
- Functions of state level educational bodies: SCERT, BSE & OPEPA

Unit – 4 Educational Management

- Meaning, Nature and Scope
- Types: Centralized vs Decentralised Authoritarian vs Democratic
- Functions of Educational Management

Unit – 5 Economics of Education

- Costs in Education: The current cost and capital cost of education
 - The Direct and Indirect cost of education.
 - The private cost, social cost and unit cost of education.
- Educational Expenditure as investment
- Financing of Education :
 - Agencies of financing Education
 - Financing of education by parents
 - Financing of education by Employers.

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C-13 Practical

Visit to Administrative Unit

A visit to educational administrative unit such as DHE, SCERT, RDE, CHSE, University OPEPA interaction with administrator(s) and preparation of a report.

CORE – 14

CONTEMPORARY CONCERNS IN INDIAN EDUCATION

INTRODUCTION:

To remain current, to widen understanding levels holistically, and to thoroughly prepare learner for the world in which they will ultimately live and work, they must continually examine current practices in search of better solutions and needed change. The intent of this course is to familiarize learner to historical roots of Universalisation of Elementary education and initiative so far taken by Govt. to materialize this reality. Further, paper generally discusses the effort of Govt. to extend the provision of free and compulsory education at secondary level and developing a sound approach to dealing with the rapid pace of reform and change from the teacher's perspective. Emphasis is placed on examining over various emerging issues, problems and strategies of current trends relating to Peace education, Human Rights education value education, environmental education, Life skills education

Course Objectives

On completion of the course the students shall be able to:

- explain the concept of universalization of elementary education
- describe universalization of elementary education and secondary education implementation strategies
- describe present position of secondary education
- Explain the challenges of secondary education
- explain present scenario of higher education and agencies for improvement
- explain the concept of value education, environmental education and Life skills education

Unit – 1

Elementary Education

- Universalisation of elementary education.
- Right of Children to Free and Compulsory Education (RCFCE) Act 2009.
- Quality concerns in Elementary education.
- Sarva Sikshya Abhiyan (SSA) & District Primary Education Project (DPEP)

Unit – 2 Secondary Education

- Present position of secondary education in India
- Challenges and problems of secondary education.
- Vocationalisation of secondary education
- Rashtriya Madhyamik Sikshya Abhiyan (RMSA)

Unit – 3 Higher Education

- Present position of Higher Education in India
- Challenges in higher education : expansion, quality & inclusiveness.
- RUSA

Unit – 4 Social Commitments in Education

- Gender issues in Indian education
- Equalisation of educational opportunity
- Constitutional provisions for education
- Education for national integration and international understanding.

Unit – 5 Emerging concerns

- Environmental Education
- Value education, Peace Education and Human Rights Education
- Adolescent Education
- Life skills ducation

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C-14 Practical

Educational Programme Review

Each student is required to collect the perception of students / teachers / community members about the relevance and implementation issues in respect of an educational initiative / programme and prepare a report.

DISCIPLINE SPECIFIC ELECTIVE (DSE) – 3

DISTANCE EDUCATION

INTRODUCTION:

Distance education was an educational mode supplementary, Complementary and alternative to conventional/traditional system of education depending on the situation it was practiced. Today it has evolved into an independent system of education, hanks to the growth of communication Technologies and cognitive sciences which are flexible enough to use the technologies for pedagogic purposes. It is an educational innovation to meet the ever increasing and diversified educational needs and demands of the society which are sequal to changing social, economic and other conditions on one hand and technological developments on the other. Distance education is innovative in the sense that it sets up its own norms, approaches and methodology which are different from the face-to-face system of education. It can be non-conformist and non-traditional in nature. It makes adequate provision to impart instruction to learners at a distance by incorporating a variety of means for didactic interaction between its students and the teaches and / or the institution. This paper is an attempt to provide the students of education honours some of the fundamental concepts under the purview of distance education.

Course Objectives

On completion of this course, students shall be able to

- explain the importance of Distance education in the present context
- describe the historical perspective of distance education
- elaborate the curricular process of Distance education
- understand various modes of student support services
- develop clear idea about different type of Distance education institutions

Unit – 1 Concept of Distance Education

- Aims and objectives of Distance Education
- Purposes and functions served by distance education.
- Theories of Distance Education
- Distance education in India : Historical perspective

Unit – 2 Curricular process in Distance Education

- Preparing and supplying study material

- ICT support for distance learning
- Personal contact programme in distance learning
- Assignments and projects in distance learning

Unit – 3 Development of distance learning material /self –

instructional material (SIM)

- Planning for self instructional material: Importance objectives and learning outcomes
- Preparation of the material
- Context, language and formal editing of self – instructional material
- Self –assessment for self – instructional material

Unit – 4 Distance learners

- Profit of distance learners
- Needs of distance learner
- Problems of distance learner
- Steps for facilitating distance learner
- Student support services

Unit – 5 Open and distance learning institutions:

- Open Universities and open schools : Meaning and Nature
- IGNOU and NIOS
- Other forms of distance education – correspondence courses, Radio TV education
- Virtual universities and Massive Open online courses.

References

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DSE-3 Practical

Preparation of Self instructional materials (SIM)

Each student is required to prepare a self instructional material (SIM) on any topic.

OR

Case study of Distance education study centre

Each student is required to conduct case study of distance education study centre (IGNOU, NIOS, SOU, etc.) and write a report.

Distribution of Marks

Record - 20 marks

Viva voce - 05 marks

Total = 25 marks

DSE – 4 PROJECT

Each student is required to prepare a project on educational problem / issue and submit a report. The project shall be evaluated by an external and internal examination.

GENERIC ELECTIVE (G.E.) – 1

VISION OF EDUCATION IN INDIA:

ISSUES AND CONCERNS

INTRODUCTION

Education is essentially a normative endeavour, hence is intentional. It intends, rather deliberately, to socialize children into a value frame or normative structure. That is why history reveals that every education system, at different historical periods, had been guided by certain value concerns. In contemporary times, the education system in India derives its values from the Constitution of India. While socializing children education has to negotiate within the frame of Constitutional values. Indian Constitution envisioned a humane society based on freedom, equality and justice, and this led to evolving many institutions to realize the vision. In this regard, education has been considered as an agency of social transformation and classroom as the shaper of the envisioned destiny. Since teachers ought to play crucial role in realizing the vision, they are to be informed the Constitutional vision so as to develop normative perspectives regarding education and thereby emerging concerns and issues. This normative perspective a teacher holds in turn guides his/her actions and acquires a meaning to action.

Education being an operational area, every citizen perceives several issues related to it through personal experience. The student-teachers need to understand the main issues that touch their functioning as also situate themselves in context. Such an understanding on at least a few issues and concerns will equip student teachers to be ready for dealing with other issues and concerns in the field. This is very relevant as it may not be possible to bring under scrutiny all issues and concerns.

Since, concerns and issues cannot and should not be 'informed' like 'ready to cook facts', the course is designed in such a fashion that prospective teachers would be encouraged to come to terms with concerns and issues that would emerge out of their reasoned engagement with contemporary educational reality in the light of professed humanistic values,

Course Objectives

On completion of the course the students shall be able to:

- explain normative vision of Indian Society

- explain the view points of Indian thinkers on Education
- elaborate the contemporary issues like universalisation of school education, RTE Act -2009 and Rastriya Madhyamika sikshya Abhiyan
- identify importance of common school system

Unit – 1 Normative vision of Indian Education

- Normative orientation of Indian Education: A historical enquiry.
- Constitutional provisions on education that reflect national ideas : Democracy, Equity, Liberty, Secularism and social justice
- India as an evolving nation state : Vision, nature and salient feature – Democratic and secular polity, federal structure : Implications for educational system .
- Aims and purposes of education drawn from the normative vision.

Unit – 2 Vision of Indian Education : Four Indian thinkers

- An overview of salient features of the “Philosophy and Practice” of education advocated by these thinkers.
 - Rabindranath Tagore : Liberationist pedagogy
 - M.K. Gandhi : Basic Education
 - Jiddu Krishnamurty : Education for Individual and social Transformation
 - Sir Aurobindo : integral Education

Unit – 3 Concern for Equality in Education: Concerns and Issues

- Universalisation of school education
 - (i) Issues of (a) Universal enrollment
 - (b) Universal Retention
 - (c) Universal success
 - (ii) Issues of quality and equity

Unit – 4 Concern for Equality in Education

- Equality of Educational opportunity
- Prevailing nature and forms of inequality including Dominant and Minor groups and the related issues.
- Inequality in schooling : Public-private schools, Rural-urban schools, single teachers schools and many other forms of inequalities in school systems and the process leading to

disparity.

- Idea of common school system

Unit – 5

Education and Development – an interface

- Education for National Development : Education Commission (1964-66)
- Emerging trends in the interface between:
 - Political process and education
 - Economic Development and Education
 - Social cultural – changes in Education

References

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GE-1 Practical

Term paper

Each student is required to prepare a term paper on the educational ideas of any Indian Thinkers or on any contemporary issues on Education.

GENERIC ELECTIVE (G.E.) - 2

ASSESSMENT AND EVALUATION TECHNIQUES

INTRODUCTION

Assessment is considered to be one of the most crucial aspects of any teaching learning process, as it helps the teacher to record the growth of their students, planning for instructional strategy and most importantly helps to assess their own growth over the years. An effective method of assessment in the classroom helps to create conducive learning environment and a teacher must have to know different techniques of assessment which may improve students' learning. The key issues that involve in assessment are how to assess, when to assess, and what will be its implication on students learning. The paper outlines the above mentioned questions and different issues that involves in assessment.

Course Objectives

After completion of the course the students shall be able to:

- describe the role of assessment in education.
- differentiate measurement, assessment and evaluation.
- establish the relationship among measurement, assessment and evaluation.
- explain different forms of assessment that aid student learning.
- use wide range of assessment tools and techniques and construct these appropriately.
- classify educational objectives in terms of specific behavioral form
- prepare a good achievement test on any school subject

Unit – 1 The Measurement, Evaluation and Assessment Process

- Educational Testing and Assessment : Context, Issues and Trends.
- The Role of Measurement, Evaluation and Assessment in Teaching.
- Instructional Goals and objectives : Foundation for Assessment.
- Types of Assessment: Placement, Formative, Diagnostic and Summative.

Unit – 2 Classroom tests and Assessment

- Planning classroom tests and assessment
- Constructing objective test items: simple forms and multiple choice forms.
- Constructing Essay type questions: Form and uses; suggestions for scoring essay questions.

Unit – 3 Alternative Techniques of Assessment

- Observational Technique: Observation schedule, Anecdotal Records, Rating scales, Checklists
- Self – reporting Techniques: Interview, portfolio, questionnaire and inventories.
- Peer – appraisal: “Guess who” technique, sociometric technique.

Unit – 4 Processing and Reporting in Assessment

- Processing qualitative evaluation data: Content Analysis
- Considerations for reporting the performance
- Scheme of reporting: criterion – reformed and non reformed interpretation.
- Combining mark or grades over different subjects and reporting results of assessment to different users.

Unit – 5 Contemporary Trends in Assessment

- Marks vs Grading system
- Credit system
- Concept of Continuous and Comprehensive Evaluation (CCE)
- ☐ Computers in student evaluation

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- Earl, L.M. (2006). Assessment as Learning: Using Classroom Assessment to Maximize Student Learning. Thousand Oaks, California: Corwin Press
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GE-2 Practical

Achievement Test Construction

Each student is required to construct 50 objective based objective type test items along with a blue print.

GENERIC ELECTIVE (G.E.) - 3

CONTEMPORARY PEDAGOGY

INTRODUCTION

It is important to note that 'education' is not synonymous with 'school'. It has always been the case that a range of activities that are educational in nature can, indeed should, occur outside the school, even from the earliest age given the educative role of the parents. The Delors Commission Report on education for the 21st century proposed 'learning to live together' as one of the four pillars of education. It advocates learning to live together by developing an understanding of other people and an appreciation of interdependence – carrying out joint projects and learning to manage conflicts in a spirit of respect for the values of pluralism, mutual understanding and peace (UNESCO, 1996). The policy context in India and around the globe is moving towards recognition of the educational value of newer forms of pedagogy in the 21st Century which will enable the children to develop critical reasoning power, justify their views, independent decision making power, expression of thoughts, and empathy to others' feelings. Recently NCERT (2005) and NCTE (2009) have changed their curriculum framework and accordingly revised their text books and teacher orientation process to empower the prospective teachers to cope up with emerging pedagogies and to promote higher order learning of the learners like, creative expression, authenticity, abstraction of ideas, and multiple thinking, etc. This paper is intended to give insight to the students on importance of pedagogy in education.

Course objectives

After completion of the course, the students shall be able to:

- explain the concept of pedagogy;
- differentiate pedagogy from other allied concepts;

Unit – 1 Meaning process and Aims of Education

- Concept of Teaching and learning
- Nature and characteristics of teaching
- Meaning and characteristics of learning

Unit – 2 The task of teaching

- Meaning and definition of teaching task
- Variables involved in teaching task
- Phases of teaching : Pre-active, interactive and post – active

- Levels of teaching : Memory, understanding and reflective
- Lesson plan design : Herbartian steps, ICON Model and 5E Model

Unit – 3 Principles and maxims of teaching

- General principles of teaching
- Psychological principles of teaching
- Maxims of teaching

Unit – 4 Approaches and methods of teaching

- Inductive –Deductive
- Analytic and synthetic
- Problems solving and project method
- Shift in focus from teaching to learning – The constructivist approach.
- Activity based and child centered approach to teaching .

Unit – 5 Technology in teaching

- ICT tools and techniques facilitating teaching : www, internet applications in teaching and learning.
- Teaching Learning Material (TLM) : purpose, types and use
- Role of mass media in teaching learning.

GE-3 Practical

Preparation of Lesson

Plan

Each student is required to develop 05(Five) lesson plans on any school subject (Odia, English, History, Geography, Math, General Science) based on Herbartian approach / SE Model / Icon design Model.

REFERENCES

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GENERIC ELECTIVE (G.E.) – 4

EARLY CHILDHOOD CARE AND EDUCATION

INTRODUCTION

This paper will help the students to develop a sensitivity towards the needs and rights of children and will provide an understanding of their development. Students will also acquire skills that will help them to interact with children. Besides orienting the students towards a vocation in childcare, this course will orient the students towards organizing services for children. These services are crèches / day care centres and pre- schools for children upto six years of age. Students will enlighten themselves regarding how the pre-school education prepares the child for schooling which lies ahead. Pre-schools in our country are called by various names: anganwadi, balwadi, nursery school, kindergarden and play center.

Course Objectives

On completion of this course, students shall be able to:

- understand the importance of early childhood stage as the formative stage of growth and development
- explain the basic principles of curriculum formulation and their respective growth
- list out the activities for the different type of developmental needs of early child
- elaborate the learning materials needed for their appropriate developmental stage.

Unit – 1 Introduction to childcare and development

- Basic concepts in child development : Scope, growth and development, stages of development, areas of development, significance of study of child development.
- Principles of growth and development.

Unit – 2 Curriculum for ECCE

- Basic principles of the curricular framework
- Areas: cognitive development, language

development, social and emotional development, exploring, the environment, habit formation.

Unit – 3 Activities for physical development, movement and mobility.

- Activities for cognitive development
- Activities for language development
- Activities for social and emotional development
- Activities for exploring the environment
- Creative and aesthetic activities.

Unit – 4 Learning materials for ECCE

- Principles of selection of materials
- Type of materials
- Specific materials for different activities
- Preparation of teacher made materials
- Concept of toy bank

Unit – 5 Statutory framework for ECCE

- Constitutional framework
- National ECCE Policy, 2013
- Rights of the children

REFERENCES:

- Aggarawal J.C. and Gupta S. (2013) Early Childhood care and Education New Delhi: Shipra Publications
- Kaul Veneta (2009) Early child hood Education Programme, New Delhi, NCERT
- Soni Romila, Kapoor Rajendra & Vashishitha Krushna Kanta (2008) Early childhood Education an Introduction, New Delhi, NCERT
- NCF Curriculum Framework-2005

GE-4 Practical Observation of ECCE Centre

Each student is required to observe an ECCE centre and prepare a report.

SYLLABUS FOR B.A. (HONORS) ENGLISH
UNDER CHOICE BASED CREDIT SYSTEM OF
UTKAL UNIVERSITY, BHUBANESWAR

CBCS UG SYLLABUS Sem 1

Core 1

British Poetry and Drama: 14th to 17th Centuries

The paper seeks to introduce the students to British poetry and drama from the 14th to the 17th centuries. It offers the students an exploration of certain seminal texts that set the course of British poetry and plays.

British Poetry and Drama: 14th to 17th Centuries

Unit 1

A historical overview:

The period is remarkable in many ways: 14th century poetry evokes an unmistakable sense of “modern” and the spirit of Renaissance is marked in the Elizabethan Drama. The Reformation brings about sweeping changes in religion and politics. A period of expansion of horizons: intellectual and geographical.

Unit 2

Chaucer: *The Wife of Bath’s Tale* or *Sir Gawain and the Green Knight* (Part 1, lines 1-490)

Unit 3

Thomas Campion: “Follow Thy Fair Sun, Unhappy Shadow”, Sir Philip Sidney: “Leave , O Love, which reachest but to dust”, Edmund Waller: “Go, lovely Rose”, Ben Jonson: “Song to Celia”, William

Shakespeare: Sonnets: “Shall I compare thee to a summer’s day?”, “When to the seasons of sweet silent thought”,

“Let me not to the marriage of true minds.”

Unit 4

William Shakespeare: *Macbeth* or *Twelfth*

Night. Unit 5

Marlowe: *The Jew of Malta* or Thomas Dekker: *The Shoemaker’s Holiday*.

Suggested Readings:

Weller series: *Macbeth&Twelfth Night*

Chaudhury & Goswami: *A History of English Literature: Traversing Centuries.*

Orient Blackswan

Harold Bloom: *Shakespeare: The Invention of the Human*

Sanders, Andrews: *The Short Oxford History of English Literature.* Oxford: OUP

CBCS UG SYLLABUS Sem 1

Core 2

British Poetry and Drama: 17th and 18th Century

The objective of this paper is to acquaint students with the Jacobean and the 18th century British poetry and drama, the first a period of the acid satire and the comedy of humours; and the second a period of supreme satiric poetry and the comedy of manners.

Unit 1

A historical overview

17th C: Period of the English Revolution (1640–60); the Jacobean period; metaphysical poetry; cavalier poetry; comedy of humours; masques and beast fables

18th C: Puritanism; Restoration; Neoclassicism; Heroic poetry; Restoration comedy; Comedy of manners

Unit 2

John Milton: *Lycidas* Or *L'Allegro* and *Il Penseroso*:

John Donne: *A Nocturnall upon S. Lucie's Day, Love's Deity*; and Andrew Marvel: *To His Coy Mistress*; *The Garden*; *A Dialogue between the Soul and the Body*

Unit 3

Ben Jonson: *Volpone* or *The Alchemist*:

Unit 4

Pope: *Ode on Solitude*, *Summer*, *Sound and Sense*, *The Dying Christian to his*

Soul; and Robert Burns: *A Red Red Rose*, *A Fond Kiss*, *A Winter Night*, *My*

Heart's in the Highlands **Unit 5**

Dryden : *All for Love* Or Congreve: *The Old Bachelor*

Suggested readings:

1. *A History of English Literature: Traversing the Centuries* - Chowdhury & Goswami, Orient Blackswan
2. *Lycidas* - John Milton (Eds. Paul & Thomas), Orient Blackswan
3. *The Norton Anthology of English Literature, Vol. B: The Sixteenth Century & The Early Seventeenth Century*
4. *The Norton Anthology of English Literature: The Restoration and the Eighteenth Century*

Core 3

British Literature: 18th Century

The objective of the paper is to acquaint the students with two remarkable forms of literature: Essay and novel. The period is also known for its shift of emphasis from reason to emotion.

Unit -1 A historical overview:

Restoration, Glorious Revolution, Neo-classicism, Enlightenment.

Unit-2 Joseph Addison : On Giving Advice

Reflections in Westminster Abbey

Defence and Happiness of Married

Life

Richard Steele: Recollections

On Long-Winded People

Unit-3 Daniel Defoe: *Robinson Crusoe*

Unit-4 Oliver Goldsmith: A City Night-Piece

On National

Prejudices Man in

Black

Samuel Johnson: Expectations of Pleasure frustrated

Domestic Greatness Unattainable

Mischiefs of Good Company

The Decay of Friendship

Unit-5 Thomas Gray: Elegy written in a country churchyard

Suggested Readings:

1. *A History of English Literature: Traversing the Centuries* - Chowdhury & Goswami, Orient Blackswan
2. *The Norton Anthology of English Literature: The Restoration and the Eighteenth Century*

CBCS UG SYLLABUS Sem 2

Core 4

Indian Writing in English

Though a late developer, Indian writing in English has been the fastest growing branch of Indian literature. It has delivered a rich and vibrant body of writing spanning all genres. As a 'twice born' form of writing, it partakes of both the native and alien perspectives and has an inherent inclination to be postcolonial. This paper attempts to introduce the students to the field of Indian writing in English through some representative works.

Unit – 1

A historical overview of Indian writing in English the key points of which are East India Company's arrival in India, Macaulay's 1835 Minutes of Education, India's first war of independence and the establishment of colleges to promote Western education. The focus in the literary setting will include Dean Mohammed's travel writing, said to be the first work of Indian English writing, Toru Dutt and Henry Derezio in poetry and Bankim Chandra Chatterjee and Lal Behari Day in prose fiction.

Unit 2

Crystallization: R.K. Narayan, *The Bachelor of Arts* or Mulk Raj Anand, *Untouchable*

Unit 3

Flowering: R. Parthasarathy (ed) *Ten Twentieth Century Indian Poets*. The following poets and their poems are to be studied. Nissim Ezekiel, "Good Bye Party for Miss Puspa T.S", "Poet, Lover, Bird Watcher", Arun Kolatkar, "The Boat Ride", "Jejuri", Kamala Das, "My Grandmother's House", "A Hot Noon in Malabar", Jayanta Mahapatra, "Indian Summer", "Grass", A. K. Ramanujan, "Looking for a Cousin on a Swing", "Small Scale Reflections on a Great House"

Unit 4

Performing: Mahesh Dattani, *The Final Solution* Or Manjula Padmanabhan, *The Harvest*

Unit 5

Maturation: Amitav Ghosh, *Shadow Lines* Or Kiran Desai, *The Inheritance of Loss*

Suggested Readings:

1. Arvind Krishna Mehrotra, *An illustrated History of Indian Literature in English*. Hyderabad: Orient BlackSwan, 2003.
2. R. Parthasarathy, *Ten Twentieth-Century Indian Poets*. Delhi: Oxford University Press, 1975.
3. Vinay Dharwadkar, "The Historical Formation of Indian-English Literature" in Sheldon Pollock (ed.) *Literary Cultures in History*. New Delhi: Oxford University Press, 2003.

CBCS UG SYLLABUS Sem 3

Core 5

British Romantic Literature

The paper aims at acquainting the students with the Romantic period and some of its representative writers. At the same time one of the chief objectives of the paper is to give the students with a broad idea of the social as well as historical contexts that shaped this unique upheaval.

UNIT I: A Historical Overview:

The period otherwise known as The Romantic Revival may also be called as The Age of Revolution as it owes its origin to the Epoch making French Revolution of 1789. The emphasis on individual liberty and unbridled desire free from the shackles of classicism made this period unique, intriguing and controversial.

UNIT-II

Robert Burns: "To a Muse" and "The Cotter's Saturday Night"

William Blake: "The Holy Thursday" and "London"

UNIT-III

William Wordsworth: "Tintern Abbey" and "Ode on Intimations of

Immortality" Samuel Taylor Coleridge: "Kubla Khan" and "Road to Xanadu"

UNIT-IV

John Keats "Ode on a Grecian Urn" and "Ode on Melancholy"

P.B. Shelley: "Ode to the West Wind" and "To a Skylark"

UNIT-V:

William Wordsworth: Preface to *Lyrical Ballads* (2nd Edition)

OR

P.B. Shelley: "A Defence of Poetry"

Suggested Reading:

The Routledge History of Literature in English
History of English Literature: Traversing the Centuries – Chowdhury & Goswami
Romantic Imagination by C. M. Bowra
Pelican Guide to English Literature. Vol.5. Edited by Boris Ford

CBCS UG SYLLABUS Sem 3

Core 6

19th Century British Literature

The paper seeks to expose students to the literature produced in Britain in the 19th century. The focus is mainly on prose (fictional and non-fictional) and criticism. The 19th century embraces three distinct periods of the Regency, Victorian and late Victorian.

Unit 1

A Historical Overview

The 19th century British literature though mainly famous for the Romantic Movement, was also a witness to major socio-political developments like industrialization, technological advancements and large scale mobilization of people from the rural to the urban centers. Much of these prosaic activities/developments needed the medium of prose for its articulation. Politically known as the Victorian period 19th century also witnessed what is known as the culture and society debate.

Unit 2 : Essays

Charles Lamb: "Old China"

William Hazlitt: "On Going Journey"

Leigh Hunt: "A Few Thoughts on sleep"

R L Stevenson: "Walking Tours"

Unit 3: Novels

Mary Shelly: *Frankenstein* OR R.L .Stevenson: *Dr. Jekyll and Mr. Hyde*

Unit 4: Novel

Jane Austen: *Pride and Prejudice* OR Elizabeth Gaskell: *Mary Barton*

Unit 5 : Criticism

Mathew Arnold: *Culture and Anarchy* (Chapter 1)

OR

William Hazlitt: "Lectures Chiefly on the Dramatic Literature of the Age of Elizabeth" from *Lectures on English Poets*

Suggested Reading:

- Chapter 4, 5 from a *Short Introduction to English Literature* by Jonathan Bate
- *The English Novel* by Terry Eagleton
- *The Cultural Critics* by Leslie Johnson

CBCS UG SYLLABUS Sem 3

Core 7

American Literature

This paper seeks to give the students a sense of how the great American themes of self-reliance, individualism, sin and redemption and multiculturalism were shaped through its rich and varied Literature.

Unit – I : Genesis and evolution, and the defining myths of American Literature—city on a hill, the frontier spirit, the American Dream, manifest destiny, e pluribus unum

Unit – II: Harriet Jacobs *Incidents in the Life of a Slave Girl* OR “Economy” , “Where I lived, and What I Lived for”, “Reading” and “Pond in Winter” from H D Thoreau’s *Walden*

Unit – III: *The Pioneers* – James Fennimore Cooper OR *Billy Budd*—Herman Melville

Unit – IV: (Any four poets to be studied)

- Walt Whitman: “when I heard the learn’d astronomer” and “A noiseless patient spider”
- Emily Dickinson: “Success is counted sweetest” and “‘Faith’ is fine invention”
- Robert Frost: “The road not taken” and “Fire and Ice”
- Wallace Stevens: “Thirteen ways of looking at a blackbird” and “Disillusionment of ten o’ clock”
- Adrienne Rich: “For the record” and “A valediction forbidding mourning”
- Susan Howe: “From the midnight” and “That this”
- Rita Dove: “Teach us to number our days” and “Exit”

Unit – V *Desire under the Elms*– Eugene O’Neill OR *The Dutchman*—Amiri Baraka

Suggested Reading

- Lewisohn, Ludwig. *The Story of American Literature*. The Modern Library, N. Y.
- Horton, Rod & Herbert W.. Edwards. *Backgrounds of American Literary Thought* . 3rd edition.
- Stewart, Randall(ed). *Living Masterpieces Of American Literature* . Brown University
- Norton Anthology of American Literature. 8th edition.

Core 8

British Literature: Early 20th Century

British Literature: Early 20th Century

This paper aims to familiarize the students with the new literature of Britain in the early decades of the 20th century. The course will mainly focus on the modernist canon, founded on Ezra Pound's idea of 'make it new', but will cover war poetry, social poetry of the 1930s and literary criticism.

Unit 1 (A historical overview): Highlights will include developments in society and economy, leading to a crisis in western society known as the First World War and the resultant change in the ways of knowing and perceiving. Such triggers for the modern consciousness as Marx's concept of class struggle, Freud's theory of the unconscious, Bergson's *duree*, Nietzsche's will to power and Einstein's theory of relativity are to be discussed.

Unit 2 T.S. Eliot "The Love Song of J. Alfred Prufrock"

W.B. Yeats	"Sailing to Byzantium"
Ezra Pound	"In a Station of the Metro"
T.E. Hulme	"Autumn"
Hilda Doolittle	"The Mysteries Remain"

Unit 3 War Poetry : Wilfred Owen "Dulce Et

Decorumest" Siegfried Sassoon "Suicide in the

Trenches"

Social Poetry: W.H Auden "The Unknown Citizen"

Stephen Spender "An Elementary Classroom in a

Slum" Louis MacNeice "Prayer before

Birth"

Unit 4 Virginia Woolf: *Mrs. Dalloway* OR

James Joyce: Stories from *Dubliners* ("The Sisters", "Evelyn", "An Encounter", "Clay", "Two Gallants")

Unit 5 Literary Criticism: Henry James, "The Art of Fiction" or T.S. Eliot, "Tradition and Individual Talent"

Suggested Readings:

1. *Pelican Guide to English Literature: The Modern Age*(ed.) Boris Ford
2. Jonathan Bate, *English Literature: A Very short Introduction*, Oxford Paperback
3. Peter Faulkner, *Modernism*. London: Methuen
4. Peter Childs, *Modernism, New Accents*. Routledge

CBCS UG SYLLABUS Sem 4

Core 9

European Classical Literature

The objective of this paper is to introduce the students to European Classical literature, commonly considered to have begun in the 8th century BC in ancient Greece and continued until the decline of the Roman Empire in the 5th century AD. The paper seeks to acquaint the students with the origins of the European canon.

Unit-1 A historical overview:

Classical Antiquity: ancient Greece, the rise and decline of the Roman Empire

Geographical space: cultural history of the Greco-Roman world centered on the Mediterranean Sea

Unit-2 Epic poetry:

Homer *Odyssey* (Book I) **OR**

Virgil *Aeneid* (Book I)

Unit-3 Tragedy:

Sophocles *Oedipus the King* **OR**

Aeschylus *Prometheus Bound*

Unit-4 Comedy:

Aristophanes *Frogs* **OR** Plautus *Asinaria*

Unit-5 Criticism:

Plato *Republic*, (Book 10) **OR**

Aristotle *Poetics*, Chapter 6,7,8 **OR**

Horace *Ars Poetica* or *Essay on Poetic Theory***OR**

Longinus *On the Sublime*, Chapter 7, 39

Suggested Readings:

Auerbach, Erich. *Mimesis: The Representation of Reality in Western Literature*. USA: Princeton University Press. 2013.

Beye, Charles Rowan. *Ancient Greek Literature and Society*. Ithaca, New York: Cornell University Press. 1987

*All the texts are available for access on Project Gutenberg <https://www.gutenberg.org/>

CBCS UG SYLLABUS Sem 4

Core 10

Women's writing

The course aims to acquaint the students with the complex and multifaceted literature by women of the world, reflecting the diversity of women's experiences and their varied cultural moorings. It embraces different forms of literature: poetry, fiction, short fiction, and critical writings. In certain respects, it interlocks concerns of women's literary history, women's studies and feminist criticism.

Unit 1: In Defence of A Literature of Their Own

Mary Wollstonecraft: "Introduction" from "A Vindication of the Rights of Women"

OR

Sarala Devi: "Narira Dabi" (The Claim of the Woman) Trans. S.Mohanty, Chapters 13 & 17 from the collective novel *Basanti* (The first two in *Lost Tradition: Early Women's Writing from Orissa* and the third in *Indian Literature No.*)

Unit 2: Desiring Self: Fiction by Women from the Centre

Charlotte Bronte: *Jane Eyre* OR Emily Bronte: *Wuthering Heights*

Jean Rhys: *Wide Sargasso Sea* OR Dorris Lessing: *The Grass is Singing*

Unit 3: Desiring and Dissenting Self: Fiction by Women from the Periphery

Krupabai Sathianadhan: *Saguna or Kamala*

OR

Prativa Ray: *Yajnaseni*

Unit 4: Tongues of Flame: Poetry by Women from Across the World

***Any Four Poets to be read**

Kamala Das "An Introduction" & "The

Sunshine Cat" Shanta Acharya

"Homecoming", "Shringara"

Eunice de Souza "Women in Dutch Painting" & "Remember

Medusa?" Tishani Doshi "Ode to the Walking Woman"

& "What the Body Knows"

Maya Angelou "Phenomenal Woman" & "I Know Why the Caged

Bird Sings" Sylvia Plath "Mirror" & "Barren Woman"

Margaret Atwood "This is a Photograph of me" & "The

Landlady" **Unit 5: Discoursing at Par: Literary Criticism**

by Women Virginia Woolf: "Chapter 1" from *A Room of*

One's Own

OR

Simone de Beauvoir: "Introduction" from *The Second Sex*

Web Resources:

- Virginia Woolf, *A Room of One's Own*
<https://victorianpersistence.files.wordpress.com/2013/03/a-room-of-ones-own-virginia-woolf-1929.pdf>
- Mary Wollstonecraft, *A Vindication of the Rights of Women*:
Introduction <http://pinkmonkey.com/dl/library1/vindicat.pdf>
- Maya Angelou's Poems
http://www.poemhunter.com/i/ebooks/pdf/maya_angelou_2012_6.pdf
- Sylvia Plath's Collected Poems
https://monoskop.org/images/2/27/Plath_Sylvia_The_Collected_Poems_1981.pdf
- Margaret Atwood's Poems
<http://www.poemhunter.com/margaret-atwood/poems/>
- Eunice de Souza, "Remember Medusa?" & "Women in Dutch Painting"
<http://www.poetrynook.com/poem/remember-medusa> ,
<http://www.gallerie.net/issue14/poetry1.html>
- Tishani Doshi's Poems

http://www.poemhunter.com/i/ebooks/pdf/tishani_doshi_2012_6.pdf

- Simone de Beauvoir *The Second Sex*
<http://burawoy.berkeley.edu/Reader.102/Beauvoir.I.pdf>

Suggested Reading:

- Toril Moi, *Sexual Textual Criticism*
- Elaine Showalter, *A Literature of Their Own*
- Sandra Gilbert and Susan Gubar, *The Mad Woman in the Attic*
- Gill Plain and Susan Sellers, *A History of Feminist Literary Criticism*. Cambridge University Press. 2007. Essays to be read: Helen Carr, "A History of Women's Writing" and Mary Eagleton, "Literary Representations of Women"
https://mthoyibi.files.wordpress.com/2011/09/05-history-of-feminist-literary-criticism_gill-plain-and-sus.pdf

CBCS UG SYLLABUS Sem 5

Core 11

Modern European Drama

The aim of this paper is to introduce the students to the best of experimental and innovative dramatic literature of modern Europe.

Unit 1: Politics, social change and the stage; text and performance; European Drama: Realism and Beyond; Tragedy and Heroism in Modern European Drama; The Theatre of the Absurd

Unit 2: Henrik Ibsen: *Ghosts* OR August Strindberg: *Miss Julie*

Unit 3: Luigi Pirandello: *Six Characters in Search of an Author* OR Heiner Müller: *Hamletmachine*

Unit 4: Eugene Ionesco: *Chairs* OR Jean Genet: *The Maids*

Unit 5: Samuel Beckett: *Waiting for Godot* OR Bertolt Brecht: *The Good Woman of Szechuan*

Web Resources

- *Hamletmachine*: <http://theater.augent.be/file/13>
- Pirandello: <http://www.eldritchpress.org/lp/six.htm>
- Ionesco: <http://www.kkworld.com/kitablar/ejen-ionesko-kergedan-eng.pdf>
- Genet: <http://web.mit.edu/jscheib/Public/phf/themaids.pdf>
- Ibsen: <http://www.gutenberg.org/files/8121/8121-h/8121-h.htm>
- Strindberg: <https://archive.org/details/missjulieotherpl00striiala>

Suggested Reading:

1. Constantin Stanislavski, *An Actor Prepares*, Chap. 8, 'Faith and the Sense of Truth', tr. Elizabeth Reynolds Hapgood (Harmondsworth: Penguin, 1967) sections 1,2, 7,8,9, pp. 121-5, 137-46.
2. Bertolt Brecht, 'The Street Scene', 'Theatre for Pleasure or Theatre for Instruction', and 'Dramatic Theatre vs Epic Theatre', in *Brecht on Theatre: The Development of an Aesthetic*, ed. And tr. John Willet (London: Methuen, 1992) pp.68-76, 121-8.
3. George Steiner, 'On Modern Tragedy', in *The Death of Tragedy* (London: Faber, 1995) pp. 303- 24.
4. Raymond Williams, "Tragedy and Revolution" in *Modern Tragedy*, Rvsd Ed (London: Verso, 1979) pp. 61-84.
5. Jean Genet, Reflections on Theatre (London:Faber & Faber) Chapter 2: "The Strange World Urb..." pp. 63-74.

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Core 12

Indian Classical Literature

This paper aims at creating awareness among the students of the rich and diverse literary culture of ancient India.

Unit 1: Vedic Literature

1. *Samjnana Sukta* Rig Veda X.19
2. *Sivasankalpa Sukta* Yajur Veda XXX.I.6
3. *Purusha Sukta* Yajur Veda XV.XXXI. 1-16

References: The New Vedic Selection Vol 1, Telang and Chaubey, Bharatiya Vidya Prakashan, New Delhi

Unit 2: Selections from Epic Lit.

Vyasa 'The Dicing' and 'The Sequel to Dicing,' 'The Book of the Assembly Hall', 'The Temptation of Karna', Book V 'The Book of Effort', in *The Mahabharata*: tr. And ed. J.A.B. van Buitenen (Chicago: Brill, 1975) pp. 106-69 OR 'Ayodhya Kanda' (Book II), 1st Canto—The Ramayana of Valmiki. Gita Press Edition.

Unit 3: Sanskrit Drama

Kalidasa, *Abhijnanasakuntalam*, Act IV, tr. M.R Kale, Motilal Banarasi Dass, New Delhi OR Bhavabhuti's *Rama's Last Act (Uttararamacharita)* tr. Sheldon Pollock (New York: Clay Sanskrit Library, 2007)

Unit 4: Sanskrit Drama

Mrcchakatika by Sudraka, Act I, tr. M.M. Ramachandra Kale (New Delhi: Motilal Banarasi Dass, 1962)

Unit 5: Aesthetics and Maxims

- Bharata's *Natyasastra*, Chapter VI on Rasa theory References- English Translation by M.M. Ghosh, Asiatic Society, Kolkata, 1950
- *Sahitya Darpana* of Vishvanatha Kaviraja Chaps-I & II References- English Translation by P.V. Kane, Motilal Banarsi Dass, N Delhi
- Nitisataka of Bhartrhari 20 verses from the beginning References- The Satakatraya edited by D.D. Kosambi, Published in Anandashrama Series, 127, Poona, 1945. Also English Translation published from Ramakrishna Mission, Kolkata

Suggested Reading:

- Kalidasa. Critical Edition, Sahitya Akademi
- B.B Choubey, New Vedic Selection, Vol 1, Bharatiya Vidya Prakashan, New Delhi
- H.H.Wilson (Tr.)- *Rig Veda*
- Bharata, *Natyashastra*, tr. Manomohan Ghosh, vol.I, 2 nd edn (Calcutta: Granthalaya, 1967) chap. 6: 'Sentiments', pp. 100–18.
- J.A.B.Van Buitenen, 'Dharma and Moksa', in Roy W. Perrett, ed., *Indian Philosophy*, vol. V, *Theory of Value: A Collection of Readings* (New York: Garland, 2000) pp.33–40.
- Vinay Dharwadkar, 'Orientalism and the Study of Indian Literature', in *Orientalism and the Postcolonial Predicament: Perspectives on South Asia*, ed. Carol A. Breckenridge and Peter van der Veer (New Delhi: OUP, 1994) pp. 158–95
- *Universals of Poetics* by Haldhar Panda

CBCS UG SYLLABUS Sem 6

Core 13

Postcolonial Literature

This paper seeks to introduce the students to postcolonial literature—a body of literature that responds to the discourses of European colonialism and empire in Asia, Africa, Middle East, the Pacific and elsewhere. By focusing on representative texts situated in a variety of locations, the paper aims to provide the students with the opportunity to think through and understand the layered response – compliance, resistance, mimicry and subversion - that colonial power has provoked from the nations in their search for a literature of their own.

Unit 1: Concept

- Definition and characteristics: Resistant descriptions, appropriation of the colonizer's language, reworking colonial art forms & etc.
- Scope and Concerns: Reclaiming spaces and places, asserting cultural integrity, revising history

Prescribed Reading:

Achebe, Chinua "An image of Africa: Racism in Joseph Conrad's *Heart of Darkness*," *Research in*

Unit 2: Indian

Raja Rao: *Kanthapura* OR R K Narayan: *The English Teacher*

Unit 3: Caribbean and African

V S Naipaul: *The Mimic Men* OR Chinua Achebe: *No Longer at Ease*

Unit 4: South African

Nadine Gordimer: *July's People* OR J M Coetzee: *Life & Times of Michael K*

Unit 5: Criticism

Chinua Achebe: "English and the African Writer" and
Ngugi wa Thiong'o: "The Quest for Relevance" from *Decolonising the Mind: The Politics of Language in African Literature*

Web Resources

- Achebe, Chinua "An image of Africa: Racism in Joseph Conrad's Heart of Darkness," *Research in African Literatures, Vol. 9, No.1, Special Issue on Literary Criticism. (Spring, 1978), pp. 1-15.* <http://english.gradstudies.yorku.ca/files/2013/06/achebe-chinua.pdf>
- Achebe, Chinua: "English and the African Writer"
<https://mrvenglish.wikispaces.com/file/view/English+and+the+African+Writer.pdf>
- Thiong'o, Ngugi Wa. "The Quest for Relevance" from *Decolonising the Mind: The Politics of Language in African Literature*
https://www.humanities.uci.edu/critical/pdf/Wellek_Readings_Ngugi_Quest_for_Relevance.pdf
- Ashcroft, Bill, Gareth Griffiths, Helen Tiffin. *Post-Colonial Studies: The Key Concepts*. New York: Routledge. 2007.

Suggested Reading:

- Ashcroft, Bill, Gareth Griffiths, Helen Tiffin. "Introduction", *The Empire Writes Back: Theory and Practice in Post-Colonial Literature*. London, New York: Routledge, 2nd edition, 2002.
- Bhabha, Homi K. *The Location of Culture*. Noida: Atlantic Books. 2012.
- Gandhi, Leela. *Postcolonial Theory: An Introduction*. OUP. 1998.
- Said, Edward. *Orientalism*. India: Penguin. 2001.
- Spivak, Gayatri Chakraborty. *Can the Subaltern Speak?*. UK: Macmillan.1998
<http://planetarities.web.unc.edu/files/2015/01/spivak-subaltern-speak.pdf>

Core 14

Popular Literature

This paper seeks to introduce the students to genres such as romance, detective fiction, campus fiction, fantasy/mythology, which have a “mass” appeal, and can help us gain a better understanding of the popular roots of literature.

Unit 1: Introduction to the concept

- What is popular literature?
- Debate between popular and high cultures ('high brow' v/s 'low brow')
- What is Genre fiction?
- Debate between genre fiction and literary

fiction

Essays for discussion:

- Lev Grossman: “Literary Revolution in the Supermarket Aisle: Genre Fiction is Disruptive Technology”
<http://entertainment.time.com/2012/05/23/genre-fiction-is-disruptive-technology/>
- Arthur Krystal: “Easy Writers: Guilty pleasures without guilt”
<http://www.newyorker.com/magazine/2012/05/28/easy-writers>
- Joshua Rothman: “A Better Way to Think About the Genre Debate”
<http://www.newyorker.com/books/joshua-rothman/better-way-think-genre-debate>

Stephen Marche: How Genre Fiction Became More Important than Literary Fiction”

<http://www.esquire.com/entertainment/books/a33599/genre-fiction-vs-literary-fiction/>Midterm:

Unit 2: Detective Fiction

Sherlock Holmes: *The Hound of the Baskervilles* OR Agatha Christie: *Murder on the Orient Express*

Unit 3: Romance

Shobha De: *Socialite Evenings* OR Nicholas Sparks: *The Notebook*

Unit 4: Campus Fiction

Chetan Bhagat: *Five Point Someone* OR David Lodge: *Small World: An Academic Romance*

Unit 5: Rewriting Mythology

Amish Tripathi: *The Immortals of Meluha* OR Anuja Chandramouli: *Arjuna: Saga of a Pandava Warrior-Prince*

Suggested Reading

- Leslie Fiedler, *What was Literature? Class, Culture and Mass Society*
- Leo Lowenthal, *Literature, Popular Culture and Society*
- *Popular Fiction: Essays in Literature and History* by Peter Humm, Paul Stigant, Peter Widdowson

CBCS UG SYLLABUS SEM 5

Discipline Specific Course

1. Literary Theory

Objective

The development of theory in the last half-century or more is a fact of critical importance in the academic study of literature. Far from being seen as a parasite on the text, theory has been seen as a discourse that provides the conceptual framework for literature. This paper aims to give the students a firm grounding in a major methodological aspect of literary studies known as theory.

Starred texts are to be taught. Questions with alternatives are also to be set from these

texts. Unit 1: Overview

- Crisis in literary criticism and the search for a method
- Rise of theory
- What does it mean to theorise?

Unit 2: New Criticism and Formalism: with an emphasis on the main critical concepts of NC such as paradox, irony, tension, intentional and affective fallacy, heresy of paraphrase and of Formalism such as ostranenie, literariness, foregrounding, dominant and deviant

- *Cleanth Brooks, "The Language of Paradox" Or W.K. Wimsatt Jr. and Monroe Beardsley, "The Intentional Fallacy"
- *Viktor Shklovsky, "Art as Device" Or Roman Jakobson, "Linguistics and Poetics"

Unit 3: Structuralism and Poststructuralism: with an emphasis on the main critical concepts of Structuralism such as binary opposition, synchrony and diachrony, syntagm and paradigm and of Poststructuralism such as collapse of the binary, difference, mise-en-abym, erasure

- *Gerard Genette, "Introduction" to *Narrative Discourse*
(https://archive.org/stream/NarrativeDiscourseAnEssayInMethod/NarrativeDiscourse-AnEssayInMethod_djvu.txt) Or Roland Barthes, "Face of Garbo" and "French Fries" (from *Mythologies*)
- Jacques Derrida, "On the Idea of the Supplement" (from *Of Grammatology*) Or Michel Foucault, "What is an Author?"
(<http://artsites.ucsc.edu/faculty/Gustafson/FILM%20162.W10/readings/foucault.author.pdf>) (Either of the two essays can be taught depending on availability)

Unit 4: Marxism and New Historicism: with an emphasis on main critical concepts of Marxism such as base, superstructure, ideology, commodification, determination and of New Historicism such as power, resistance, high-low dialectic

- *Louis Althusser, "Letters on Art" (from *Lenin and Philosophy and Other Essays*) Or Georg Lukacs, "On Reification" (from *History and Class Consciousness*)
- Raymond Williams, "In Memory of Lucien Goldman" Or Stephen Greenblatt, "Learning to Curse" (Either of the two essays can be taught depending on availability)

Unit 5: Eco-criticism and Eco-feminism: with an emphasis on main critical concepts of Ecology as environment, balance, food chain and of Eco-feminism as body and its colonisation, patriarchy, woman as a creative principle in harmony with nature

- *Rachel Carson, "A Fable for Tomorrow" and "The Obligation to Endure" (from *Silent Spring* ([http://library.uniteddiversity.coop/More Books and Reports/Silent Spring-Rachel Carson-1962.pdf](http://library.uniteddiversity.coop/More_Books_and_Reports/Silent_Spring-Rachel_Carson-1962.pdf)))
- *Mack-Canty, Colleen, "Third-Wave Feminism and the Need to Reweave the Nature/Culture Duality." *NWSA Journal* 16, no. 3 (2004): 154-179 (from [JSTOR Arts & Sciences VI](#))

Suggested Reading:

Terry Eagleton, *Literary Theory: An Introduction for Foreign Students*

David Robey and Anne Jefferson, *Modern Literary*

Theory Jonathan Culler, *Literary Theory: A Very Short*

Introduction Richard Barry, *Beginning Theory*

Tony Bennett, *Formalism and Marxism*

Terence Hawkes, *Structuralism and Semiotics*

Christopher Norris, *Deconstruction: Theory and*

Practice Veese H. Aram (ed), *The New Historicism*

Reader

Greg Gerrard, *Eco-Criticism*

Discipline Specific Course

2: Reading World Literature

This paper proposes to introduce the students to the study of world literature through a representative selection of texts from around the world. The idea is to read beyond the classic European canon by including defining literary texts from other major regions/countries—except the United States of America—written in languages other than English, but made available to the readers in English translation.

Unit 1: Concept

- The idea of world literature: Scope and definition
- Uses of reading world literature

Unit 2: European

Albert Camus *The Outsider*

OR

Fyodor Dostoevsky *Notes from Underground*

Unit 3: Caribbean and African

V S Naipaul *In a Free State*

OR

Chimamanda Ngozi Adichie *Purple Hibiscus*

Unit 4: Canadian Short Fiction

Margaret Atwood *Stone Mattress* & *Pretend Blood*

OR

Alice Munro *The Bear Came Over the Mountain* & *Face*

Unit 5: Latin American Poetry

Pablo Neruda "Death Alone", "Furies and Suffering", "There's no Forgetting", "Memory"

OR

Octavio Paz "from San Ildefonso Nocturne", "Between Going and Staying the Day
Wavers", "Humayun's Tomb", "Motion"

Web Resources:

- The Complete Stories by Franz Kafka
http://www.vanderbilt.edu/olli/class-materials/Franz_Kafka.pdf
- What is world Literature? (Introduction) David Damrosch
<http://press.princeton.edu/chapters/i7545.html>
- Tagore's comparative world literature
https://www.academia.edu/4630860/Rabindranath_Tagores_Comparative_World

Literature

- Dostoevsky's *Notes from Underground* <http://www.gutenberg.org/files/600/600-h/600-h.htm>
- Margaret Atwood's *Stone Mattress* <http://www.newyorker.com/magazine/2011/12/19/stone-mattress>
- Margaret Atwood's *Pretend Blood* <http://www.independent.co.uk/arts-entertainment/books/features/first-lives-club-pretend-blood-a-short-story-by-margaret-atwood-1779529.html>
- Alice Munro's short Stories <http://www.newyorker.com/magazine/2013/10/21/the-bear-came-over-the-mountain-2>, <http://www.newyorker.com/magazine/2008/09/08/face>
- Poems of Octavio Paz http://www.poetrysoup.com/famous/poems/best/octavio_paz

Suggested Reading:

- *Weltliteratur*: John Wolfgang von Goethe in *Essays on Art and Literature* Goethe : The Collected Works Vol.3
- Rabindranath Tagore "World Literature": *Selected Writings On Literature and Language: Rabindranath Tagore* Ed. Sisir Kumar Das and Sukanta Chaudhuri Damrosch
- Goethe's "World Literature Paradigm and Contemporary Cultural Globalization" by John Pizer "Something Will Happen to You Who Read": Adrienne Rich, Eavan Boland' by Victor Luftig .JSTOR iv. *Comparative Literature* University of Oregon.
- David Damrosch, *What is World Literature?* Princeton University Press
- "WLT and the Essay" *World Literature Today* Vol. 74, No. 3, 2000. JSTOR Irish University Review, Vol.23 Spring 1, Spring-Summer.

CBCS UG SYLLABUS SEM 6

Discipline Specific Course

3: Research Methodology

Research methodology is a discipline specific course pitched at a higher level than the generic academic preparatory courses. Research is at the core of every university course starting from the UG to the PhD level. This course is designed to develop the fundamentals of research from creating a questioning mechanism in the students' minds leading up to writing research papers and dissertations. Students learn the methodological issues imperative for conducting research and for research documentation. The course also aims to train students in the essentials of academic and research writing skills.

Unit 1 Research and the Initial Issues

- Research as systematic investigation
- Searching for and locating research questions; Finding the general background about research problem/question: review of existing literature and applicable

theories

- Refining the research problem/question; formulating its rationale and objectives
- Writing a research synopsis

Unit 2 Literature review

- Selecting review areas based on the research objectives
- Primary, secondary and tertiary sources, and related theory/s (sources: library, databases, online sources, previous research, archives, media, social/psychological/political/educational contexts, and such others)
- Gathering, reading and analysing literature and related theory
- Writing the review with implications for the research question selected

Unit 3 Hypotheses and formulation of research design

- Formulating hypotheses based on research objectives
- Formulation of research design: qualitative, quantitative, combinatory; steps in research design Theory application
- Data collection tools: surveys, questionnaires, interviews, observation checklists, review checklists, comparison tools, text analysis tools
- Data analysis and interpretation

Unit 4 Results and documentation

- Preparing tables, charts, and graphs to present data; Collating the findings
- Testing hypotheses; Generalisation of results
- Writing a dissertation; MLA/APA citation: in-text and works cited pages
- Plagiarism and related problems

Unit 5 Practical (for Internal Assessment)

Students will write i. literature review of 1000 words on a research question and ii. a book review of 500 words.

Texts prescribed

- i. K Samantray, *Academic and Research Writing*. Orient Blackswan (2015)
- ii. Kothari & Garg, *Research Methodology*. New Age Publishers
- iii. Deepak Chawla & Neena Sondhi. *Research methodology: Concepts & Cases*. Vikas Publishing

Generic Elective

Academic Writing and Composition

This is a generic academic preparatory course designed to develop the students' writing skills from basic to academic and research purposes. The aim of this course is to prepare students to succeed in complex academic tasks in writing along with an improvement in vocabulary and syntax.

Unit 1 Instruments of writing I

- Vocabulary development: synonyms and antonyms; words used as different parts of speech; vocabulary typical to 'science' and 'commerce'
- Collocation; effective use of vocabulary in context

Unit 2 Instruments of writing II

- Syntax: word order; subject-predicate; subject-verb agreement; simple, complex, compound, compound-complex sentences; structure and uses of active and passive sentences
- Common errors in Indian writing

Unit 3 Academic writing I

- What is academic writing?
- The formal academic writing process: the 'what' and the 'how' of writing; use of cohesive and transitional devices in short and extended pieces of writing

Unit 4 Academic writing II

- Paragraph writing: topic sentence, appropriate paragraph development ; expository, descriptive, narrative and argumentative paragraphs
- Extended pieces of writing: process development using comparison-contrast, cause and effect, argumentation, and persuasion

Unit 5 Project writing: (writing projects)

- What's a Project: reading-based, field work-based project : how to pick a topic for the project; background reading
- Structure of a Project: Title, aim of the project (a short statement), other objectives if any, significance of the Project : why is the project being undertaken, sources/books to be consulted for the study, method: Is it quantitative (field work) or qualitative (text-related), analysis/interpretation, findings, conclusion

Texts prescribed

1. K Samantray, *Academic and Research Writing: A Course for Undergraduates*, Orient

- BlackSwan
2. Leo Jones (1998) *Cambridge Advanced English: Student's Book* New Delhi: CUP
 3. Stanley Fish (2011) *How to Write a Sentence*

CBCS UG SYLLABUS SEM 2-GE 2

Generic Elective

Modern Indian Literature

The paper aims at introducing students to the richness and diversity of modern Indian literature written in many languages and translated into English.

Unit-I Historical Overview

Background, definition of the subject and historical perspectives will be covered.

Unit-II The Modern Indian Novel

Fakir Mohan Senapati: *Six Acres and a Third* Or U. R. Ananthamurthy: *Sanskara*

Unit-III The Modern Indian Short Story

Selected stories by Fakir Mohan Senapati: "Rebati", Rabindra Nath Tagore: "Post Master" Premchand: "The Shroud", Ishmat Chughtai: "Lihaaf"

Unit-IV Modern Indian Life Writing

Excerpts from M.K. Gandhi's *Story of My Experiments with Truth* (First two chapters), Amrita Pritam's *The Revenue Stamp* (first two chapters), *Autobiography* by Rajendra Prasad (chapter six & seven)

Unit-V The Modern Indian Essay

- A. K. Ramanujan "Is there an Indian Way of Thinking? An Informal Essay" *Collected Essays*, OUP, 2013
- "Decolonising the Indian Mind" by Namwar Singh. Tr. Harish Trivedi *Indian Literature*, Vol. 35, No. 5 (151) (Sept.-Oct., 1992), pp. 145-156
- G. N. Devy's introduction to *After Amnesia*, pp. 1-5, *The G. N. Devy Reader*, Orient BlackSwan, 2009.

Suggested Readings:

1. Sisir Kumar Das, *History of Indian Literature 1910–1956, Triumph and Tragedy*, Sahitya Akademi, New Delhi, 2000
2. Amit Chaudhuri, *The Vintage Book of Modern Indian Literature*, 2004
3. M.K. Naik, *A History of Indian English Literature*, Sahitya Akademi, 2004

Generic Elective

Language, Literature and Culture

This is a broad-based course that aims to encourage students to be knowledgeable and inquiring into the nature of language, nature of literature and the role of culture in both. The course introduces students to how language is special for humans, and how literature and culture make human beings caring. There is a strong emphasis here on encouraging students to develop intercultural understanding, open-mindedness, and the attitudes necessary for them to respect and evaluate a range of points of view.

Unit 1 Language

- Nature of language
- Functions of language : transactional, informative, interactional

(use these terms under each category above: Instrumental language, Regulatory Language, Interactional Language, Personal Language, imaginative Language, Heuristic Language, Informative Language)

Unit 2 Language and Literature 1

- Literature and its language
- Literary terms, Figures of speech used in literature: simile, metaphor, metonymy, irony, paradox, synecdoche, oxymoron

Unit 3 Language and Literature 2

- Language used in poetry, fiction and non-fiction
- Text analysis

Unit 4 Language and culture 1

- Culture, its implications and interpretations
- Transmission of culture through language: Culture and society

Unit 5 Language and Culture 2

- Intercultural and cross-cultural communications
- Analysis and applications

Suggested Reading

- Kalyani Samantray, *Pragmatics* (E-Pathsala)
- Bibhudendra Narayan Patnaik & Kalyani Samantray, *Cross-Cultural and Intercultural Communications* ((E-Pathsala)
- Brown, G & Yule, G. *Discourse Analysis*. CUP
- **Scaglia, B (ed.)** *Language, Understood: Examining the Linguistics of Discourse*

Analysis and Studies. Webster's Digital Service.

- **Culture and language**
- <http://www2.lib.nifs-k.ac.jp/HPBU/annals/an46/46-11.pdf>
- <http://barthimeous.blogspot.in/2011/03/relationship-between-culture-and.html>
- *Companion to Literary Forms* by Padmaja Ashok, Orient BlackSwan. 2015
- *Literature and Language* (ed.) Loveleen Mohan, Randep Rana, Jaibir S. Hooda. Orient BlackSwan.

CBCS UG SYLLABUS SEM 4-GE 4

Generic Elective

Language and Linguistics

Unit 1: Language and Human Language

- Nature and features of Human language ; language and human communication; differences from other forms of communications
- Artificial intelligence and human language

Unit 2 :Linguistics and Language 1

- What is linguistics; development in the history of linguistic studies; contribution of linguistics to other areas of human inquiry
- Linguistics for jobs

Unit 3 :Linguistics and Language 2

- Phonetics and accuracy in pronunciation
- Fluency and contextual speaking

Unit 4 :Linguistics and Language 3

- Morphology and Nature of words
- Word formation processes

Unit 5: Linguistics and Language 4

- Nature of sentences and connected texts; syntax and discourse
- Language and meaning: semantics

Recommended reading

- i. *A Course in Linguistics*. Tarni Prasad. PHI
- ii. *Linguistics: A very short introduction*. P H

Mathews.OUP

Skill Enhancement Compulsory Course

2. SEC 1 (English Communication)
3. SEC 2
 - A. Soft Skills OR
 - B. Translation and Principles of Translation

SEC 1: Skill Enhancement Compulsory Course

for Arts Semester 1

Paper: 1 Marks: 100 Credits: 04

The purpose of this course is twofold: to train students in communication skills and to help develop in them a facility for communicative English.

Since language is which binds society together and serves as a crucial medium of interaction as well as interchange of ideas and thoughts, it is important that students develop a capacity for clear and effective communication, spoken and written, at a relatively young age. The need has become even more urgent in an era of globalization and the increasing social and cultural diversity that comes with it.

English, being a global language par excellence, it is important that any course in communication is tied to an English proficiency programme. The present course will seek to create academic and social English competencies in speaking, listening, arguing, enunciation, reading, writing and interpreting, grammar and usage, vocabulary, syntax, and rhetorical patterns.

Students, at the end of the course, should be able to unlock the communicator in them by using English appropriately and with confidence for further studies or in professional spheres where English is the indispensable tool of communication.

Unit-1:

[20]

Introduction

1. What is communication?
2. Types of communication
 - Horizontal
 - Vertical
 - Interpersonal
 - Grapevine

3. Uses of Communication

Prescribed Reading: Chapter 1 *Applying Communication Theory for Professional Life: A Practical Introduction* by Dainton and Zelle

http://tsime.uz.ac.zw/claroline/backends/download.php?url=L0ludHJvX3RvX2NvbW11bmljYXRpb25fVGhlb3J5L_nBkZg%3D%3D&cidReset=true&cidReq=MBA563

Unit-2: Language of Communication [20]

1. Verbal: spoken and written

2. Non-verbal

- Proxemics
- Kinesics
- Haptics
- Chronemics
- Paralinguistics

3. Barriers to communication

4. Communicative English

Unit-3: Reading Comprehension [20]

- Locate and remember the most important points in the reading
- Interpret and evaluate events, ideas, and information
- Read “between the lines” to understand underlying meanings
- Connect information to what they already know

Unit-4: Writing [20]

- Expanding an Idea
- Note Making
- Information Transfer
- Writing a Memo
- Writing Formal Email
- Writing a Business Letter
- Letters to the Editor
- CV & Resume Writing
- Covering Letter
- Report Writing
- News Story
- Interviewing for news papers

(The above-mentioned writing activities are covered in the prescribed textbook *Vistas and Visions*)

Unit 5: Language functions in listening and conversation [20]

- Discussion on a given topic in pairs
- Speaking on a given topic individually
- Group Discussion
- Interview
- Dialogue

(Practice to be given using the set pieces from the prescribed textbook *Vistas and Visions*)

Grammar and Usage

1. Phrasal Verbs
2. Collocation
3. Using Modals
4. Use of Prepositions
5. Common Errors in English Usage

(The above-mentioned grammar items are covered in the textbook *Vistas and Visions*)

Grammar questions must be set in contexts; not as isolated sentences as used for practice in the prescribed textbook.

Book Prescribed:

Vistas and Visions: An Anthology of Prose and Poetry. (Ed.) Kalyani Samantray, Himansu S. Mohapatra, Jatindra K. Nayak, Gopa Ranjan Mishra, Arun Kumar Mohanty. OBS

Texts to be

studied Prose

- Decoding Newspapers
- Pleasures of Ignorance
- Playing the English Gentleman
- Lifestyle English
- A Cup of Tea

Poetry

- Last Sonnet
- Sonnet 46 (Shakespeare)
- Pigeons
- Miracles

All grammar and writing activities in the textbook *Vistas and Visions*

Recommended Reading:

Fluency in English – Part II, OUP, 2006

Business English, Pearson, 2008

Communicative English. E. Suresh Kumar and P. Sreehari

Break Free: Unlock the Powerful Communicator in You. Rajesh, V. Rupa, 2015

Soft Skills Shalini Verma, 2009.

Language, Literature and Creativity, Orient BlackSwan, 2013

Skill Enhancement Compulsory Course for Science

Semester 1

Paper: 1 Marks: 100 Credits: 04

The purpose of this course is twofold: to train students in communication skills and to help develop in them a facility for communicative English.

Since language it is which binds society together and serves as a crucial medium of interaction as well as interchange of ideas and thoughts, it is important that students develop a capacity for clear and effective communication, spoken and written, at a relatively young age. The need has become even more urgent in an era of globalization and the increasing social and cultural diversity that comes with it.

English, being a global language par excellence, it is important that any course in communication is tied to an English proficiency programme. The present course will seek to create academic and social English competencies in speaking, listening, arguing, enunciation, reading, writing and interpreting, grammar and usage, vocabulary, syntax, and rhetorical patterns.

Students, at the end of the course, should be able to unlock the communicator in them by using English appropriately and with confidence for further studies or in professional spheres where English is the indispensable tool of communication.

Unit 1

[20]

Introduction

1. What is communication?
2. Types of communication
 - Horizontal
 - Vertical
 - Interpersonal
 - Grapevine
3. Uses of Communication

Prescribed Reading: Chapter 1 *Applying Communication Theory for Professional Life: A Practical Introduction* by Dainton and Zellely

<http://tsime.uz.ac.zw/claroline/backends/download.php?url=L0ludHJvX3RvX2NvbW11bmljYXR>

Unit-2

[20]

Language of Communication

1. Verbal: spoken and written
2. Non-verbal
 - Proxemics
 - Kinesics
 - Haptics
 - Chronemics
 - Paralinguistics
3. Barriers to communication
4. Communicative English

Unit-3

[20]

Reading Comprehension

- Locate and remember the most important points in the reading
- Interpret and evaluate events, ideas, and information
- Read “between the lines” to understand underlying meanings
- Connect information to what they already know

Unit 4

[20]

Writing

- Expanding an Idea
- Note Making
- Information Transfer
- Writing a Memo
- Writing Formal Email
- Writing a Business Letter
- Letters to the Editor
- CV & Resume Writing
- Covering Letter
- Report Writing
- News Story
- Interviewing for news papers

(The above-mentioned writing activities are covered in the prescribed textbook *Vistas and Visions*)

Unit 5: Language functions in listening and conversation

[20]

1. Discussion on a given topic in pairs
2. Speaking on a given topic individually

3. Group Discussion
4. Interview
5. Dialogue

(Practice to be given using the set pieces from the prescribed textbook *Vistas and Visions*)

Grammar and Usage

1. Phrasal Verbs
2. Collocation
3. Using Modals
4. Use of Prepositions
5. Common Errors in English Usage

(The above-mentioned grammar items are covered in the textbook *Vistas and Visions*)

Book Prescribed:

Vistas and Visions: An Anthology of Prose and Poetry. (Ed.) Kalyani Samantray, Himansu S. Mohapatra, Jatindra K. Nayak, Gopa Ranjan Mishra, Arun Kumar Mohanty. OBS

Texts to be

studied Prose

- The Gold Frame
- Lifestyle English
- Need for Excellence
- Ecology and Community
- My Lost Dollar

Poetry

- The Darkling Thrush
- The Felling of the Banyan Tree
- Another Woman
- Meeting Poets

All grammar and writing activities in the textbook *Vistas and Visions*

Recommended Reading:

Fluency in English – Part II, OUP, 2006

Business English, Pearson, 2008

Communicative English. E. Suresh Kumar and P. Sreehari

Break Free: Unlock the Powerful Communicator in You. Rajesh, V. Rupa, 2015

Soft Skills Shalini Verma, 2009.

Language, Literature and Creativity, Orient BlackSwan, 2013

Language through Literature. (forthcoming) ed. Gauri Mishra, Dr. Ranajan Kaul, Dr. Brati Biswas

SEC 1

Skill Enhancement Compulsory Course for

Commerce Semester 1

Paper: 1 Marks: 100 Credits: 04

The purpose of this course is twofold: to train students in communication skills and to help develop in them a facility for communicative English.

Since language is which binds society together and serves as a crucial medium of interaction as well as interchange of ideas and thoughts, it is important that students develop a capacity for clear and effective communication, spoken and written, at a relatively young age. The need has become even more urgent in an era of globalization and the increasing social and cultural diversity that comes with it.

English, being a global language par excellence, it is important that any course in communication is tied to an English proficiency programme. The present course will seek to create academic and social English competencies in speaking, listening, arguing, enunciation, reading, writing and interpreting, grammar and usage, vocabulary, syntax, and rhetorical patterns.

Students, at the end of the course, should be able to unlock the communicator in them by using English appropriately and with confidence for further studies or in professional spheres where English is the indispensable tool of communication.

Unit 1

[20]

Introduction

1. What is communication?
2. Types of communication
 - Horizontal
 - Vertical
 - Interpersonal
 - Grapevine
3. Uses of Communication

Prescribed Reading: Chapter 1 *Applying Communication Theory for Professional Life: A Practical Introduction*

by Dainton and Zelle

<http://tsime.uz.ac.zw/claroline/backends/download.php?url=L0ludHJvX3RvX2NvbW11bmljYXRpb25fv>

Unit 2 [20]

Language of Communication

1. Verbal: spoken and written
2. Non-verbal
 - Proxemics
 - Kinesics
 - Haptics
 - Chronemics
 - Paralinguistics
3. Barriers to communication
4. Communicative English

Unit--3

[20]

Reading Comprehension

- Locate and remember the most important points in the reading
- Interpret and evaluate events, ideas, and information
- Read “between the lines” to understand underlying meanings
- Connect information to what they already know

Unit 4

[20]

Writing

- Expanding an Idea
- Note Making
- Information Transfer
- Writing a Memo
- Writing Formal Email
- Writing a Business Letter
- Letters to the Editor
- CV & Resume Writing
- Covering Letter
- Report Writing
- News Story
- Interviewing for news papers

(The above-mentioned writing activities are covered in the prescribed textbook *Vistas and Visions*)

Unit 5: Language functions in listening and conversation

[20]

1. Discussion on a given topic in pairs

2. Speaking on a given topic individually
3. Group Discussion
4. Interview
5. Dialogue

(Practice to be given using set pieces from the prescribed textbook *Vistas and Visions*)

Grammar and Usage

1. Phrasal Verbs
2. Collocation
3. Using Modals
4. Use of Prepositions
5. Common Errors in English Usage

(The above-mentioned grammar items are covered in the textbook *Vistas and Visions*)

Grammar questions must be set in contexts; not as isolated sentences as used for practice in the prescribed textbook.

Book Prescribed:

Vistas and Visions: An Anthology of Prose and Poetry. (Ed.) Kalyani Samantray, Himansu S. Mohapatra, Jatindra K. Nayak, Gopa Ranjan Mishra, Arun Kumar Mohanty. OBS

Texts to be

studied Prose

The Last Leaf

- Need for Excellence
- How Wealth Accumulates and Men Decay
- Values in Life
- Lifestyle English

Poetry

- Hidden Flame
- One Day I wrote Her Name
- The Darkling Thrush
- Meeting Poets

All grammar and writing activities in the textbook *Vistas and Visions*

Recommended Reading:

Fluency in English – Part II, OUP, 2006

Business English, Pearson, 2008

Communicative English. E. Suresh Kumar and P. Sreehari

Break Free: Unlock the Powerful Communicator in You. Rajesh, V. Rupa, 2015

Soft Skills Shalini Verma, 2009.

Language, Literature and Creativity, Orient BlackSwan, 2013

Language through Literature. (forthcoming) ed. Gauri Mishra, Dr. Ranajan Kaul, Dr. Brati Biswas

Skill Enhancement Course Credits: 4

Marks: 100

1. Soft Skills

Soft skills are 'people skills' that include communication skills, work ethic, positive attitude, emotional intelligence and other personal attributes crucial for success in business or career. Soft skills can be learnt and practiced for personal fulfillment and progress in career. This course provides the soft skills required mainly for professional achievements, and in the process, many of the personal requirements of an individual can be compiled with.

Unit 1

Soft skills and why they are important

What are soft skills?

Soft skills in communication; soft skills and intercultural communication

Unit 2

Soft skills in preparing for a career 1

Competency in verbal and written communication skills: active listening, interactive speaking, reading different types of texts, writing for formal and business contexts

Unit 3

Soft skills in preparing for a career 2

1. Using the Microsoft Office: word, excel, powerpoint; working online and offline; telephone and face-to-face etiquette in professional communication
2. Cross-Cultural etiquette: cultural awareness, cultural sensitivity, cultural flexibility, cross-cultural communication

Unit 4

Soft skills in getting jobs

CV Writing, writing job applications; GD Skills and interview taking skills; getting another job

Unit 5

Soft skills on the job

Emotional Intelligence; time and stress management; team work and net-working; presentation skills;

making meeting work: preparing, executing, following up; negotiation skills and crisis management

Prescribed Reading:

- i. Kalyani Samantray, Soft Skills for your Career, OUP
- ii. Himansu S. Mohapatra, Model of the Middle (Pieces to read: “ Our Literature Their Literature”, “ Life style English”, “Writing it Right”, “ The Vinglish way to English”)

Suggested Reading:

- i. Jayashri Mohanraj, Skill Sutras
- ii. Marian K Woodab, How to Communicate under Pressure

CBCS UG SYLLABUS SEM 4-SEC 2

Skill Enhancement Course Credits: 2

Marks: 50

2. Translation and Principles of Translation

This paper seeks to make students aware of a fundamental process of human communication which involves movement between languages. Known by the familiar term of translation, this process of transfer of meaning and values across language borders is as inevitable as it is problematic and challenging. The paper would acquaint students with the ‘what’, ‘why’ and ‘how’ of translation, approaches and problems of translation, and it would also sensitize them to the various ways of reading a translation.

Unit 1

What is Translation? Carrying across of meaning from source language to target language

Why Translation? Translation as a bridge, self –other interaction

Unit 2

Approaches to translation

- Domestication: Readability in the target language
- Foreignisation: Faithfulness to the source language text

Unit 3

How to Translate:

- sense translation based on difference (metaphrase), word-to-word translation based on

equivalence (paraphrase), regulated transformation (imitation)

- adaptation

Unit 4

Problems of translation

- Cultural gap
- Untranslatability
- Translation as appropriation of indigenous languages by English

Unit 5

How to read a translation:

Cultural difference and how to locate it, presence of the foreign in terms of cultural contexts and language

Text to be studied: *Rebati*, in *Bride Price and Other Stories* by Fakir Mohan Senapati, Rupa Publications.

Suggested Reading:

Translation Studies by Susan Basnett

“Found in Translation” Hamid Dabashi http://opinionator.blogs.nytimes.com/2013/07/28/found-in-translation/?_r=0

“Cultural Translation” by Harish Trivedi, “Translation and Globalization” by Paul St-Pierre from *Translation: Reflection, Refraction, Transformation*. Ed. Paul St-Pierre, Prafulla C Kar

**SYLLABUS FOR B.A. (HONORS) HISTORY UNDER
CHOICE BASED CREDIT SYSTEM OF UTKAL UNIVERSITY,
BHUBANESWAR**

Semester I

C.C.I: HISTORY OF INDIA- I

Unit-I: Reconstructing Ancient Indian History

- [1] Early Indian notions of History
- [2] Sources of Historical Writings
- [3] Historical Geography (Identification of Ancient historic sites and their importance)

Unit-II: Pre-historic hunter-gatherers

- [1] Paleolithic culture- Upper, Middle and Lower; Tool making habit
- [2] Mesolithic culture-New developments in technology and economy; rock art.

Unit-III: The advent of food production

Neolithic and Chalcolithic cultures:

- [1] Regional and chronological distribution
- [2] Settlements and Food Production

Unit-IV: The Harappan civilization

- [1] Origins; settlement patterns and town planning
- [2] Agrarian base; craft productions and trade
- [3] Social and political organization; religious beliefs and practices
- [4] Causes of Decline

Unit-V: Cultures in transition

- [1] Origin of the Aryans
- [2] Early Vedic Age- Society, Polity, Religion and Philosophy
- [3] Later Vedic Age- Social Stratification (Varna and Gender), Polity, Religion, Literature and Philosophy

Reading List:

- R.S. Sharma, India's Ancient Past, New Delhi, OUP, 2007
R. S. Sharma, Material Culture and Social Formations in Ancient India, 1983.
R.S. Sharma, Looking for the Aryas, Delhi, Orient
Longman Publishers,1995
D. P. Agrawal, The Archaeology of India, 1985
Bridget & F. Raymond Allchin, The Rise of Civilization in India and Pakistan, 1983.
A. L. Basham, The Wonder that Was India, 1971.
D. K. Chakrabarti, The Archaeology of Ancient Indian Cities, 1997,
Paperback.
D. K. Chakrabarti, The Oxford Companion to Indian Archaeology, New Delhi, 2006.
H. C. Raychaudhuri, Political History of Ancient India, Rev. ed. With Commentary by
B. N. Mukherjee, 1996
K. A. N. Sastri, ed., History of South India, OUP, 1966.
Upinder Singh, A History of Ancient and Early Medieval India, 2008.
Romila Thapar, Early India from the Beginnings to 1300, London,
2002.
Irfan Habib, A People's History-Vol.1, PreHistory, 2001,
----Vol.-2, Indus Civilization: Including Other Copper Age Cultures and

the History of Language Change till 155 B.C., 2002
Uma Chakravarti, The Social Dimensions of Early Buddhism. 1997.
Rajan Gurukul, Social Formations of Early South India, 2010.
R. Champakalakshmi, Trade, Ideology and urbanization: South India 300 BC- AD 1300, 1996.
Gregory L. Possehl, A Indus Civilization: The Contemporary Perspectives, New Delhi, Vistaar publications, 2002.

C.C.II: SOCIAL FORMATIONS AND CULTURAL PATTERNS OF THE ANCIENT WORLD

Unit-I: Evolution of humankind; Paleolithic and Mesolithic-cultures.

Unit-II: Neolithic Culture: Food production; beginnings of agriculture and animal husbandry

Unit-III: Bronze Age Civilizations: with reference to *any one* of the following: i) Egypt (Old

Kingdom); ii) Mesopotamia (Sumeria & Babylonia); iii) China (Shang); iv) Eastern Mediterranean (Minoan); economy, social stratification, state structure, religion.

Unit-IV: Nomadic groups in Central and West Asia; Advent of iron and its implications

Unit-V: Ancient Greece:

Agrarian economy, urbanization, trade and politics in Ancient Greece: Athens and Sparta; Greek Culture.

Reading List:

Burns and Ralph. World Civilizations.
Cambridge History of Africa, Vol. I.
I. Gordon Childe, What Happened in History.
G. Clark, World Prehistory: A New Perspective.
B. Fagan, People of the Earth.
Amar Farooqui, Early Social Formations.
M. I. Finley, The Ancient Economy.
Jacquetta Hawkes, First Civilizations.
G. Roux, Ancient Iraq.
Bai Shaoyi, An Outline History of China.
H. W. F. Saggs, The Greatness that was Babylon.
B. Trigger, Ancient Egypt: A Social History.
UNESCO Series: History of Mankind, Vols. I - III./ or New ed.
History of Humanity.
R. J. Wenke, Patterns in Prehistory.
G. E. M. Ste Croix, Class Struggles in the Ancient Greek World.
J. D. Bernal, Science in History, Vol. I.
V. Gordon Childe, Social Evolution.
Glyn Daniel, First Civilizations.
A. Hauser, A Social History of Art, Vol. I.

A.E.C.C-I: Environmental Science

(to be prepared by University)

GE-I: For non-History students, Minor-1

Semester II

C.C.III: HISTORY OF INDIA-II

Unit-I: Economy and Society (circa 300 BCE to circa CE 300):

- [1] Expansion of agrarian economy
- [2] Urban growth; craft production: trade and trade routes
- [3] Social stratification: class, Varna, jati, untouchability; gender; marriage and property relations

Unit-II: Changing political formations (circa 300 BCE to circa CE 300):

- [1] The Mauryan Empire: Chandragupta Maurya and Asoka-Conquest and Administration;
- [2] Post-Mauryan Polities with special reference to the Kushanas and the Satavahanas- Kaniska I and Gautamiputra Satakarni

Unit-III: Towards early medieval India [circa CE fourth century to CE 750]:

- [1] Gupta Age: Agrarian expansion, land grants, graded Land rights and peasantry
- [2] The problem of urban decline: patterns of trade, currency, and urban Settlements.
- [3] Varna, proliferation of *jatis*: changing norms of marriage and property.
- [4] The nature of polities: the Gupta empire and its contemporaries: post- Gupta polities – Pallavas, Chalukyas

Unit-IV: Religion, philosophy and society (circa 300 BCE- CE 750):

- (1) Consolidation of the brahmanical tradition: dharma, *Varnashram*, *Purusharthas*, *Samskaras*.
- (2) Theistic cults (from circa second century BC): Mahayana; the Puranic tradition.
- (3) The beginnings of Tantricism

Unit-V: Cultural developments (circa 300 BCE- CE 750):

- [1] A brief survey of Sanskrit, Pali, Prakrit and Tamil literature. Scientific and technical treatises
- [2] Art and architecture; Mauryan, post-Mauryan, Gupta, post-Gupta

Reading List:

- B. D. Chattopadhyaya, *The Making of Early Medieval India*, 1994.
- D. P. Chattopadhyaya, *History of Science and Technology in Ancient India*, 1986.
- D. D. Kosambi, *An Introduction to the Study of Indian History*, 1975.
- S. K. Maity, *Economic Life in Northern India in the Gupta Period*, 1970.
- B. P. Sahu (ed), *Land System and Rural Society in Early India*, 1997.
- K. A. N. Sastri, *A History of South India*.
- R. S. Sharma, *Indian Feudalism*, 1980.
- R.S.Sharma, *Urban Decay in India, c.300-1000*, Delhi, Munshiram Manohar Lal, 1987
- Romila Thapar, *Asoka and the Decline of the Mauryas*, 1997.

Susan Huntington, *The Art of Ancient India: Buddhist, Hindu, and Jain*, New York, 1985.
 N. N. Bhattacharya, *Ancient Indian Rituals and Their Social Contents*, 2nd ed., 1996.
 J. C. Harle, *The Art and Architecture of the Indian Subcontinent*, 1987.
 P. L. Gupta, *Coins*, 4th ed., 1996.
 Kesavan Veluthat, *The Early Medieval in South India*, New Delhi, 2009
 H. P. Ray *Winds of Change*, 1994.
 Romila Thapar, *Early India: From the Origins to 1300*, 2002.

C.C. IV: SOCIAL FORMATIONS AND CULTURAL PATTERNS OF THE MEDIEVAL WORLD

Unit-I: Roman Republic: Polity and Empire in ancient Rome: Agrarian economy, urbanization, trade.

Unit-II: Religion and culture in ancient Rome; Crises of the Roman Empire- Rise and fall

of Julius Caesar

Unit-III: Economic developments in Europe from 7th to 14th centuries:

[1] Organization of production, towns and trade,

[2] Technological developments.

[3] Feudalism- Origin, growth and decline

Unit-IV: Religion and culture in medieval Europe: Medieval Church, Monastic Communities, and Papacy

Unit-V: Societies in Central Islamic Lands:

[1] The tribal background, *ummah*, Caliphate state; rise of Sultanates

[2] Religious developments: the origins of shariah, Sufism

[3] Urbanization and trade

Reading List:

Perry Anderson, *Passages from Antiquity to Feudalism*.

Marc Bloch, *Feudal Society*, 2 Vols.

Cambridge History of Islam, 2 Vols.

Georges Duby, *The Early Growth of the European Economy*.

Fontana, *Economic History of Europe*, Vol. I (relevant chapters).

P. K. Hitti, *History of the Arabs*.

P. Garnsey and Saller, *The Roman Empire*.

SUGGESTED READINGS

S. Ameer Ali, *The Spirit of Islam*.

J. Barrowclough, *The Medieval Papacy*.

Encyclopedia of Islam, 1st ed., 4 vols.

M. G. S. Hodgson, *The Venture of Islam*.

GE-II- (For non-History Students, Minor-2)

Semester III

C.C.V: HISTORY OF INDIA-III (c. 750 -1206)

Unit –I: Studying Early Medieval India:

[1] Historical geography

[2] Sources: texts, epigraphic and numismatic Data,

[3] Indian feudalism

[4] Rise of the Rajputs and the nature of the state

Unit-II: Political Structures:

[1] Evolution of political structures: Rashtrakutas, Palas, Pratiharas, and Cholas

[2] Legitimization of kingship; *Brahmanas* and temples; royal genealogies and rituals

[3] Arab conquest of Sindh: causes and impact

[4] Causes and consequences of early Turkish invasions: Mahmud of Ghazni; Shahab-ud-Din of Ghur

Unit-III: Agrarian Structure and Social Change:

[1] Agricultural expansion; crops

[2] Landlords and peasants

[3] Proliferation of castes; status of Untouchables

[4] Tribes as peasants and their place in the Varna Order

Unit-IV: Trade and Commerce:

[1] Inter-regional trade

[2] Maritime trade and forms of exchange [3] Process of urbanization

[4] Merchant guilds of South India

Unit-V: Religious and Cultural Developments:

[1] Bhakti, Tantrism, Puranic traditions; Condition of Buddhism and Jainism

[2] Islamic intellectual traditions: Al-Biruni; Al-Hujwiri

[3] Regional languages and literature

[4] Art and architecture: Evolution of regional styles: Kalingan and Dravidian style of Temple Architecture.

Reading List:

R.S. Sharma, *Indian Feudalism (circa 300 - 1200)*. B.D. Chattopadhyaya, *The Making of Early Medieval India*. R.S. Sharma and K.M. Shrivastava, eds, *Comprehensive History of India*, Vol. IV (A & B).

Mohammad Habib and K.A. Nizami, eds, *Comprehensive History of India*, Vol. V, *The Delhi Sultanate* Hermann Kulke, ed., *The State in India (AD 1000 - AD 1700)*.

Dissanayake, W. and K. M. Gokul Singh, *Indian Popular Cinema*, Trentham Book, London, 2004 John Storey, *Cultural Theory and Popular Culture*, London, 2001 Oberoi, Patricia, *Freedom and Destiny: Gender, Family and Popular Culture in India*, Delhi, 2009 Christopher Princy, *Camera Indica: The Social Life of Indian Photographs*, Chicago, 1998

Pankaj Rag, *Dhuno ke Yatri*, Rajkamal, New Delhi, 2006 (Hindi) Ramanujan, A.K. *Folktales from India A Selection of Oral Tales from Twenty-two Languages (Only Introduction)*. Ramaswamy, V. 'Women and the 'Domestic' in Tamil Folk Songs' in Kumkum Sangari and Uma Chakravarti, eds., *From Myths to Markets: Essays on Gender*, Shimla, 1999

Singh, Lata (ed.), *Theatre in Colonial India: Playhouse of Power*, New Delhi, 2009

N. Karashima, *South Indian History and Society (Studies from Inscriptions, AD 850 - 1800)*

Derryl N. Maclean, *Religion and Society in Arab Sindh*. Irfan Habib, *Medieval India: The Study of a Civilization*. Richard Davis *Lives of Indian Images*.

Romila Thapar, *Somanatha: The Many Voices of a History*. John S. Deyell, *Living*

Without Silver: The Monetary History of Early Medieval North India.
 Vijaya Ramaswamy, Walking Naked: Women, Society, and Spirituality in South India.
 Burton Stein, Peasant State and Society in Medieval South India.
 R. Champakalakshmi, Trade, Ideology and Urbanization: South India, 300 BC to 1300 AD.
 Al. Beruni's India, NBT edition. Ali Hujwiri, Kashful Mahjoob, tr. R. Nicholson.
 S C Mishra, Rise of Muslim Communities in Gujarat. J. Schwartzberg, Historical Atlas of South Asia.

C.C.VI: RISE OF THE MODERN WEST – I

Unit-I: Transition from feudalism to capitalism:

1. The problems of Transition: Economic Expansion, Industrial production, trade and commerce
2. Urban Development, Town life

Unit-II: Early colonial expansion:

1. Motives, voyages and explorations
2. The conquests of the Americas: Beginning of the era of colonization
3. Mining and plantation, The African slaves

Unit-III: Renaissance:

1. Its social roots, city-states of Italy
2. Spread of humanism in Europe
3. The Art of Renaissance- Architecture, Sculpture, Painting and Literature

Unit-IV: The Reformation

1. Origins, course and results
2. Spread of Reformation movements.
3. Emergence of European State system: Spain, France, England, Russia

Unit-V: Economic developments of the sixteenth century:

1. Shift of economic balance from the Mediterranean to the Atlantic.
2. Commercial Revolution- Causes and Nature
3. Growth of Industries and its impact

Reading List:

B. H. Slicher von Bath, The Agrarian History of Western Europe. AD.500 - 1850.
 Charles A. Nauert, Humanism and the Culture of the Renaissance (1996).
 D. H. Pennington, Seventeenth Century Europe.
 F. Rice, The Foundations of Early Modern Europe
 G. R. Elton, Reformation Europe, 1517 - 1559.
 Harry Miskimin, The Economy of Later Renaissance Europe: 1460 - 1600.
 J. Lynch, Spain under the Hapsburgs.
 James B. Collins, The State in Early Modern France, New Approaches to European History.
 L. W. Owie, Seventeenth Century Europe.
 M. P. Gilmore, The World of Humanism. 1453 - 1517.
 M. S. Anderson, Europe in the Eighteenth Century.
 Perry Anderson, The Lineages of the Absolutist State.
 Peter Kriedte, Peasants, Landlords and Merchant Capitalists. Peter Mathias, First Industrial Revolution.
 Stuart Andrews, Eighteenth Century Europe.
 The Cambridge Economic History of Europe. Vol. I - VI.
 The New Cambridge Modern History of Europe, Vols. I - VII.

C.C. VII: HISTORY OF INDIA IV (c.1206 - 1526)

Unit-I: Interpreting the Sources of Delhi Sultanate:

Survey of Sources: (a) Persian *Tarikh* Tradition, (b) Vernacular Histories; (c) Epigraphy

Unit-II: Sultanate Political Structures:

1. Consolidation of the Sultanate of Delhi: Balban, the Khaljis and the Tughluqs.
2. Theories of kingship: The ruling elites, Sufis, Ulema and the imperial monuments

Unit-III: Emergence of Regional Identities

1. Bahamanis, Vijayanagar, Gujarat and Odisha.
2. Regional Art, Architecture and Literature.

Unit-IV: Society and Economy:

1. Iqta and the Revenue-free Grants.
2. Agricultural production, Technology.
3. Market Regulations, Growth of Urban Centers.
4. Trade and Commerce, Indian Ocean (Maritime) Trade.

Unit-V: Religion, Society and Culture:

1. Sufi silsilas: Chishtis and Suhrawardis; doctrines and practices, Social roles
2. Bhakti movement and monotheistic traditions: Kabir, Nanak and Sri Chaitanya.
3. Social Impact of the Bhakti tradition: Rise of Liberal Thought, Ideology of Equality and Gender Relations

Reading List:

- K.A. Nizami, Religion and Politics in the Thirteenth Century.
S.A.A. Rizvi, A History of Sufism in India, Vol. I.
Satish Chandra, Medieval India, vol.I, Har Anand Publications, New Delhi.
Tapan Raychaudhuri and Irfan Habib, eds, Cambridge Economic History of India, Vol. I.
W.H. McLeod, Karine Schomer, et al, Eds, The Sants.
Burton Stein, New Cambridge History of India: Vijayanagara.
Pushpa Prasad, Sanskrit Inscriptions of the Delhi Sultanate.
Richard M. Eaton, ed., India's Islamic Traditions.
Sheldon Pollock, Languages of the Gods in the World of Men.
Vijaya Ramaswamy, Walking Naked: Women, Society, and Spirituality in South India.
K.C. Panigrahi, History of Orissa, Cuttack, Kitab Mahal, 2008

SEC.I: Understanding Heritage

This course will enable students to understand the different facets of heritage and their significance. It highlights the legal and institutional frameworks for heritage protection in India as also the challenges facing it. The implications of the rapidly changing interface between heritage and history will also be examined. The course will be strongly project-based and will require visits to sites and monuments. At least two Projects will be based on visits to Museums/Heritage Sites.

Unit-I: Defining Heritage

- [1] Meaning of 'antiquity'
- [2] Archaeological sites
- [3] Tangible heritage
- [4] Intangible heritage and art treasures

Unit-II: Evolution of Heritage -Legislation and the Institutional Framework:

[1] Conventions and Acts— national and international Heritage

[2] Heritage related government departments

[3] Museums, Regulatory Bodies

[4] Conservation Initiatives

Unit-III: Challenges facing Tangible and Intangible Heritage

[1] Development of Heritage Sites

[2] Antiquity smuggling.

[3] Conflicts (to be examined through specific case studies)

Unit-IV: Heritage and Travel:

[1] Viewing Heritage Sites

[2] The relationship between cultural heritage, landscape and travel, and recent trends

[3] Management of heritage sites

Unit-V: World Heritage Monuments:

[1] Tajmahal

[2] Red Fort

[3] Golden temple at Amritsar

[4] Sun temple at Konark

Reading List

David Lowenthal, *Possessed By The Past: The Heritage Crusade and The Spoils of History*, Cambridge, 2010

Layton, R. P. Stone and J. Thomas. *Destruction and Conservation of Cultural Property*. London: Rutledge, 2001

Lahiri, N. *Marshaling the Past - Ancient India and its Modern Histories*. Ranikhet: Permanent Black. 2012, Chapters 4 and 5.

S.S. Biswas, *Protecting the Cultural Heritage (National Legislations and International Conventions)*. New Delhi: INTACH, 1999.

Acts, Charters and Conventions are available on the UNESCO and ASI websites (www.unesco.org; www.asi.nic.in)

Agrawal, O.P., *Essentials of Conservation and Museology*, Delhi, 2006_ Chainani, S. 2007. *Heritage and Environment*. Mumbai: Urban Design Research Institute, 2007

GE-III- (For non-History Students, Minor-1)

Semester IV

C.C.VIII: RISE OF THE MODERN WEST – II

Unit- I: 17th century European crisis: economic, social and political dimensions

Unit-II: The English Revolution and European politics in the 18th century:

(1) Major issues-political and intellectual Currents

(2) Parliamentary monarchy

(3) Patterns of Absolutism in Europe

Unit-III: Rise of modern science

(1) Development of Science from Renaissance to the 17th century

(2) Impact of Modern science on European society

Unit-IV: Mercantilism, European economics and Preludes to the Industrial Revolution

(1) Origin and spread of Mercantilism

(2) Impact of Mercantilism on European economy

(3) Agricultural and Scientific Background to the Industrial Revolution

Unit-V: The American Revolution, 1776

- (1) Political currents
- (2) Socio-Economic Issues
- (3) Significance of the American Revolution

Reading List:

- T.S. Aston and C.H.E. Philpin (eds.), *The Brenner Debate*.
- H. Butterfield, *The Origins of Modern Science*.
- Carlo M. Cipolla, *Fontana Economic History of Europe, Vols. II and III*. Carlo M. Cipolla, *Before the Industrial Revolution, European Society and Economy, 1000 -1700*. 3rd ed. (1993)
- . D.C. Coleman (ed.), *Revisions in Mercantilism*.
- Ralph Davis, *The Rise of the Atlantic Economics*.
- Maurice Dobb, *Studies in the Development of Capitalism*.
- J.R. Hale, *Renaissance Europe*.
- R. Hall, *From Galileo to Newton*.
- Christopher Hill, *A Century of Revolutions*.
- Rodney Hilton, *Transition from Feudalism to Capitalism*.
- Stephen J. Lee, *Aspects of European History, 1494 - 1789*.
- G. Parker, *Europe in Crisis, 1598 - 1648*.
- G. Parker and L.M. Smith, *General Crisis of the Seventeenth Century*.
- J.H. Parry, *The Age of Reconnaissance*.
- Meenaxi Phukan, *Rise of the Modern West: Social and Economic History of Early Modern Europe*.
- V. Poliensky, *War and Society in Europe. 1618 -48*. Theodore K. Rabb, *The Struggle for Stability in Early Modern Europe*.
- V. Scammell, *The First Imperial Age: European Overseas Expansion, 1400-1715*.
- Jan de Vries, *Economy of Europe in an Age of Crisis 1600- 1750*.
- B. V. Rao, *World History, New Delhi: Sterling Publishers*
- M. S. Anderson, *Europe in the Eighteenth Century*.
- Perry Anderson, *The Lineages of the Absolutist State*
- Stuart Andrews, *Eighteenth Century Europe*.
- B. H. Slicher von Bath, *The Agrarian History of Western Europe. AD. 500 - 1850*.
- The Cambridge Economic History of Europe. Vol. I - VI*.
- James B. Collins, *The State in Early Modern France, New Approaches to European History*.
- G. R. Elton, *Reformation Europe, 1517-1559*.
- M. P. Gilmore, *The World of Humanism. 1453 -1517*. Peter Kriedte, *Peasants, Landlords and Merchant Capitalists*.
- J. Lynch, *Spain under the Hapsburgs*.
- Peter Mathias, *First Industrial revolution*.
- Harry Miskimin, *The Economy of Later Renaissance Europe: 1460 - 1600*.
- Charles A. Nauert, *Humanism and the Culture of the Renaissance (1996)*.

The New Cambridge Modern History of Europe, Vols. I - VII.

L. W. Owie, Seventeenth Century Europe.

D. H. Pennington, Seventeenth Century Europe.

F. Rice, The Foundations of Early Modern Europe

C.C. IX: HISTORY OF INDIA V (c. 1526 - 1750)

Unit-I: Sources and Historiography:

- (1) Persian literary culture, translations; (2) Vernacular literary Traditions; (3) Memoirs and Travelogues

Unit-II: Establishment of Mughal rule:

- (1) India on the eve of advent of the Mughals
- (2) Fire arms, military technology and warfare
- (3) Sher Shah: Administrative and Revenue reforms

Unit-III: Consolidation of Mughal rule:

- (1) Incorporation of Rajputs and other indigenous groups in Mughal Nobility
- (2) Evolution of administrative institutions: *zabti*, *mansab*, *jagir*, *madad-i-maash*
- (3) Beginning of the crisis: Agrarian and Jagir crises; Revolts
- (4) Emergence of the Marathas; Shivaji; expansion under the Peshwas

Unit-IV: Society and Economy:

- (1) Land rights and revenue system: Zamindars and peasants
- (2) Trade routes and patterns of internal commerce; overseas trade
- (3) Urban Centres, Craft and Technology

Unit-V: Cultural ideals:

- (1) Religious tolerance and *sulh-i-kul*; Sufi mystical and intellectual interventions
- (2) Mughal Art and Architecture
- (3) Mughal and Rajput Paintings: Themes and Perspectives

Reading List:

M. Athar Ali, The Mughal Nobility under Aurangzeb.

Muzaffar Alam and Sanjay Subramanian, eds, The Mughal State, 1526 - 1750.

J.F. Richards, The Mughal Empire.

Satish Chandra, Essays on Medieval Indian History.-----, Medieval India, vol.2, Har Anand Publications, New Delhi

Irfan Habib, Agrarian System of Mughal India, 1526-1707. S.A.A. Rizvi, Muslim Revivalist Movements in Northern India.

S. Arsatnam, Maritime India in the Seventeenth Century. Satish Chandra, Parties and Politics at the Mughal Court.

Andre Wink, Land and Sovereignty in India. Harbans Mukhia, The Mughals of India.

Iqbal Husain, Ruhela Chieftancies in 18th Century India.

C.C. X: HISTORICAL THEORIES & METHODS

Unit-I: Meaning and Scope of History

1. Definition, Nature and Scope of History.
2. Object and Value of History.
3. History, Science and Morality.

Unit-II: Traditions of Historical Writing

1. Ancient Greek Traditions – Herodotus, Thucydides
2. Ancient Roman Traditions - Polybius, Tacitus
3. Medieval Understanding: Western – St. Augustine, Arabic – Ibn Khaldun.

Unit-III: History as Interdisciplinary Practice

1. History and Archaeology, History and Anthropology.
2. History and Psychology, History and Literature.
3. History and Political Science

Unit-IV: Modern Theories

1. Scientific History: Ranke, Croce, Comte
2. Karl Marx, RG Collingwood, Toynbee
3. Total History: Marc Bloch, Lucien Febver, Fernand Braudel

Unit-V: Historical Methods

1. Sources of History: Written, Oral. Visual & Archaeological.
2. Historical facts.
3. Historical Causation.
4. Historical Objectivity

Reading List:

Arthur Marwick, *New Nature of History: Knowledge Evidence, Language* (Chapter V: The Historian at work: Forget 'facts' Foreground Sources), Lyceum Books Incorporated, 2001.

-----, *The Nature of History* (Chapter IV: History, Science and Social Science), London: Macmillan, 1989.

B. Sheik Ali, *History: Its Theory and Method*, Macmillan, Reprinted, 1996.

E. H. Carr, *What is History?*, Penguin Books, Reprinted, 1983.

E. Sreedharan, *A Text Book of Historiography*, Orient Longman, Reprinted, 2004.

Irfan Habib, *Interpreting Indian History*, Northeastern Hill University Publications, Shillong, 1988.

Marc Bloch, *The Historian's Craft*, Vintage Book, New York, 1953.(Introduction and Chapter-I: History Men and Time)

Maurice Aymard and Harbans Mukhia (eds), *French Studies in History*, Vols- I & II, Orient Longman, 1989.

Romila Thapar, *Past and Prejudice*, NBT, New Delhi, 1975.

S. K. Bajaj, *History: It's Philosophy, Theory & Methodology*, Patiala, 1987.

SEC.II: Understanding Popular Culture

The paper examines some popular cultures expressed in different mediums like visual, oral and cultural. In the process of their evolution, these cultures eclectically draw from traditions, articulate anxieties, and even give rise to new traditions. The paper endeavours to equip students with understanding such phenomena historically, with special reference to India. It is imperative that the Students use electronic devices to view, record, and document the subject matter.

Unit-I: Introduction of Popular Culture

[1] Meaning and Definition of popular culture

[2] Understanding it historically

Unit-II: Visual expressions:

[1] Folk art,

[2] Calendar art

[3] Photography

Unit-III: Performance:

[1] Theatres

[2] Music

[3] Folk tales/songs/Suang, Yatra and Nautanki: Identifying themes, functionality

Unit-IV: The audio-visual: cinema and television:

[1] Indian cinema: Mapping the influence of the national struggle for independence (1930s and 40s)

[2] Idealized nationalism (1950s), disillusionment and the anti-establishment mood (1970s and 80s)

[3] Documentary films, Expressions of popular culture in television; the impact of the Internet and audio-visual media

Unit-V: Fairs, Festivals and Rituals:

[1] Disentangling mythological stories

[2] Patronage

[3] Regional variations

[4] Impact on Society

Reading List:

Dissanayake, W. and K. M. Gokul Singh, Indian Popular Cinema, Trentham Book, London, 2004

John Storey, Cultural Theory and Popular Culture, London, 2001.

Oberoi, Patricia, Freedom and Destiny: Gender, Family and Popular Culture in India, Delhi, 2009

Christopher Princy, Camera Indica: The Social Life of Indian Photographs, Chicago, 1998

Pankaj Rag, Dhuno ke Yatri, Rajkamal, New Delhi, 2006(Hindi)

Ramanujan, A.K. Folktales from India A Selection of Oral Tales from Twenty-two Languages (Only Introduction).

Ramaswamy, V. 'Women and the 'Domestic' in Tamil Folk Songs' in

KumkumSangari and Uma Chakravarti, eds., From Myths to Markets: Essays on Gender, Shimla, 1999
Singh, Lata (ed.), Theatre in Colonial India: Playhouse of Power, New Delhi, 2009

G.E. IV:(For non-History students, Minor-2)

Semester V

C.C.XI: History of Modern Europe- I (c. 1780-1939)

Unit-I: The French Revolution:

- [1] Crisis of Ancient Regime
- [2] Intellectual currents.
- [3] Social classes and emerging gender relations.

Unit-II: Revolution and its European repercussions:

- [1] Phases of the French Revolution 1789 - 99.
- [2] Art and Culture of French Revolution.
- [3] Napoleonic consolidation - reform and empire.

Unit-III: Restoration and Revolution: c. 1815 - 1848:

- [1] Forces of conservatism & restoration of old hierarchies.
- [2] Social, Political and intellectual currents.
- [3] Revolutionary and Radical movements, 1830 - 1848.

Unit-IV: Capitalist Industrialization and Socio-Economic Transformation (Late 18th century to AD 1914)

- [1] Process of capitalist development in industry and agriculture: case Studies of Britain, France, the German States and Russia.
- [2] Evolution and Differentiation of social classes: Bourgeoisie, Proletariat, land owning classes and peasantry.
- [3] Changing trends in demography and urban patterns.
- [4] Family, gender and process of industrialization.

Unit-V: Varieties of Nationalism and the Remaking of States in the 19th and 20th Centuries.

- [1] Intellectual currents, popular movements and the formation of National identities in Germany, Italy
- [2] Specificities of economic development, political and administrative Reorganization - Italy, Germany

Reading List:

C.M. Cipolla: Fontana Economic History of Europe, Volume III: The Industrial Revolution.

Norman Davies, Europe.

J. Evans: The Foundations of a Modern State in 19th Century Europe.

T.S. Hamerow: Restoration, Revolution and Reaction: Economics and Politics in

Germany [1815 - 1871]. E.J. Hobsbawm: The Age of Revolution.

Lynn Hunt: Politics, Culture and Class in the French Revolution.

James Joll, Europe Since 1870. George Lefebvre, Coming of the French Revolution.

George Lichtheim : A Short History of Socialism. Alec Nove: An Economic History of the

USSR.

Andrew Porter, European Imperialism, 18760-1914 (1994). Anthony Wood, History of Europe, 1815 û 1960 (1983).

Stuart Woolf: History of Italy, 1700-1860. G. Barrowclough, An Introduction to Contemporary History.

Fernand Braudel, History and the Social Science in M. Aymard and H. Mukhia Ed. French Studies in History, Vol. I (1989).

Maurice Dobb: Soviet Economic Development Since 1917. M. Perrot and G. Duby [eds.]: A History of Women in the West, Volumes 4 and 5.

H.J. Hanham; Nineteenth Century Constitution, 1815 - 1914. E.J. Hobsbawm, Nations and Nationalism.

Charles and Barbara Jelavich: Establishment of the Balkan National States, 1840 û 1920. James Joll, Origins of the First World War (1989).

Jaon B. Landes: Women and the Public Sphere in the Age of the French Revolution. Colin Lucas: The French Revolution and the Making of Modern Political Culture, Volume Nicholas Mansergh: The Irish Question, 1840 û 1921.

K.O. Morgan: Oxford Illustrated History of Britain, Volume 3 [1789 -1983].

R.P. Morgan: German Social Democracy and the First International.

N.V. Riasanovsky: A History of Russia.

J.M. Robert, Europe 1880 û 1985. J.J. Roth (ed.), World War I : A Turning Point in Modern History.

Albert Soboul: History of the French Revolution (in two volumes).

Lawrence Stone, History and the Social Sciences in the Twentieth Century The Past and the Present (1981).

Dorothy Thompson: Chartists: Popular Politics in the Industrial Revolution.

E.P. Thompson: Making of the English Working Class.

Michel Vovelle, fall of the French Monarchy (1984).

H. Seton Watson: The Russian Empire.

Raymond Williams: Culture and Society.

C.C.XII: HISTORY OF INDIA VII (c. 1750 - 1857)

Unit-I: India in the mid 18th Century; Society, Economy, Polity

Unit-II: Expansion and Consolidation of colonial Power:

[1] Foreign trade and early forms of exactions from Bengal.

[2] Dynamics of expansion, with special reference to Bengal, Mysore, Awadh, Punjab

Unit-III: Colonial State and Ideology:

[1] Arms of the colonial state: army, police, law

[2] Ideologies of the Raj and racial attitudes

[3] Education: indigenous and modern

Unit-IV: Economy and Society:

[1] Land revenue systems- Permanent, Ryotwari and Mahalwari

[2] Commercialization of Agriculture- Consequences

[3] Drain of Wealth-causes and consequences

[4] Growth of modern industry

Unit-V: Popular Resistance: Causes and Consequences

[1] Santhal uprising (1856-57), Indigo rebellion (1860)

[2] Pabna agrarian Leagues (1873), Deccan riots (1875)

[3] Movement of 1857-causes and consequences

Reading List:

- C. A. Bayly, Indian Society and the Making of the British Empire, New Cambridge History of India.
- Bipan Chandra, Rise and Growth of Economic Nationalism in India.
- Suhash Chakravarty, The Raj Syndrome: A Study in Imperial Perceptions, 1989.
- J.S. Grewal, The Sikhs of the Punjab, New Cambridge History of India Ranajit Guha, ed., A Subaltern Studies Reader.
- Dharma Kumar and Tapan Raychaudhuri, eds., The Cambridge Economic History of India, Vol. II.
- P.J. Marshall, Bengal: The British Bridgehead, New Cambridge History of India.
- R.C. Majumdar, ed., History and Culture of Indian People, Vols. IX and X. British Paramountcy and Indian Renaissance.
- David Arnold and Ramchandra Guha, eds, Nature, Culture and Imperialism.
- Amiya Bagchi, Private Investment in India.
- Bipan Chandra, K.N. Panikkar, Mridula Mukherjee, Sucheta Mahajan and Aditya Mukherjee, India's Struggles for Independence.
- A.R. Desai, Peasant Struggles in India.
- R.P. Dutt, India today.
- M.J. Fisher, ed., Politics of Annexation (Oxford in India Readings).
- Ranjit Guha, Elementary Aspects of Peasant Insurgency in Colonial India (1983).
- P.C. Joshi, Rebellion 1857: A Symposium.
- J.Krishnamurti, Women in Colonial India.
- Dadabhai Naroji, Poverty and Un-British Rule in India.
- Rajat K. Ray, ed., Entrepreneurship and Industry in India, 1800-1947, Oxford In India Readings.
- Eric Stokes, English Utilitarians and India Thomas
- R. Metcalf, The Ideologies of the Raj

D.S.E-I: HISTORY OF THE UNITED STATES OF AMERICA (c.1776-1945)

Unit-I: The Background:

- [1] The land and indigenous people: settlement and colonization by Europeans
- [2] Early colonial society and politics; indentured labour-White and Black

Unit-II: Making of the Republic:

- [1] Revolution, Sources of conflict: Revolutionary groups, Ideology:
- [2] The American War of Independence- Causes and consequences
- [3] Processes and Features of Constitution making

Unit-III: Evolution of American Democracy:

- [1] Federalists: Jeffersonianism: Jacksonianism, Rise of political parties-1840-1960; Judiciary-role of the Supreme Court
- [2] Limits of democracy: Blacks and women.

Unit-IV: Early Capitalism:

- [1] Beginnings of Industrialization.
- [2] Immigrants and changing composition of Labour; Early Labour Movements.

Unit-V: The Agrarian South and Civil War:

- [1] Plantation economy.
- [2] Slave Society and Culture: Slave resistance.
- [3] Rise of Republicanism, Emancipation and Lincoln

Reading List:

- Bernard Bailyn, The Great Republic.
Bernard Bailyn, The Ideological Origins of the American Revolution.
Charles Beard, An Economic Interpretation of the American Constitution.
Peter Carroll and David Noble, Free and Un-free: A New History of the United States.
David B. Davis, The Problem of Slavery in the Age of Revolution.
U. Faulkner, American Economic History.
Eric Foner, America's Black Past.
John Hope Franklin, From Slavery to Freedom.
Gerald N. Grobb and George A. Billias, Interpretations of American History: Patterns and Perspectives, 2 Vols.
David M. Potter, The Impending Crisis.
J. G. Randall and David Donald, The Civil War and Reconstruction.
Kenneth Stampp, The Peculiar Institution, Slavery in the Antebellum South.
Federick Jackson Turner, The Frontier in American History.
Lee Benson, The Concept of Jackson Democracy.
Ray A. Billington, Westward Expansion.
Paul Boyer, Harvard Sitkoff, Nancy Woloch, The Enduring Vision: A History of the American People, Vols. Land 2.
Thomas Cochran, The Inner Revolution.
A. O. Craven, The Growth of Southern Nationalism, 1848 - 1861.
Carl N. Degler, At Odds: Women and Family in America from the Revolution to the Present.
Lewis L. Gould (ed.), The Progressive Era.
John D. Hicks, The Federal Union: A History of USA Since 1865.
R.P. Kaushik, Significant Themes in American History.
Irving Kristol, Gordon Wood and others, America's Continuing Revolution.
Richard W. Leopold, The Growth of American Foreign Policy.
Perry Miller, From Colony to Province.

Gary Nash (ed.), Retracing the Past.

Henry Pelling, American Labor.

Edward Pessen, Jacksonian Panorama.

Charles Sellers, Henry May and Neil McMillen, A Synopsis of American History; 2 Vols.

Donald Shiha, The Making of American History: The Emergence of the Nation, Vols. II & I.

Dwijendra Tripathi and S.C. Tiwari, Themes and Perspectives in American History.

DSE.II: History and Culture of Odisha

Unit-I: Socio-political life of Early and Medieval Odisha:

[1] Kalinga War (261 B.C.) and its significance

[2] Mahameghavahan Kharavela: His time and achievements

[3] The Bhauma Karas and The Somavamsis

[4] The Gangas and The Suryavamsis

Unit-II: Religion, Art and Literature of Early and Medieval Odisha:

[1] Buddhism, Jainism and Sanatana Dharma in Odisha.

[2] Development of Art and Architecture: Buddhist Art, Temples and Jain Sculptures

[3] Evolution and Growth of Odia Language

[4] Development of Odia Literature-Sarala Mohabharata

[5] Panchasakhas, Sri Chaitanya and Bhakti Movement in Odisha

Unit-III: Political and Economic structure in Medieval Odisha:

[1] Mughal Administration

[2] Maratha Administration

[3] Impact on Odisha's Socio-Economic Condition

Unit-IV: Colonialism in Odisha:

[1] The Early British Administration: Its Socio-economic impact

[2] The Odia Identity Movement

[3] Freedom Struggle in Odisha

Unit-V: Socio-cultural Changes in Modern Odisha:

[1] Development of Modern Education

[2] Social Reform Movements in Odisha

Reading List:

- A. Easchman et al (eds) The Cult of Jagannath and Regional Tradition of Orissa, Manohar, New Delhi, 1978.
- A. K. Mishra, Intellectual Tradition of Orissa: 2006.
- A. K. Mishra, The Raj, Nationalists and Reforms, 2007.
- A.K. Mishra, Indian Culture, Science and Technology (with special emphasis on Odisha), 2011.
- B.K. Mallik; Paradigms of Dissent and Protest: Social Movements in Eastern India (1400-1700 AD Manohar, New Delhi, 2004.
- J. Dora, Sakta Monuments of Orissa, A Study of Art, Architecture and Iconography, New Delhi, 2010.
- K.C. Mishra, The Cult Jagarnath.
- M.N. Das (ed) Sidelights on History and Culture of Orissa, Vidyapuri
- A.C. Pradhan, A Study of History of Orissa, Bhubaneswar, Panchsheel
- K.C. Panigrahi, History of Orissa, Cuttack, Kitab Mahal, First edition, 1981
- Chittaranjan Das, A Glimpse into Oriya Literature, Orissa Sahitya Akademi, Bhubaneswar, 1962
- K.B. Tripathi, The Evolution of Oriya Language and Script, Utkal University, Bhubaneswar
- K.C. Panigrahi, Sarala Dasa, Sahitya Akademi, New Delhi, 1975 Khageswar
- Mahapatra, (ed), Charyagitika

Semester VI

C.C. XIII: HISTORY OF INDIA VIII (c. 1857 - 1950)

Unit-I: Cultural changes and Social and Religious Reform

Movements:

- [1] The advent of printing and its implications
- [2] Reform and Revival: Brahmo Samaj, Arya Samaj, Aligarh Movement
- [3] Emancipation of Women, Sanskritization and Anti-Caste Movements

Unit-II: Nationalism: Trends up to 1919:

- [1] Political ideology and organizations, formation of INC
- [2] Moderates and Extremists.
- [3] Swadeshi Movement
- [4] Revolutionary Movements

Unit-III: Gandhian nationalism after 1919: Ideas and Movements:

- [1] Mahatma Gandhi: Perspectives and Methods

[2] Non- Cooperation, Civil Disobedience, Quit India, and INA

[3] Princely India: States' Peoples' Movement

[4] Nationalism and Social Groups: Peasants, Tribals, Dalits and Women

Unit-IV: Communalism and Partition:

[1] Ideologies and practices, Hindu Mahasabha, Muslim League

[2] Partition and Independence

Unit-V: Emergence of a New State:

[1] Making of the Constitution

[2] Integration of Princely States

[3] Land Reforms and beginnings of Planning

Reading List:

Judith Brown, Gandhi's rise to Power, 1915-22.

Paul Brass, The Politics of India Since Independence, OUP, 1990.

Bipan Chandra, Nationalism and Colonialism in Modern India, 1979.

Bipan Chandra, Rise and Growth of Economic Nationalism in India.

Mohandas K. Gandhi, An Autobiography or The Story of My Experiments with Truth.

Ranjit Guha, ed., A Subaltern Studies Reader.

Peter Hardy, Muslims of British India.

Mushirul Hasan, ed., India's Partition, Oxford in India Readings.

D.A. Low, ed., Congress and the Raj.

John R. McLane, Indian Nationalism and the Early Congress.

Jawaharlal Nehru, An Autobiography.

Gyanendra Pandey, The Construction of Communalism in colonial north India.

Sumit Sarkar, Modern India, 1885-1947. Anil

Seal, Emergence of Indian Nationalism.

Ram Lakhan Shukla (ed.), Adhunik Bharat ka Itihas.

Eleanor Zelliot, From Untouchable to Dalit: Essays on the Ambedkar Movement.

Judith Brown, Gandhi: (et al) A Prisoner of Hope.

Bipan Chandra, Communalism in Modern India, 2nd ed., 1987. Bipan

Chandra, K.N. Panikkar, Mridula Mukherjee, Sucheta Mahajan and Aditya Mukherjee, India's, Struggles for Independence.

A.R. Desai, Social Background of Indian Nationalism.

A.R. Desai, Peasant Struggles in India.

Francine Frankel, India's Political Economy, 1947-77. Ranajit

Guha, and G.C. Spivak, eds. Select Subaltern Studies.

Charles Heimsath, Indian Nationalism and Hindu Social Reform.

F. Hutchins, Illusion of Permanence.

F. Hutchins, Spontaneous Revolution.

V.C. Joshi (ed.), Rammohan Roy and the process of Modernization in India.

J.Krishnamurti, Women in Colonial India

C.C. XIV: HISTORY OF MODERN EUROPE II (c. 1780 -1939)

Unit-I: Liberal Democracy, Working Class Movements and Socialism in the 19th and 20th Centuries:

[1] The struggle for parliamentary democracy and civil liberties in Britain.

[2] Forms of protest during early capitalism: food riots in France and England: Luddites and Chartism.

[3] Early Socialist Thought; Marxian Socialism

Unit-II: The Crisis of Feudalism in Russia and Experiments in Socialism:

[1] Emancipation of serfs.

[2] Revolutions of 1905; the Bolshevik Revolution of 1917.

[3] Programmes of Socialist Construction.

Unit-III: Imperialism, War and Crisis: c. 1880-1939:

[1] Theories and mechanisms of imperialism; Growth of Militarism; Power blocks and alliances: expansion of European empires –First World War(1914 – 1918)

[2] The post 1919 World Order: economic crises, the Great Depression and Recovery.

[3] Fascism and Nazism.

[4] Origins of the Second World War.

Unit-IV: Cultural Transformation since circa 1850:

[1] Changing contexts: [i] Notions of Culture [ii] Creation of a New public sphere and mass media

[2] Creation of new cultural forms: from Romanticism to Abstract Art.

[3] Culture and the making of ideologies: Constructions of Race, Class and Gender, ideologies of Empire.

Unit-V: Intellectual Developments since circa 1850:

Major intellectual trends:

[1] Mass education and extension of literacy.

[2] Institutionalization of disciplines: History, Sociology and Anthropology.

[3] Darwin and Freud.

Reading List:

Gerald Brennan: The Spanish Labyrinth: An Account of the Social and Political Background of the Civil War

C.M. Cipolla: Fontana Economic History of Europe, Volume II the Present (1981). I : The Industrial Revolution.

Norman Davies, Europe.

J. Evans: The Foundations of a Modern State in 19th Century Europe.

T.S. Hamerow: Restoration, Revolution and Reaction: Economics and Politics in Germany [1815 - 1871].

E.J. Hobsbawm : The Age of Revolution. Lynn Hunt: Politics, Culture and Class in the French Revolution.

James Joll, Europe Since 1870. David Landes: Prometheus Unbound. George Lefebvre, Coming of the French Revolution.

George Lichtheim: A Short History of Socialism. Peter Mathias, First Industrial Revolution.

Alec Nove: An Economic History of the USSR. Andrew Porter, European Imperialism, 18760 -1914 (1994).

Anthony Wood, History of Europe, 1815 û 1960 (1983). Stuart Woolf: History of Italy, 1700 û 1860.

G. Barrowclough, An Introduction to Contemporary History.

Fernand Braudel, History and the Social Science in M. Aymard and H. Mukhia eds. French Studies in History, Vol. I (1989).

Maurice Dobb: Soviet Economic Development Since 1917.

M. Perrot and G. Duby [eds.]: A History of Women in the West, Volumes 4 and 5.

H.J. Hanham; Nineteenth Century Constitution, 1815 û 1914.
 E.J. Hobsbawm, Nations and Nationalism.
 Charles and Barbara Jelavich: Establishment of the Balkan National States, 1840 û 1920.
 James Joll, Origins of the First World war (1989).
 Jaon B. Landes: Women and the Public Sphere in the Age of the French Revolution.
 David lowenthal, The Past is a Foreign Country.
 Colin Licas: The French Revolution and the Making of Modern Political Culture, Volume 2.
 Nicholas Mansergh: The Irish Question, 1840 - 1921. K.O. Morgan: Oxford Illustrated History of Britain, Volume 3 [1789 - 1983].
 R.P. Morgan: German Social Democracy and the First International. N.V. Riasanovsky: A History of Russia.
 J.M. Robert, Europe 1880 - 1985.
 J.J. Roth (ed.), World War I: A Turning Point in Modern History. Albert Soboul: History of the French Revolution (in two volumes).

D.S.E. III: HISTORY OF THE UNITED STATES OF AMERICA-II (c.1776- 1945)

Unit-I: Reconstructions: Political changes and Economic transformation:

- [1] Conservative and Radical phases.
- [2] The New South: Participants and Reactions, Carpetbaggers; Scalawags, Blacks, Ku Klux Klan.
- [3] Growth of Capitalism
- [4] Depression.

Unit-II: Resistance and Reform:

- [1] Agrarian crises and populism
- [2] Urban corruption and progressivism
- [3] Labour movements and Unionization.
- [4] New Deal.

Unit-III: U.S. Imperialism:

- [1] Spanish-American War
- [2] Expansion in the Far East and Latin America
- [3] World War I and Fourteen Points
- [4] Americans in World War II: Bombing of Hiroshima and Nagasaki

Unit-IV: Afro-American Movements:

Black Movements: Booker T. Washington, W.E.B. Dubois; NAACP and Marcus Garvey.

Unit-V: Socio-Cultural, Religious and Intellectual Movements:

- [1] Abolitionists, Women's rights movement and Suffrage
- [2] Religious movements: Early Revivalism; Puritans, Quakers, Mormons; Temperance
- [3] Mass culture (circa 1900 - 1945)
- [4] Major literary trends (circa 1900 – 1945)

Reading List:

Bernard Bailyn, The Great Republic.
 Bernard Bailyn, The Ideological Origins of the American Revolution.
 Charles Beard, An Economic Interpretation of the American Constitution.
 Dee Brown, Bury My Heart at Wounded Knee, An Indian History of

the American West.

Peter Carroll and David Noble, *Free and Unfree: A New History of the United States*.

David B. Davis, *The Problem of Slavery in the Age of Revolution*.
32

U. Faulkner, *American Economic History*.

Robert Fogel, *Railroads and American Economic Growth*.

Eric Foner, *America's Black Past*.

John Hope Franklin, *From Slavery to Freedom*.

Gerald N. Grobb and George A. Billias, *Interpretations of American History: Patterns and Perspectives*, 2 Vols.

Richard Hofstadter, *The Age of Reform, From Bryan to FDR* Linda Kerber, *Women's America: Refocusing the Past*.

David M. Potter, *The Impending Crisis*.

W. Pratt, *A History of the United States Foreign Policy*.

James Randail, *The Civil War and Reconstruction*.

J. G. Randall and David Donald, *The Civil War and Reconstruction*.

Kenneth Stampp, *The Peculiar Institution, Slavery in the Antebellum South*.

Federick Jackson Turner, *The Frontier in American History*.

Robert Wiebe, *The Search for Order*.

Lee Benson, *The Concept of Jackson Democracy*.

Ray A. Billington, *Westward Expansion*.

Paul Boyer, Harvard Sitkoff, Nancy Woloch, *The Enduring Vision: A History of the American People*, Vols. Land 2.

Thomas Cochran, *The Inner Revolution*.

A. O. Craven, *The Growth of Southern Nationalism, 1848 - 1861*.

Lance E. Davis (ed.), *American Economic Growth*.

Carl N. Degler, *At Odds: Women and Family in America from the Revolution to the Present*.

Fogel and Engerman? *Time on the Cross-*.

Lewis L. Gould (ed.), *The Progressive Era*.

John D. Hicks, *The Federal Union: A History of USA Since 1865*.

R.P. Kaushik, *Significant Themes in American History*.

David M. Kennedy, Thomas Bailey and Mel Piehl, *The Brief American Pageant*.

Irving Kristol, Gordon Wood and others, *America's Continuing Revolution*.

Richard W. Leopold, *The Growth of American Foreign Policy*.

Perry Miller, *From Colony to Province*.

Gary Nash (ed.), *Retracing the Past*.

Henry Pelling, *American Labor*.

Edward Pessen, *Jacksonian Panorama*.

Charles Sellers, Henry May and Neil McMillen, *A Synopsis of American History*; 2 Vols.

Donald Shiham, *The Making of American History: The Emergence of the Nation*, Vols. II & I.

Dwijendra Tripathi and S.C. Tiwari, *Themes and Perspectives in American History*.

James Weinstein, *The Corporate Ideal in the Liberal state*.

GENERIC ELECTIVE (GE) PAPERS

(For non-History students)

(1) HISTORY AND CULTURE OF ODISHA

Unit-I: Socio-political life of Early and Medieval Odisha:

- [1] Kalinga War (261 B.C.) and its significance
- [2] Mahameghavahan Kharavela: His times and achievements
- [3] The Bhauma Karas and The Somavamsis
- [4] The Gangas and The Suryavamsis

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- [2] Development of Art and Architecture: Buddhist Art, Temples and Jaina Sculptures
- [3] Evolution and Growth of Odia Language and Literature: Sarala Mohabharata
- [4] Panchasakhas, Sri Chaitanya and Bhakti Movement in Odisha

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- [2] Maratha Administration
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- [2] The Odia Identity Movement
- [3] Freedom Struggle in Odisha

Unit-V: Socio-cultural Changes in Modern Odisha:

- [1] Development of Modern Education
- [2] Social Reform Movements in Odisha
- [3] Modern Odia Literature: Radhanath Roy, Phakir Mohan Senapati and Gangadhar Meher

Reading List:

- A. Easchman et al (eds) The Cult of Jagannath and Regional Tradition of Orissa, Manohar, New Delhi, 1978.
- A. K. Mishra, Intellectual Tradition of Orissa, Bhubaneswar, 2006.
- , The Raj, Nationalists and Reforms, Bhubaneswar, 2007.
-, Indian Culture, Science and Technology (with special emphasis on Odisha), 2011.
- B.C. Ray, Orissa under the Mughals
- , Orissa under the Marahatas
- , Foundation of British Orissa
- B.K. Mallik, Medieval Orissa: Literature, Society, Economy, Bhubaneswar, 1996
- , Paradigms of Dissent and Protest: Social Movements in Eastern India (1400-1700 AD Manahar, New Delhi, 2004.

J. Dora, Sakta Monuments of Orissa, A Study of Art, Architecture and Iconography, New Delhi, 2010.

K.C. Mishra, The Cult Jagannath.

M.N. Das (ed) Sidelights on History and Culture of Orissa, Vidyapuri

M. A. Haq, Muslim Administration in Orissa

A.C. Pradhan, A Study of History of Orissa, Bhubaneswar, Panchsheel

K.C. Panigrahi, History of Orissa, Cuttack, Kitab Mahal, First edition, 1981

Chittaranjan Das, A Glimpse into Oriya Literature, Orissa Sahitya Akademi, Bhubaneswar, 1962

K.B. Tripathi, The Evolution of Oriya Language and Script, Utkal University, Bhubaneswar

K.C. Panigrahi, Sarala Dasa, Sahitya Akademi, New Delhi, 1975 Khageswar Mahapatra, (ed), Charyagitika

(2) FREEDOM MOVEMENT IN INDIA

Unit-I: Growth of National Consciousness in 19th century:

[1] Socio-Economic impact of British Rule

[2] Role of Press and Journalism

[3] Formation of Political associations prior to 1885

Unit-II: Nationalism: Trends up to 1919:

[1] Formation of Indian National Congress: Its ideology and Performance

[2] Moderates and Extremists

[3] Swadeshi Movement and its impact

Unit-III: Gandhian nationalism after 1919: Ideas and Movements:

[1] Mahatma Gandhi: Perspectives and Methods

[2] Non- Cooperation, Civil Disobedience, Quit India Movements

[3] Indian National Army (INA) and Subash Chandra Bose

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[1] Ideologies and practices: Hindu Mahasabha, Muslim League

[2] Partition and Independence

Unit-V: Emergence of a New Nation:

[1] Making of the Constitution

[2] Integration of Princely States

[3] Land Reforms and beginnings of Planning

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Seal, Emergence of Indian Nationalism.
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 Eleanor Zelliott, From Untouchable to Dalit: Essays on the Ambedkar Movement.
 Judith Brown, Gandhi: (et al) A Prisoner of Hope.
 Bipan Chandra, Communalism in Modern India, 2nd ed., 1987. Bipan Chandra, K.N. Panikkar, Mridula Mukherjee, Sucheta Mahajan and Aditya Mukherjee, India's, Struggles for Independence.
 A.R. Desai, Social Background of Indian Nationalism.
 A.R. Desai, Peasant Struggles in India.
 Francine Frankel, India's Political Economy, 1947-77. Ranajit Guha, and G.C. Spivak, eds. Select Subaltern Studies.
 Charles Heimsath, Indian Nationalism and Hindu Social Reform.
 F. Hutchins, Illusion of Permanence.
 F. Hutchins, Spontaneous Revolution.
 V.C. Joshi (ed.), Rammohan Roy and the process of Modernization in India.
 J.Krishnamurti, Women in Colonial India

(3) MAKING OF CONTEMPORARY INDIA

Unit-I: Towards Independence and Emergence of the New State :

Government of India Act 1935; Working of the GOI Act; Negotiations for Independence

and Popular Movements; Partition: Riots and Rehabilitation

Unit-II: Making of the Republic -The Constituent Assembly:

Drafting of the Constitution, Integration of Princely States

Unit-III: Indian Democracy at Work c1950- 1970s:

Language, Region, Caste and Religion; Electoral Politics and the Changing Party System;

Regional Experiences, India and the World (Non Aligned Movement)

Unit-IV: Economy c 1950-1970s:

The Land Question, Planning and Economy, Industry and Labour

Unit-V: Society and Culture c 1950-1970s:

The Women's Question: Movements and Legislation

Cultural Trends: Education, Institutions and Ideas, Science, Literature, Media, Arts

Reading List:

Granville Austin, Indian Constitution: Cornerstone of a Nation, New Edition, OUP, 2011

Francine Frankel, India's Political Economy, 1947-2004, New Delhi: Oxford University Press, 2006.

Paul Brass, The Politics of India Since Independence, Cambridge: Cambridge University Press, 1994.

Ram Chandra Guha, India after Gandhi: The History of the World's Largest Democracy, New Delhi: Picador, 2007

Bipan Chandra, et al (ed) India after Independence, New Delhi: Penguin Books, 1999

Appadurai, Domestic Roots of India's Foreign Policy 1947-1972. New Delhi: Oxford University Press, 1979.

Rajni Kothari, Politics in India, New Delhi: Orient Longman,1970.
Joya Chatterji, The Spoils of Partition: Bengal and India, 1947-67,
Cambridge: Cambridge University Press, 2007.
Sunil Khilnani, The Idea of India, Penguin Books, New Delhi, 2004

(4) ISSUES IN THE CONTEMPORARY WORLD

Unit-I: Colonialism and Nationalism: Social Transformation after the Second World War; United Nations and UNESCO; NAM, Cold War: the character of Communist States

Unit-II: Perspectives on Development and

Underdevelopment: Globalization and Liberalization--Impact

Unit-III:Social Movements in the North and the South:

Feminist & Human Rights issues

Unit-IV:Ecological Movements: Recent Issues and Developments

Unit-V: Modernity and Cultural Transformation: Emerging trends in Culture, Media and

Consumption

Reading List:

E.J. Hobsbawm, The Age of Extremes, 1914 – 1991, New York: Vintage, 1996

Carter V. Findley and John Rothay, Twentieth-Century World,Boston: Houghton-Mifflin, 5th ed.,2003.

Norman Lowe, Mastering Modern World History, London: Palgrave Macmillan, 1997

Mark Mazower, The Balkans: A Short History [especially chap.

4], New York: Modern Library, 2000: paperback, 2002

Basil Davidson, Modern Africa: A Social and Political History, 3d edn. London / New Jersey: Addison – Wesley, 1995

I, Rigoberta Menchu, An India Woman in Guatemala [Memoir of

1992 Nobel Peace Prize Winner, London: Verso.1987 {Hindi translation available}

Jonathan Spence, The Gate of Heavenly Peace: The Chinese and Their Revolution, 1895 – 1980, Penguin, 1982

SYLLABUS FOR B.A. (HONORS) ODIA UNDER CHOICE
BASED CREDIT SYSTEM OF UTKAL
UNIVERSITY, BHUBANESWAR

ଓଡ଼ିଆ ଭାଷାରେ ସମ୍ମୁଖାଳିନୀ ପଢ଼ା ପ୍ରଣାଳୀ

Ability Enhancement Compulsory Course (AECC)

ଓଡ଼ିଆ ଭାଷାରେ ସମ୍ମୁଖାଳିନୀ ପଢ଼ା ପ୍ରଣାଳୀ

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ଓଡ଼ିଆ ଭାଷାରେ ସମ୍ମୁଖାଳିନୀ ପଢ଼ା ପ୍ରଣାଳୀ-2, ଓଡ଼ିଆ ଭାଷାରେ ସମ୍ମୁଖାଳିନୀ ପଢ଼ା ପ୍ରଣାଳୀ-20, ଓଡ଼ିଆ ଭାଷାରେ ସମ୍ମୁଖାଳିନୀ ପଢ଼ା ପ୍ରଣାଳୀ

ଓଡ଼ିଆ ଭାଷାରେ ସମ୍ମୁଖାଳିନୀ ପଢ଼ା ପ୍ରଣାଳୀ

ଓଡ଼ିଆ ଭାଷାରେ ସମ୍ମୁଖାଳିନୀ ପଢ଼ା ପ୍ରଣାଳୀ-1, ଓଡ଼ିଆ ଭାଷାରେ ସମ୍ମୁଖାଳିନୀ ପଢ଼ା ପ୍ରଣାଳୀ-2, ଓଡ଼ିଆ ଭାଷାରେ ସମ୍ମୁଖାଳିନୀ ପଢ଼ା ପ୍ରଣାଳୀ-50

(Credits-2, total classes-20, one period-1 hours, course-II, Full Marks-50)

* ଓଡ଼ିଆ ଭାଷାରେ ସମ୍ମୁଖାଳିନୀ ପଢ଼ା ପ୍ରଣାଳୀ:

Gjò _ôVýLiWÿûUò _i! | @ûiÚûbòðK (CBCS / iòàòìòGip) _ôVý _âYûkú @^êiûùe _âÊêZ ùjûAQòö aòbò^Û Éeùe @ûagýK @^êiûùe iciûcdòK _eòìÚòZòKê ù^A búaaò^òcd | _ûeÆeòK ù~ûMûù~ûM iÚû^ Kò_eò IWÿò@û bûhûùe ijRùe, iekùe | @û^!ùe ùjûA_ûeòà- G \òM _âZò G[òùe xû^ \ò@û~ûAQòö IWÿò@û bûhû | iûjòZýe i\ýZc _âûùdûMòK mû^e aòKûg ^òcòð +3 Éeúd aò\ýû[ðúuê Gòj _ôVýKâce LiWÿûUò iûjû~ý Keòàö ùi[ô_ûAñ _âPkòZ aòKûg ^òcòð +3 Éeúd aò\ýû[ðúuê Gjò _ôVýKâce LiWÿûUò iûjû~ý Keòàö ùi[ô_ûAñ _âPkòZ bûhûe ùa÷dûKeYòK, aýûajûeòK | _âûùdûMòK \òM _âZò G[òùe xû^ \ò@û~ûAQòö G[òùe iðù~ûM _âKòâdûee @^êaò]ô, ù~ûMûù~ûMe Z[ý | Zðß _âZò MêeêZß \ò@û~ûAQòö Gjû aò\ýû[ôðu búaaò^òcdûcòK \IZû aéjòùe ijû~ý Keòàö ùicûù^ gêj | _eòz^Û búauè ù~ùKøYìò _âKûe mû^e ìP^û Z[ý | iòjû«Kê ùcûLòK | fòLòZ Éeùe ijRùe _âKûg Keò_ûeòà Gaõ ùicû^u cûZébûhûe aòKûg NUò_ûeòàö

G[òùe _ôVý-1 / _ôVý-2 / _ôVý-3 / _ôVý-4 / _ôVý-5 / _ôVý-6 / _ôVý-7 Gjò_eò iûZùMûUò Z[ý, ìP^û | @û«aòð\ýûcìkK iðù~ûM _ûV ejòQòö aò\ýû[ðú ùicû^u eêPò | cêq _i! @^êiûùe ù~ ùKøYìò \êAUòKê aûQò ù^A_ûeòàö _â[c Zòù^ûUòeê ùMûUòG _â[c _~ðýûde (1c ùicòÁûe) | ùgh PûùeûUòeê ùMûUòG \ßòZúd _~ðýûd (2d ùicòÁûe) _ûAñ

aúQòùäö

cífýûu^ aòbûR^ _jZò :

- (K) _ûVe _âùZýK GKKeê (dê^òUþ) ùMûUòG ùMûUòG Keò ùcûU 4Uò
 \úNđ_âgÛ _Wÿòäö 600eê 700 g± cæùe 2Uòe C?e ù\âûKê ùjaö
 (2"12=24)
- (L) _ûVe _âùZýK GKKeê 4Uò iöìò¯ _âgÛ _Wÿòäö 2Uòe C?e 200eê 300 g±
 cæùe ù\âûKê ùja (2"8=16)
- (M) _ûVe _âùZýK GKKeê 2Uò ùfLûG 8Uò @Zò iöìò¯ _âgÛ @ûiòäö aò\ýû[đú
 ùMûUòG aûKýùe 5Uòe C?e ù\ùäö (2"5=10)
 ùcûU ^'e / cífýûu - 50ö

iaòùgh _ûVý

ù~ûMûù~ûMcikK cûZébûhû-IWÿò@û (AECC)

ù~ùKøYìò 2Uò _ûV aûQ

Elective-Any Two

_â[c _~đýûd / 1st SEMESTER

ûVý-1 / Course-3: aòmû ^ Kkû I bûhû-iûjòZý

1c GKK : aòmû_ ^e _eòbûhû, _eòie, _âKû~đý

2d GKK : aòmû_ ^e KkûcôK Cùÿgý

3d GKK : aòmû_ ^e _âKûe I _âÉêZò

4[đ GKK : ùfûK iö_Kđ-aòmû_ ^ I aòmû_ ^e bûhû

5c GKK : aòmû_ ^ Kkû I iûjòZý

iöaû\, bûhû I iûjòZý

_ûVý-2 / Course-5

1. íû\e _eòbûhû I _eòie

2. íû\e _âKûe I C_ù~ûMòZû

3. MYcûæc]cđú iöaû\ _âÉêZò

4. eì_KûcôK `òPe É,eP^û, iµû\Kúd

5. iöaû\ I iûjòZý, íû\e bûhû

gévkuùK÷!òâK Azù]ú^ _ûV-IWÿò@û

(ù~ùKøYiò 4Uò aùQòaùKê ùja)

DISCIPLINE SPECIFIC (CENTRIC) ELECTIVE-ODIA (ANY FOUR)

- * ahðûjð _~ðýûd - 5c I 6Â (Semester-V, VI)
- * ahðûj _~ðýûd-5c (Semester-V) _â[c I \βòZúd _Zâ100+100=200 ^'e
- * ahðûj _~ðýûd-6Â (Semester-VI) ZÉZúd _Zâ
20 ^'e @û«ü _eúlû / 80 ^'e cêLý _eúlû) 100 ^'e
- * PZê[ð _Zâ - _âKì _âÉÊZò (hÂ _~ðýûd / Semester-VI
(75 ^'e _âKì ùfLû + 25 ^'e iûlûZKûe) 100 ^'e
ùcûU 400 ^'e
- * ùcûU @ûiÚûcìfýûu (Total Credits) 6 " 4 = 24
- * cìfýûu I _âgÛ_Zâ aòbûR^ ^òdc : _â[c Zòù^ûUò _Zâ _âùZýK 100 ^'e
aògòÁö 80 ^'e cêLý _eúlû I 20 ^'e @û«ü _eúlûö @û«ü _eúlûe 20 ^'e
_âgÛ @Zò iöìò`cìkK ùjaû CPòZpö G cêLý _eúlû 80 ^'e Gjûe aòbûR^
^òdc ùjCQò-
- (K) _âùZýK _Zâe _âùZýK (5Uò~ûK) GKKeê ùMûUòG ùfLûGñ ùcûU 5Uò
_âgÛ _Wòàö aò\ýû[ðúuê _i! @^êiûùe 600 eê 700 g±ùe 3Uò _âgÛe
C☑e ù\àùKê ùjaö ùcûU cìfýûu- 3 " 12=36ö
- (L) _âùZýK _Zâe _âùZýK (5Uò~ûK) GKKeê iöìò` ùaû]mû^cìkK 5Uò _âgÛ
_Wòàö Zòù^ûUòe C☑e 400 g± cæùe ù\àùKê ùjaö cìfýûu aòbûR^-
3"8=24ö
- (M) _âùZýK _Zâe 5Uò~ûK GKKeê ùcûU 15ùMûUò _âgÛ @ûiòàö 10Uò
_âgÛe iöìò` C☑e 50Uò g± @[aû 2Uò aùKý cæùe ù\àùKê ùjaö 10 "2=20ö
- * bìcòKû (_òdû`f) : Gjò _ûVýKâcUò aò\ýû[ðúcuê IWÿògûe iûöÄÉZòK,
iûcûRòK I eûR^úZòK AZòjûie aòa☑ð^ aòhdùe mû^ @ûjeY _ûAñ
iêù~ûM ù\àö IWÿò@û iûjòZýùe icûR I iöÄÉZòe _âZò`k^, iûjòZýZ☑β,
iRð^gúkZû, bûhòK gévkû, iûjòZýe aòàò]Zû, iûjòZý g±ùKûh, fòL^ ùKøgk,
ùKûhMâ^Úû\ò iµû\^û I _âPkòZ bûhûe ayûKeY, Kûö_êUeòK ùKøgk
aò\ýû gòIY AZýû\ò \òMKê æû^ \ò@û~ûA G _ûVýKâcUò _âÉÊZ
ùjûAQöö
Gjò _ûVýKâcùe ùcûU 13ùMûUò _ûV @Qòö aò\ýû[ðú ^òÿòðÁ gévkûe
aò\ýû bûaùe ù~ùKøYiò PûùeûUò _ûVKê aùQò_ùeòùàö G[ôcæê
ùMûUòG _ûVKê @û]ùe Keò Zû' ijòZ @^ý aò\ýûKê iöù~ûM Keò hÂ

_~đýûd (ùicòÁe-6) _eúlû ùakKê _âKì Kû~đýUòG ùfLò 50 _éÂû cxùe
_âÉÊZ Keòau ùjuaö _âKìUò 4[đ _Zâ bûaùe aòuaPòZ ùjaö
aòugh \âÁáy : _â[c \éAUò _Zâ 1eê 8 iõLýK _ûVeê aQû~òao Zézúd _Zâ 9eê
iõLýK _ûVeê aQû~òao

iaòùgh _ûVýKâc

ùcûU 13 ùMûUò _ûV: 4Uò aûQòua

_Zâ iõLýû- 4

_âùZýK _Zâ- 100^'e (20 ^'e @û«ü _eúlû + 80^'e @«òc cêLý _eúlû)

@ûiÚû - cìfýûu = 6"4 = 24

_âùZýK _Zâ _ûAñ 40Uò _òeòdWp, _âZò _òeòdWp - 1N?û

ahđûiđ _~đýûd- 5/6 (ùicòÁe)

_ûVý-1: IWÿògûe iûõÄézòK AZòjûi | IWÿò@û iûjòZý (@ûiÚûcìfýûu 4+2=6)

1c GKK: IWÿògûe iõlò̄ AZòjûi | IWâ RûZòe HZòjý Gaõ ùa÷gòÁýö

2d GKK: IWÿògûe iõÄézò (iõùl_ùe Kkû, aûYòRý, ice, gâúRM^Üû[iõÄézò)ö

3d GKK: IWÿògûe aòbò^Ü lcđe aòKûg | Zûle iûjòZòýK _âZò`k^ (iûeûõg
mû^bò?òK)ö

4[đ GKK: ùaøj iõÄézò | P~đýû_ \, IWÿògûe iûcûRòK | iûõÄézòK AZòjûiùe
i~đýaõg | IWÿò@û iûjòZýö

5c GKK: IWÿò@û iûjòZýùe Mûşòau\ú Pò«û]ûeûö

_ûVý-2: iûjòZý Z?ß | iûjòZý _eòbûhû

1c GKK: eúzò, iòjû« ùeûcû?òK Pò«û]ûeû, aòNU^aû\ (_âûPý-_û½ûZý
aòPûeùe)

2d GKK: iRđ^gúkZû (_âûPý-_û½ûZý \éÁòbwúùe)

3d GKK: \kòZ iûjòZý | Zêk^ûcòK iûjòZý(_eòbûhû | C_ù~ûMòZû)

4[đ GKK: @ûbûi Mì, @Yê _ZâòKû, PòZâKì, c^Éû?ßòK C_^ýûi, cêq]ûeùe
^ûUK, _âûùdûMòK icûùfûP^ûö

5c GKK: @bò]û^ _âÉÊZòKkû | @şd^/iûjòZý g±ùKûh MV^ aò]òö

_ûVý-3: K[ûiûjòZý @şd^

1c GKK: @ia%õđ(\kòZ C_^ýûi)- aòbìZò _...^ûdK

2d GKK: céZêý egàò (ùà÷mû^òK C_^ýûi)-ùMûKêkû^! cjû_ûZâ
 3d GKK: \lòYûa[đ (_âûùdûMòK C_^ýûi)- gû«^ê Kêcûe @ûPû~đý
 4[đ GKK: ceûke céZêý (_â[c 3Uò Mì)- iêue!â cjû«ò
 5c GKK: lê\âmì @xd^ (Mì gzû±úe)- iõKk^ ù\áu _âi^Û _...^ûdK, iõMc
 _aæòùKg^, aâjà_êe
 _ûVý Mì: cgûYòe `êf- iyò\û^! eûCZeûd
 Wòcòeò`êf- @Lòk ùcûj^ _...^ûdK
 cêLû- Ké¾ _âiû\ cògâ
 e^ôûKe- eaò _...^ûdK

_ûVý-4: ^ûUK I GKûuòKû @xd^ DSE III

1c GKK: @bò~û^ - KûkúPeY _...^ûdK
 2d GKK: aû^_âiÚ- aòRd cògâ
 3d GKK: aòZKđòZ @_eûjÛ- cù^ûeõR^ \ûi
 4[đ GKK: @[P PûYKý- e^ôKûe PA^ò
 5c GKK: GKûuòZû:
 _ûV: @kò_êeùe ^òùKûfûi- ùMû_ûk ùQûUeûd
 _âùag _âiÚû^ - aògßRòZp \ûi
 eûÉû ^ûjó- ^úkû\âò bìhY jeòP!^

_ûVý-5: IWÿò@û Kûaý-KaòZû @xd^ DSE I

1c GKK: M\û_ađ- iûekû \ûi
 2d GKK: ù_âciê]û^ò]ô (1c I 14g Qû!)- Cù_!â b-
 3d GKK: _gê_lúe Kûaý (_â[c Zòù^ûUò Mû[ûKaòZû)- eû]ûùcûj^ MWÿ^ûdK
 4[đ GKK: _âûPú^ cæKûkú^ KaòZû- _âûPú iûjòZý _âZòÂû^, KUK
 _ûVý KaòZû: bâce PòUûC- \ú^aşê eûRjeòP!^
 c^ùaû] PCZògû- bqPeY \ûi
 aûecûiú ùKûAfò- gue \ûi
 PKû^d^ ùj- cû]aú \ûiú
 5c GKK: @û]ê^òK KaòZû- KaòZû Pd^/iµû\^û- C}k aògßaò\ýûkd
 _ûVý KaòZû: K[êKòe búa^û- eû]û^û[eûd
 a!úúe iûõæ @^êPò«û- ùMû_aşê \ûg
 ~ûZâû iwúZ- ùa÷KêY× ^û[_...^ûdK
 _âbûZ @aKûg- ^!Kòùgûe ak

icê\â I cêñ- ùiøbûMý Kêcûe cògâ

_ûVý-6/M\ý iûjòZý @xd^

1c GKK: cû\kû_û-ò- ~~ûZò ùKgeú I @^wbúc ù\â- _âûPú^ M\ý _\ýû\gð-
IWÿògû iûjòZý GKûùWcú

2d GKK: IWÿò@û ecýeP^û
_ûVý _âiw: aUê@û- ùMûaò! Zâò_ûVúd
Az«ò\û_òùK- ùa÷¾a PeY iûcf
bêf- bêaù^gße ùaùjeû

3d GKK: Rúa^iáZò(1-20 _éÂû) ^ûeûdY aúeae iûc«, Mâ^Úc! òe

4[ð GKK: ù\ùgù\ùg (_â[c 3Uò _ûV)- aûeòÁe ùMûaò! \ûi

5c GKK: iRð^gúk _âa§- _âa§ Pd^, C}k aògßaò\ýûkd

_ûVý _âiw: @^« ù_âc- aògß^û[Ke
aògß bûZéZß- e^ôûKe _Zò
icûRaû\ú cû^aòKZû- eû]û^û[e[
Êû]ú^Zûe ^iZ^ cìfýuaû]- ùMûùfûK aòjûeú]k

_ûVý- 7: IWÿò@û bûhû I aýûajûeòK aýûKeY

1c GKK: IWÿò@û bûhûe ùcøkòK ùa÷gòÁý I HZòjûiòK aòa[ð^

2d GKK: IWÿò@û]ß^ò I a%òðcûkû

3d GKK: IWÿò@û g± aòba (@û[òkòK I ù\gR)

4[ð GKK: IWÿò@û g± MV^aò]ô (eì_òcZ[ß/Êeaý-^ iõù~ûM aò]ô/_âZýd
iõù~ûM)

5c GKK: I^ò@û eìXòe MV^ I _âùdûM

_ûVý-8: iûjòZý fòL^ Kkû DSE II

1c GKK: _âa§ fòL^ Kkû

2d GKK: KaòZû fòL^ Kkû

3d GKK: ^ûUK eP^û I c[C_iÚû_ ^ Kkû

4[ð GKK: lê\âMì eP^û Kkû

5c GKK: ù~ùKøYiò KaòZûe _âùdûMòK @ûùfûP^û

(_ûV\û^ icdùe gòIKcûù^ ù~ùKøYiò 3Uò KaòZû ^cê^û eìù_ C_iÚû_ ^ Keò
ùfLK I ùfLûe ^ûc ^ù\A aò\ýû[ðú ^òùR ZûjûKê Kò_eò aêSò _âùdûMòK
\òMeê aýûLýû KeêQ«ò ZûjûKê ^òeì_Y Keòuaö _âùdûMòK icûùfûP^û

_jZòKê G ùlZâùe @^êieY Keû~òäö)

_ûVý-9: **IWÿò@û bûhûe Kõ_êýUeòK aýajûe**

1c GKK: Kõ_êUee _eòbûhû I C_ù~ûMòZû

2d GKK: i`Up ùlßdûee I jûWðùlßdûe Kõ_êUe- _âKû~ðý

3d GKK: IWÿò@û bûhûe Kõ_êýUeúKeY- IWÿò@û `ãUip, Kò-ùauWð,
Kõ_êýUeòK g± _âKâòdû, a^û^ I aýûKeY ~ûõPK _âKòâdû

4[ð GKK: IWÿò@ûèe AõUeù^U aýajûee aòàò] \òM

5c GKK : IWÿò@û iûcûRòK ùlßapiûAUipip

_ûVý-10 / Course-10 : **IWÿò@û ùfûKiûjòZý** DSC-III

1c GKK : ùfûKaò\ýû I ùfûKiûjòZý (iõmû, Êeì_, _eòie)

2d GKK : IWÿò@û ùfûKMúz

3d GKK : IWÿò@û ùfûKKûjûYú I R^gîZò

4[ð GKK : IWÿò@û ùfûK ^ûUK

5c GKK : _âaû\, _âaP^, ^ñû\ò@û, eêXÿò, ùfûKûPûeúd (gKê^ aògßûi)

_ûVý-11 / Course-11 : **IWÿò@û iûjòZýe AZòjûi**

1c GKK : IWÿò@û iûjòZýee AZòjûi (AZòjûi I iûjòZýe AZòjûi, IWÿò@û iûjòZýe
AZòjûi eP^û]ûeû, ~êM aòbûMúKeY)

2d GKK : IWÿò@û @^êaû\ iûjòZýe AZòjûi

3d GKK : IWÿò@û _âa§ iûjòZýe AZòjûi

4[ð GKK : IWÿò@û _\ý iûjòZýe AZòjûi

5c GKK : IWÿò@û K[ûiûjòZý I ^ûUý iûjòZýe AZòjûi

_ûVý-12 / Course-12 : **gûÈúd IWÿò@û bûhûe @û`òìòK _âudûM**

1c GKK : bûhû-eûRbûhû, _âgûi^òK bûhû Gaõ IWÿò@û bûhûe eûRbûhû
bûaùe _âPkòZ ùjaùe AZòjûi, gûÈúd bûhû bûaùe IWÿò@û bûhûe
ùa÷gòÁýö

2d GKK : ^[úKeY _âKòâdûö

3d GKK : ieKûeú _Zâ, @û`òìòK aýqòMZ _Zâ, aûYòRòýK _Zâ, ùNûhYû _Zâö

4[ð GKK : @]ôiP^û, aòm^-ò, mû_^ I mû_^úd, aòaeYú fòL^, _âgûi^òK
g±ùKûhe bìcòKûö

5c GKK : PòVû, LiWÿû, \fòfp _âÉêZúKeY, ùa÷VKú _âÉûa I @^êùcû\^

_âKòâdûö

ijûdK Mâ^ÚîPú

1. _âúPú^ ù_ú[ô gêi iö_ú\^ú _jZò | @^êaú\ ùKøgk-...^ûdK, @ûgêùZûh, bêaù^gße
2. fò_òe KµêUe gòlû - _eòWû eùcg P!â, aò\ýû_êeú, KUK
3. ùcøkòK KµêUe gòlû - cògâ ù\âKû«, ù`âŠip _aägđip, KUK
4. IWÿò@û _âa§ iûjòZýe AZòjûi - Ke aûCeúa§ê, ù`âŠip _aäògđip, KUK
5. K[û iûjòZýe Kkû | KûeòMeú - \ûi KòùgûeúPeY, AÁ%ođ ùcWò@û, bêaù^gße
6. IWÿògûe iûöÄéZòK AZòjûi - cògâ _âuaû] Kêcûe, aò\ýû_êeú
7. IWÿò@û iûjòZýe @û\ò_ađ - cjû«ò iêùe!â
8. IWÿò@û iûjòZýe AZòjûi - _...^ûdK _VûYò, ^ûf!û
9. IWÿò@û iûjòZýùKûh - aògßûk aõgú]e, jòcûõgê _âKûg^, KUK
10. Rúa^ú iûjòZý ùK @æd^ - IWÿògû eûRý _ûVý _êÉK _âYd^ | _âKûg^ iõiÚû, bêaù^gße
11. _âûùdûMòK IWÿò@û bûhû - IWÿògû eûRý _ûVý _êÉK _âYd^ | _âKûg^ iõiÚû, bêaù^gße
12. IWÿò@û iûjòZýe iûcûRòK iûöÄéZòK AZòjûi - \ûi PòZeõR^, IWÿògû eûRý _ûVý _êÉK _âYd^ | _âKûg^ iõiÚû, bêaù^gße
13. aòcgđ aòMâj - Zòâ_ûVú iù«ûh, ù`âŠip _aäògđi, KUK
14. iûjòZýe îPú_Zâ - _...^ûdK aòbìZò, ^ûf!û, KUK
15. IWÿò@û a%ođcûkû - UòKûdZ, ùK÷kûi P!â, _êeú
16. iûjòZýe Wûk_Zâ - iûcf ùa÷¾a PeY
17. iûjòZýe eì_ùeL - jeòP!^ ^úku\òâ bìhY
18. _âPkòZ IWÿò@û bûhûe aýûKeY - cjû_ûZâ aòRd _âiû\, aò\ýû_êeú
19. iõù~ûM @^êaò]ô - Zòâ_ûVú iù«ûh, ^ûf!û, KUK

UTKAL UNIVERSITY

CBCS : BA (Hons.) 2015-16

C}k aògßaò\ýûkd

_i! | @ûiÚûbòZòK _ûVýLiWÿû : iÛûZK (IWÿò@û i'û^) 2015-16

_â]û^ _ûVýûõg- Core Course

ùcûU _Zâ iõLýû-14

_âùZýK _Zâ - 100 cìfýûu aògòÁ (20 ^'e cjûaò\ýûkd Éeúd @û«ü _~đýûd _eúlû +k 80 aògßaò\ýûkd Éeúd cû^K @«òc _eúlû)

- i¹û[^] : RùY iÛûZK - i¹û[^]e (@[^]ið) aò\ýû[ðú - ùcûUþ 1400 [^]ee _eúlû ù\ùäö
- (K) @Zò Kcpùe (ùcûUþ) 50Uò Kû~ðý [^]òNððU (_òeòdWþ)ùe ùMûUòG
_Zâe _ûV\û[^] ùgh ùjaö ùMûUòG Kû~ðý [^]òNððU aû _òeòdWþ-60
cò[^]òUþ aû 1 NðUû)
- (L) _âùZýK _Zâ 5ùMûUò dê[^]òUþ / GKK / C_ûðgùe aòbq ùjûAQòö
- (M) _âùZýK _Zâ 6 @ûiÚûbòZòK Kû~ðý [^]òNðð (4+2 ùKâWòUþ) _ûAùäö
ùMûUòG @ûiÚûbòZòK Kû~ðý [^]òNððUe cjZß ùjCQò- 10 _òeòdWþ ijòZ
icû[^]ö
ùcûU 14 ùMûUò i¹û[^] _Zâe @ûiÚûcífýûu (ùKâWòUþ) ùjCQò - 14 " 6
(4+2)= 84ö G[ôcxeê 14 " 4 = 56 ZûZßòK _ûV (Theory) Gað 14 " 2 = 28
ÊKúd ùgâYú ùaû]K _ûV (Tutorial) ijòZ RWòZö
- (N) _eúlû _~ðýûdKâc (Semester) | _âÉûaòZ _ûV ù~ûR[^]û :
- (O) aò\ýû[ðú^{cû^}u Êû]ú[^] cêq ùc]ûaéZò _eúlû _ûAñ ùicû[^]u _i| |
ùaû]mû[^]cikK \úNð iðlò⁻, @Zò iðlò⁻ _eúlû [^]òcù« C_iÚû[^]û Keû~òäö
- (P) [^]e / cìkýûu aòbûR[^] _jZò :
1. _âùZýK _â]û[^] _ûVýûðg aû _âùZýK _Zâ - 100 [^]e aògòÁ
 2. cjûaò\ýûkdÉeúd @û«ü_eúlû - 20 [^]e
aògßaò\ýûkdÉeúd cêLý @û«ü_eúlû - 80 [^]e
 3. aògßaò\ýûkdÉeúd cêLý _eúlûùe [^]òcÜcùZ _âgÜ _Wÿòä:
- (K) _âùZýK _Zâe _âùZýK GKKeê 5Uò \úNð _âgÜ _Wÿòäö aò\ýû[ðú 3Uò
_âgÜe Cûe 600 eê 700Uò g± cæùe ù\ùäö (3"12=36 [^]e)
- (L) _âùZýK _Zâe _âùZýK GKKeê 5Uò iðlò⁻ _âgÜ _Wÿòäö aò\ýû[ðú 3Uò
_âgÜe CZe 300 g± cæùe ù\ùäö (3"8=24)
- (M) ùcûU 5ùMûUò iðlò⁻ _âgÜ _âùZýK GKKeê @û]ûe Keò _Wÿòäö 3Uò
_âgÜe CZe aò\ýû[ðú 50 g± cæùe ù\ùäö (3"5=15)
- (N) 8Uò @Zò iðlò⁻ _âgÜ _Wÿòäö aò\ýû[ðú 5Uòe CZe ùMûUòG g±ùe @[aû
ùMûUòG aûKýùe ù\ùäö (5"1=5)

_ûV bìcòKû (_òâd'k)

iÛûZK ùgâYúùe IWÿò@û bûhû | iûjòZý í'súd _ûV\û[^] [^]òcù« Gjò
_ûVýKâce LiWÿûUò _âÉêZ ùjûAQòö Gjûe _âÉêZò ùlZâùe aògßaò\ýûkd
@ûùdûMu _âùùdûRòZ " _i| | @ûiÚûbòZòK [^]iZ[^] _ûVýaò[^]ýûi _jZò"Kê
MâjY Keû~ûûAQòö Gjò _ûVýLiWÿûUò i\ýZc bûhû iûjòZý í'súd mû[^]

aýaiÚû I Pk«ú icdùe C_ù~ûMòZûKê Pûjó _âÉÊZ ùjûAQòö \êAgj ahðe
 IWÿò@û bûhûe Cù^àh, àòKûg]ûeû ijòZ Gjûe iûõ_âZòK iUòZò,
 aýûKeYbòZòK I bûhûZûZßòK ùa÷gòÁý iõ_Kðùe àò\ýû[ðúcû^ue iaòùgh
]ûeYû Gjò _ûVýKâceê còkò_ûeêQòö G[ôijòZ IWÿò@û bûhûe fòLòZ
 IWÿò@û iûjòZýe _âûd 1200 ahðe iûjòZòýK àòKûg]ûeû àòhdùe
 àò\ýû[ðúcû^ue]ûeYû ^ò½òZ iKûeûcòK ùjûA_ûeòa G[ô_âZò xû^
 \ò@û~ûAQòö IWÿò@û iûjòZýe aýûajûeòK _âùdûR^ I cjZß _âZò xû^
 G[òùe \ò@û~ûAQòö IWÿò@û iûjòZýe àòàò] iûjòZòýK _âûei_, àòbò^Ü
 icde iûjòZý-]ûeû I àògòÁ iûjòZý-ùfLKu cìk_ûV ijòZ àò\ýû[ðúuê
 ù~ûWÿòù\âuùe _ûVýLiWÿûUò i`k ùjCQòö IWÿò@û bûhû I iûjòZýKê
 iaðbûeZúd bûhû iûjòZý ijòZ ù~ûWÿò ù\âuKê I @û«RðûZúd iûjòZý
 àò\ýû @^êKìk Keò àòPûe KeòâuKê Gjò LiWÿûUò àò\ýû[ðúu C_ù~ûMú
 ùjûA_ûeêQòö LiWÿûUòKê ùcûU 14ùMûUò _Zâùe I _âùZýK _ZâKê 5Uò
 ùfLûGñ GKK aû C_ûõgùe àòbq Keû~ûAQòö
 àòùgh \âÁáy : +3 i'û^ (@^ið) ùgâYú ^òcòZ _âÉÊZ Gjò _ûVýKâce 14ùMûUò
 _ûV / _Zâeê ùgh \êAUòKê KûUò\ò@û~ûA iû]ûeY +3 Azû]ú^ (B.A
 Programme) ùgâYú _ûAñ _â]û^ _ûVýûõg eìù__âPk^ Keû~òàö @^êei_
 bûaùe Cbùd SEC / DSE icû^ bûaùe @^ý i'û^ I Azû]ú^ (B.A. Honours /
 Pass) àò\ýû[ðú _â\Z _ûVýKâc @^êiùe @û«ügevku àò\ýZû bûaùe
 aûQò_ûeòùäö

iaòùgh _ûVýKâc (Detail Syllabus)

â[c~ðýûd (Semester-1)

cìk_ûV : **IWÿò@û iûjòZýe AZòjûi**

_â]û^ _ûVýûõg-1 (Core Course-1): **IWÿò@û iûjòZýe AZòjûi** (i`ceê ùhûWÿg
gZû±ú_~ðý«)

1c GKK / dê^òUþ-1 : _âûKþ-iûekû iûjòZý (P~ðýûMúz, ^û[iûjòZý)

2d GKK / dê^òUþ-2 : iûekû iûjòZý (iûekû \ûiu eP^ûi,ûe I ùiiaêe iûjòZòýK,
iûcûRòK I iûõÄézòK ùa÷gòÁý)

3/ GKK / dê^òUþ-3 : _õPiLû iûjòZýe _éÂbìcò I ùfLK (akeûc RM^Üû[)

4[ð GKK / dê^òUþ-4 : _õPiLû iûjòZýe ùa÷gòÁý

5c GKK / dê^òUþ-5 : _õPiLû iûjòZýe iûcûRòK I iûõÄézòK @ûùa\^

_â]û^ _ûVýûõg-2 (Core Course-2: **ç~êMúd IWÿò@û iûjòZýe AZòjûi**

- 1c GKK / dê^òUþ-1 : cœ~êMúd / IWÿò@û iûjòZýe _éÂbìcò I aòKûg]ûeû
- 2d GKK / dê^òUþ-2 : cœ~êMúd / IWÿò@û iûjòZý (@ûLýûdòKû Kûáy, _êeûYgòâZ, ùa÷¾a Kûáy)
- 3d GKK / dê^òUþ-3 : cœ~êMúd Kûáy @ûwòK ùa÷PòZâý (@ûkuêeòKZû, iûwúZòKZû, eúZòùa÷PòZâý)
- 4[ð GKK / dê^òUþ-4 : cœ~êMúd Kûáy @ûcòK ùa÷PòZâý (eiùPZ^û, aòhdaÉê aò^ýûi, PeòZâPòZâY)
- 5c GKK / dê^òUþ-5 : cœ~êMúd MúZòKûáy _eõ_eû (Põ_ì, PC_\ú, PCZògû)

\ßòZúd _~ðýûd (Semester-II)

_â]û^ _ûVýûõg-3 (Core Course-3): @û]ê^òK IWÿò@û iûjòZý

ZéZúd _Zâ

- 1c GKK / dê^òUþ-1 : @û]ê^òK IWÿò@û iûjòZýe _éÂbìcò I ^aRûMeYe bìcòKû
- 2d GKK / dê^òUþ-2 : _âûKþ @û]ê^òK Kûke IWÿò@û Kûáy KaòZû I K[ûiûjòZý
- 3d GKK / dê^òUþ-3 : IWÿò@û iûjòZýùe izýaû\ú]ûeû
- 4[ð GKK / dê^òUþ-4 : IWÿò@û iûjòZýùe iaêR]ûeû
- 5c GKK / dê^òUþ-5 : IWÿò@û _âMZòaû\ú I aûÉaaû\ú iûjòZý]ûeû

_â]û^ _ûVýûõg-4 (Core Course-4): Êû]ú^Zûe IWÿò@û ijòZý

PZê[ð _Zâ

- 1c GKK / dê^òUþ-1 : Êû]ú^Zû _eaZðú IWÿò@û KaòZû
- 2d GKK / dê^òUþ-2 : Êû]ú^Zû _eaZðú IWÿò@û C_^ýûi I Mì
- 3d GKK / dê^òUþ-3 : Êû]ú^Zû _eaZðú IWÿò@û ^ûUK I GKûuòKû
- 4[ð GKK / dê^òUþ-4 : Êû]ú^Zû _eaZðú IWÿò@û M\ý iûjòZý (_âa§ I icûùfûP^û)
- 5c GKK / dê^òUþ-5 : Êû]ú^Zû _eaZðú IWÿò@û iûjòZýùe _Zâ_ZòâKû
- _ûVýûõg 1 eê _ûVýûõg 4 ^òcù« ijûdK Mâ^ÚiìPú :
1. IWÿò@û iûjòZýe @û\ò_að I CZe cœ_að : cjû«ò iêùe!â, KUK ÁêùWõUip ùÁûe
 2. @û]ê^òK IWÿò@û iûjòZýe AZòjûi : iûc«eûd ^Uae, aûYúba^, bêaù^gße
 3. IWÿò@û iûjòZýe iõlò _eòPd : @ûPû~ðý aé!ûa^, Mâ^Úc!òe, KUK

4. IWÿò@û iûjòZýe AZòjûi : cû^iòðj cûdû]e, Mâ^Úc|òe, KUK
5. IWÿò@û iûjòZýe AZòjûi : Ke aûCeúaŒê, ù`âŠip _aäògđip, KUK
6. @û]ê^òK IWÿò@û iûjòZýe aòKûg]ûeû : Zòâ_ûVú iù«ûh Kêcûe, iê|eMWÿ
7. IWÿò@û iûjòZýe AZòjûi : _...^ûdK _VûYò, ^ûk|û, KUK
8. IWÿò@û iûjòZýe AZòjûi : _ûXú ùaYê]e, _âûPú iûjòZý _âZòÂû^, KUK
9. @û]ê^òK Kûaý Ròmûiû, PòZâKÌ : \ûi \ûge[ô, @Mâ|iZ, KUK
10. KaòZûe cû^PòZâ : cjû«ò Rû^Kú afäb, ù`âŠip _aäògđip, KUK
11. IWÿò@û iûjòZýe KâcaòKûg : cjû«ò iêue|â, @Mâ|iZ, KUK
12. @^êaû\ iûjòZýe ZZß I _âùdûM : _â]û^ cû^ûeõR^, IWÿògû aêKp ùÁûe, KUK
13. iûjòZý ìPú_Zâ : _...^ûdK aòbìZò, ^ûf|û, KUK
14. CZe @û]ê^òKZû ZZß I _âùdûM : iõ. gZ_[ú ù\au _âiû\, @Mâ|iZ, KUK
15. @û]ê^òKaû\ I CZe @û]ê^òKaû\ : e[_â\ú_ Kêcûe, izý^ûeûdY aêKpùÁûe, KUK
16. IWÿò@û Kûaý ùKøgk : @ûPû~đý iê\gđ^, aâjà_êe
17. K[ûiûjòZýe K[^òKû : IZû aò¾ê_òâdû, _âûPú iûjòZý _âZòÂû^, KUK
18. iûekû cjûbûeZ iéÁòe bìcò_ađ : iûjê C\d^û[, Pò^àd _âKûg^, KUK
19. iaêReê iûõ_âZòK : gZ_[ú ^òZýû^|, Mâ^Úc|òe, KUK
20. IWÿò@û iûjòZýe _âMZòaû\ú]ûeû : gZ_[ú aòRd Kêcûe, IWÿògû aêKp ùÁûe, KUK
21. IWÿò@û C_^ýûi : ùaùjeû Ké¾PeY, RM^Ûû[e[, KUK
22. @ûùfûP^û cûkû : cògâ KûjÛëPeY, ù`âŠip _aäògđip, KUK
23. IWÿò@û iûjòZýe AZòjûi : @û\ý _âdûi - cjû«ò _âi^Û Kêcûe, KUK

ZéZúd _~đýûd (Semester-III)

_â]û^ _ûVýûõg-5 (Core Course-5): **IWÿò@û bûhûe HZòjûiòK aòKûgKâc_õPc_Zâ**

1c GKK / dê^òUp-1 : IWÿò@û bûhûe C_òZò I KâcaòKûg

2d GKK / dê^òUp-2 : IWÿò@û fò_òe HZòjûiòK aòZđ^ I fIY

3d GKK / dê^òUp-3 : IWÿò@û gòkûùfLe bûhû

4[đ GKK / dê^òUp-4 : P~đýû_ \ I iûekû iûjòZýe bûhû

5c GKK / dê^òUp-5 : IWÿò@û bûhû ijòZ @^ý bûhûe iµKđ (\âûaòWÿ, @ÁòK, ~ûa^òK, AõeûRú)

_â]û^ _ûVýûõg-6 (Core Course-6): IWÿò@û bûhûe ùcøkòK Êeì_ I fLY

hÂ _Zâ

1c GKK / dê^òUþ-1 : gûÈúd bûhû, IWÿò@û bûhûe gûÈúd fLY, IWÿò@û bûhûe ùcøkòK I ùa÷gòÁý

2d GKK / dê^òUþ-2 : IWÿògûe J_bûhòKú bûhûùlZâ I IWÿò@û @ûõPkòK bûhû-C_bûhû-ùâûfö

3d GKK / dê^òUþ-3 : IWÿò@û cû^K bûhû I K[ôZ bûhû

4[õ GKK / dê^òUþ-4 : IWÿò@û M\ý bûhûe àòazõ^

5c GKK / dê^ò~þ-5 : IWÿò@û g± aòba I Gjûe @[õ ^ò¿Zò cìkK ùa÷gòÁý (@bò]ûcìkK, fLYûcìkK, aý~^ûcìkK)

_â]û^ _ûVýûõg-7 (Core Course-7): IWÿò@û bûhûe _âùdûM I aýûajûeòK aýûKeY

1c GKK / dê^òUþ-1 : IWÿò@û iûcûRòK I iûõÄézòK]ûeûùe iêbûhY I @_bûhY

2d GKK / dê^òUþ-2 : IWÿò@û iûcûRòK - ùfûKûPûecìkK g± I Zû'e _âùdûM

3d GKK / dê^òUþ-3 : @gêj a^û^ I bîþ fòL^e KûeY I Zû'e gêj ^òeûKeY

4[GKK / dê^òUþ-4 : IWÿò@û @leZZß I a%õ òbûR^

5c GKK / dê^òUþ-5 : IWÿò@û aûKýe MXÿY, _âKûe I _âùdûMPûZêeú, aòeûcPòjÛe aýajûe, cê\âY ZîUò iõùgû]^ _jZò, aòmû ^e bûhû, ùNûhYû Kkû (@ûueòõ@ûUõ) I bûhòK C_ûd

PZê[õ _~õýûd (Semester-IV)

_â]û^ _ûVýûõg-8 (Core Course-8): (ùfûK]ûeû/IWÿò@û bûhûe ùcøLòK _eõ_eû)

1c GKK / dê^òUþ-1: ùfûK iõÄézò I ùfûKiûjòZý (iõmû, Êeì_, _âKûeùb\)

2d GKK / dê^òUþ-2 : IWÿò@û ùfûKMúz, Gjûe _âKûeùb\ I ùa÷gòÁý

3d GKK / dê^òUþ-3 : IWÿò@û ùfûKKûjûYú I R^gîZò

4[õ GKK / dê^òUþ-4 : IWÿò@û ùfûùKûqò, _âKûeùb\, iûcûRòK-iûõÄézòK @ûù^\^

5c GKK / dê^òUþ-5 : ùfûK^ûUK

bòZò _ûVýûõg-1 (Core Course-9): **IWÿò@û iûjòZýe Êeì_, ZZß I iûjòZòýK g±**

1c GKK / dê^òUþ-1 : KaòZû, C_ ^ýûi, @ûcôRúa^ú

2d GKK / dê^òUþ-2 : @û]ê^òKZû, C_ ^òùagaû\, eiaû\

3d GKK / dê^òUþ-3 : _âùdûMòK icúlû, ùg÷kúZûZßòK icúlû

4[đ GKK / dê^òUþ-4 : Zêk^ûcôK iûjòZýe _eòbûhû I C_ ù~ûMòZû

5c GKK / dê^òUþ-5 : @^êaû\ZZß I @^êaû\e _âKûeùb\

cìk / _â]û^ _ûVýûõg-10 (Core Course-10): **IWÿò@û iûjòZýe iaòùgh @xd^ ùfLKúd _ûV**

1c GKK / dê^òUþ-1 : RM^Ûû[\ûi, C_ |â b-

2d GKK / dê^òUþ-2 : búcùbûA, iyò\û^ |

3d GKK / dê^òUþ-3 : MûlòK gû«^ê Kêcûe @ûPû~đý, J_ ^ýûiòK ùMû_ú^û[cjû«ò

4[đ GKK / dê^òUþ-4 : ^ûUýKûe RMù^àûj^ fûf I eùcg _âiû\ _ûYòMâûjú

5c GKK / dê^òUþ-5 : _âûaşòK PòZeõR^ \ûi I icûùfûPK ^Uae iûc«eùd

_c _~đýûd (Semester-V)

cìk / _â]û^ _ûVýûõg-11 (Core Course-11): **IWÿò@û iûjòZýe iaòùgh @xd^ Kûaý KaòZû _ûV**

1c GKK / dê^òUþ-1 : cjûbûeZ-M\û_ađ (iûekû \ûi)

2d GKK / dê^òUþ-2 : Kòùgûûe P|âû^^ Põ_ì (K-N @^ê_âûi)- Kaòi~đý akù\ae[

3d GKK / dê^òUþ-3 : PòfòKû-eû]û^û[

4[đ GKK / dê^òUþ-4 : _âûPú^ cæKûkú^ IWÿò@û KaòZû, _âûPú iûjòZý _âZòÂû^, KUK

* gâúeûc ùKûAfò-akeûc \ûi

* cjûaûjê - a^cûkò

* @û\ý cûMđgúe - @PêýZû^| \ûi

* c^ûaû] PCZògû - bqPeY

5c GKK / dê^òUþ-5 : @û]ê^òK IWÿò@û KaòZû - iõ_û\^û iÛûZùKûZe gòlû _eòh\, C}k aògßaò\ýûkd, iê]û _âKûg^ú, KUK

* @céZcd- Mwû]e ùcùje

* ^cÄûe - cûdû]e cû^iòđj

* Mûşûeúe @ûgúaðû\ - Kûkò|úPeY _ûYòMâûjú

* IWÿògû - iúZûKû« cjû_ûZâ

* bd - ecûKû« e[

cik / _â]û^ _ûVýûõg-12 (Core Course-12): **IWÿò@û iûjòZýe @xd^ - K[ûiûjòZý / ^ûUýiûjòZý**

1c GKK / dê^òUþ-1 : @ûKûge Aiûeû (C_ ^ýûi)- cù^ûR \ûi

2d GKK / dê^òUþ-2 : @cûaûiýûe P!â (C_ ^ýûi) - ùMûaò! iû

3d GKK / dê^òUþ-3 : lê\âMì

_ûVýMì : * eûšò_ê@ @^«û -`Kúeùcûj^

* ^úkcûÁâûYú-ùMû\ûaeúg cjû_ûZâ

* gâúKé¾u ùgh jûi - iêùe!â cjû«ò

* ùcûl - _âZòbû eûd

4[đ GKK / dê^òUþ-4 : cwk @cwk aòkß cwk (^ûUK) - aòRd Kêcûe gZ_ [ú, @Mâ\iZ, KUK

@[aû

* iaûùgh ùfûK (^ûUK) - ^eûdY iûjê

5c GKK / dê^òUþ-5 : GKûuòKû _ûV

_ûVý_âiw : * @ûaòÃûe - _âûYaşê Ke

* Q\àùagú - aògßRòZþ \ûi

* cKÿcû - ùMû_ûk ùQûUeûd

hÂ _~đýûd (Semester-VI)

_â]û^ _ûVýûõg-13 (Core Course-13): **IWÿò@û iûjòZý @xd^ - M\ý iûjòZý**

1c GKK / dê^òUþ-1 : ùcû icde IWÿògû-WKÖe Ké¾P!â _ûYòMâûjú (30 _éÂûe _ûVýûõg _V^úd)

2d GKK / dê^òUþ-2 : \êA \òM«e @ûKûg (bâcY KûjûYú)-Kê-aòjûeú \ûg _â[c 4Uò @xûd / 1c bûM

3d GKK / dê^òUþ-3 : Kûaý í'û\ (icûùfûP^û-1/2d @xûd) - \ûge[ô \ûi

4[đ GKK / dê^òUþ-4 : e[i_ K (1c, 2d @xûd)-P!âùgLe e[

5c GKK / dê^òUþ-5 : _âaş : @û]ê^òK IWÿò@û _âaş, iê]û _âKûg^ú,

_ûVý_âiw : cjûùiaûZ - aògß^û[Ke

* ^òR \ûdòZß - cûdû]e cû^iòđj

* _âkd iõùKZ - geZ Kêcûe cjû«ò

cik / _â]û^ _ûVýûõg-14 (Core Course-14): **IWyò@û bûhûe aýûajûeòK**
_âùdûM

1c GKK / dê^òUp-1 : aýûajûeòK fòL^Kkû - _eòbûhû, Êeì_, ùa÷PòZâý

2d GKK / dê^òUp-2 : Kû~đýûkd fòL^ @^êaò]ô (^[ô _âÉêZò I fòL^ / Uò®Yú
fòL^ / _âÉûa fòL^ I @^êùcû\^ / PòVû _âÉêZò I fòL^ / @]ôìP^û, aòm`ò
I ùNûhYû fòL^)

3d GKK / dê^òUp-3 : iûjòZý I cê\òâZ MYcûæc (iûjòZý I iû'û\òKZû / iûjòZý I
iõ_û\Kúd fòL^ PûZêeú / É, aû `òPe eP^û / cê\òâZ MYcûæce bûhû)

4[đ GKK / dê^òUp-4 : _êÉK eP^û ùKøgk

5c GKK / dê^òUp-5 : iõ_û\^û Kkû (_Zâ/_ZòâKû)

_â]û^ _ûVýûõg-5eê _ûVýûõg 14 ^òcù« ijûdK Mâ^ÚiìPú:

1. IWyò@û bûhûe C_òZò I KâcaòKûg : cjû«ò aõgú]e, ù`âŠip _aäògđip, KUK
2. IWyò@û bûhûe Cù^àh I aòKûg : iûjê aûiêù\, ù`âŠip _aäògđip, KUK
3. IWyò@û bûhûZZß I fò_òe aòKûg : Zòâ_ûVú Kê-aòjûeú, eûRý_ûVý
_êÉK _âYd^ I _âKûg^ iõiÚû, bêaù^gße
4. aézò G ùcû ù_ûùh KêUé' : cjû«ò _õPû^^, bêaù^gße
5. iûekû cjûbûeZe bûhûZûZßòK @^êgúk^ : cjû_ûZâ]ù^gße, ù`âŠip
_aäògđi, KUK
6. IWyò@û bûhû aòba : cjû_ûZâ aòRd _âiû\, aò\ýû_êeú, KUK
7. aýûajûeòK IWyò@û bûhû I _âùdûMûcôK aýûKeY : Zòâ_ûVú iù«ûh,
^ûk'û, KUK
8. aýûajûeòK IWyò@û aýûKeY : cògâ je_âiû\, _âûPú iûjòZý _âZòÂû^,
KUK
9. IWyò@û ùfûKiûjòZý I ùfûK iõÄéZò : _â]û^ Ké¾P'â, aò\ýû_êeú, KUK
10. IWyò@û ùfûKiûjòZý icúlû : cjû_ûZâ gýûciê'e, aò\ýû_êeú, KUK
11. a%õđ _eòPd : UòKûdZeûd ùK÷kûi P'â, iêfb _âKûg^ú, _êeú
12. ùfûK^ûUK : \ûi ùjc« Kêcûe, Mâ^Úc'òe, KUK
13. IWyò@û @ûiuc I aõMkûe ùfûK^ûUý : iûjê ^ûeûdY, iZý^ûeûdY aêKp
ùÁûe, KUK
14. IWyò@û ùfûKiõÄéZò I ùfûKiûjòZý : cògâ cùj'â Kêcûe, Mâ^Úc'òe, KUK
15. IWyò@û fò_ò I bûhû : cjû_ûZâ LùMgße, Mâ^Úc'òe, KUK
16. _âùdûMòK bûhû aòmû_ ^e \òMaò\òM : _...^ûdK ùK.aò., IWyò@û

- _ûVý_êÉK_âYd^ I _âKûg^ iõiÚû, bêaù^gße
17. aòPòZâ KaòZß : Zòâ_ûVú iù«ûh, ^ûk!û, KUK
 18. _âùdûMòK IWÿò@û bûhû : cògâ @Rd, KújûYú, KUK
 19. g±MV^ ùKûh : Zòâ_ûVú _â`êfä, bêaù^gße
 20. @û]ê^òK K[û iùjòZý : _...^ûdK aòbìZò, Mâ^Úc!òe, KUK
 21. IWÿò@û _âa§ iùjòZý : Ke aùCeòa§ê, cjúaúe _âKûg^, bêaù^gße
 22. _âùdûMòK IWÿò@û bûhû : eûRý _ûVý_êÉK_âYd^ I _âKûg^ iõiÚû, bêaù^gße
 23. _âPkòZ IWÿò@û bûhûe aýûKeY : cjû_ûZâ aòRd _âiû\, aò\ýû_êeú, KUK
 24. IWÿò@û iùjòZý ùKûh : aògßûk aõgú]e, jòcûõgê _âKûg^, KUK
 25. IWÿò@û iùjòZýe iúcûRòK I iùõÄéZòK AZòjûi : \ûi PòZeõR^, eûRý _ûVý_êÉK_âYd^ I _âKûg^ iõiÚû, bêaù^gße
 26. IWÿò@û bûhûZûZßòK _âa§ I icûùfûP^û : cògâ je_âiû\, @Mâ\ìZ, KUK
 27. IWÿò@û ùføKòK _\ (1c/2d bûM) : _âjeûR ùMû_ûk P!â, KUK ùUâWòõ Kõ_û^ú
 28. C]k MâûcýMúZ I Kkû : cjû_ûZâ PKâ]e, IWÿògû iùjòZý GKûùWcú
 29. iùjòZýe eì_ùeL : jeòP!^ ^úku\òâ bìhY

**@û«üicÁòcìkK Azû]ú^ _ûV - IWÿò@û
GENERIC ELECTIVES (GE)- COURSE**

ìP^û

- * _ZâiõLýû - 4/8 ùMûUò _ûV \ò@û~òâ - 4ùMûUò _ûV 4Uò _Zâ_ûAñ aùQòaûKê ùjaö
- * _âùZýK _Zâ - 100 ^'e aògòÁ / ùcûU - 400
- * _âùZýK _Zâùe 5ùMûUò GKK ejòaö
- * _âùZýK _Zâe @ûiÚûcìfýûu (Credits) 6 / ùcûU cìfýûu 6 " 4 = 24
- * ahđûjđ _~đýûd 1, 2, 3, 4 (ùicòÁûe 1-2-3-4) _âùZýK _~đýûd aù ùicòÁûeùe ùMûUòG ùMûUòG _ûV_Zâ ejòaö ~[û-
 - * aùhđûjđ _~đýûd-1 (Sem-I) _â[c_Zâ / _ûV-1
 - * aùhđûjđ _~đýûd-2 (Sem-II)\ßòZúd _Zâ / _ûV-2
 - * aùhđûjđ _~đýûd-3 (Sem-III) _â[c_Zâ / _ûV-3
 - * aùhđûjđ _~đýûd-4 (Sem-IV) _â[c_Zâ / _ûV-4
- _âùZýK _Zâ_ûAñ ahđKê @ZòKcpùe 50Uò ùgâYú _ûV\û^ ùja Gaõ 10 ùMûUò ÊKúdùaû]^ cìkK ùgâYú gòlû\û^ (UêýùUêeû@ûfp Kâûip) ùjaö

^'e aòbûR^ aò]ô

(K) ùcûU ^'e - 100

(L) @û«ü_eúlû - 20 / cêLý_eúlû - 80

(M) cêLý_eúlûe_âùZýK GKKeê ùMûUòG ùfLûGñ_i!cìkK ùaû]mû^ cû_K
5Uò \úNđ_âgÛ_Wÿòäö 5Uò \úNđ_âgÛeê 3Uòe CZe 600 g± cæùe
ù\âûKê ùjaö 3¹²=36

(N) _âùZýK GKKeê ùMûUòG ùfLûGñ f²mû^cìkK iöìò_ _âgÛ_Wòäö ùcûU
5ùMûUò_âgÛeê 3ùMûUò_âgÛe CZe 400 g± cæùe ù\âûKê ùjaö
3⁸=24

(O) _ûðùPûUò GKKeê ùcûU 8Uò @Zò iöìò_cìkK _âgÛ_Wÿòäö 5Uòe CZe
ùMûUòG aûKýùe ù\âûKê ùjaö
1⁵=5

iaòùgh_ûVýKâc

â[c~đýûd (Semester-1) (ùMûUòG aûQ)

_ûV-2 / _Zâ-1 (Core Course-2) : **iRđ^ûgúk Kkû**

1c GKK : iRđ^gúkZûe iömû, Êeì_ I fIY

2d GKK : iRđ^gúkZûe @û]ûe

3d GKK : ^ûUK iökû_eP^û / M_-C_ ^ýûiKê ^ûUý eì_û«e

4[đ GKK : fòL^ Kkû I bûa iö_âiûeY_ jZò

5c GKK : Mì eP^û ùKøgk

@[aû

_ûV-4 / _Zâ-2 (Core Course-4) : **iûjòZý @xd^**

1c GKK : _âa§ Pd^ (iö. C}k aògßaò\ýûkd)

_ûVý : * @^« ù_âc - aògß^û[Ke

* iûekû iûjòZý - aögú]e cjû«ò

* cêñ iZý[cđû KjêQò - P!âùgLe e[

2d GKK : KaòZû Pd^ (iö. C}k aògßaò\ýûkd)

_ûVý : * KõPêKòe bûa^û - eû]û^û[eûd

* Zòù^ûUò iù^U - cûdû]e cû^iòöj

* icê\â I cêñ - ùiøbûMý Kêcûe cògâ

3d GKK : @aùaû]_eúlY - (ùMûUòG _\ý_eòùz\ 200 g± cæùe @]aû lê\â
KaòZûUòG _Wÿòäö Zjòeê 5Uò _âgÛ @aùaû]_eúlYcìkK CZe _ûAñ

@ûMZ ùjaö)
 4[đ GKK : _âaP^ / ìqò @ûgòâZ iRđ^ûcôK fòL^ (ùMûUòG _âaP^ / XM / ìqò
 @ûMZ Keû~òaaö Zû'e bûaûhđKê 200Uò g± cæùe iõ_âiûeY Keò
 ùfLôaûKê gòlû \ò@û~òaaö)
 5c GKK : g± @gêjò | Zûjûe gêj fòL^ (işòcìkK @gêjò / _âZýdcìkK
 @gêjò / aP^MZ @gêjò / icûi-fòw-a^û^MZ @gêjò Gaõ ùiaêe
 ^òeûKeY)

SYLLABUS FOR B.A. (HONORS) PHILOSOPHY UNDER CHOICE BASED
 CREDIT SYSTEM OF UTKAL UNIVERSITY, BHUBANESWAR

GENERAL PHILOSOPHY

- Unit-I** : Definition, Nature and Function of Philosophy, Philosophy in relation to other modes of thinking like science and Religion
- Unit – II** : Problems of Being : Monism and Pluralism
 Realism: (a) Naive Realism (b) Representative Realism (Locke), Idealism
 : Meaning, Esse est Percipi (Berkeley)
- Unit – III** : Problems of Knowledge: What is Knowledge? Sources of Knowledge
 : Empiricism, Rationalism
- Unit –IV** : Problems of Ethics : (1) Theories of Goodness : The Good and the Evil (2) Theories of Conduct : Egoism and Altruism
- Unit-V** : Problems of Metaphysics:
 (1) Substance and Universal
 (2) Mind and Body

Basic Study Materials:

1. John Hospers - An Introduction to Philosophical Analysis

2. G. T. W. Patrick - Introduction to Philosophy
3. G. W. Cunningham - Problems of Philosophy
4. B. Russell - Problems of Philosophy
5. D. W. Hamlyn - Metaphysics
6. Richard Taylor - Metaphysics

FIRST YEAR U. G. CORE COURSE

Semester – I

Paper – II: Logic & Scientific Method

Full Marks: 20 + 80 = 100

Credit Points: 04

- Unit-I** : Definition of Logic, Deductive & Inductive Arguments, Validity & Soundness of Arguments, Laws of Thought
- Unit – II** : Classification of Propositions (from Quality & quantity stand point) Distribution of terms, Square of Oppositions, Existential Import of Propositions, Interpretation of Categorical Propositions
- Unit-III** : Inference – Immediate Inference (Conversion & Observation) Mediate Inference (Syllogism) : Figure & Moods, Testing Validity of Arguments by syllogistic Rules
- Unit-IV** : Inductive Reasoning & Scientific Enquiry
- (a) Laws of Causation – Meaning & Definition cause and condition, Qualitative & Quantitative Marks of Causation
- (b) Mills Experimental Methods
- Unit-V** : Science & Probability : (a) Scientific Explanation and Unscientific explanation (b) Hypothesis & Confirmation

Recommended Books:

1. Copi, Cohen & MacMahan – Introduction to Logic (14th Edition)
2. Cohen & Nagel – Introduction to Logic & Scientific Method
3. Alex Rosenberg – Philosophy of Science : A Cont. Introduction
4. W. Kneale – Probability & Introduction
5. John Hospers – Philosophical Analysis

SYSTEMS OF INDIAN PHILOSOPHY (I)

Full Mark: 20 + 80 = 100

Credit Points: 04

- Unit-I** : Salient Features of Indian Philosophy, Astika & Nastika systems,
Basic concepts like Rta, Rna, Purusartha, Law of Karma
- Unit – II** : Carvakas – Epistemology and Metaphysics (Lokayatamata)
- Unit-III** : Jainism – Syadvada, Anekantavada Jaina ethics (concept of Triratna)
- Unit-IV** : Buddhism – Four Noble Truths, Doctrine of Momentariness,
Dependant Origination, No Soul Theory, Nirvana
- Unit-V** : Samkhya Dualistic System : Purusa, Prakriti, Theory of Causation,
Theory of Evolution

Books Recommended:

1. G. C. Nayak (ODIA) - Bharatiya Darshana
2. B. B. Choudhury (ODIA) - Bharatiya Darshanara Ruparekha (Trans.) of M. Hiriyana's Outline of Indian Philosophy
3. Dutta & Chatterjee – An Introduction to Indian Philosophy
4. C. D. Sharma – A Critical Survey of Indian Philosophy
5. R. K. Puligandla – Fundamentals of Indian Philosophy
6. S. Radhakrishnan – Indian Philosophy, Vol. I / II
7. J. N. Sinha – Indian Philosophy

Semester-II / Paper-IV / Phil. Core

SYMBOLIC LOGIC

Full Mark: 20 + 80 = 100

Credit Points: 04

Books Prescribed: Basson & O' Corner: Introduction to Symbolic Logic

Unit-I	Chapter-I	Introduction
	Chapter-II	The Calculus of Propositions
Unit – II	Chapter-III	Calculus of Propositions (Sec 1 to 60)
Unit-III	Chapter – III	Calculation of Propositions (Sec 7 to 9)
Unit-IV	Chapter-V	The Elements of Predicate Calculus (Section 1 to 9)
Unit-V	Appendix	(Sec-1 to Sec-4)

2nd Year U. G. Philosophy (Core)

Semester-III / Paper-VI / Ethics

Full Mark: 20 + 80 = 100

Credit Points: 04

Unit-I	: Definition, Nature & Scope of Ethics. Ethics in relation to Politics, Sociology and Religion
Unit – II	: Distinction between moral and non-moral action Moral Judgement and factual judgement, subject or Moral judgement
Unit-III	: Utilitarianism, Hedonism
Unit-IV	: Rigorism, Perfectionism
Unit-V	: Theories of punishment; Retributive, Reformative and Preventive theory

Books for Reference:

1. J. N. Sinha – A Manual of Ethics
2. W. Frankena – Ethics

Semester – II Paper

– VII / Phil. (Core)

HISTORY OF GREEK PHILOSOPHY

F. M.: 20 + 80 = 100

Credits: 04

- Unit-I** : Nature of Greek Philosophy: What is Philosophy? Origin, development and salient features of early Greek Thought
- Unit – II** : Pre-Socratic Thought : The Being of Thales, Becoming of Heraclitus and Atomism of Democritus
- Unit-III** : Socrates : Problem before Socrates, Dialectical method, epistemology of Socrates and ethics
- Unit-IV** : Plato : Theory of Idea, Theory of Knowledge and Theory of Soul
- Unit-V** : Aristotle : A Critique of Plato, Theory of Form and Matter, Theory of Causation

Suggested Readings:

- (1) W. T. Stace - Greek Philosophy
- (2) Burnet - Greek Philosophy
- (3) Y. Masih - A Critical History of Philosophy
- (4) F. Thilly - A History of Philosophy
- (5) B. Russell - A History of Western Philosophy
- (6) B. A. G. Fuller - A History of Greek Philosophy

Semester – III

Paper – V / Phil. (Core)

SYSTEMS OF INDIAN PHILOSOPHY (II)

F. M.: 20 + 80 = 100

Credits: 04

- Unit-I** : Yoga system of Patanjali: Citta Vriti Nirodha and Astanga Yoga
- Unit – II** : Nyaya: Pramanas
Vaisesika: Categories (Padarthas)
- Unit-III** : Upanisadic view of Atman and Brahman Vidya & Avidya, Para
Vidya & Apra Vidya
- Unit-IV** : Sankara's View on Maya, Jiva, Isvara & Brahman and Liberation
(Jivanmukti & Videhamukti)
- Unit-V** : Ramanuja – Refutation of Sankara's view of Maya, Concept of
Brahman, Jiva and Liberation

Books Recommended:

- (1) G. C. Nayak (ODIA) - Bharatiya Darshana
- (2) B. B. Choudhury (ODIA) (Trans.) - Bharatiya Darshanara Ruparekha
- (3) Dutta & Chatterjee – An Introduction to Indian Philosophy
- (4) J. N. Sinha – Indian Philosophy
- (5) R. K. Puligandla – Fundamentals of Indian Philosophy
- (6) S. Radhakrishnan – Indian Philosophy (Vol. I & II)
- (7) J. N. Sinha – Indian Philosophy

Semester – IV

U. G. Arts Core (Philosophy)

Paper - VII

CONTEMPORARY INDIAN PHILOSOPHY

F. M.: 20 + 80 = 100

Credits: 04

- Unit-I** : R. N. Tagore : God and Reality, Nature of Religion Man and his destiny
- Unit – II** : Swami Vivekananda : Concept of Man and his Destiny, Practical Vedanta, Universal Religion
- Unit-III** : Sri Aurovindo: Nature of World, Maya, Theory of Evolution, Satchidananda, Integral Yoga
- Unit-IV** : M. K. Gandhi: Truth, God, Non-violence, Satyagraha and Sarvodaya
- Unit-V** : S. Radhakrishnan : Concept of Man, Reality, Intellect & Institution Religion

Basic Study Materials:

- (1) B. K. Lal – Contemporary Indian Philosophy
- (2) T. M. P. Mahadevan & V. Saroja – Contemporary Indian Philosophy
- (3) H. Sahoo (ed.) – Contemporary Indian Philosophy

Semester – IV

Paper – IX

(HISTORY OF MODERN EUROPEAN PHILOSOPHY)

F. M. : 20 + 80 = 100

Credits : 04

- Unit-I** : Bacon – Theory of Idola, Inductive Method
Descartes – Universal Doubt, Cogito-ergo-sum, Existence of God,
Interactionism
- Unit – II** : Spinoza – Substance, Attribute and Modes Psycho-physical parallelism
Leibnitz – Theory of Monads, pre-established Harmony
- Unit-III** : Locke : Refutation of Innate Ideas, Sources of Knowledge
Berkeley : Subjective Idealism, Esse-est-Percipi
- Unit-IV** : Hume – Impression & Ideas, Scepticism, Theory of Causality
- Unit-V** : Kant – Reconciliation between Empiricism and Rationalism, Possibility
of Synthetic Apriority Judgement Space & Time

Books Prescribed

1. Y. Masih – History of Western Philosophy
2. H. Ray & G. Das – (O) Paschatya Darshanara Itihasa
3. Fran Thilly – A History of Philosophy
4. Ira Sengupta – A History of Western Philosophy
5. B. Russell – History of Western Philosophy
6. Barlingay & Kulkarni – A critical survey of Western Philosophy

Semester – IV

(Philosophy Core)

Paper – X

(PHILOSOPHY OF LANGUAGE)

F. M.: 20 + 80 = 100

Credits: 04

- Textual Study** : John Hospers – An Introduction to Philosophical Analysis
- Unit-I** : Word – Meaning : Meaning of the word “Meaning” Ambiguity and vagueness
- Unit – II** : Definitions : Denotative, Connotative, & Ostensive Defining and Accompanying characteristics stipulate & Reparative Definition, Persuasive definition
- Unit-III** : Sentence – Meaning : Proposition and sentence word-meaning and sentence – meaning, criteria of sentence – meaning/
- Unit –IV** : Analytic – synthetic, a priori – a posteriori, distinction, logical possibility and impossibility.
- Unit – V** : Concept ; Nature and source
Truth : Correspondence, Coherence and Truth as it “Works”

B.A. (Hons)

Semester – V / Paper – XI

F.M. 20+80

=100

3rd Year

Study of Western Classic

Credits -04

[Meditations of Rene Descartes]

Unit-I

Meditation – I

Sceptical Doubts

Meditation – II

Cogito ergo sum, Sum res cogitans The wax
Argument

Unit – II

Meditation – III

Clear and distinct perceptions Theory of Ideas,
Existence of God

Unit-III

Meditation – IV

God is no Deceiver, Will, Intellect and
Possibility of Error

Unit – IV

Meditation – V

Essence of Material Things, Existence of God

Unit – V

Meditation – VI

Mind-body Dualism, Primary & Secondary
Quality

Book Recommended

1. Rene Descartes - Meditations on First Philosophy
2. Rae Langton - A study guide to Descartes Meditations
3. Amelie Rorty - Essays on Descartes Meditations

ISA UPANISADS WITH SANKARA’S COMMENTARY

Unit-I	What are Upanisads, place of Upanisads in Indian Philosophy and Culture – Isa Upanisad
Unit – II	Mantra 1 to 44
Unit-III	Mantra 5 to 9
Unit – IV	Mantra 10 to 14
Unit – V	Mantra 15 to 18

Basic Study Materials:

1. The Isa Upanisad with Sankara’s Commentary
2. S. Radhakrishnan - The Principal Upanisad
3. Satyavadi Mishra - Central Philosophy of the Upanisads

SOCIAL & POLITICAL PHILOSOPHY

Unit-I	Sociality, Social Science & Social Laws Philosophy of Social Science – Relation between Individual society (Mechanical, Organic and Idealistic view)
Unit – II	Political Ideals – Justice, Liberty, Equality, Equality Political Doctrines – Humanism, Secularism Feminism, Philosophy Ecology
Unit-III	Democratic Ideals: Democratic Government, Conditions for successful functioning of Democracy.
Unit – IV	Political Ideologies (a) Anarchism (b) Marxism (C) Sarvodaya
Unit – V	Social progress: Human Rights: Origin and development, Declaration of Human Rights : Theory and Practice

Basic for Suggested Readings:

1. O.P. Gauba – An Introduction to Political Philosophy
2. J. Sinha – Outlines of Political Philosophy
3. D.D. Raphael – Problems of Political Philosophy
4. Krishna Ray & Chhanda Gupta – Essays in Social & Political Philosophy
5. M.K. Gandhi – Hind Swaraj

APPLIED ETHICS

- Unit – I** What is Applied Ethics : Nature & Scope of applied ethics – Ethical Theories – Deontology, Utilitarianism, Relativism and Subjectivism
- Unit – II** **Taking Life : Animals** – Animals Rights, Reverence for life, killing of animals
- Unit – III** **Taking Life : Humans** – Euthanasia : Types Abortion
- Unit – IV** Environmental Ethics : Relation between man and nature, Anthropocentrism, Non-Anthropocentrism
Western Tradition – Responsibility for Future Generation, Deep Ecology
- Unit – V** Professional Ethics : (a) Business ethics – Rights and obligations, justice & honesty in ethics.
(b) Bio-medical Ethics – Hippocratic Oath, Rights and obligations of Health – care Professionals, Doctor- Patient-Relationship

Books Recommended

1. Peter Singer – Practical Ethics
2. J. Jagadev – Biomedical Ethics
3. Tom Regan – Animal Rights
4. J.P. Thirou – Ethics : Theory & Practice

Discipline Specific Elective (DSE)

Semester – V

(Credits 4/F.M. 100)

Paper – I

THE PHILOSOPHY OF BHAGBAD GITA

- Unit – I** The Bhagabad Gita: Concept of Yoga, Concept of life and death.
- Unit – II** Karma & Karmaphala in the Bhagabad Gita, classification of Karma :
Karma, Akarma, Vikarma
- Unit- III** Concepts like Jnana & Vijnana, Ksara and Aksara, Uttama Purusa in Bhagabad Gita.
- Unit – IV** Chapter XVIII (Verse 1 to 36) with Sankara’s commentary

Basic Study Materials:

1. S.Radhakrishnan (Trans. & Ed) - The Bhagabad Gita
2. S.C. Panigrahi - Concept of Yoga in the Gita
3. A.G.K. Warrior (Trans.) - Srimad Bhagabad Gita Bhasya of Sri Sankaracharya
4. K.M. Munshi & R.R. Diwakar - Bhagabad Gita & Modern Life
5. P.N. Srinivasachari - The Ethical Philosophy of the Gita

Paper – II Philosophy

of Religion (DSE-II)

- Basic Text** John Hick – Philosophy of Religion
- Unit – I** Introduction to Philosophy of Religion Judaism – Christian Concept of God (Chapter – 1)
- Unit – II** Grounds for belief in existence of God (Chapter – 2)
- Unit – III** Grounds for belief against existence of God (Chapter – 3)
- Unit – IV** The Problem of Evil (Chapter – 4)
- Unit- V** Conflicting Truth Claims of different Religions (Chapter – 9)
Religious Pluralism

Books for Reference

1. Y. Masih- Introduction to Religious Philosophy
2. Arvind Sharma – Philosophy of Religion

Paper – III

Philosophy of Mind (DSE-3)

- Unit – I Nature and Scope of Philosophy of Mind, Mind and Soul, Nature of Mental Phenomena Consciousness – Theories of Mental Phenomena
- Unit – II The Third Person Account: Merits and Limitations. The First Person Account, Theory of intentionality.
- Unit – III Some theories of Mind – Dualism, Materialism, Identity Theory, Double Aspect Theory.
- Unit – IV The Concept of a person and the problem of personal Identity.
- Unit – V Some theories of Mind – Interactionism, Parallelism, Epiphenomenalism, The Problem of Free will.

Basic Study Materials

1. J.A. Shaffer – Philosophy of Mind
2. S. Shoemaker – Self knowledge & self- identity
3. S. Hampshire – Philosophy of Mind
4. T.E. Wilkerson – Minds brains and people

SEMESTER – VI

PAPER - I

Project Compulsory

(Dissertation 60 + Viva 40 Marks)

The student has to prepare a project of his own selecting a topic from Philosophical perspective in consultation with a teacher. He / She has to prepare a dissertation of 60 marks which will be evaluated by an external examiner and he / she will face a viva-voice test (40 marks) by an external examiner along with his / her supervisor of the concerned project.

Paper – II

Gandhian Studies

- Unit – I Political Thought of Gandhi** : Gandhi's concept of Politics – goals and methods of action; concept and claim of spiritualizing politics, Satyagraha
- Unit – II Economic Thought of Gandhi** : Gandhi's ideas and efforts in the field of economics; Gandhi's critique of industrialization – evils and consequences; philosophy of work & employment, need and greed
- Unit – III Gandhi's Social Thought and Social Work:** Philosophy of Sarvodaya, concept of Gram Swaraj, Varnashrama Versus Caste system untouchability.
- Unit- IV Gandhi on Education:** Meaning and aims of education Basic education (Nai Talim), Duties of Students, Parents and Teachers in education and their interrelationship.
- Unit – V Gandhi's idea of Peace:** Meaning of peace and violence; peace and Disarmament; Non-violent way to world peace. Combating terrorism through non-violence; Gandhian Approach to conflict Resolution – Shanti Sena

Basic Study Materials :

1. Mahatma Gandhi - Autobiography
2. Mahatama Gandhi - Hind- Swaraj
3. Mahatama Gandhi - Towards Non-violent Socialism
4. Mahatma Gandhi - Towards New Education
5. S. Radhakrishnan (ed.) - Mahatma Gandhi: Essays & Reflect
6. R.K. Prabhu & U.R. Rao- The mind of Mahatma Gandhi
7. Sarat Mahanty (ODIA) - Gandhi Manisha

Semester – VI DSE**Study of Major Religions of the World****Paper –III**

- unit– I** Sanatan Dharma: Basic features of Sanatan Dharma, The
Conception of Man (amritasya Putra), His Pursuits: Dharma , Artha,
Kama &
Moksa
- Unit – II** Buddhism: Basic features of Buddhism, Four noble truths, Eight-fold
Path, Nirvana
- Unit – III** Jainism: Three Gems, Five Vows, Liberation
- Unit – IV** Christianity: Basic features, God, World ,Salvation
- Unit – V** Islam: Basic features, Man ,God & Human Destiny

Suggested Readings:

- 1.Y. Masih - A Comparative Study of Religions
2. Lloyd Ridgeon - Major World Religions
3. K. N.Tiwary - Comparative Religion

Four Sem.

Paper – I

Credits: 04

Ethics: Theory & Practice

- Unit – I **Definition, Nature & Scope of Ethics**, Distinction between moral & non-moral action, stages of development of voluntary Action.
- Unit – II Distinction between factual and moral judgment, objects of moral judgment.
- Unit – III **Moral Standards** : Hedonism, Mill’s Utilitarianism, Kant’s Rigorism & Perfectionism
- Unit – IV **Environmental Ethics**: Relation between Man & Nature, Anthropocentrism and Non - Anthropocentrism
- Unit- V Concept of Bio-centric, Egalitarianism, Deep Ecology – Man’s Responsibility for the future generation

Recommended Study Materials :

1. William Franken – Ethics
2. J.N. Sinha – A Manual of Ethics
3. Peter Singer – Practical Ethics

SKILL ENHANCEMENT COURSE

Paper – I

F.M 50

Critical Thinking

- Unit – I Introduction to Critical Thinking : Standards of Critical thinking, benefits and limitations
- Unit – II Arguments & Recognising arguments : Definition & Contents of argument premises, hidden premises, conclusions intermediate conclusions

Book Recommended :

1. Hurley, Patrick. J. – A concise Introduction to Logic (2015) 12th Ed.
2. Madhuchhanda Sen - An Introduction to Critical Thinking (2010)

SKILL ENHANCEMENT COURSE

Paper – II

F.M 50

Applied Reasoning

- Unit – I Fallacies: Introduction, fallacies of Relevance, fallacies of Presumption, Fallacies of Ambiguity, Illicit Transference, fallacies in Ordinary language
- Unit – II Types of Reasoning: Analogical, Legal and Moral
- Unit – III Science & Superstition: Distinction, Evidentiary Support, Objectivity Integrity

Book Recommended :

1. H. Patrick, J. – A Concise Introduction to Logic (2015) 12th Edition
2. M. Sen - An Introduction to Critical Thinking (2010)

**SYLLABUS FOR B.A. (HONORS) POLITICAL SCIENCE
UNDER CHOICE BASED CREDIT SYSTEM OF UTKAL
UNIVERSITY, BHUBANESWAR**

1.1

Paper I- Understanding Political Theory

Course Objective: This course is divided into two sections. Section A introduces the studentsto the idea of political theory, its history and approaches, and an assessment of its critical and contemporary trends. Section B is designed to reconcile political theory and practice through reflections on the ideas and practices related to democracy.

I: Introducing Political Theory (30 Lectures)

1. What is Politics: Theorizing the 'Political'
2. Traditions of Political Theory: Liberal, Marxist, Anarchist and Conservative
3. Approaches to Political Theory: Normative, Historical and Empirical
Critical and Contemporary Perspectives in Political Theory: Feminist and Postmodern

II: Political Theory and Practice (30 Lectures)

The Grammar of Democracy

1. Democracy: The history of an idea
2. Procedural Democracy and its critique
3. Deliberative Democracy

4. Participation and Representation

Essential Readings

I: Introducing Political Theory

Bhargava, R. (2008) 'What is Political Theory', in Bhargava, R and Acharya, A. (eds.) *Political Theory: An Introduction*. New Delhi: Pearson Longman, pp. 2-16.

Bellamy, R. (1993) 'Introduction: The Demise and Rise of Political Theory', in Bellamy, R. (ed.) *Theories and Concepts of Politics*. New York: Manchester University Press, pp. 1-14.

Glaser, D. (1995) 'Normative Theory', in Marsh, D. and Stoker, G. (eds.) *Theory and Methods in Political Science*. London: Macmillan, pp. 21-40.

Sanders, D. (1995) 'Behavioral Analysis', in Marsh, D. and Stoker, G. (eds.) *Theory and Methods in Political Science*. London: Macmillan, pp. 58-75.

Chapman, J. (1995) 'The Feminist Perspective', in Marsh, D. and Stoker, G. (eds.) *Theory and Methods in Political Science*. London: Macmillan, pp. 94-114.

Bhargava, R, 'Why Do We Need Political Theory', in Bhargava, R. and Acharya, A. (eds.) *Political Theory: An Introduction*. New Delhi: Pearson Longman, pp. 17-36.

Bannett, J. (2004) 'Postmodern Approach to Political Theory', in Kukathas, Ch. and Gaus, G. F. (eds.) *Handbook of Political Theory*. New Delhi: Sage, pp. 46-54.

Vincent, A. (2004) *The Nature of Political Theory*. New York: Oxford University Press, 2004, pp. 19-80.

II: The Grammar of Democracy

Srinivasan, J. (2008) 'Democracy', in Bhargava, R. and Acharya, A. (eds.) *Political Theory: An Introduction*. New Delhi: Pearson Longman, pp. 106-128.

Owen, D. (2003) 'Democracy', in Bellamy, R. and Mason, A. (eds.) *Political Concepts*. Manchester and New York: Manchester University Press, pp. 105-117.

Christiano, Th. (2008) 'Democracy', in Mckinnon, C. (ed.) *Issues in Political Theory*, New York: Oxford University Press, pp. 80-96.

Arblaster, A. (1994) *Democracy*. (2nd Edition). Buckingham: Open University Press.

Roy, A. 'Citizenship', in Bhargava, R. and Acharya, A. (eds.) *Political Theory: An Introduction*. New Delhi: Pearson Longman, pp. 130-146.

Brighouse, H. (2008) 'Citizenship', in Mckinnon, C. (ed.) *Issues in Political Theory*, New York: Oxford University Press, pp. 241-258.

1.2 Paper II- Constitutional Government and Democracy in India

Course objective: This course acquaints students with the constitutional design of state structures and institutions, and their actual working over time. The Indian Constitution accommodates conflicting impulses (of liberty and justice, territorial decentralization and a strong union, for instance) within itself. The course traces the embodiment of some of these conflicts in constitutional provisions, and shows how these have played out in political practice. It further encourages a study of state institutions in their mutual interaction, and in interaction with the larger extra-constitutional environment.

I. The Constituent Assembly and the Constitution (16 lectures)

- a. Philosophy of the Constitution, the Preamble, and Features of the Constitution (2 weeks or 8 lectures)
- b. Fundamental Rights and Directive Principles (2 weeks or 8 lectures)

II. Organs of Government (20 lectures)

- a. The Legislature: Parliament (1.5 weeks or 6 lectures)
- b. The Executive: President and Prime Minister (2 weeks or 8 lectures)
- c. The Judiciary: Supreme Court (1.5 weeks or 6 lectures)

III. Federalism and Decentralization (12 lectures)

- a. Federalism: Division of Powers, Emergency Provisions, Fifth and Sixth Schedules (2 weeks or 8 lectures)
- b. Panchayati Raj and Municipalities (1 week or 4 lectures)

READING LIST

I. The Constituent Assembly and the Constitution

a. Philosophy of the Constitution, the Preamble, and Features of the Constitution

Essential Readings:

G. Austin, (2010) 'The Constituent Assembly: Microcosm in Action', in *The Indian Constitution: Cornerstone of a Nation*, New Delhi: Oxford University Press, 15th print, pp.1-25.

R. Bhargava, (2008) 'Introduction: Outline of a Political Theory of the Indian Constitution', in R. Bhargava (ed.) *Politics and Ethics of the Indian Constitution*, New Delhi: Oxford University Press, pp. 1-40.

Additional Reading:

D. Basu, (2012) *Introduction to the Constitution of India*, New Delhi: Lexis Nexis.

S. Chaube, (2009) *The Making and Working of the Indian Constitution*, Delhi: National Book Trust.

b. Fundamental Rights and Directive Principles

Essential Readings:

G. Austin, (2000) 'The Social Revolution and the First Amendment', in *Working a Democratic Constitution*, New Delhi: Oxford University Press, pp. 69-98.

A. Sibal, (2010) 'From Niti to Nyaya,' *Seminar*, Issue 615, pp 28-34.

Additional Reading:

The Constitution of India: Bare Act with Short Notes, (2011) New Delhi: Universal, pp. 4-16.

II. Organs of Government

a. The Legislature: Parliament

Essential Readings:

B. Shankar and V. Rodrigues, (2011) 'The Changing Conception of Representation: Issues, Concerns and Institutions', in *The Indian Parliament: A Democracy at Work*, New Delhi: Oxford University Press, pp. 105-173.

V. Hewitt and S. Rai, (2010) 'Parliament', in P. Mehta and N. Jayal (eds.) *The Oxford Companion to Politics in India*, New Delhi: Oxford University Press, pp. 28-42.

b. The Executive: President and Prime Minister

Essential Readings:

J. Manor, (2005) 'The Presidency', in D. Kapur and P. Mehta P. (eds.) *Public Institutions in India*, New Delhi: Oxford University Press, pp.105-127.

J. Manor, (1994) 'The Prime Minister and the President', in B. Dua and J. Manor (eds.) *Nehruto the Nineties: The Changing Office of the Prime Minister in India*, Vancouver: University of British Columbia Press, pp. 20-47.

H. Khare, (2003) 'Prime Minister and the Parliament: Redefining Accountability in the Age of Coalition Government', in A. Mehra and G. Kueck (eds.) *The Indian Parliament: A Comparative Perspective*, New Delhi: Konark, pp. 350-368.

c. The Judiciary: Supreme Court

Essential Readings:

U. Baxi, (2010) 'The Judiciary as a Resource for Indian Democracy', *Seminar*, Issue 615, pp. 61-67.

R. Ramachandran, (2006) 'The Supreme Court and the Basic Structure Doctrine' in B. Kirpal et.al (eds.) *Supreme but not Infallible: Essays in Honour of the Supreme Court of India*, New Delhi: Oxford University Press, pp. 107-133.

Additional Reading:

L. Rudolph and S. Rudolph, (2008) 'Judicial Review Versus Parliamentary Sovereignty', in *Explaining Indian Institutions: A Fifty Year Perspective, 1956-2006: Volume 2: The Realm of Institutions: State Formation and Institutional Change*. New Delhi: Oxford University Press, pp. 183-210.

III. Federalism and Decentralization

a. Federalism: Division of Powers, Emergency Provisions, Fifth and Sixth Schedules

Essential Readings:

M. Singh, and R. Saxena (eds.), (2011) 'Towards Greater Federalization,' in *Indian Politics: Constitutional Foundations and Institutional Functioning*, Delhi: PHI Learning Private Ltd., pp.166-195.

V. Marwah, (1995) 'Use and Abuse of Emergency Powers: The Indian Experience', in B. Arora and D. Verney (eds.) *Multiple Identities in a Single State: Indian Federalism in a Comparative Perspective*, Delhi: Konark, pp. 136-159.

B. Sharma, (2010) 'The 1990s: Great Expectations'; 'The 2000s: Disillusionment Unfathomable', in *Unbroken History of Broken Promises: Indian State and Tribal People*, Delhi: Freedom Press and Sahyog Pustak Kuteer, pp. 64-91.

The Constitution of India: Bare Act with Short Notes, (2011) New Delhi: Universal, pp 192-213.

Additional Readings:

R. Dhavan and R. Saxena, (2006) 'The Republic of India', in K. Roy, C. Saunders and J. Kincaid (eds.) *A Global Dialogue on Federalism*, Volume 3, Montreal: Queen's University Press, pp. 166-197.

R. Manchanda, (2009) *The No Nonsense Guide to Minority Rights in South Asia*, Delhi: Sage Publications, pp. 105-109.

b. Panchayati Raj and Municipalities

Essential Readings:

P. deSouza, (2002) 'Decentralization and Local Government: The Second Wind of Democracy in India', in Z. Hasan, E. Sridharan and R. Sudarshan (eds.) *India's Living Constitution: Ideas, Practices and Controversies*, New Delhi: Permanent Black, pp. 370-404.

M. John, (2007) 'Women in Power? Gender, Caste and Politics of Local Urban Governance', in *Economic and Political Weekly*, Vol. 42(39), pp. 3986-3993.

Raghunandan, J. R (2012) *Decentralization and local governments: The Indian Experience*, Orient Black Swan, New Delhi

Baviskar, B.S and George Mathew (eds) 2009 *Inclusion and Exclusion in local governance: Field Studies from rural India*, New Delhi, Sage

2.1 Paper III – Political Theory-Concepts and Debates

Course Objective: This course is divided into two sections. Section A helps the student familiarize with the basic normative concepts of political theory. Each concept is related to a crucial political issue that requires analysis with the aid of our conceptual understanding. This exercise is designed to encourage critical and reflective analysis and interpretation of social practices through the relevant conceptual toolkit. Section B introduces the students to the important debates in the subject. These debates prompt

us to consider that there is no settled way of understanding concepts and that in the light of new insights and challenges, besides newer ways of perceiving and interpreting the world around us, we inaugurate new modes of political debates.

Section A: Core Concepts

I. Importance of Freedom (10 Lectures)

a) Negative Freedom: Liberty

b) Positive Freedom: Freedom as Emancipation and Development

Important Issue: Freedom of belief, expression and dissent

II. Significance of Equality (12 lectures)

a) Formal Equality: Equality of opportunity

b) Political equality

c) Egalitarianism: Background inequalities and differential treatment

Important Issue: Affirmative action

III. Indispensability of Justice (12 Lectures)

a) Procedural Justice

b) Distributive Justice

c) Global Justice

Important Issue: Capital punishment

IV. The Universality of Rights (13 Lectures)

a) Natural Rights

b) Moral and Legal Rights

c) Three Generations of Rights

d) Rights and Obligations

Important Issue: Rights of the girl child

Section B: Major Debates (13 Lectures)

I. Why should we obey the state? Issues of political obligation and civil disobedience.

II. Are human rights universal? Issue of cultural relativism.

III. How do we accommodate diversity in plural society? Issues of multiculturalism and toleration.

Essential Readings Section

A: Core Concepts

I. Importance of Freedom

Riley, Jonathan. (2008) 'Liberty' in McKinnon, Catriona (ed.) *Issues in Political Theory*, New York: Oxford University Press, pp. 103-119.

Knowles, Dudley. (2001) *Political Philosophy*. London: Routledge, pp. 69- 132.

Swift, Adam. (2001) *Political Philosophy: A Beginners Guide for Student's and Politicians*. Cambridge: Polity Press, pp. 51-88.

Carter, Ian. (2003) 'Liberty', in Bellamy, Richard and Mason, Andrew (eds.). *Political Concepts*. Manchester: Manchester University Press, pp. 4-15.

Sethi, Aarti. (2008) 'Freedom of Speech and the Question of Censorship', in Bhargava, Rajeev and Acharya, Ashok. (eds.) *Political Theory: An Introduction*. New Delhi: Pearson Longman, pp. 308-319.

II. Significance of Equality

Swift, Adam. (2001) *Political Philosophy: A Beginners Guide for Student's and Politicians*. Cambridge: Polity Press, pp. 91-132.

Casal, Paula & William, Andrew. (2008) 'Equality', in McKinnon, Catriona. (ed.) *Issues in Political Theory*. New York: Oxford University Press, pp. 149- 165.

Acharya, Ashok. (2008) 'Affirmative Action', in Bhargava, Rajeev and Acharya, Ashok. (eds.) *Political Theory: An Introduction*. New Delhi: Pearson Longman, pp. 298-307.

III. Indispensability of Justice

Menon, Krishna. (2008) 'Justice', in Bhargava, Rajeev and Acharya, Ashok. (eds.) *Political Theory: An Introduction*. New Delhi: Pearson Longman, pp. 74-86.

Wolf, Jonathan. (2008) 'Social Justice', in McKinnon, Catriona. (ed.) *Issues in Political Theory*. New York: Oxford University Press, pp. 172-187.

Swift, Adam. (2001) *Political Philosophy: A Beginners Guide for Student's and Politicians*.

Cambridge: Polity Press, pp. 9-48.

Knowles, Dudley. (2001) *Political Philosophy*. London: Routledge, pp. 177-238.

McKinnon, Catriona. (ed.) (2008) *Issues in Political Theory*. New York: Oxford University Press, pp. 289-305.

Bedau, Hugo Adam. (2003) 'Capital Punishment', in LaFollette, Hugh (ed.). *The Oxford Handbook of Practical Ethics*. New York: Oxford University Press, pp. 705-733.

IV. The Universality of Rights

Seglow, Jonathan. (2003) 'Multiculturalism' in Bellamy, Richard and Mason, Andrew (eds.). *Political Concepts*. Manchester: Manchester University Press, pp. 156-168.

Tulkdar, P.S. (2008) 'Rights' in Bhargava, Rajeev and Acharya, Ashok. (eds.) *Political Theory: An Introduction*. New Delhi: Pearson Longman, pp. 88-104.

McKinnon, Catriona. (2003) 'Rights', in Bellamy, Richard and Mason, Andrew. (eds.) *Political Concepts*. Manchester: Manchester University Press, pp. 16-27.

Menlowe, M.A. (1993) 'Political Obligations', in Bellamy Richard.(ed.) *Theories and Concepts of Politics*. New York: Manchester University Press, pp. 174-194.

Amoah, Jewel. (2007) 'The World on Her Shoulders: The Rights of the Girl-Child in the Context of Culture & Identity', in *Essex Human Rights Review*, 4(2), pp. 1-23.

Working Group on the Girl Child (2007), *A Girl's Right to Live: Female Foeticide and Girl Infanticide*, available on [http://www.crin.org/docs/Girl's infanticide CSW 2007.txt](http://www.crin.org/docs/Girl's%20infanticide%20CSW%202007.txt)

Section B: Major Debates

Hyums, Keith. (2008) 'Political Authority and Obligation', in Mckinnon, Catriona. (ed.) *Issues in Political Theory*, New York: Oxford University Press, pp. 9-26

Martin, Rex. (2003) 'Political Obligation', in Bellamy, Richard and Mason, Andrew. (eds.) *Political Concepts*, Manchester: Manchester University Press, pp. 41-51.

Campbell, Tom. (2008) 'Human Rights' in Mckinnon, Catriona. (ed.) *Issues in Political Theory*. New York: Oxford University Press, pp. 194-210.

Mookherjee, Monica, 'Multiculturalism', in Mckinnon, Catriona. (ed.) *Issues in*

Political Theory. New York: Oxford University Press, pp. 218- 234.

Seglow, Jonathan, 'Multiculturalism', in Bellamy, Richard and Mason, Andrew. (eds.) *Political Concepts*, Manchester: Manchester University Press, pp. 156-168.

2.2 Paper IV- Political Process in India

Course objective: Actual politics in India diverges quite significantly from constitutional legal rules. An understanding of the political process thus calls for a different mode of analysis - that offered by political sociology. This course maps the working of 'modern' institutions, premised on the existence of an individuated society, in a context marked by communitarian solidarities, and their mutual transformation thereby. It also familiarizes students with the working of the Indian state, paying attention to the contradictory dynamics of modern state power.

I. Political Parties and the Party System (1.5 weeks or 6 lectures)

Trends in the Party System; From the Congress System to Multi-Party Coalitions

II. Determinants of Voting Behaviour (2 weeks or 8 lectures)

Caste, Class, Gender and Religion

III. Regional Aspirations (2 weeks or 8 lectures)

The Politics of Secession and Accommodation

IV. Religion and Politics (2 weeks or 8 lectures)

Debates on Secularism; Minority and Majority Communalism

V. Caste and Politics (1.5 weeks or 6 lectures)

Caste in Politics and the Politicization of Caste

VI. Affirmative Action Policies (1.5 weeks or 6 lectures)

Women, Caste and Class

VII. The Changing Nature of the Indian State (1.5 weeks or 6 lectures)

Developmental, Welfare and Coercive Dimensions

READING LIST

I. Political Parties and the Party System: Trends in the Party System; From the Congress System to Multi-Party Coalitions

Essential Readings:

R. Kothari, (2002) 'The Congress System', in Z. Hasan (ed.) *Parties and Party Politics in India*, New Delhi: Oxford University Press, pp 39-55.

E. Sridharan, (2012) 'Introduction: Theorizing Democratic Consolidation, Parties and Coalitions', in *Coalition Politics and Democratic Consolidation in Asia*, New Delhi: Oxford University Press.

Additional Reading:

Y. Yadav and S. Palshikar, (2006) 'Party System and Electoral Politics in the Indian States, 1952-2002: From Hegemony to Convergence', in P. deSouza and E. Sridharan (eds.) *India's Political Parties*, New Delhi: Sage Publications, pp. 73-115.

II. Determinants of Voting Behaviour: Caste, Class, Gender and Religion

Essential Readings:

Y. Yadav, (2000) 'Understanding the Second Democratic Upsurge', in F. Frankel, Z. Hasan, and R. Bhargava (eds.) *Transforming India: Social and Political Dynamics in Democracy*, New Delhi: Oxford University Press, pp. 120-145.

C. Jaffrelot, (2008) 'Why Should We Vote? The Indian Middle Class and the Functioning of World's Largest Democracy', in *Religion, Caste and Politics in India*, Delhi: Primus, pp. 604-619.

R. Deshpande, (2004) 'How Gendered was Women's Participation in Elections 2004?', *Economic and Political Weekly*, Vol. 39, No. 51, pp. 5431-5436.

S. Kumar, (2009) 'Religious Practices Among Indian Hindus,' *Japanese Journal of Political Science*, Vol. 10, No. 3, pp. 313-332.

III. Regional Aspirations: The Politics of Secession and Accommodation

Essential Readings:

M. Chadda, (2010) 'Integration through Internal Reorganisation', in S. Baruah (ed.) *Ethnonationalism in India: A Reader*, New Delhi: Oxford University Press, pp. 379-402.

P. Brass, (1999) 'Crisis of National Unity: Punjab, the Northeast and Kashmir', in *The Politics of India Since Independence*, New Delhi: Cambridge University Press and Foundation Books, pp. 192-227.

IV. Religion and Politics: Debates on Secularism: Minority and Majority Communalism

Essential Readings:

T. Pantham, (2004) 'Understanding Indian Secularism: Learning from its Recent Critics', in R. Vora and S. Palshikar (eds.) *Indian Democracy: Meanings and Practices*, New Delhi: Sage, pp. 235-256.

N. Menon and A. Nigam, (2007) 'Politics of Hindutva and the Minorities', in *Power and Contestation: India since 1989*, London: Fernwood Publishing, Halifax and Zed Books, pp. 36-60.

Additional Reading:

N. Chandhoke, (2010) 'Secularism', in P. Mehta and N. Jayal (eds.) *The Oxford Companion to Politics in India*, New Delhi: Oxford University Press, pp. 333-346.

V. Caste and Politics: Caste in Politics and the Politicization of Caste

Essential Readings:

R. Kothari, (1970) 'Introduction', in *Caste in Indian Politics*, Delhi: Orient Longman, pp.3-25. M. Weiner, (2001) 'The Struggle for Equality: Caste in Indian Politics', in Atul Kohli (ed.) *The Success of India's Democracy*, New Delhi: Cambridge University Press, pp. 193-225.

G. Omvedt, (2002) 'Ambedkar and After: The Dalit Movement in India', in G. Shah (ed.) *Social Movements and the State*, New Delhi: Sage Publications, pp. 293-309.

VI. Affirmative Action Policies: Women, Caste and Class

Essential Readings:

M. Galanter, (2002) 'The Long Half-Life of Reservations', in Z. Hasan, E. Sridharan and R. Sudarshan (eds.) *India's Living Constitution: Ideas, Practices, Controversies*, New Delhi: Permanent Black, pp. 306-318.

C. Jaffrelot, (2005) 'The Politics of the OBCs', in *Seminar*, Issue 549, pp. 41-45.

M. John, (2011) 'The Politics of Quotas and the Women's Reservation Bill in India', in M. Tsujimura and J. Steele (eds.) *Gender Equality in Asia*, Japan: Tohoku University Press, pp. 169-195.

VII. Changing Nature of the Indian State: Developmental, Welfare and Coercive Dimensions

Essential Readings:

S. Palshikar, (2008) 'The Indian State: Constitution and Beyond', in R. Bhargava (ed.) *Politics and Ethics of the Indian Constitution*, New Delhi: Oxford University Press, pp. 143-163.

R. Deshpande, (2005) 'State and Democracy in India: Strategies of Accommodation and Manipulation', Occasional Paper, Series III, No. 4, Special Assistance Programme, Department of Politics and Public Administration, University of Pune.

M. Mohanty, (1989) 'Duality of the State Process in India: A Hypothesis', *Bhartiya Samajik Chintan*, Vol. XII (1-2)

Additional Readings:

T. Byres, (1994) 'Introduction: Development Planning and the Interventionist State Versus Liberalization and the Neo-Liberal State: India, 1989-1996', in T. Byres (ed.) *The State, Development Planning and Liberalization in India*, New Delhi: Oxford University Press, 1994, pp.1-35.

A. Verma, (2007) 'Police Agencies and Coercive Power', in S. Ganguly, L. Diamond and M. Plattner (eds.) *The State of India's Democracy*, Baltimore: John Hopkins University Press, pp. 130-139.

3.1 Paper V- Introduction to Comparative Government and Politics

Course objective: This is a foundational course in comparative politics. The purpose is to familiarize students with the basic concepts and approaches to the study of comparative politics. More specifically the course will focus on examining politics in a historical framework while engaging with various themes of comparative analysis in developed and developing countries.

I. Understanding Comparative Politics (8 lectures)

- a. Nature and scope
- b. Going beyond Eurocentrism

II. Historical context of modern government (16 lectures)

- a. Capitalism: meaning and development: globalization
- b. Socialism: meaning, growth and development
- c. Colonialism and decolonization: meaning, context, forms of colonialism; anti-colonialism struggles and process of decolonization

III. Themes for comparative analysis (24 lectures)

A comparative study of constitutional developments and political economy in the following countries: Britain, Brazil, Nigeria and China.

I. Understanding Comparative Politics

Essential Readings:

J. Kopstein, and M. Lichbach, (eds), (2005) *Comparative Politics: Interests, Identities, and Institutions in a Changing Global Order*. Cambridge: Cambridge University Press, pp.1-5; 16-36; 253-290.

M. Mohanty, (1975) 'Comparative Political Theory and Third World Sensitivity', in *Teaching Politics*, Nos. 1 and 2, pp. 22-38

Additional Readings:

A. Roy, (2001) 'Comparative Method and Strategies of Comparison', in *Punjab Journal of Politics*. Vol. xxv (2), pp. 1-15.

J. Blondel, (1996) 'Then and Now: Comparative Politics', in *Political Studies*. Vol. 47 (1), pp. 152-160.

N. Chandhoke, (1996) 'Limits of Comparative Political Analysis', in *Economic and Political Weekly*, Vol. 31 (4), January 27, pp. PE 2-PE2-PE8

II Historical context of modern government a. Capitalism

Essential Readings:

R. Suresh, (2010) *Economy & Society -Evolution of Capitalism*, New Delhi, Sage Publications, pp. 151-188; 235-268.

G. Ritzer, (2002) 'Globalization and Related Process I: Imperialism, Colonialism, Development, Westernization, Easternization', in *Globalization: A Basic Text*. London: Wiley-Blackwell, pp. 63-84.

Additional Readings:

M. Dobb, (1950) 'Capitalism', in *Studies in the Development of Capitalism*. London: Routledge and Kegan Paul Ltd, pp. 1-32.

E. Wood, (2002) 'The Agrarian origin of Capitalism', in *Origin of Capitalism: A Long View*. London: Verso, pp. 91-95; 166-181.

A. Hoogvelt, (2002) 'History of Capitalism Expansion', in *Globalization and Third World Politics*. London: Palgrave, pp. 14-28.

b. Socialism

Essential Readings:

A. Brown, (2009) 'The Idea of Communism', in *Rise and Fall of Communism*, Harpercollins (e-book), pp. 1-25; 587-601.

J. McCormick, (2007) 'Communist and Post-Communist States', in *Comparative Politics in Transition*, United Kingdom: Wadsworth, pp. 195-209

Additional Readings:

R. Meek, (1957) 'The Definition of Socialism: A Comment', *The Economic Journal*. 67 (265), pp. 135-139.

c. Colonialism, decolonization& postcolonial society

Essential Readings:

P. Duara, (2004) 'Introduction: The Decolonization of Asia and Africa in the Twentieth Century', in P. Duara, (ed), *Decolonization: Perspective From Now and Then*. London: Routledge, pp. 1-18.

J. Chiryankandath, (2008) 'Colonialism and Post-Colonial Development', in P. Burnell, et. al, *Politics in the Developing World*. New Delhi: Oxford University Press, pp. 31-52.

Additional Reading:

M. Mohanty, (1999) 'Colonialism and Discourse in India and China', Available at http://www.ignca.nic.in/ks_40033.html http, Accessed: 24.03.2011.

III. Themes for Comparative Analysis

Essential Reading:

L. Barrington et. al (2010) *Comparative Politics - Structures & Choices*, Boston, Wadsworth, pp. 212-13; 71-76; 84-89.

M. Grant, (2009) 'United Kingdom Parliamentary System' in *The UK Parliament*. Edinburgh: Edinburgh University Press, pp. 24-43

J. McCormick, (2007) *Comparative Politics in Transition*, UK: Wadsworth, pp. 260-270 (China)

M. Kesselman, J. Krieger and William (2010), *Introduction to Comparative Politics: Political Challenges and Changing Agendas*, UK: Wadsworth. pp. 47-70 (Britain); 364-388 (Nigeria); 625-648 (China); 415-440 (Brazil).

Additional Reading:

P. Rutland, (2007) 'Britain', in J. Kopstein and M. Lichbach. (eds.) *Comparative Politics: Interest, Identities and Institutions in a Changing Global Order*. Cambridge: Cambridge University Press, pp. 39-79.

3.2 PERSPECTIVES ON PUBLIC ADMINISTRATION

Objective: The course provides an introduction to the discipline of public administration. This paper encompasses public administration in its historical context with an emphasis on the various classical and contemporary administrative theories. The course also explores some of the recent trends, including feminism and ecological conservation and how the call for greater democratization is restructuring public administration. The course will also attempt to provide the students a comprehensive understanding on contemporary administrative developments.

I. PUBLIC ADMINISTRATION AS A DISCIPLINE [15 lectures]

- Meaning, Dimensions and Significance of the Discipline
- Public and Private Administration
- Evolution of Public Administration

II. THEORETICAL PERSPECTIVES [25 lectures]

CLASSICAL THEORIES

- Scientific management (F.W. Taylor)
- Administrative Management (Gullick, Urwick and Fayol)
- Ideal-type bureaucracy (Max Weber)

NEO-CLASSICAL THEORIES

- Human relations theory (Elton Mayo)
- Rational decision-making (Herbert Simon)

CONTEMPORARY THEORIES

- Ecological approach (Fred Riggs)
- Innovation and Entrepreneurship (Peter Drucker)

III. PUBLIC POLICY [10 lectures]

- Concept, relevance and approaches
- Formulation, implementation and evaluation

IV. MAJOR APPROACHES IN PUBLIC ADMINISTRATION [20 lectures]

- New Public Administration
- New Public Management
- New Public Service Approach
- Good Governance
- Feminist Perspectives

READINGS

I. Public Administration as a Discipline

Meaning, Dimensions and Significance of the Discipline.

Nicholas Henry, *Public Administration and Public Affairs*, Prentice Hall, 1999

D. Rosenbloom, R. Kravchuk. and R. Clerkin, (2009) *Public Administration: Understanding Management, Politics and Law in Public Sector*, 7th edition, New Delhi: McGraw Hill, pp. 1-40

W. Wilson, (2004) 'The Study of Administration', in B. Chakrabarty and M. Bhattacharya (eds), *Administrative Change and Innovation: a Reader*, New Delhi: Oxford University Press, pp. 85-101

b. Public and Private Administration.

M. Bhattacharya, (2008) *New Horizons of Public Administration*, 5th Revised Edition. New Delhi: Jawahar Publishers, pp. 37-44.

G. Alhson, (1997) 'Public and Private Management', in Shafritz, J. and Hyde, A. (eds.) *Classic of Public Administration*, 4th Edition. Forth Worth: Hartcourt Brace, TX, pp. 510-529.

Evolution of Public Administration

N. Henry, *Public Administration and Public Affairs*, 12th edition. New Jersey: Pearson, 2013

M. Bhattacharya, *Restructuring Public Administration: A New Look*, New Delhi: Jawahar Publishers, 2012

P. Dunleavy and C. Hood, "From Old Public Administration to New Public Management", *Public Money and Management*, Vol. XIV No-3, 1994

M. Bhattacharya, *New Horizons of Public Administration*, New Delhi: Jawahar

Publishers, 2011

Basu, Rumki, *Public Administration : Concepts and Theories* Sterling Publishers, New Delhi 2014

II. Theoretical Perspectives Scientific Management

D. Gvishiani, *Organisation and Management*, Moscow: Progress Publishers, 1972

F. Taylor, 'Scientific Management', in J. Shafritz, and A. Hyde, (eds.) *Classics of Public Administration*, 5th Edition. Belmont: Wadsworth, 2004

P. Mouzelis, 'The Ideal Type of Bureaucracy' in B. Chakrabarty, And M. Bhattacharya, (eds), *Public Administration: A Reader*, New Delhi: Oxford University Press, 2003

Administrative Management

H. Ravindra Prasad, Y. Pardhasaradhi, V. S. Prasad and P. Satyrnarayana, [eds.], *Administrative Thinkers*, Sterling Publishers, 2010

I. J. Ferreira, A. W. Erasmus and D. Groenewald , *Administrative Management*, Juta Academics, 2010

Ideal Type-Bureaucracy

R. Weber, 'Bureaucracy', in C. Mills, and H. Gerth, *From Max Weber: Essays in Sociology*. Oxford: Oxford University Press, 1946

Warren. G. Bennis, *Beyond Bureaucracy*, Mc Graw Hill, 1973

Human Relations Theory

D. Gvishiani, *Organisation and Management*, Moscow: Progress Publishers, 1972

B. Miner, 'Elton Mayo and Hawthorne', in *Organisational Behaviour 3: Historical Origins and the Future*. New York: M.E. Sharpe, 2006

Rational-Decision Making

S. Maheshwari, *Administrative Thinkers*, New Delhi: Macmillan, 2009

Fredrickson and Smith, 'Decision Theory', in *The Public Administration Theory Primer*. Cambridge: Westview Press, 2003

Ecological approach

R. Arora, 'Riggs' Administrative Ecology' in B. Chakrabarty and M. Bhattacharya (eds), *Public Administration: A reader*, New Delhi, Oxford University Press, 2003

A. Singh, *Public Administration: Roots and Wings*. New Delhi: Galgotia Publishing Company, 2002

F. Riggs, *Administration in Developing Countries: The Theory of Prismatic Society*. Boston: Houghton Mifflin, 1964

Innovation and Entrepreneurship

Peter Drucker, *Innovation and Entrepreneurship*, Harper Collins, 1999

Peter F. Drucker , *The Practice of Management*, Harper Collins, 2006

III. Public Policy

Concept, Relevance and Approaches

T. Dye, (1984) *Understanding Public Policy*, 5th Edition. U.S.A: Prentice Hall, pp. 1- 44
The Oxford Handbook of Public Policy ,OUP,2006

Xun Wu, M.Ramesh, Michael Howlett and Scott Fritzen ,*The Public Policy Primer: ManagingThe Policy Process*, Rutledge, 2010

Mary Jo Hatch and Ann .L. Cunliffe *Organisation Theory : Modern, Symbolicand Postmodern Perspectives*, Oxford University Press,2006

Michael Howlett, *Designing Public Policies : Principles And Instruments*, Rutledge, 2011
The Oxford Handbook Of Public Policy, Oxford University Press, 2006

Formulation, implementation and evaluation

Prabir Kumar De, *Public Policy and Systems*, Pearson Education, 2012

R.V. Vaidyanatha Ayyar, *Public Policy Making In India*, Pearson,2009

Surendra Munshi and Biju Paul Abraham [Eds.] *Good Governance, Democratic Societies AndGlobalisation*, Sage Publishers, 2004

IV. Major Approaches in Public Administration a. Development administration

M. Bhattacharya, 'Chapter 2 and 4', in *Social Theory, Development Administration andDevelopment Ethics*, New Delhi: Jawahar Publishers, 2006

F. Riggs,*The Ecology of Public Administration, Part 3*, New Delhi: Asia Publishing House, 1961

c. New Public Administration

Essential Reading:

M. Bhattacharya, *Public Administration: Issues and Perspectives*, New Delhi: Jawahar Publishers, 2012

H. Frederickson, 'Toward a New Public Administration', in J. Shafritz, & A. Hyde, (eds.) *Classics of Public Administration*, 5th Edition, Belmont: Wadsworth, 2004

d.New Public Management

U. Medury, *Public administration in the Globalization Era*, New Delhi: Orient Black Swan, 2010

A. Gray, and B. Jenkins, 'From Public Administration to Public Management' in E. Otenyo and N. Lind, (eds.) *Comparative Public Administration: The Essential Readings*: Oxford University Press, 1997

C. Hood, 'A Public Management for All Seasons', in J. Shafritz, & A. Hyde, (eds.) *Classics ofPublic Administration*, 5th Edition, Belmont: Wadsworth, 2004

d. New Public Service Approach

R.B.Denhart & J.V.Denhart [Arizona State University] “ The New Public Service: Serving Rather Than Steering”, in Public Administration Review ,Volume 60, No-6,November-December 2000

e. Good Governance

A. Leftwich, ‘Governance in the State and the Politics of Development’, in *Development and Change*. Vol. 25,1994

M. Bhattacharya, ‘Contextualizing Governance and Development’ in B. Chakrabarty and M. Bhattacharya, (eds.) *The Governance Discourse*. New Delhi: Oxford University Press,1998 B. Chakrabarty, *Reinventing Public Administration: The India Experience*. New Delhi: Orient Longman, 2007

U. Medury, *Public administration in the Globalisation Era*, New Delhi: Orient Black Swan, 2010

f. Feminist Perspective

Camila Stivers, *Gender Images In Public Administration*, California : Sage Publishers,2002 Radha Kumar, *The History of Doing*, New Delhi: Kali For Women, 1998

Sylvia Walby, *Theorising Patriarchy*, Oxford, Basil Blackwell.1997

Amy. S. Wharton, *The Sociology Of Gender*, West Sussex : Blackwell-Wiley Publishers,2012 Nivedita Menon [ed.], *Gender and Politics*, Delhi: Oxford University Press, 1999

Simone De Beauvoir, *The Second Sex*, London: Picador, 1988

Alison Jaggar, *Feminist Politics And Human Nature*, Brighton: Harvester Press,1983

Maxine Molyneux and Shahra Razavi , *Gender, Justice, Development and Rights* ,Oxford: Oxford University Press, 2002

3.3 Paper VII- Perspectives on International Relations and World History

Course Objective: This paper seeks to equip students with the basic intellectual tools for understanding International Relations. It introduces students to some of the most important theoretical approaches for studying international relations. The course begins by historically contextualizing the evolution of the international state system before discussing the agency-structure problem through the levels-of-analysis approach. After having set the parameters of the debate, students are introduced to different theories in International Relations. It provides a fairly comprehensive overview of the major political developments and events starting from the twentieth century. Students are expected to learn about the key milestones in world history and equip them with the tools to understand and analyze the same from different perspectives. A key objective of the course is to make students aware of the implicit Euro - centricism of International Relations by highlighting certain specific perspectives from the Global South.

A. Studying International Relations (15 Lectures)

- i. How do you understand International Relations: Levels of Analysis (3 lectures)
- ii. History and IR: Emergence of the International State System (2 Lectures)
- iii. Pre-Westphalia and Westphalia (5 lectures)
- iv. Post-Westphalia (5 lectures)

D. Theoretical Perspectives (25 Lectures)

- i. Classical Realism & Neo-Realism (6 lectures)
- ii. Liberalism & Neoliberalism (5 lectures)
- iii. Marxist Approaches (5 lectures)
- iv. Feminist Perspectives (4 lectures)
- v. Eurocentricism and Perspectives from the Global South (5 Lectures)

C. An Overview of Twentieth Century IR History (20 Lectures)

- i. World War I: Causes and Consequences (1 Lecture)
- ii. Significance of the Bolshevik Revolution (1 Lecture)
- iii. Rise of Fascism / Nazism (2 Lectures)
- iv. World War II: Causes and Consequences (3 Lectures)
- v. Cold War: Different Phases (4 Lectures)
- vi. Emergence of the Third World (3 Lectures)
- vii. Collapse of the USSR and the End of the Cold War (2 Lectures)
- viii. Post Cold War Developments and Emergence of Other Power Centers of Power (4 Lectures)

Essential Readings:

M. Nicholson, (2002) *International Relations: A Concise Introduction*, New York: Palgrave, pp. 1-4.

R. Jackson and G. Sorensen, (2007) *Introduction to International Relations: Theories and Approaches*, 3rd Edition, Oxford: Oxford University Press, pp. 2-7

S. Joshua. Goldstein and J. Pevehouse, (2007) *International Relations*, New York: Pearson Longman, 2007, pp. 29-35

C. Brown and K. Ainley, (2009) *Understanding International Relations*, Basingstoke: Palgrave, pp. 1-16.

Additional Readings:

K. Mingst and J. Snyder, (2011) *Essential Readings in International Relations*, New York: W.W. Norton and Company, pp. 1-15.

M. Smith and R. Little, (eds) (2000) 'Introduction', in *Perspectives on World Politics*, New York: Routledge, 2000, 1991, pp. 1-17.

J. Baylis and S. Smith (eds), (2008) *The Globalization of World Politics: An Introduction to International Relations*, New York: Oxford University Press, pp. 1- 6.

R. Mansbach and K. Taylor, (2008) *Introduction to Global Politics*, New York: Routledge, pp. 2-32.

Rumki Basu, (ed)(2012) *International Politics: Concepts, Theories and Issues* New Delhi, Sage.

History and IR: Emergence of the International State System:

Essential Readings:

R. Mansbach and K. Taylor, (2012) *Introduction to Global Politics*, New York: Routledge, pp. 33-68.

K. Mingst, (2011) *Essentials of International Relations*, New York: W.W. Norton and Company, pp. 16-63.

P. Viotti and M. Kauppi, (2007) *International Relations and World Politics: Security, Economy, Identity*, Pearson Education, pp. 40-85.

Additional Readings:

J. Baylis, S. Smith and P. Owens, (2008) *The Globalization of World Politics: An Introduction to International Relations*, New York: Oxford University Press, pp. 36- 89.

R. Mansbach and K. Taylor, (2008) *Introduction to Global Politics*, New York: Routledge, pp. 70-135.

J Goldstein and J. Pevehouse, (2007) *International Relations*, New York: Pearson Longman, pp. 50-69.

E. Hobsbawm, (1995) *Age of Extremes: The Short Twentieth Century 1914-1991*, Vikings.

S. Lawson, (2003) *International Relations*, Cambridge: Polity Press, pp. 21-60.

How do you Understand IR (Levels of Analysis):

Essential Readings:

J. Singer, (1961) 'The International System: Theoretical Essays', *World Politics*, Vol. 14(1), pp. 77-92.

B. Buzan, (1995) 'The Level of Analysis Problem in International Relations Reconsidered,' in K. Booth and S. Smith, (eds), *International Relations Theory Today*, Pennsylvania: The Pennsylvania State University Press, pp. 198-216.

Additional Readings:

K. Mingst, (2011) *Essentials of International Relations*, New York: W.W. Norton and Company, pp. 93-178.

J. Goldstein and J. Pevehouse, (2007) *International Relations*, New York: Pearson Longman, pp. 35-49.

K. Waltz, (1959) *Man, The State and War*, Columbia: Columbia University Press.

Theoretical Perspectives:

Classical Realism and Neorealism

Essential Readings:

E. Carr, (1981) *The Twenty Years Crisis, 1919-1939: An Introduction to the Study of International Relations*, London: Macmillan, pp. 63-94.

H. Morgenthau, (2007) 'Six Principles of Political Realism', in R. Art and R. Jervis, *International Politics*, 8th Edition, New York: Pearson Longman, pp. 7-14.

T. Dunne and B. Schmidt, (2008) 'Realism', in J. Baylis and S. Smith (eds), *The Globalization of World Politics: An Introduction to International Relations*, New York: Oxford University Press, pp. 90-107.

K. Waltz, (2007) 'The Anarchic Structure of World Politics', in R. Art and R. Jervis, *International Politics*, 8th Edition, New York: Pearson Longman, pp. 29-49.

Additional Readings:

M. Nicholson, (2002) *International Relations: A Concise Introduction*, New York: Palgrave, pp. 6-7.

H. Bull, (2000) 'The Balance of Power and International Order', in M. Smith and R. Little (eds), *Perspectives on World Politics*, New York: Routledge, pp. 115-124.

Liberalism and Neoliberalism

Essential Readings:

T. Dunne, (2008) 'Liberalism', in J. Baylis and S. Smith (eds.), *The Globalization of World Politics: An Introduction to International Relations*, New York: Oxford University Press, pp. 108-123.

R. Keohane and J. Nye, (2000) 'Transgovernmental Relations and the International Organization', in M. Smith and R. Little (eds.), *Perspectives on World Politics*, New York: Routledge, pp. 229-241.

Additional Readings:

J. Goldstein and J. Pevehouse, (2007) *International Relations*, New York: Pearson Longman, pp. 127-137.

R. Jackson and G. Sorensen, (2007) *Introduction to International Relations: Theories and Approaches*, 3rd Edition, Oxford: Oxford University Press, pp. 97- 128.

Marxist Approaches

Essential Readings:

I. Wallerstein, (2000) 'The Rise and Future Demise of World Capitalist System: Concepts for Comparative Analysis', in Michael Smith and Richard Little (eds), *Perspectives on World Politics*, New York: Routledge, pp. 305-317.

S. Hobden and R. Jones, (2008) 'Marxist Theories of International Relations' in J. Baylis and S. Smith (eds), *The Globalization of World Politics: An Introduction to International Relations*, New York: Oxford University Press, pp. 142-149; 155-158.

J. Goldstein and J. Pevehouse, (2007) *International Relations*, New York: Pearson Longman, pp. 494-496; 500-503.

Additional Readings:

J. Galtung, (2000) 'A Structural Theory of Imperialism', in M. Smith and R. Little, (eds), *Perspectives on World Politics*, New York: Routledge, pp. 292-304.

A. Frank, (1966) 'The Development of Underdevelopment' *Monthly Review*, pp. 17-30.

P. Viotti and M. Kauppi (2007), *International Relations and World Politics: Security, Economy, Identity*, Pearson Education, pp. 40-85.

Modern History Sourcebook: Summary of Wallerstein on World System Theory, Available at <http://www.fordham.edu/halsall/mod/Wallerstein.asp>, Accessed: 19.04.2013

Feminist Perspectives

Essential Readings:

J. Tickner, (2007) 'A Critique of Morgenthau's Principles of Political Realism', in R. Art and R. Jervis, *International Politics*, 8th Edition, New York: Pearson Longman, pp. 15-28.

F. Halliday, (1994) *Rethinking International Relations*, London: Macmillan, pp. 147-166. Additional Readings:

M. Nicholson, *International Relations: A Concise Introduction*, New York: Palgrave, 2002, pp. 120-122.

J. Goldstein and J. Pevehouse, (2007) *International Relations*, New York: Pearson

Longman, pp. 138-148.

S. Smith and P. Owens, (2008) 'Alternative Approaches to International Theory' in J. Baylis and S. Smith (eds), *The Globalization of World Politics: An Introduction to International Relations*, New York: Oxford University Press, pp. 181-184.

IR, Eurocentrism and Perspectives from the Global South on Eurocentrism

Essential Readings:

A. Acharya and B. Buzan, (2007) 'Why Is There No Non- Western IR Theory: Reflections on and From Asia', *International Relations Of The Asia- Pacific*, Vol 7(3), pp. 285-286.

T. Kayaoglu, (2010) 'Westphalian Eurocentrism in I R Theory', in *International Studies Review*, Vol. 12(2), pp. 193-217.

Additional Readings:

O. Weaver and A. Tickner, (2009) 'Introduction: Geocultural Epistemologies', in A. Tickner and O. Waever (eds), *International Relations: Scholarship Around The World*, London: Routledge, pp. 1-31.

R.Kanth (ed), (2009) *The Challenge of Eurocentrism: Global Perspectives, Policy & Prospects*, New York: Palgrave-McMillan.

S. Amin, (2010) *Eurocentrism: Modernity, Religion & Democracy*, New York: Monthly Review Press.

An Overview of Twentieth Century IR History

(a) World War I: Causes and Consequences

Hobsbawm, E. (1995) *Age of Extreme: The Short Twentieth Century, 1914—1991*. London: Abacus, pp. 22-35.

(b) Significance of the Bolshevik Revolution

Hobsbawm, E. (1995) *Age of Extreme: The Short Twentieth Century, 1914—1991*. London: Abacus, pp. 54-78.

(c) Rise of Fascism / Nazism

Hobsbawm, E. (1995) *Age of Extreme: The Short Twentieth Century, 1914—1991*. London: Abacus, pp. 108-141.

Carr, E.H. (2004) *International Relations between the Two World Wars: 1919-1939*. New York: Palgrave, pp. 197-231 and 258-278.

(d) World War II: Causes and Consequences

Taylor, A.J.P. (1961) *The Origins of the Second World War*. Harmondsworth: Penguin,

pp.29-65.

Carruthers, S.L. (2005) 'International History, 1900-1945' in Baylis, J. and Smith, S. (eds.) (2008)

The Globalization of World Politics. An Introduction to International Relations. 4th edn. Oxford: Oxford University Press, pp. 76-84.

(e) Cold War: Different Phases

Calvocoressi, P. (2001) *World Politics: 1945—2000*. Essex: Pearson, pp. 3-91.

Scott, L. (2005) 'International History, 1945-1990' in Baylis, J. and Smith, S. (eds.) (2008) *The Globalization of World Politics. An Introduction to International Relations.* 4th edn. Oxford: Oxford University Press, pp. 93-101.

Hobsbawm, E. (1995) *Age of Extreme: The Short Twentieth Century, 1914—1991*. London: Abacus, pp. 225-226.

(f) Emergence of the Third World

Hobsbawm, E. (1995) *Age of Extreme: The Short Twentieth Century, 1914—1991*. London: Abacus, pp. 207-222.

(g) Collapse of the USSR and the End of the Cold War

Scott, L. (2005) 'International History, 1945-1990' in Baylis, J. and Smith, S. (eds.) (2008) *The Globalization of World Politics. An Introduction to International Relations.* 4th edn. Oxford: Oxford University Press, pp. 93-101.

(h) Post Cold War Developments and Emergence of Other Power Centres of Power: Japan, European Union (EU) and Brazil, Russia, India, China (BRIC)

Brezekski, Z. (2005) *Choice: Global Dominance or Global Leadership*. New York: Basic Books, pp. 85-127.34

Gill, S. (2005) 'Contradictions of US Supremacy' in Panitch, L. and Leys, C. (eds.) *Socialist Register: The Empire Reloaded*. London: Merlin Press. 2004, London, Merlin Press and New York, Monthly Review Press. *Socialist Register*, pp.24-47.

Therborn, G. (2006) 'Poles and Triangles: US Power and Triangles of Americas, Asia and Europe' in Hadiz, V.R. (ed.) *Empire and Neo Liberalism in Asia*. London: Routledge, pp.23-37.

4.1 Paper VIII- Political Processes and Institutions in Comparative Perspective

Course objective: In this course students will be trained in the application of comparative methods to the study of politics. The course is comparative in both what we study and how we study. In the process the course aims to introduce undergraduate students to some of the range of issues, literature, and methods that cover comparative political.

I. Approaches to Studying Comparative Politics (8 lectures)

a. Political Culture
b. New Institutionalism

II. Electoral System (8 lectures)

Definition and procedures: Types of election system (First Past the Post, Proportional Representation, Mixed Representation)

III. Party System (8 lectures)

Historical contexts of emergence of the party system and types of parties

IV. Nation-state (8 lectures)

What is nation–state? Historical evolution in Western Europe and postcolonial contexts
'Nation' and 'State': debates

V. Democratization (8 lectures)

Process of democratization in postcolonial, post- authoritarian and post-communist countries

VI. Federalism (8 lectures) Historical context Federation and Confederation: debates around territorial division of power.

READING LIST

I: Approaches to Studying Comparative Politics

Essential Readings:

M. Pennington, (2009) 'Theory, Institutional and Comparative Politics', in J. Bara and Pennington. (eds.) *Comparative Politics: Explaining Democratic System*. Sage Publications, New Delhi, pp. 13-40.

M. Howard, (2009) 'Culture in Comparative Political Analysis', in M. Lichback and A. Zuckerman, pp. 134- S. (eds.) *Comparative Political: Rationality, Culture, and Structure*. Cambridge: Cambridge University Press.

B. Rosamond, (2005) 'Political Culture', in B. Axford, et al. *Politics*, London: Routledge, pp. 57-81.

Additional Readings:

P. Hall, Taylor and C. Rosemary, (1996) 'Political Science and the Three New Institutionalism', *Political Studies*. XLIV, pp. 936-957.

L. Rakner, and R. Vicky, (2011) 'Institutional Perspectives', in P. Burnell, et .al. (eds.) *Political in the Developing World*. Oxford: Oxford University Press, pp. 53-70.

II: Electoral System

Essential Readings:

A. Heywood, (2002) 'Representation, Electoral and Voting', in *Politics*. New York: Palgrave, pp. 223-245.

A. Evans, (2009) 'Elections Systems', in J. Bara and M. Pennington, (eds.) *Comparative politics*. New Delhi: Sage Publications, pp. 93-119.

Additional Reading:

R. Moser, and S. Ethan, (2004) 'Mixed Electoral Systems and Electoral System Effects: Controlled Comparison and Cross-national Analysis', in *Electoral Studies*. 23, pp. 575-599.

III: Party System

Essential Readings:

A. Cole, (2011) 'Comparative Political Parties: Systems and Organizations', in J. Ishiyama, and M. Breuning, (eds) *21st Century Political Science: A Reference Book*. Los Angeles: Sage Publications, pp. 150-158.

A. Heywood, (2002) 'Parties and Party System', in *Politics*. New York : Palgrave, pp. 247-268.

Additional Readings:

- B. Criddle, (2003) 'Parties and Party System', in R. Axtmann, (ed.) *Understanding Democratic Politics: An Introduction*. London: Sage Publications, pp. 134-142.

IV: Nation-state

Essential Readings:

W. O'Conner, (1994) 'A Nation is a Nation, is a Sate, is a Ethnic Group, is a ...', in J. Hutchinson and A. Smith, (eds.) *Nationalism*. Oxford: Oxford University Press, pp. 36-46.

K. Newton, and J. Deth, (2010) 'The Development of the Modern State ', in *Foundations of Comparative Politics: Democracies of the Modern World*. Cambridge: Cambridge University Press, pp. 13-33.

Additional Reading:

A. Heywood, (2002), 'The State', in *Politics*. New York: Palgrave, pp. 85-102

V. Democratization

Essential Readings:

T. Landman, (2003) 'Transition to Democracy', in *Issues and Methods of Comparative Methods: An Introduction*. London: Routledge, pp. 185-215.

K. Newton, and J. Deth, (2010) 'Democratic Change and Persistence', in *Foundations of Comparative Politics: Democracies of the Modern World*. Cambridge: Cambridge University Press, pp. 53-67.

J. Haynes, (1999) 'State and Society', in *The Democratization*. Oxford: Blackwell, pp. 20-38; 39-63.

Additional Reading:

B. Smith, (2003) 'Democratization in the Third World', in *Understanding Third World Politics: Theories of Political Change and Development*. London: Palgrave Macmillan, pp.250-274.

VI: Federalism

Essential Readings:

M. Burgess, (2006) *Comparative Federalism: Theory and Practice*. London: Routledge, pp. 135-161.

R. Watts, (2008) 'Introduction', in *Comparing Federal Systems*. Montreal and Kingston: McGill Queen's University Press, pp. 1-27

Additional Reading:

R. Saxena, (2011) 'Introduction', in Saxena, R (eds.) *Varieties of Federal Governance: Major Contemporary Models*. New Delhi: Cambridge University Press, pp. xii-x1.

4.2 Paper-IX PUBLIC POLICY AND ADMINISTRATION IN INDIA

Objective: The paper seeks to provide an introduction to the interface between public policy and administration in India. The essence of public policy lies in its effectiveness in translating the governing philosophy into programs and policies and making it a part of the community living. It deals with issues of decentralization, financial management, citizens and administration and social welfare from a non-western perspective.

I. Public Policy [10 lectures]

a. Definition, characteristics and models

b. Public Policy Process in India

II. Decentralization [10 lectures]

- g. Meaning, significance and approaches and types
- h. Local Self Governance: Rural and Urban

III. Budget [12 lectures]

- h. Concept and Significance of Budget
- i. Budget Cycle in India
- j. Various Approaches and Types Of Budgeting

IV. Citizen and Administration Interface [15 lectures]

- a. Public Service Delivery
- b. Redressal of Public Grievances: RTI, Lokpal, Citizens' Charter and E-Governance

V. Social Welfare Administration [20 lectures]

- a. Concept and Approaches of Social Welfare
- b. Social Welfare Policies:
 - Education:** Right To Education,
 - Health:** National Health Mission,
 - Food:** Right To Food Security
 - Employment:** MNREGA

READINGS

Public Policy

T. Dye, (1984) *Understanding Public Policy*, 5th Edition. U.S.A: Prentice Hall

R.B. Denhardt and J.V. Denhardt, (2009) *Public Administration*, New Delhi: Brooks/Cole

J. Anderson, (1975) *Public Policy Making*. New York: Thomas Nelson and sons Ltd.

M. Howlett, M. Ramesh, and A. Perl, (2009), *Studying Public Policy: Policy Cycles and Policy subsystems*, 3rd edition, Oxford: Oxford University Press

T. Dye, (2002) *Understanding Public Policy*, New Delhi: Pearson

Y. Dror, (1989) *Public Policy Making Reexamined*. Oxford: Transaction Publication

Decentralization

Satyajit Singh and Pradeep K. Sharma [eds.] *Decentralisation: Institutions And Politics In Rural India*, OUP, 2007

D. A. Rondinelli and S. Cheema, *Decentralisation and Development*, Beverly Hills: Sage Publishers, 1983

N.G. Jayal, *Democracy and The State: Welfare, Secular and Development in Contemporary India*, Oxford : Oxford University Press, 1999

Bidyut Chakrabarty, *Reinventing Public Administration: The Indian Experience*, Orient Longman, 2007

Noorjahan Bava, *Development Policies and Administration in India*, Delhi: Uppal Publishers, 2001

Gabriel Almond and Sidney Verba, *The Civic Culture*, Boston: Little Brown, 1965 M.P. Lester,

Political Participation- How and Why do People Get Involved in Politics
Chicago: McNally, 1965

III. Budget

Erik-Lane, J. (2005) *Public Administration and Public Management: The Principal Agent Perspective*. New York: Routledge

Henry, N. (1999) *Public Administration and Public Affairs*. New Jersey: Prentice Hall

Caiden, N. (2004) 'Public Budgeting Amidst Uncertainty and Instability', in Shafritz, J.M. & Hyde, A.C. (eds.) *Classics of Public Administration*. Belmont: Wadsworth

IV Citizen And Administration Interface

R. Putnam, *Making Democracy Work*, Princeton University Press, 1993

Jenkins, R. and Goetz, A.M. (1999) 'Accounts and Accountability: Theoretical Implications of the Right to Information Movement in India', in *Third World Quarterly*. June

Sharma, P.K. & Devasher, M. (2007) 'Right to Information in India' in Singh, S. and Sharma, P. (eds.) *Decentralization: Institutions and Politics in Rural India*. New Delhi: Oxford University Press

Vasu Deva, *E-Governance In India: A Reality*, Commonwealth Publishers, 2005

World Development Report, World Bank, Oxford University Press, 1992.

M.J. Moon, *The Evolution of Electronic Government Among Municipalities: Rhetoric or Reality*, American Society For Public Administration, *Public Administration Review*, Vol 62, Issue 4, July – August 2002

Pankaj Sharma, *E-Governance: The New Age Governance*, APH Publishers, 2004

Pippa Norris, *Digital Divide: Civic Engagement, Information Poverty and the Internet*

in Democratic Societies, Cambridge: Cambridge University Press, 2001.

Stephan Goldsmith and William D. Eggers, *Governing By Network: The New Shape of the Public Sector*, Brookings Institution [Washington], 2004

United Nation Development Programme, *Reconceptualising Governance*, New York, 1997
Mukhopadhyay, A. (2005) 'Social Audit', in *Seminar*. No.551.

V. Social Welfare Administration

Jean Drèze and Amartya Sen, *India, Economic Development and Social Opportunity*, Oxford: Oxford University Press, 1995

J.Dreze and Amartya Sen, *Indian Development: Selected Regional Perspectives*, Oxford: Clareland Press, 1997

Reetika Khera- Rural Poverty And Public Distribution System, EPW, Vol-XLVIII, No.45-46, Nov 2013

Pradeep Chaturvedi [ed.], *Women And Food Security: Role Of Panchayats*, Concept Publishers, 1997

National Food Security Mission: nfsm.gov.in/Guidelines/XIIPlan/NFSMXII.pdf

Jugal Kishore, *National Health Programs of India: National Policies and Legislations*, Century Publications, 2005

K. Lee and Mills, *The Economic Of Health In Developing Countries*, Oxford: Oxford University Press, 1983

K. Vijaya Kumar, *Right to Education Act 2009: Its Implementation as to Social Development in India*, Delhi: Akansha Publishers, 2012.

Marma Mukhopadhyay and Madhu Parhar(ed.) *Education in India: Dynamics of Development*, Delhi: Shipra Publications, 2007

Nalini Juneja, *Primary Education for All in the City of Mumbai: The Challenge Set By Local Actors'*, International Institute For Educational Planning, UNESCO: Paris, 2001

Surendra Munshi and Biju Paul Abraham [eds.] *Good Governance, Democratic Societies and Globalisation*, Sage Publishers, 2004

Basu Rumki (2015) *Public Administration in India Mandates, Performance and Future Perspectives*, New Delhi, Sterling Publishers

www.un.org/millenniumgoals
<http://www.cefsindia.org>
www.righttofoodindia.org

4.3 Paper X- Global Politics

Course objective: This course introduces students to the key debates on the meaning and nature of globalization by addressing its political, economic, social, cultural and technological dimensions. In keeping with the most important debates within the globalization discourse, it imparts an understanding of the working of the world economy, its anchors and resistances offered by global social movements while analyzing the changing nature of relationship between the state and trans-national actors and networks. The course also offers insights into key contemporary global issues such as the proliferation of nuclear weapons, ecological issues, international terrorism, and human security before concluding with a debate on the phenomenon of global governance.

I. Globalization: Conceptions and Perspectives (23 lectures)

- a. Understanding Globalization and its Alternative Perspectives (6 lectures)
- b. Political: Debates on Sovereignty and Territoriality (3 lectures)
- c. Global Economy: Its Significance and Anchors of Global Political Economy: IMF,
- d. World Bank, WTO, TNCs (8 lectures)
- e. Cultural and Technological Dimension (3 lectures)
- f. Global Resistances (Global Social Movements and NGOs) (3 lectures)

II. Contemporary Global Issues (20 lectures)

- a. Ecological Issues: Historical Overview of International Environmental Agreements, Climate Change, Global Commons Debate (7 lectures)
- b. Proliferation of Nuclear Weapons (3 lectures)
- c. International Terrorism: Non-State Actors and State Terrorism; Post 9/11 developments (4 lectures)
- d. Migration (3 lectures)
- e. Human Security (3 lectures)

III. Global Shifts: Power and Governance (5 lectures)

READING LIST

I. Globalization – Conceptions and Perspectives Understanding Globalization and its Alternative Perspectives

Essential Readings:

G. Ritzer, (2010) *Globalization: A Basic Text*, Sussex: Wiley-Blackwell, pp. 33-62.
M. Strager, (2009) *Globalization: A Very Short Introduction*, London: Oxford University Press, pp. 1-16.
R. Keohane and J. Nye Jr, (2000) 'Globalization: What's New? What's Not? (And So What?)', in *Foreign Policy*, No 118, pp. 104-119.

Additional Reading:

A. McGrew, (2011) 'Globalization and Global Politics', in J. Baylis, S. Smith and P. Owens (eds.) *Globalization of World Politics: An Introduction to International Relations*, New York: Oxford University Press, pp. 14-31.
A. Heywood, (2011) *Global Politics*, New York: Palgrave-McMillan, pp. 1-24.
W. Ellwood, (2005) *The No-nonsense Guide to Globalization*, Jaipur: NI-Rawat Publications, pp. 12-23.

Political: Debates on Sovereignty and Territoriality

Essential Readings:

A. Heywood, (2011) *Global Politics*, New York: Palgrave-McMillan, pp. 112-134.
R. Keohane, (2000) 'Sovereignty in International Society', in D. Held and A. McGrew (eds.) *The Global Trans-Formations Reader*, Cambridge: Polity Press, pp. 109-123.

Additional Reading:

K. Shimko, (2005) *International Relations: Perspectives and Controversies*, New York: Houghton Mifflin, pp. 195-219.

Global Economy: Its Significance and Anchors of Global Political Economy: IMF, World Bank, WTO, TNCs

Essential Readings:

A. Heywood, (2011) *Global Politics*, New York: Palgrave-McMillan, pp. 454-479.
T. Cohn, (2009) *Global Political Economy: Theory and Practice*, pp. 130-140 (IMF), 208-218 (WTO).
R. Picciotto, (2003) 'A New World Bank for a New Century', in C. Roe Goddard et al., *International Political: State-Market Relations in a Changing Global Order*, Boulder: LynneReinner, pp. 341-351.
A. Narlikar, (2005) *The World Trade Organization: A Very Short Introduction*, New York: Oxford University Press, pp. 22-98.
J. Goldstein, (2006) *International Relations*, New Delhi: Pearson, pp. 392-405 (MNC).
P. Hirst, G. Thompson and S. Bromley, (2009) *Globalization in Question*, Cambridge: Polity Press, pp. 68-100 (MNC).

Additional Readings:

G. Ritzer, (2010) *Globalization: A Basic Text*, Sussex: Wiley-Blackwell, pp. 180-190.
F. Lechner and J. Boli (ed.), (2004) *The Globalization Reader*, London: Blackwell, pp. 236-239 (WTO).
D. Held et al, (1999) *Global Transformations: Politics, Economics and Culture*,

California: Stanford University Press, pp. 242-282 (MNC).

T. Cohn, (2009) *Global Political Economy*, New Delhi: Pearson, pp. 250-323 (MNC).

Cultural and Technological Dimension

Essential Readings:

D. Held and A. McGrew (eds.), (2002) *Global Transformations Reader: Politics, Economics and Culture*, Cambridge: Polity Press, pp. 1-50; 84-91.

M. Steger, (2009) 'Globalization: A Contested Concept', in *Globalization: A Very Short Introduction*, London: Oxford University Press, pp. 1-16.

A. Appadurai, (2000) 'Grassroots Globalization and the Research Imagination', in *Public Culture*, Vol. 12(1), pp. 1-19.

Additional Reading:

J. Beynon and D. Dunkerley, (eds.), (2012) *Globalisation: The Reader*, New Delhi: Rawat Publications, pp. 1-19.

A. Vanaik, (ed.), (2004) *Globalization and South Asia: Multidimensional Perspectives*, New Delhi: Manohar Publications, pp. 171-191, 192-213, 301-317, 335-357.

Global Resistances (Global Social Movements and NGOs)

Essential Readings:

G. Ritzer, (2010) *Globalization: A Basic Text*, Sussex: Wiley-Blackwell, pp. 487-504.

R. O'Brien et al., (2000) *Contesting Global Governance: Multilateral Economic Institutions and Global Social Movements*, Cambridge: Cambridge University Press, pp. 1-23.

J. Fisher, (1998) *Non-Governments: NGOs and Political Development in the Third World*, Connecticut: Kumarian Press, pp. 1- 37 (NGO).

Additional Readings:

G. Laxter and S. Halperin (eds.), (2003) *Global Civil Society and Its Limits*, New York: Palgrave, pp. 1-21.

A. Heywood, (2011) *Global Politics*, New York: Palgrave-McMillan, pp. 150-156 (NGO).

P. Willets, (2011) 'Trans-National Actors and International Organizations in Global Politics', in J. Baylis, S. Smith and P. Owens (eds.) *Globalization of World Politics*, New York: Oxford University Press, pp. 334-342. (NGO)

II. Contemporary Global Issues

Ecological Issues: Historical Overview of International Environmental Agreements, Climate Change, Global Commons Debate

Essential Readings:

J. Volger, (2011) 'Environmental Issues', in J. Baylis, S. Smith and P. Owens (eds.) *Globalization of World Politics*, New York: Oxford University Press, pp. 348-362.

A. Heywood, (2011) *Global Politics*, New York: Palgrave, pp. 383-411.

N. Carter, (2007) *The Politics of Environment: Ideas, Activism, Policy*, Cambridge: Cambridge University Press, pp. 13-81.

Additional Readings:

P. Bidwai, (2011) 'Durban: Road to Nowhere', in *Economic and Political Weekly*,

Vol.46, No. 53, December, pp. 10-12.

K.Shimko, (2005) *International Relations Perspectives and Controversies*, New York: Hughton-Mifflin, pp. 317-339.

Proliferation of Nuclear Weapons

Essential Readings:

D. Howlett, (2011) 'Nuclear Proliferation', in J. Baylis, S. Smith and P. Owens (eds.) *Globalization of World Politics*, New York: Oxford University Press, pp. 384-397.

P. Viotti and M. Kauppi, (2007) *International Relations and World Politics: Security, Economy and Identity*, New Delhi: Pearson, pp. 238-272.

Additional Reading:

A. Heywood, (2011) *Global Politics*, New York: Palgrave, pp. 264-281.

International Terrorism: Non-State Actors and State Terrorism; Post 9/11 developments

Essential Readings:

P. Viotti and M. Kauppi, (2007) *International Relations*, New Delhi: Pearson, pp. 276-307.

A.Heywood, (2011) *Global Politics*, New York: Palgrave, pp. 282-

301. Additional Readings:

J. Kiras, (2011) 'Terrorism and Globalization', in J. Baylis, S. Smith and P. Owens (eds.) *Globalization of World Politics*, New York: Oxford University Press, pp. 366- 380.

A.Vanaik, (2007) *Masks of Empire*, New Delhi: Tulika, pp. 103-128.

Migration

Essential Readings:

G. Ritzer, (2010) *Globalization: A Basic Text*, Sussex: Wiley-Blackwell, pp. 298-322.

S. Castles, (2012) 'Global Migration', in B. Chimni and S. Mallavarapu (eds.) *International Relations: Perspectives For the Global South*, New Delhi: Pearson, pp. 272-285.

Human Security

Essential Readings:

A. Acharya, (2011) 'Human Security', in J. Baylis, S. Smith and P. Owens (eds.) *Globalization of World Politics*, New York: Oxford University Press, pp. 480-493.

S. Tadjbakhsh and A. Chenoy, (2007) *Human Security*, London: Routledge, pp. 13-19; 123-127; 236-243.

Additional Reading:

A. Acharya, (2001) 'Human Security: East versus West', in *International Journal*, Vol. 56, no. 3, pp. 442-460.

III. Global Shifts: Power and Governance

Essential Readings:

J. Rosenau, (1992) 'Governance, Order, and Change in World Politics', in J. Rosenau, and

E. Czempiel (eds.) *Governance without Government: Order and Change in World Politics*, Cambridge: Cambridge University Press, pp. 1-29.

A. Kumar and D. Messner (eds), (2010) *Power Shifts and Global Governance: Challenges from South and North*, London: Anthem Press.

P. Dicken, (2007) *Global Shift: Mapping the Changing Contours of the World Economy*, New York: The Guilford Press.

J. Close, (2001) 'The Global Shift: A quantum leap in human evolution', Available at <http://www.stir-global-shift.com/page22.php>, Accessed: 19.04.2013.

5.1

Paper XI- Classical Political Philosophy

Course objective: This course goes back to Greek antiquity and familiarizes students with the manner in which the political questions were first posed. Machiavelli comes as an interlude inaugurating modern politics followed by Hobbes and Locke. This is a basic foundation course for students.

I. Text and Interpretation (2 weeks)

II. Antiquity Plato (2 weeks)

Philosophy and Politics, Theory of Forms, Justice, Philosopher King/Queen, Communism Presentation theme: Critique of Democracy; Women and Guardianship, Censorship

Aristotle (2 weeks)

Forms, Virtue, Citizenship, Justice, State and Household
Presentation themes: Classification of governments; man as zoon politikon

III. Interlude:

Machiavelli (2 weeks)

Virtu, Religion, Republicanism
Presentation themes: morality and statecraft; vice and virtue

IV. Possessive

Individualism Hobbes (2 weeks)

Human nature, State of Nature, Social Contract, State
Presentation themes: State of nature; social contract; Leviathan; atomistic individuals.

Locke (2 weeks)

Laws of Nature, Natural Rights, Property,
Presentation themes: Natural rights; right to dissent; justification of property

READING LIST

I. Text and Interpretation

Essential Readings:

T. Ball, (2004) 'History and Interpretation' in C. Kukathas and G. Gaus, (eds.) *Handbook of Political Theory*, London: Sage Publications Ltd. pp. 18-30.

B. Constant, (1833) 'The Liberty of the Ancients Compared with that of the Moderns', in D. Boaz, (ed), (1997) *The Libertarian Reader*, New York: The Free Press.

Additional Readings:

J. Coleman, (2000) 'Introduction', in *A History of Political Thought: From Ancient Greece to Early Christianity*, Oxford: Blackwell Publishers, pp. 1-20.

Q. Skinner, (2010) 'Preface', in *The Foundations of Modern Political Thought Volume I*, Cambridge: Cambridge University Press pp. ix-xv.

II.

Antiquity:

Plato

Essential Readings:

A. Skoble and T. Machan, (2007) *Political Philosophy: Essential Selections*. New Delhi: Pearson Education, pp. 9-32.

R. Kraut, (1996) 'Introduction to the study of Plato', in R. Kraut (ed.) *The Cambridge Companion to Plato*. Cambridge: Cambridge University Press, pp. 1-50.

C. Reeve, (2009) 'Plato', in D. Boucher and P. Kelly, (eds) *Political Thinkers: From Socrates to the Present*, Oxford: Oxford University Press, pp. 62-80

Additional Readings:

S. Okin, (1992) 'Philosopher Queens and Private Wives', in S. Okin *Women in Western Political Thought*, Princeton: Princeton University Press, pp. 28-50

R. Kraut, (1996) 'The Defence of Justice in Plato's Republic', in R. Kraut (ed.) *The Cambridge Companion to Plato*. Cambridge: Cambridge University Press, pp. 311-337

T. Saunders, (1996) 'Plato's Later Political Thought', in R. Kraut (ed.) *The Cambridge Companion to Plato*. Cambridge: Cambridge University Press, pp. 464-492.

Aristotle

Essential Readings:

A. Skoble and T. Machan, (2007) *Political Philosophy: Essential Selections*. New Delhi: Pearson Education, pp. 53-64.

T. Burns, (2009) 'Aristotle', in D. Boucher, and P. Kelly, (eds) *Political Thinkers: From*

Socrates to the Present. Oxford: Oxford University Press, pp.81-99.

C. Taylor, (1995) 'Politics', in J. Barnes (ed.), *The Cambridge Companion to Aristotle*. Cambridge: Cambridge University Press, pp. 232-258

Additional Readings:

J. Coleman, (2000) 'Aristotle', in J. Coleman *A History of Political Thought: From Ancient Greece to Early Christianity*, Oxford: Blackwell Publishers, pp.120-186

D. Hutchinson, (1995) 'Ethics', in J. Barnes, (ed.), *The Cambridge Companion to Aristotle* Cambridge: Cambridge University Press, pp. 195-232.

III. Interlude:

Machiavelli

Essential Readings:

A. Skoble and T. Machan, (2007) *Political Philosophy: Essential Selections*. New Delhi: Pearson Education, pp. 124-130

Q. Skinner, (2000) 'The Adviser to Princes', in *Machiavelli: A Very Short Introduction*, Oxford: Oxford University Press, pp. 23-53

J. Femia, (2009) 'Machiavelli', in D. Boucher, and P. Kelly, (eds) *Political Thinkers: From Socrates to the Present*. Oxford: Oxford University Press, pp. 163-184

Additional Reading:

Q. Skinner, (2000) 'The Theorist of Liberty', in *Machiavelli: A Very Short Introduction*. Oxford: Oxford University Press, pp. 54-87.

IV. Possessive

Individualism Hobbes

Essential Readings:

A. Skoble and T. Machan, (2007) *Political Philosophy: Essential Selections*. New Delhi: Pearson Education pp. 131-157.

D. Baumgold, (2009) 'Hobbes', in D. Boucher and P. Kelly (eds) *Political Thinkers: From Socrates to the Present*. Oxford: Oxford University Press, pp. 189-206.

C. Macpherson (1962) *The Political Theory of Possessive Individualism: Hobbes to Locke*. Oxford University Press, Ontario, pp. 17-29.

Additional Readings:

I. Hampsher-Monk, (2001) 'Thomas Hobbes', in *A History of Modern Political Thought: Major Political Thinkers from Hobbes to Marx*, Oxford: Blackwell Publishers, pp. 1-67.

A. Ryan, (1996) 'Hobbes's political philosophy', in T. Sorell, (ed.) *Cambridge Companion to Hobbes*. Cambridge: Cambridge University Press, pp. 208-245.

Locke

Essential Readings:

A. Skoble and T. Machan, (2007) *Political Philosophy: Essential Selections*. New Delhi: Pearson Education, pp. 181-209.

J. Waldron, (2009) 'John Locke', in D. Boucher and P. Kelly, (eds) *Political Thinkers: From Socrates to the Present*. Oxford: Oxford University Press, pp. 207-224

C. Macpherson, (1962) *The Political Theory of Possessive Individualism: Hobbes to Locke*. Oxford University Press, Ontario, pp. 194-214.

Additional Readings:

R. Ashcraft, (1999) 'Locke's Political Philosophy', in V. Chappell (ed.) *The Cambridge Companion to Locke*, Cambridge. Cambridge University Press, pp. 226-251.

I. Hampsher-Monk, (2001) *A History of Modern Political Thought: Major Political Thinkers from Hobbes to Marx*, Oxford: Blackwell Publishers, pp. 69-116

5.2 Paper XII- Indian Political Thought-I

Course objective: This course introduces the specific elements of Indian Political Thoughtspanning over two millennia. The basic focus of study is on individual thinkers whose ideas are however framed by specific themes. The course as a whole is meant to provide a sense of the broad streams of Indian thought while encouraging a specific knowledge of individual thinkers and texts. Selected extracts from some original texts are also given to discuss in class. The list of additional readings is meant for teachers as well as the more interested students.

I. Traditions of Pre-colonial Indian Political Thought (8 lectures)

- a. Brahmanic and Shramanic
- b. Islamic and Syncretic.

II. Ved Vyasa (Shantiparva): Rajadharma (5 lectures)

III. Manu: Social Laws (6 lectures)

IV. Kautilya: Theory of State (7 lectures)

V. Aggannasutta (Digha Nikaya): Theory of kingship (5 lectures)

VI. Barani: Ideal Polity (6 lectures)

VII. Abul Fazal: Monarchy (6 lectures)

VIII. Kabir: Syncretism (5 lectures)

READING LIST

I. Traditions of Pre-modern Indian Political Thought:

Essential Readings:

B. Parekh, (1986) 'Some Reflections on the Hindu Tradition of Political Thought', in T. Pantham, and K. Deutsch (eds.), *Political Thought in Modern India*, New Delhi: Sage Publications, pp. 17- 31.

A. Altekar, (1958) 'The Kingship', in *State and Government in Ancient India*, 3rd edition, Delhi: Motilal Banarsidass, pp. 75-108.

M. Shakir, (1986) 'Dynamics of Muslim Political Thought', in T. Pantham, and K. Deutsch (eds.), *Political Thought in Modern India*, New Delhi: Sage Publications, pp. 142- 160

G. Pandey, (1978) *Sraman Tradition: Its History and Contribution to Indian Culture*, Ahmedabad: L. D. Institute of Indology, pp. 52-73.

S. Saberwal, (2008) 'Medieval Legacy', in *Spirals of Contention*, New Delhi: Routledge, pp.1-31

II. Ved Vyasa (Shantiparva): Rajadharm

Essential Readings:

The Mahabharata (2004), Vol. 7 (Book XI and Book XII, Part II), Chicago and London:University of Chicago Press.

V. Varma, (1974) *Studies in Hindu Political Thought and Its Metaphysical Foundations*, Delhi: Motilal Banarsidass, pp. 211- 230.

B. Chaturvedi, (2006) 'Dharma-The Foundation of Raja-Dharma, Law and Governance', in
The Mahabharata: An Inquiry in the Human Condition, Delhi: Orient Longman, pp. 418- 464.

III. Manu: Social Laws

Essential Readings:

Manu, (2006) 'Rules for Times of Adversity', in P. Olivelle, (ed. & trans.) *Manu's Code of Law:A Critical Edition and Translation of the Manava- Dharamsastra*, New Delhi: OUP, pp. 208-213.

V. Mehta, (1992) 'The Cosmic Vision: Manu', in *Foundations of Indian Political Thought*, Delhi: Manohar, pp. 23- 39.

R. Sharma, (1991) 'Varna in Relation to Law and Politics (c 600 BC-AD 500)', in *Aspects of Political Ideas and Institutions in Ancient India*, Delhi: Motilal Banarsidass, pp. 233-251.

P. Olivelle, (2006) 'Introduction', in *Manu's Code of Law: A Critical Edition and Translation of the Manava –Dharmasastra*, Delhi: Oxford University Press, pp. 3- 50.

IV. Kautilya: Theory of State

Essential Readings:

Kautilya, (1997) 'The Elements of Sovereignty' in R. Kangle (ed. and trns.), *Arthashastra of Kautilya*, New Delhi: Motilal Publishers, pp. 511- 514.

V. Mehta, (1992) 'The Pragmatic Vision: Kautilya and His Successor', in *Foundations of Indian Political Thought*, Delhi: Manohar, pp. 88- 109.

R. Kangle, (1997) *Arthashastra of Kautilya-Part-III: A Study*, Delhi: Motilal Banarsidass, rpt., pp. 116- 142.

Additional Reading:

J. Spellman, (1964) 'Principle of Statecraft', in *Political Theory of Ancient India: A Study of Kingship from the Earliest time to Circa AD 300*, Oxford: Clarendon Press, pp. 132-170.

V. Agganna Sutta (Digha Nikaya): Theory of Kingship

Essential Readings:

S. Collins, (ed), (2001) *Agganna Sutta: An Annotated Translation*, New Delhi: Sahitya Academy, pp. 44-49.

S. Collins, (2001) 'General Introduction', in *Agganna Sutta: The Discussion on What is Primary (An Annotated Translation from Pali)*, Delhi: Sahitya Akademi, pp. 1- 26.

B. Gokhale, (1966) 'The Early Buddhist View of the State', in *The Journal of Asian Studies*, Vol. XXVI, (1), pp. 15- 22.

Additional Reading:

L. Jayasurya, 'Buddhism, Politics and Statecraft', Available at ftp.buddhism.org/Publications/.../Voll1_03_Laksiri%20Jayasuriya.pdf, Accessed: 19.04.2013.

VI. Barani: Ideal Polity

Essential Reading:

I. Habib, (1998) 'Ziya Barani's Vision of the State', in *The Medieval History Journal*, Vol. 2,

(1), pp. 19- 36.

Additional Reading:

M. Alam, (2004) 'Sharia Akhlaq', in *The Languages of Political Islam in India 1200- 1800*, Delhi: Permanent Black, pp. 26- 43

VII. Abul Fazal: Monarchy

Essential Readings:

A. Fazl, (1873) *The Ain-i Akbari* (translated by H. Blochmann), Calcutta: G. H. Rouse, pp. 47-57.

V. Mehta, (1992) 'The Imperial Vision: Barani and Fazal', in *Foundations of Indian Political Thought*, Delhi: Manohar, pp. 134- 156.

Additional Readings:

M. Alam, (2004) 'Sharia in Naserean Akhlaq', in *Languages of Political Islam in India 1200-1800*, Delhi: Permanent Black, pp. 46- 69.

I. Habib, (1998) 'Two Indian Theorist of The State: Barani and Abul Fazal', in *Proceedings of the Indian History Congress*. Patiala, pp. 15- 39.

VIII. Kabir: Syncreticism

Essential Readings:

Kabir. (2002) *The Bijak of Kabir*, (translated by L. Hess and S. Singh), Delhi: Oxford University Press, No. 30, 97, pp. 50- 51 & 69- 70.

V. Mehta, (1992) *Foundation of Indian Political Thought*, Delhi: Manohar, pp. 157- 183.

G. Omvedt, (2008) 'Kabir and Ravidas, Envisioning Begumpura', in *Seeking Begumpura: The Social Vision of Anti Caste Intellectual*, Delhi: Navayana, pp. 91- 107.

Additional Reading:

L. Hess and S. Singh, (2002) 'Introduction', in *The Bijak of Kabir*, New Delhi: Oxford University Press, pp. 3- 35.

6.1 Paper XIII- Modern Political Philosophy

Course objective: Philosophy and politics are closely intertwined. We explore this convergence by identifying four main tendencies here. Students will be exposed to the manner in which the questions of politics have been posed in terms that have implications for larger questions of thought and existence.

I. Modernity and its discourses (8 lectures)

This section will introduce students to the idea of modernity and the discourses around modernity. Two essential readings have been prescribed.

II. Romantics (16 lectures)

a. Jean Jacques Rousseau (8 Lectures)

Presentation themes: General Will; local or direct democracy; self-government; origin of inequality.

b. Mary Wollstonecraft (8 Lectures)

Presentation themes: Women and paternalism; critique of Rousseau's idea of education; legal rights

III. Liberal socialist (8 lectures)

a. John Stuart Mill

Presentation themes: Liberty, suffrage and subjection of women, right of minorities; utility principle.

IV. Radicals (16 lectures)

a. Karl Marx (8 Lectures)

Presentation themes: Alienation; difference with other kinds of materialism; class struggle

b. Alexandra Kollontai (8 Lectures)

Presentation themes: Winged and wingless Eros; proletarian woman; socialization of housework; disagreement with Lenin

Reading List

I. Modernity and its discourses

Essential Readings:

I. Kant. (1784) 'What is Enlightenment?,' available at <http://theliterarylink.com/kant.html>, Accessed: 19.04.2013

S. Hall (1992) 'Introduction', in *Formations of Modernity* UK: Polity Press pages 1-16

II. Romantics

Essential Readings:

B. Nelson, (2008) *Western Political Thought*. New York: Pearson Longman, pp. 221- 255.

M. Keens-Soper, (2003) 'Jean Jacques Rousseau: The Social Contract', in M. Forsyth and M. Keens-Soper, (eds) *A Guide to the Political Classics: Plato to Rousseau*. New York: Oxford University Press, pp. 171-202.

C. Jones, (2002) 'Mary Wollstonecraft's *Vindications* and their Political Tradition' in C. Johnson, (ed.) *The Cambridge Companion to Mary Wollstonecraft*, Cambridge: Cambridge University Press, pp. 42-58.

S. Ferguson, (1999) 'The Radical Ideas of Mary Wollstonecraft', in *Canadian Journal of Political Science* XXXII (3), pp. 427-50, Available at <http://digitalcommons.ryerson.ca/politics>, Accessed: 19.04.2013.

III. Liberal Socialist

Essential Readings:

H. Magid, (1987) 'John Stuart Mill', in L. Strauss and J. Cropsey, (eds), *History of Political Philosophy*, 2nd edition. Chicago: Chicago University Press, pp. 784-801.

P. Kelly, (2003) 'J.S. Mill on Liberty', in D. Boucher, and P. Kelly, (eds.) *Political Thinkers: From Socrates to the Present*. New York: Oxford University Press, pp. 324- 359.

IV. Radicals

Essential Readings:

J. Cropsey, (1987) 'Karl Marx', in L. Strauss and J. Cropsey, (eds) *History of Political Philosophy*, 2nd Edition. Chicago: Chicago University Press, pp. 802-828.

L. Wilde, (2003) 'Early Marx', in D. Boucher and P. Kelly, P. (eds) *Political Thinkers: From Socrates to the Present*. New York: Oxford University Press, pp. 404-435.

V. Bryson, (1992) 'Marxist Feminism in Russia' in *Feminist Political Theory*, London: Palgrave Macmillan, pp. 114-122

C. Sypnowich, (1993) 'Alexandra Kollontai and the Fate of Bolshevik Feminism' *Labour/Le Travail* Vol. 32 (Fall 1992) pp. 287-295

A. Kollontai (1909), *The Social Basis of the Woman Question*, Available at <http://www.marxists.org/archive/kollonta/1909/social-basis.htm>, Accessed: 19.04.2013

Additional Readings:

A. Bloom, (1987) 'Jean-Jacques Rousseau', in Strauss, L. and Cropsey, J. (eds.) *History of Political Philosophy*, 2nd edition. Chicago: Chicago University Press, pp. 559-580.

Selections from *A Vindication of the Rights of Woman*, Available at <http://oregonstate.edu/instruct/phl302/texts/wollstonecraft/woman-a.html#CHAPTER%20II>, Accessed: 19.04.2013.

A. Skoble and T. Machan, (2007) *Political Philosophy: Essential Selections*, New Delhi: Pearson Education, pp. 328-354.

B. Ollman (1991) *Marxism: An Uncommon Introduction*, New Delhi: Sterling Publishers.

G. Blakely and V. Bryson (2005) *Marx and Other Four Letter Words*, London: Pluto

A. Skoble, and T. Machan, (2007) *Political Philosophy: Essential Selections*, New Delhi: Pearson Education, pp. 286-327.

A. Kollontai, (1977) 'Social Democracy and the Women's Question', in *Selected Writings of Alexandra Kollontai*, London: Allison & Busby, pp. 29-74.

A. Kollontai, (1977) 'Make Way for Winged Eros: A Letter to the Youth', in *Selected Writings of Alexandra Kollontai* Allison & Busby, pp. 201-292.

C. Porter, (1980) *Alexandra Kollontai: The Lonely Struggle of the Woman who defied Lenin*, New York: Dutton Children's Books.

6.2 Paper XIV- Indian Political Thought-II

Course objective: Based on the study of individual thinkers, the course introduces a wide span of thinkers and themes that defines the modernity of Indian political thought. The objective is to study general themes that have been produced by thinkers from varied social and temporal contexts. Selected extracts from original texts are also given to discuss in the class. The list of additional readings is meant for teachers as well as the more interested students.

I. Introduction to Modern Indian Political Thought (4 lectures)

II. Rammohan Roy: Rights (4 lectures)

III. Pandita Ramabai: Gender (4 lectures)

IV. Vivekananda: Ideal Society (5 lectures)

V. Gandhi: Swaraj (5 lectures)

VI. Ambedkar: Social Justice (5 lectures)

VII. Tagore: Critique of Nationalism (4 lectures)

VIII. Iqbal: Community (5 lectures)

IX. Savarkar: Hindutva (4 lectures)

X. Nehru: Secularism (4 lectures)

XI. Lohia: Socialism (4 lectures)

Reading List

I. Introduction to Modern Indian Political Thought

Essential Readings:

V. Mehta and T. Pantham (eds.), (2006) '*A Thematic Introduction to Political Ideas in Modern India: Thematic Explorations, History of Science, Philosophy and Culture in Indian civilization*'

Vol. 10, Part: 7, New Delhi: Sage Publications, pp. xxvii-ixi.

D. Dalton, (1982) 'Continuity of Innovation', in *Indian Idea of Freedom: Political Thought of Swami Vivekananda, Aurobindo Ghose, Rabindranath Tagore and Mahatma Gandhi*, Academic Press: Gurgaon, pp. 1-28.

II. Rammohan Roy: Rights

Essential Readings:

R. Roy, (1991) 'The Precepts of Jesus, the Guide to Peace and Happiness', S. Hay, (ed.) *Sources of Indian Tradition, Vol. 2*. Second Edition. New Delhi: Penguin, pp. 24-29.

C. Bayly, (2010) 'Rammohan and the Advent of Constitutional Liberalism in India 1800-1830', in Sh. Kapila (ed.), *An intellectual History for India*, New Delhi: Cambridge University Press, pp. 18- 34.

T. Pantham, (1986) 'The Socio-Religious Thought of Rammohan Roy', in Th. Panthom and K. Deutsch, (eds.) *Political Thought in Modern India*, New Delhi: Sage, pp.32-52.

Additional Reading:

S. Sarkar, (1985) 'Rammohan Roy and the break With the Past', in *A Critique on colonial India*, Calcutta: Papyrus, pp. 1-17.

III. Pandita Ramabai: Gender

Essential Readings:

P. Ramabai, (2000) 'Woman's Place in Religion and Society', in M. Kosambi (ed.), *Pandita Ramabai Through her Own Words: Selected Works*, New Delhi: Oxford

University Press, pp.150-155.

M. Kosambi, (1988) 'Women's Emancipation and Equality: Pandita Ramabai's Contribution to Women's Cause', in *Economic and Political Weekly*, Vol. 23(44), pp. 38-49.

Additional Reading:

U. Chakravarti, (2007) *Pandita Ramabai - A Life and a Time*, New Delhi: Critical Quest, pp. 1-40.

G. Omvedt, (2008) 'Ramabai: Women in the Kingdom of God', in *Seeking Begumpura: The Social Vision of Anti Caste Intellectuals*, New Delhi: Navayana. pp. 205-224.

IV. Vivekananda: Ideal Society

Essential Readings:

S. Vivekananda, (2007) 'The Real and the Apparent Man', S. Bodhasarananda (ed.), *Selections from the Complete Works of Swami Vivekananda*, Kolkata: Advaita Ashrama, pp.126-129.

A. Sen, (2003) 'Swami Vivekananda on History and Society', in *Swami Vivekananda*, Delhi: Oxford University Press, pp. 62- 79.

H. Rustav, (1998) 'Swami Vivekananda and the Ideal Society', in W. Radice (ed.), *Swami Vivekananda and the Modernisation of Hinduism*, Delhi: Oxford University Press, pp. 264-280.

Additional Reading:

Raghuramaraju, (2007) 'Swami and Mahatma, Paradigms: State and Civil Society', in *Debates in Indian Philosophy: Classical, Colonial, and Contemporary*, Delhi: Oxford University Press, pp. 29-65.

V. Gandhi: Swaraj

Essential Readings:

M. Gandhi, (1991) 'Satyagraha: Transforming Unjust Relationships through the Power of the Soul', in S. Hay (ed.), *Sources of Indian Tradition*, Vol. 2. Second Edition, New Delhi: Penguin, pp. 265-270.

A. Parel, (ed.), (2002) 'Introduction', in *Gandhi, freedom and Self Rule*, Delhi: Vistaar Publication.

D. Dalton, (1982) *Indian Idea of Freedom: Political Thought of Swami Vivekananda, Aurobindo Ghose, Mahatma Gandhi and Rabindranath Tagore*, Gurgaon: The Academic Press, pp. 154- 190.

Additional Reading:

R. Terchek, (2002) 'Gandhian Autonomy in Late Modern World', in A. Parel (ed.), *Gandhi, Freedom and Self Rule*. Delhi: Sage.

VI. Ambedkar: Social Justice

Essential Readings:

B. Ambedkar, (1991) 'Constituent Assembly Debates', S. Hay (ed.), *Sources of Indian Tradition, Vol. 2*, Second Edition, New Delhi: Penguin, pp. 342-347.

V. Rodrigues, (2007) 'Good society, Rights, Democracy Socialism', in S. Thorat and Aryama (eds.), *Ambedkar in Retrospect - Essays on Economics, Politics and Society*, Jaipur: IIDS and Rawat Publications.

B. Mungekar, (2007) 'Quest for Democratic Socialism', in S. Thorat, and Aryana (eds.), *Ambedkar in Retrospect - Essays on Economics, Politics and Society*, Jaipur: IIDS and Rawat Publications, pp. 121-142.

Additional Reading:

P. Chatterjee, (2005) 'Ambedkar and the Troubled times of Citizenship', in V. Mehta and Th. Pantham (eds.), *Political ideas in modern India: Thematic Explorations*, New Delhi: Sage, pp. 73-92.

VII. Tagore: Critique of Nationalism

Essential Readings:

R. Tagore, (1994) 'The Nation', S. Das (ed.), *The English Writings of Rabindranath Tagore, Vol. 3*, New Delhi: Sahitya Akademi, pp. 548-551.

R. Chakravarty, (1986) 'Tagore, Politics and Beyond', in Th. Panthams and K. Deutsch (eds.), *Political Thought in Modern India*, New Delhi: Sage, pp. 177-191.

M. Radhakrishnan, and Debasmita, (2003) 'Nationalism is a Great Menace: Tagore and Nationalism' in P. Hogan, Colm and L. Pandit, (eds.) *Rabindranath Tagore: Universality and Tradition*, London: Rosemont Publishing and Printing Corporation, pp. 29-39.

Additional Reading:

A. Nandy, (1994) 'Rabindranath Tagore & Politics of Self', in *Illegitimacy of Nationalism*, Delhi: Oxford University Press, pp. 1-50.

VIII. Iqbal: Community

Essential Readings:

M. Iqbal, (1991) 'Speeches and Statements', in S. Hay (ed.), *Sources of Indian Tradition, Vol.2*, Second Edition, New Delhi: Penguin, pp. 218-222.

A. Engineer, (1980) 'Iqbal's Reconstruction of Religious Thought in Islam', in *Social Scientist*, Vol.8 (8), pp. 52-63.

Madani, (2005) *Composite Nationalism and Islam*, New Delhi: Manohar, pp. 66-91.

Additional Reading:

L. Gordon-Polonskya, (1971) 'Ideology of Muslim Nationalism', in H. Malik (ed.), *Iqbal: Poet-Philosopher of Pakistan*, New York: Columbia University Press, pp. 108- 134.

IX. Savarkar: Hindutva

Essential Readings:

V.Savarkar, 'Hindutva is Different from Hinduism', available at <http://www.savarkar.org/en/hindutva-/essentials-hindutva/hindutva-different-hinduism>, Accessed: 19.04.2013

J. Sharma, (2003) *Hindutva: Exploring the Idea of Hindu Nationalism*, Delhi: Penguin, pp. 124-172.

Additional Reading:

Dh. Keer, (1966) *Veer Savarkar*, Bombay: Popular Prakashan, pp. 223-250.

X. Nehru: Secularism

Essential Readings:

J. Nehru, (1991) 'Selected Works', in S. Hay (ed.), *Sources of Indian Tradition, Vol. 2*, Second Edition, New Delhi: Penguin, pp. 317-319.

R. Pillai, (1986) 'Political thought of Jawaharlal Nehru', in Th. Pantham, and K. Deutsch (eds.), *Political Thought in Modern India*, New Delhi: Sage, pp. 260- 274.

B. Zachariah, (2004) *Nehru*, London: Routledge Historical Biographies, pp. 169-213.

Additional Reading:

P. Chatterjee, (1986) 'The Moment of Arrival: Nehru and the Passive Revolution', in *Nationalist Thought and the Colonial World: A Derivative Discourse?* London: Zed Books, pp.131-166

XI. Lohia: Socialism

Essential Readings:

M. Anees and V. Dixit (eds.), (1984) *Lohia: Many Faceted Personality*, Rammanohar Lohia Smarak Smriti.

S. Sinha, (2010) 'Lohia's Socialism: An underdog's perspective', in *Economic and Political Weekly*, Vol. XLV (40) pp. 51-55.

- A. Kumar, (2010) 'Understanding Lohia's Political Sociology: Intersectionality of Caste, Class, Gender and Language Issue', in *Economic and Political Weekly*, Vol. XLV (40), pp. 64-70.

B) Generic Elective (Interdisciplinary): 4

1.

Feminism: Theory and Practice

Course Objective: The aim of the course is to explain contemporary debates on feminism and the history of feminist struggles. The course begins with a discussion on construction of gender and an understanding of complexity of patriarchy and goes on to analyze theoretical debates within feminism. Part II of the paper covers history of feminism in the west, socialist societies and in anti-colonial struggles. Part III focuses a gendered analysis of Indian society, economy and polity with a view to understanding the structures of gender inequalities. And the last section aims to understand the issues with which contemporary Indian women's movements are engaged with.

I. Approaches to understanding Patriarchy (22 Lectures)

- Feminist theorising of the sex/gender distinction. Biologism versus social constructivism
- Understanding Patriarchy and Feminism
- Liberal, Socialist, Marxist, Radical feminism, New Feminist Schools/Traditions

II. History of Feminism (22 Lectures)

- Origins of Feminism in the West: France, Britain and United States of America
- Feminism in the Socialist Countries: China, Cuba and erstwhile USSR
- Feminist issues and women's participation in anti-colonial and national liberation movements with special focus on India

III. The Indian Experience (16 Lectures)

- Traditional Historiography and Feminist critiques. Social Reforms Movement and position of women in India. History of Women's struggle in India
- Family in contemporary India - patrilineal and matrilineal practices. Gender Relations in the Family, Patterns of Consumption: Intra Household Divisions, entitlements and bargaining, Property Rights
- Understanding Woman's Work and Labour – Sexual Division of Labour, Productive and Reproductive labour, Visible - invisible work – Unpaid (reproductive and

care), Underpaid and Paid work,- Methods of computing women's work , Female headed households

Essential Readings

I. Approaches to understanding Patriarchy

Geetha, V. (2002) *Gender*. Calcutta: Stree.

Geetha, V. (2007) *Patriarchy*. Calcutta: Stree.

Jagger, Alison. (1983) *Feminist Politics and Human Nature*. U.K.: Harvester Press, pp. 25-350.

Supplementary Readings:

Ray, Suranjita. *Understanding Patriarchy*. Available at:

http://www.du.ac.in/fileadmin/DU/Academics/course_material/hrge_06.pdf

Lerner, Gerda. (1986) *The Creation of Patriarchy*. New York: Oxford University Press.

II. History of Feminism

Rowbotham, Shiela. (1993) *Women in Movements*. New York and London: Routledge, Section I, pp. 27-74 and 178-218.

Jayawardene, Kumari. (1986) *Feminism and Nationalism in the Third World*. London: Zed Books, pp. 1-24, 71-108, and Conclusion.

Forbes, Geraldine (1998) *Women in Modern India*. Cambridge: Cambridge University Press, pp. 1-150.

Supplementary Readings:

Eisentein, Zillah. (1979) *Capitalist Patriarchy and the Case for Socialist Feminism*. New York: Monthly Review Press, pp. 271-353.

Funk, Nanette & Mueller, Magda. (1993) *Gender, Politics and Post-Communism*. New York and London: Routledge, Introduction and Chapter 28.

Chaudhuri, Maiyatri. (2003) 'Gender in the Making of the Indian Nation State', in Rege, Sharmila. (ed.) *The Sociology of Gender: The Challenge of Feminist Sociological Knowledge*. New Delhi: Sage.

Banarjee, Sikata. (2007) 'Gender and Nationalism: The Masculinisation of Hinduism and

Female Political Participation', in Ghadially, Rehana. (ed.) *Urban Women in Contemporary India: A Reader*. New Delhi: Sage.

III. Feminist Perspectives on Indian Politics

Roy, Kumkum. (1995) 'Where Women are Worshipped, There Gods Rejoice: The Mirage of the Ancestress of the Hindu Women', in Sarkar, Tanika & Butalia, Urvashi. (eds.) *Women and the Hindu Right*. Delhi: Kali for Women, pp. 10-28.

Chakravarti, Uma. (1988) 'Beyond the Altekarian Paradigm: Towards a New Understanding of Gender Relations in Early Indian History', *Social Scientist*, Volume 16, No. 8.

Banerjee, Nirmala. (1999) 'Analysing Women's work under Patriarchy' in Sangari, Kumkum & Chakravarty, Uma. (eds.) *From Myths to Markets: Essays on Gender*. Delhi: Manohar.

Additional Readings

Gandhi, Nandita & Shah, Nandita. (1991) *The Issues at Stake – Theory and Practice in Contemporary Women's Movement in India*. Delhi: Zubaan, pp. 7-72.

Shinde, Tarabai (1993) 'Stri-Purush Tulna', in Tharu, Susie & Lalita, K. (eds.) *Women Writing in India, 600 BC to the Present. Vol. I*. New York: Feminist Press.

Desai, Neera & Thakkar, Usha. (2001) *Women in Indian Society*. New Delhi: National Book Trust.

2. Gandhi and the Contemporary World

Course objective: Locating Gandhi in a global frame, the course seeks to elaborate Gandhian thought and examine its practical implications. It will introduce students to key instances of Gandhi's continuing influence right up to the contemporary period and enable them to critically evaluate his legacy.

I. Gandhi on Modern Civilization and Ethics of Development (2 weeks)

- a. Conception of Modern Civilisation and Alternative Modernity
- b. Critique of Development: Narmada Bachao Andolan

II. Gandhian Thought: Theory and Action (4 weeks)

- a. Theory of Satyagraha
- b. Satyagraha in Action
 - i. Peasant Satyagraha: Kheda and the Idea of Trusteeship
 - ii. Temple Entry and Critique of Caste
 - iii. Social Harmony: 1947 and Communal Unity

III. Gandhi's Legacy (4 weeks)

- a) Tolerance: Anti - Racism Movements (Anti - Apartheid and Martin Luther King)
- b) The Pacifist Movement
- c) Women's Movements
- d) *Gandhigiri*: Perceptions in Popular Culture

IV. Gandhi and the Idea of Political (2 weeks)

- a) Swaraj
- b) Swadeshi

READINGS

I. Gandhi on Modern Civilization and Ethics of Development

Essential Readings:

B. Parekh, (1997) 'The Critique of Modernity', in *Gandhi: A Brief Insight*, Delhi: Sterling Publishing Company, pp. 63-74.

K. Ishii, (2001) 'The Socio-economic Thoughts of Mahatma Gandhi: As an Origin of Alternative Development', *Review of Social Economy*. Vol. 59 (3), pp. 297-312.

D. Hardiman, (2003) 'Narmada Bachao Andolan', in *Gandhi in his Time and Ours*. Delhi: Oxford University Press, pp. 224- 234.

A Baviskar, (1995) 'The Politics of the Andolan', in *In the Belly of the River: Tribal Conflict Over Development in the Narmada Valley*, Delhi: Oxford University Press, pp.202-228.

R Iyer, (ed) (1993) 'Chapter 4' in *The Essential Writings of Mahatma Gandhi*, New Delhi: Oxford University Press.

R. Ramashray, (1984) 'Liberty Versus Liberation', in *Self and Society: A Study in Gandhian Thought*, New Delhi: Sage Publication.

II. Gandhian Thought: Theory and Action

Essential Readings:

B. Parekh, (1997) 'Satyagrah', in *Gandhi: A Brief Insight*, Delhi: Sterling Publishing Company, pp. 51-63.

D. Dalton, (2000) 'Gandhi's originality', in A. Parel (ed) *Gandhi, Freedom and Self- Rule*, New Delhi: Lexington Books, pp.63-86.

D. Hardiman, (1981) 'The Kheda Satyagraha', in *Peasant Nationalists of Gujarat: Kheda District, 1917-1934*, Delhi: Oxford University Press, pp. 86-113.

J. Brown, (2000) 'Gandhi and Human Rights: In search of True humanity', in A. Parel

(ed) *Gandhi, Freedom and Self-Rule*, New Delhi: Lexington Books, pp. 93- 100.

R. Iyer, (2000) 'Chapter 10 and 11', in *The Moral and Political Thought of Mahatma Gandhi*, New Delhi: Oxford University Press, pp. 251-344

I. Knudegaard, (2010), *Gandhi's Vision for Indian Society: Theory and Action*, Master Thesis in History, University of Oslo, Available at

https://docs.google.com/viewer?a=v&q=cache:Eqj9br1n3_oJ:https://www.duo.uio.no/bi/tst

[ream/handle/123456789/23275/IngfridKnudegaardxmasteroppavexixhistorie.pdf?sequence%3D1+gandhi+and+temple+entry&hl=en&gl=in&pid=bl&srcid=ADGEEsiKGssA7q2z1kxiut3bciHPH_HI3chWKbJIVo9HE4LcWCLmKdKXCirPalzh7Tp47fyBQJHX9GUesefn8YCAQeaQSKMRdrwvYT2Q8c7XV95tQhSGuO9bNCGEdIYGoBjzoVdJc&sig=AHIEtbQ78zwxGvh92AnwmRHiA7t2wWXXJQ](https://docs.google.com/viewer/a=v&q=cache:Eqj9br1n3_oJ:https://www.duo.uio.no/bi/tst), Accessed: 14.04.2013, pp.27-38.

P. Rao, (2009) 'Gandhi, Untouchability and the Postcolonial Predicament: A Note'. *SocialScientist*. Vol. 37 (1/2). Pp. 64-70.

B. Parekh, (1999) 'Discourse on Unsociability', in *Colonialism, Tradition and Reform: An Analysis of Gandhi's Political Discourse*, New Delhi: Sage Publication.

D. Hardiman, (2003) 'Fighting Religious Hatreds', in *Gandhi in His Time and Ours*. Delhi: Oxford University Press.

III. Gandhi's Legacy

Essential Readings:

D. Hardiman, (2003) 'Gandhi's Global Legacy', in *Gandhi in His Time and Ours*. Delhi: Oxford University Press, pp. 238-283.

Manimala, (1984) 'Zameen Kenkar? Jote Onkar: Women's participation in the Bodhgaya struggles', in M. Kishwar and R. Vanita (eds) *In Search of Answers: Indian Women's Voices from Manushi*, London: Zed Press.

M. Shah, (2006) 'Gandhigiri; A Philosophy of Our Times', *The Hindu* Available at <http://www.hindu.com/2006/09/28/stories/2006092802241000.htm>, Accessed: 14.04.2013.

A. Ghosh and T. Babu, (2006) 'Lage Raho Munna Bhai: Unravelling Brand 'Gandhigiri'', *Economic and Political Weekly*, 41 (51), pp. 5225 – 5227.

H. Trivedi (2011) 'Literary and Visual Portrayal of Gandhi', in J Brown and A Parel (eds) *Cambridge Companion to Gandhi*, Cambridge University Press 2011, pp. 199-218.

IV. Gandhi and the Idea of Political

Essential Readings:

P. Chatterjee, (1986) 'The Moment of Maneuver', in *Nationalist Thought and the Colonial World: A derivative discourse?*, Delhi: Zed Books.

Indian Council for Historical Research (1976) 'The Logic of Gandhian Nationalism: Civil Disobedience and the Gandhi – Irwin Pact, 1930-31', *Indian Historical Review*, Available at <http://www.ichrindia.org/journal.pdf>, Accessed: 18.04.2013.

D. Dalton, (1996) 'Swaraj: Gandhi's Idea of Freedom', in *Mahatma Gandhi: Selected Political Writings*, USA: Hackett Publishing, pp. 95-148.

A. Parel (ed.) (1997) 'Editor's Introduction', in *Gandhi, Hind Swaraj and Other Writings* Cambridge: Cambridge University Press.

Additional Readings:

A. Baviskar, (1995) 'National Development, Poverty and the environment', in *In the Belly of the River: Tribal Conflict Over Development in the Narmada Valley*, Delhi: Oxford University Press, pp. 18-33.

B. Parekh, (1997) 'Religious Thought', in *Gandhi: A Brief Insight*, Delhi: Sterling Publishing Company.

R. Iyer, (1993) *The Essential Writings of Mahatma Gandhi*, New Delhi: Oxford University Press, pp. 299-344; 347-373.

S. Sarkar, (1982) *Modern India 1885-1947*, New Delhi: Macmillan, pp. 432-39.

R. Iyer, (2001) *The Moral and Political Thought of Mahatma Gandhi*, New Delhi: Oxford University Press. pp. 344-358.

H. Coward, (2003) 'Gandhi, Ambedkar, and Untouchability', in H. Coward (ed) *Indian Critiques of Gandhi*, New York: State University of New York Press, pp. 41-66.

J. Lipner, (2003) 'A Debate for Our Times', in Harold Coward (ed) *Indian Critiques of Gandhi*, New York: State University of New York Press, pp. 239-58

M. Gandhi, (1941) 'Chapter 1, 2, 9, 15, and 16', in *Constructive Programme: Its Meaning and Place*, Ahmedabad: Navjivan Trust.

R. Terchek, (1998) *Gandhi: Struggling for Autonomy*, USA: Rowman and Littlefield Publishers.

N. Dirks, (2001), 'The Reformation of Caste: Periyar, Ambedkar and Gandhi', in *Castes of Mind: Colonialism and the making of Modern India*, Princeton: Princeton University

Press.

R. Mukharjee, (ed) (1995), *The Penguin Gandhi Reader*, New Delhi: Penguin.

T. Weber, (2006) 'Gandhi is dead, Long live Gandhi- The Post Gandhi Gandhian Movement in India', in *Gandhi, Gandhism and the Gandhians*, New Delhi: Roli.

A. Taneja, (2005) *Gandhi Women and the National Movement 1920-1947*, New Delhi: Haranand Publishers.

J. Brown, (2008) *Gandhi and Civil Disobedience: The Mahatma in Indian Politics*, Cambridge: Cambridge University Press, 2008

R. Ramashray, (1984) 'What Beyond the Satanic Civilization?', in *Self and Society: A Study in Gandhian Thought*, New Delhi: Sage Publication.

Activities

Topic 1

1. Reading of primary texts:- M K Gandhi Chapter VI and XIII "Hind Swaraj" Navjeevan Trust, Ahmedabad, 1910

2. A site visit to any on-going developmental project preferably in NCT Delhi by students and submission of report on Environmental law Violation and Resistance by People in a Gandhian Way.

Topic 2

1. Reading of primary texts:- M K Gandhi Chapter XII&XIII, "Satyagraha in South Africa, Navjivan Trust, Ahmedabad, 1928, pp. 95-107

2. A Report followed by presentation on functioning of Cooperative and Community engagement for example Amul and/or SEWA in Gujarat to understand Trusteeship and its relevance

Topic 3

1. Movie Screenings (Movies like Lage Raho Munna Bhai, Gandhi by Richard Attenborough and Student's Participation in reviewing/discussing the movie from a Gandhian perspective or Cultural engagement of Students with Gandhian Ideas through Staging of a street play.

Topic 4

Student Visit to Any Gandhian Institution in Delhi like, Gandhi Darshan and Smriti to understand on-going Gandhian work and programme and interacting with Gandhian activists.

3. GOVERNANCE: ISSUES AND CHALLENGES

Objectives: This paper deals with concepts and different dimensions of governance highlighting the major debates in the contemporary times. There is a need to understand the importance of the concept of governance in the context of a globalising world, environment, administration, development. The essence of governance is explored through the various good governance initiatives introduced in India.

1. GOVERNMENT AND GOVERNANCE: CONCEPTS [12 lectures]

Role of State In The Era Of Globalisation State, Market and Civil Society

2. GOVERNANCE AND DEVELOPMENT [12 lectures]

Changing Dimensions of Development Strengthening Democracy through Good Governance

3. ENVIRONMENTAL GOVERNANCE [12 lectures]

Human-Environment Interaction

Green Governance: Sustainable Human Development

4. LOCAL GOVERNANCE [12 lectures]

Democratic

Decentralisation

n

People's Participation In Governance

5. GOOD GOVERNANCE INITIATIVES IN INDIA: BEST PRACTICES [20 lectures]

- a. Public Service Guarantee Acts
- b. Electronic Governance
- c. Citizens Charter & Right to Information
- d. Corporate Social Responsibility

READINGS

GOVERNMENT AND GOVERNANCE: CONCEPTS

B. Chakrabarty and M. Bhattacharya, (eds.) *The Governance Discourse*. New Delhi: Oxford University Press, 1998

Surendra Munshi and Biju Paul Abraham [eds.], *Good Governance, Democratic Societies And Globalisation*, Sage Publishers, 2004

United Nation Development Programme, *Reconceptualising Governance*, New York, 1997

Carlos Santiso, *Good Governance and Aid Effectiveness: The World Bank and Conditionality*

Johns Hopkins University, The Georgetown Public Policy Review ,Volume VII, No.1, 2001

Vasudha Chotray and Gery Stroker , *Governance Theory: A Cross Disciplinary Approach* ,

Palgrave Macmillan ,2008

J. Rosenau, 'Governance, Order, and Change in World Politics', in J. Rosenau, and E. Czempiel (eds.) *Governance without Government: Order and Change in World Politics*, Cambridge: Cambridge University Press ,1992

B. Nayar (ed.), *Globalization and Politics in India*. Delhi: Oxford University Press, 2007 pp. 218-240.

Smita Mishra Panda , *Engendering Governance Institutions: State, Market And Civil Society*, Sage Publications,2008

Neera Chandhoke, *State And Civil Society Explorations In Political Theory* , Sage Publishers,1995

GOVERNANCE AND DEVELOPMENT

B. C. Smith, *Good Governance and Development*, Palgrave, 2007

World Bank Report, *Governance And Development*, 1992

P. Bardhan, 'Epilogue on the Political Economy of Reform in India', in *The Political Economy of Development in India*. 6th edition, Delhi: Oxford University Press, 2005

J. Dreze and A. Sen, *India: Economic Development and Social Opportunity*. New Delhi: Oxford University Press, 1995

Niraja Gopal Jayal[ed.], *Democracy in India*, Oxford University Press, 2007

ENVIRONMENTAL GOVERNANCE

Ramachandra Guha, *Environmentalism: A Global History*, Longman Publishers, 1999

J.P. Evans, *Environmental Governance*, Routledge , 2012

Emilio F. Moran, *Environmental Social Science: Human - Environment interactions and Sustainability*, Wiley-Blackwell, 2010

Burns H Weston and David Bollier, *Green Governance: Ecological Survival, Human Rights, and the Law of the Commons*, Cambridge University Press, 2013

Bina Agarwal, *Gender And Green Governance* , Oxford University Press, Oxford, 2013

J. Volger, 'Environmental Issues', in J. Baylis, S. Smith and P. Owens (eds.) *Globalization of World Politics*, New York: Oxford University Press, 2011, pp. 348- 362.

A. Heywood, *Global Politics*, New York: Palgrave, 2011, pp. 383-411.

N. Carter, *The Politics of Environment: Ideas, Activism, Policy*, Cambridge: Cambridge University Press, 2007, pp. 13-81.

LOCAL GOVERNANCE

Pranab Bardhan and Dilip Mookherjee, *Decentralization And Local Governance In Developing Countries: A Comparative Perspective*, MIT Press, 2006

T.R. Raghunandan, *Decentralization And Local Governments: The Indian Experience, Readings On The Economy, Polity And Society*, Orient Blackswan, 2013

Pardeep Sachdeva, *Local Government In India*, Pearson Publishers, 2011

P. de Souza, (2002) 'Decentralization and Local Government: The Second Wind of Democracy in India', in Z. Hasan, E. Sridharan and R. Sudarshan (eds.) *India's Living Constitution: Ideas, Practices and Controversies*, New Delhi: Permanent Black, 2002

Mary John, 'Women in Power? Gender, Caste and Politics of Local Urban Governance', in *Economic and Political Weekly*, Vol. 42(39), 2007

GOOD GOVERNANCE INITIATIVES IN INDIA: BEST PRACTICES

Niraja Gopal Jayal, *Democracy and the State: Welfare, Secularism, and Development in Contemporary India*, Oxford University Press, 1999

Reetika Khera [ed.], *The Battle for Employment Guarantee*, Oxford University Press, 2011

Nalini Juneja, *Primary Education for All in the City of Mumbai: The Challenge Set By Local Actors*, International Institute For Educational Planning, UNESCO : Paris, 2001

Maxine Molyneux and Shahra Razavi, *Gender, Justice, Development, and Rights*, Oxford University Press, 2002

Jugal Kishore, *National Health Programs of India: National Policies and Legislations*, Century Publications, 2005

Jean Drèze and Amartya Sen, *India, Economic Development and Social Opportunity*, Oxford University Press, 1995

K. Lee and Mills, *The Economic Of Health In Developing Countries*, Oxford University Press, 1983

Marmar Mukhopadhyay and Madhu Parhar (eds.) *Education in India: Dynamics of Development*, Shipra Publications, 2007

K. Vijaya Kumar, *Right to Education Act 2009: Its Implementation as to Social Development in India*, Akansha Publishers, 2012

Amartya Sen and Jean Dreze, *Omnibus: Poverty and Famines, Hunger and Public Action, India- Economic Development and Social Opportunity*, Oxford University Press, 1998

Jean Dreze and Amartya Sen, *An Uncertain Glory: India And Its Contradictions*, Princeton University Press, 2013

Reetika Khera- *Rural Poverty And Public Distribution System*, EPW, Vol- XLVIII, No. 45-46, Nov 2013

Pradeep Chaturvedi , *Women And Food Security: Role Of Panchayats* , Concept Publishing House, 2002

Bidyut Mohanty, "Women, Right to Food and Role of Panchayats", *Mainstream*, Vol. LII, No. 42, October 11, 2014

D. Crowther, *Corporate Social Responsibility*, Deep and Deep Publishers, 2008

Sanjay K. Agarwal, *Corporate Social Responsibility in India*, Sage Publishers, 2008

Pushpa Sundar, *Business & Community: The Story of Corporate Social Responsibility in India*, New Delhi: Sage Publications, 2013

4. UNITED NATIONS AND GLOBAL CONFLICTS

Course Objective: This course provides a comprehensive introduction to the most important multilateral political organization in international relations. It provides a detailed account of the organizational structure and the political processes of the UN, and how it has evolved since 1945, especially in terms of dealing with the major global conflicts. The course imparts a critical understanding of the UN's performance until now and the imperatives as well as processes of reforming the organization in the context of the contemporary global system.

I. The United Nations (29 Lectures)

(a) An Historical Overview of the United Nations

(b) Principles and Objectives

(c) Structures and Functions: General Assembly; Security Council, and Economic and Social Council; the International Court of Justice and the specialised agencies (International Labour Organisation [ILO], United Nations Educational, Scientific and Cultural Organisation [UNESCO], World Health Organisation [WHO], and UN programmes and funds: United Nations Children's Fund [UNICEF], United Nations Development Programme [UNDP], United

Nations Environment Programme [UNEP], United Nations High Commissioner for Refugees [UNHCR])

(d) Peace Keeping, Peace Making and Enforcement, Peace Building and Responsibility to Protect (e) Millennium Development Goals

II. Major Global Conflicts since the Second World War (20 Lectures)

(a) Korean War

(b) Vietnam War

(c) Afghanistan Wars

(d) Balkans: Serbia and Bosnia

III. Assessment of the United Nations as an International Organisation: Imperatives of Reforms and the Process of Reforms (11 Lectures)

Essential Readings I. The United Nations (a) An Historical Overview of the United Nations

Moore, J.A. Jr. and Pubantz, J. (2008) *The new United Nations*. Delhi: Pearson Education, pp. 39-62.

Goldstein, J. and Pevehouse, J.C. (2006) *International relations*. 6th edn. New Delhi: Pearson, pp. 265-282.

Taylor, P. and Groom, A.J.R. (eds.) (2000) *The United Nations at the millennium*. London: Continuum, pp. 1-20.

Gareis, S.B. and Varwick, J. (2005) *The United Nations: an introduction*. Basingstoke: Palgrave, pp. 1-40.

Gowan, P. (2010) 'US: UN', in Gowan, P. 'A calculus of power: grand strategy in the twenty-first century. London: Verso, pp. 47-71.

Baylis, J. and Smith, S. (eds.) (2008) *The globalization of world politics. an introduction to international relations*. 4th edn. Oxford: Oxford University Press, pp. 405-422.

Thakur, R. (1998) 'Introduction', in Thakur, R. (eds.) *Past imperfect, future uncertain: The UN at Fifty*. London: Macmillan, pp. 1-14.

Basu, Rumki (2014) *United Nations: Structure and Functions of an international organization*, New Delhi, Sterling Publishers

(b) Principles and Objectives

Gareis, S.B. and Varwick, J. (2005) *The United Nations: An introduction*. Basingstoke: Palgrave, pp. 15-21.

(c) Structures and Functions: General Assembly; Security Council, and Economic and Social Council; the International Court of Justice and the specialised agencies (International Labour Organisation [ILO], United Nations Educational, Scientific and Cultural Organisation [UNESCO], World Health Organisation [WHO], and UN programmes and funds: United Nations Children's Fund [UNICEF], United Nations Development Programme [UNDP], United Nations Environment Programme [UNEP], United Nations High Commissioner for Refugees [UNHCR])

Taylor, P. and Groom, A.J.R. (eds.) (2000) *The United Nations at the millennium*. London: Continuum, pp. 21-141.

Moore, J.A. Jr. and Pubantz, J. (2008) *The new United Nations*. Delhi: Pearson Education, pp. 119-135.

(d) Peace Keeping, Peace Making and Enforcement, Peace Building and Responsibility to Protect

Nambiar, S. (1995) 'UN peace-keeping operations', in Kumar, S. (eds.) *The United Nations at fifty*. New Delhi, UBS, pp. 77-94.

Whittaker, D.J. (1997) 'Peacekeeping', in *United Nations in the contemporary world*. London: Routledge, pp. 45-56.

White, B. et al. (eds.) (2005) *Issues in world politics*. 3rd edn. New York: Macmillan, pp. 113-132.

(e) Millennium Development Goals

Moore, J.A. Jr. and Pubantz, J. (2008) *The new United Nations*. Delhi: Pearson Education, pp.264-266.

Sangal, P.S. (1986) 'UN, peace, disarmament and development', in Saxena, J.N. et.al. *United Nations for a better world*. New Delhi: Lancers, pp.109-114.

Baxi, U. (1986) 'Crimes against the right to development', in Saxena, J.N. et.al. *United Nations for a better world*. New Delhi: Lancers, pp.240-248.

Ghali, B.B. (1995) *An agenda for peace*. New York: UN, pp.5-38.

United Nations Department of Public Information. (2008) *The United Nations Today*. New York: UN.

II. Major Global Conflicts since the Second World War (a) Korean War

Calvocoressi, P. (2001) *World Politics: 1945-200*. 3rd edn. Harlow: Pearson Education, pp. 116-124.

Armstrong, D., Lloyd, L. and Redmond, J. (2004) *International organisations in world politics*. 3rd edn. New York: Palgrave Macmillan, pp. 42-43.

Moore, J.A. Jr. and Pubantz, J. (2008) *The new United Nations*. Delhi: Pearson Education, pp. 64-65 and 172-173.

(b) Vietnam War

Calvocoressi, P. (2001) *World Politics: 1945-200*. 3rd edn. Harlow: Pearson Education, pp. 528-546.

Baylis, J. and Smith, S. (eds.) (2008) *The globalization of world politics. an introduction to international relations*. 4th edn. Oxford: Oxford University Press, pp. 562-564.

(c) Afghanistan Wars

Achcar, G. (2004) *Eastern cauldron*. New York: Monthly Review Press, pp. 29-45 and 234-241.

Achcar, G. (2003) *The clash of barbarisms: Sept. 11 and the making of the new world disorder*. Kolkata: K.P. Bachi & Co., pp. 76-81.

Prashad, V. (2002) *War against the planet*. New Delhi: Leftword, pp. 1-6. Ali, T. (ed.) (2000) *Masters of the Universe*. London: Verso, pp. 203-216.

Calvocoressi, P. (2001) *World Politics: 1945-200*. 3rd edn. Harlow: Pearson Education, pp. 570-576.

(d) Balkans: Serbia and Bosnia Ali, T. (ed.) (2000) *Masters of the Universe*. London: Verso, pp. 230-245 and 271-284.

Kaldor, M. and Vashee, B. (eds.) (1997) *New wars*. London: Wider Publications for the UN University, pp. 137-144 and 153-171.

Viotti, P.R. and Kauppi, M.V. (2007) *International relations and world politics- security, economy, identity*. 3rd edn. New Delhi: Pearson Education, pp. 470-471.

Goldstein, J.S. (2003) *International relations*. 3rd edn. Delhi: Pearson Education, pp. 43-51.

Moore, J.A. Jr. and Pubantz, J. (2008) *The new United Nations*. Delhi: Pearson Education, pp. 24-27.

III. Political Assessment of the United Nations as an International Organisation: Imperatives of Reforms and the Process of Reforms

Roberts, A. and Kingsbury, B. (eds.) (1994) *United Nations, Divided World*. 2nd edn. Oxford: Clarendon Press, pp. 420-436.

Taylor, P. and Groom, A.J.R. (eds.) (2000) *The United Nations at the millennium*. London: Continuum, pp. 196-223 and 295-326.

Gareis, S.B. and Varwick, J. (2005) *The United Nations: An introduction*. Basingstoke: Palgrave, pp. 214-242.

Moore, J.A. Jr. and Pubantz, J. (2008) *The new United Nations*. Delhi: Pearson Education, pp. 91-112.

Additional Readings

Claude, I. (1984) *Swords into plowshares: the progress and problems of international organisation*. 4th edn. New York: Random House.

Dodds, F. (ed.) (1987) *The way forward: beyond the agenda 21*. London: Earthscan.

Rajan, M.S., Mani, V.S and Murthy, C.S.R. (eds.) (1987) *The nonaligned and the United Nations*. New Delhi: South Asian Publishers.

South Asia Human Rights Documentation Centre. (2006) *Human rights: an overview*. New Delhi: Oxford University Press.

Anan, K. (1997) *Renewing the United Nations: A Programme for Survival*. General Assembly Document: A/51/950; 14 July 1997. Available from:

[http://daccessdds.un.org/doc/UNDOC/GEN/N97/189/79/1MG/n9718979.pdf](http://daccessdds.un.org/doc/UNDOC/GEN/N97/189/79/1MG/n9718979.pdf?OpenElement), Open Element (accessed on 13 October 2011).

(C) DISCIPLINE SPECIFIC ELECTIVE -4 (DSE)

1.

Human Rights in a Comparative Perspective

Course objective: This course attempts to build an understanding of human rights amongst students through a study of specific issues in a comparative perspective. It is important for students to see how debates on human rights have taken distinct forms historically and in the contemporary world. The course seeks to anchor all issues in the Indian context, and pulls out another country to form a broader comparative frame. Students will be expected to use a range of resources, including films, biographies, and official documents to study each theme. Thematic discussion of sub-topics in the second and third sections should include state response to issues and structural violence questions.

I. Human Rights: Theory and Institutionalization (3 weeks)

- a. Understanding Human Rights: Three Generations of Rights
- b. Institutionalization: Universal Declaration of Human Rights
- c. Rights in National Constitutions: South Africa and India

II. Issues (5 weeks)

- a. Torture: USA and India
- b. Surveillance and Censorship: China and India

c. Terrorism and Insecurity of Minorities: USA and India

III. Structural Violence (4 weeks)

a. Caste and Race: South Africa and India

b. Gender and Violence: India and Pakistan

c. Adivasis/Aboriginals and the Land Question: Australia and India

READING LIST

I. Human Rights: Theory and Institutionalization

Essential Readings:

J. Hoffman and P. Graham, (2006) 'Human Rights', *Introduction to Political Theory*, Delhi, Pearson, pp. 436-458.

SAHRDC (2006) 'Introduction to Human Rights'; 'Classification of Human Rights: An Overview of the First, Second, and Third Generational Rights', in *Introducing Human Rights*, New Delhi: Oxford University Press.

The Constitution of the Republic of South Africa, Chapter 2: Bill of Rights.

The Constitution of India, Chapter 3: Fundamental Rights

II. Issues

a. Torture: USA and India

Essential Readings:

M. Lippman, (1979) 'The Protection of Universal Human Rights: The Problem of Torture' *Universal Human Rights*, Vol. 1(4), pp. 25-55

J. Lokaneeta, (2011) 'Torture in the TV Show 24: Circulation of Meanings'; 'Jurisprudence on Torture and Interrogations in India', in *Transnational Torture Law, Violence, and State Power in the United States and India*, Delhi: Orient Blackswan,

D. O'Byrne, (2007) 'Torture', in *Human Rights: An Introduction*, Delhi: Pearson, pp. 164-197.

b. Surveillance and Censorship: China and India

Essential Readings:

D. O'Byrne, (2007) 'Censorship', in *Human Rights: An Introduction*, Delhi: Pearson, pp. 106-138.

D. Lyon, (2008) Surveillance Society, Talk for Festival del Diritto, Piacenza, Italia, September 28, pp.1-7.

Fu Hualing, (2012) 'Politicized Challenges, Depoliticized Responses: Political Monitoring in China's Transitions', paper presented at a conference on States of Surveillance: Counter-Terrorism and Comparative Constitutionalism, at the

University of New South Wales, Sydney, 13-14 December.

U. Singh, (2012) 'Surveillance Regimes in India', paper presented at a conference on States of Surveillance: Counter-Terrorism and Comparative Constitutionalism, at the University of New South Wales, Sydney, 13-14 December.

c. Terrorism and Insecurity of Minorities: USA and India

Essential Readings:

E. Scarry, (2010) 'Resolving to Resist', in *Rule of Law, Misrule of Men*, Cambridge: Boston Review Books, MIT, pp.1-53.

M. Ahmad, (2002) 'Homeland Insecurities: Racial Violence the Day after September 11', *Social Text*, 72, Vol. 20(3), pp. 101-116.

U. Singh, (2007) 'The Unfolding of Extraordinariness: POTA and the Construction of Suspect Communities', in *The State, Democracy and Anti-terror Laws in India*, Delhi: Sage Publications, pp.165-219

3. Structural Conflicts

a. Caste and Race: South Africa and India

Essential Readings:

A. Pinto, (2001) 'UN Conference against Racism: Is Caste Race?', in *Economic and Political Weekly*, Vol. 36(30)

D. O'Byrne, (2007) 'Apartheid', in *Human Rights: An Introduction*, Delhi: Pearson, pp. 241-262.

R. Wasserstorm, (2006), 'Racism, Sexism, and Preferential Treatment: An approach to the Topics', in R. Goodin and P. Pettit, *Contemporary Political Philosophy: an Anthology*, Oxford: Blackwell, pp-549-574

R. Wolfrum, (1998) 'Discrimination, Xenophobia and Racism' in J. Symonides, *Human Rights: New Dimensions and Challenges*, Aldershot, Ashgate/UNESCO, pp.181-198.

b. Gender and Violence: India and Pakistan

Essential Readings:

A. Khan and R. Hussain, (2008), 'Violence Against Women in Pakistan: Perceptions and Experiences of Domestic Violence', *Asian Studies Review*, Vol. 32, pp. 239 – 253

K. Kannabiran (2012) 'Rethinking the Constitutional Category of Sex', in *Tools of Justice: Non-Discrimination and the Indian Constitution*, New Delhi, Routledge, pp.425-443

N. Menon (2012) 'Desire', *Seeing Like a Feminist*, New Delhi: Zubaan/Penguin, pp. 91-146

c. Adivasis/Aboriginals and the Land Question: Australia and India

Essential Readings:

H. Goodall, (2011) 'International Indigenous Community Study: Adivasi Indigenous People in India', in A. Cadzow and J. Maynard (eds.), *Aboriginal Studies*, Melbourne: Nelson Cengage Learning, pp.254-259.

K. Kannabiran, (2012) 'Adivasi Homelands and the Question of Liberty', in *Tools of Justice: Non-Discrimination and the Indian Constitution*, New Delhi: Routledge, pp.242-271.

N. Watson (2011) 'Aboriginal and Torres Strait Islander Identities' in A. Cadzow and J. Maynard (eds.), *Aboriginal Studies*, Melbourne: Nelson Cengage Learning, pp.43-52.

W. Fernandes (2008) 'India's Forced Displacement Policy and Practice. Is Compensation up to its Functions?', in M. Cernea and H. Mathus (eds), *Can Compensation Prevent Impoverishment? Reforming Resettlement through Investments and Benefit-Sharing*, pp.181-207, New Delhi: Oxford University Press.

Additional Readings:

A. Laws and V. Iacopino, (2002) 'Police Torture in Punjab, India: An Extended Survey', in *Health and Human Rights*, Vol. 6(1), pp. 195-210

D. O'Byrne, (2007) 'Theorizing Human Rights', in *Human Rights: An Introduction*, Delhi, Pearson, pp.26-70.

J. Morsink, (1999) *The Universal Declaration of Human Rights: Origins, Drafting and Intent*, Philadelphia: University of Pennsylvania Press, pp. ix-xiv

J. Nickel, (1987) *Making Sense of Human Rights: Philosophical Reflections on the Universal Declaration of Human Rights*, Berkeley: University of California Press.

J. Goldman, (2005) 'Of Treaties and Torture: How the Supreme Court Can Restrain the Executive', in *Duke Law Journal*, Vol. 55(3), pp. 609-640.

K. Tsutsui and C. Wotipka, (2004) Global Civil Society and the International Human Rights Movement: Citizen Participation in Human Rights International Nongovernmental Organizations, in *Social Forces*, Vol. 83(2), pp. 587-620.

L. Rabben, (2001) Amnesty International: Myth and Reality, in *Agni*, No. 54, Amnesty International Fortieth Anniversary pp. 8-28

M. Mohanty, (2010) 'In Pursuit of People's Rights: An Introduction', in M. Mohanty et al., *Weapon of the Oppressed: Inventory of People's Rights in India*, New Delhi: Danish Books, pp.1-11

M. Cranston, (1973) *What are Human Rights?* New York: Taplinger

M. Ishay, (2004) *The History of Human Rights: From Ancient Times to the Globalization Era*, Delhi: Orient Blackswan.

R. Sharan, (2009) 'Alienation and Restoration of Tribal Land in Jharkhand in N Sundar (ed.) *Legal Grounds*, New Delhi: Oxford University Press, pp. 82-112

Text of UDHR available at <http://www.un.org/en/documents/udhr/index.shtml>

U. Baxi, (1989) 'From Human Rights to the Right to be Human: Some Heresies', in S. Kothari and H. Sethi (eds.), *Rethinking Human Rights*, Delhi: Lokayan, pp.181-166

2. Development Process and Social Movements in Contemporary India

Course objective: Under the influence of globalization, development processes in India have undergone transformation to produce spaces of advantage and disadvantage and new geographies of power. The high social reproduction costs and dispossession of vulnerable social groups involved in such a development strategy condition new theatres of contestation and struggles. A variety of protest movements emerged to interrogate and challenge this development paradigm that evidently also weakens the democratic space so very vital to the formulation of critical consensus. This course proposes to introduce students to the conditions, contexts and forms of political contestation over development paradigms and their bearing on the retrieval of democratic voice of citizens.

I. Development Process since Independence (2 weeks)

a. State and planning

b. Liberalization and reforms

II. Industrial Development Strategy and its Impact on the Social Structure (2 weeks)

a. Mixed economy, privatization, the impact on organized and unorganized labour

b. Emergence of the new middle class

III. Agrarian Development Strategy and its Impact on the Social Structure (2 weeks)

a. Land Reforms, Green Revolution

b. Agrarian crisis since the 1990s and its impact on farmers

IV. Social Movements (6 weeks)

a. Tribal, Peasant, Dalit and Women's movements

b. Maoist challenge

c. Civil rights movements

READING LIST

I. The Development Process since Independence

Essential Readings:

A. Mozoomdar, (1994) 'The Rise and Decline of Development Planning in India', in T. Byres (ed.) *The State and Development Planning in India*. Delhi: Oxford University Press, pp. 73-108.

A. Varshney, (2010) 'Mass Politics or Elite Politics? Understanding the Politics of India's Economic Reforms' in R. Mukherji (ed.) *India's Economic Transition: The Politics of Reforms*, Delhi: Oxford University Press, pp 146-169.

P. Chatterjee, (2000) 'Development Planning and the Indian State', in Zoya Hasan (ed.), *Politics and the State in India*, New Delhi: Sage, pp.116-140.

P. Patnaik and C. Chandrasekhar, (2007) 'India: Dirigisme, Structural Adjustment, and the Radical Alternative', in B. Nayar (ed.), *Globalization and Politics in India*. Delhi: Oxford University Press, pp. 218-240.

P. Bardhan, (2005) 'Epilogue on the Political Economy of Reform in India', in *The Political Economy of Development in India*. 6th impression, Delhi: Oxford University Press.

T. Singh, (1979) 'The Planning Process and Public Process: a Reassessment', *R. R. Kale Memorial Lecture*, Pune: Gokhale Institute of Politics and Economics.

II. Industrial development strategy and its impact on social structure

Essential Readings:

A. Aggarwal, (2006) 'Special Economic Zones: Revisiting the Policy Debate', in *Economic and Political Weekly*, XLI (43-44), pp.4533-36.

B. Nayar (1989) *India's Mixed Economy: The Role of Ideology and its Development*, Bombay: Popular Prakashan.

F. Frankel, (2005) 'Crisis of National Economic Planning', in *India's Political Economy (1947-2004): The Gradual Revolution*, Delhi: Oxford University Press, pp. 93-340.

L. Fernandes, (2007) *India's New Middle Class: Democratic Politics in an Era of Economic Reform*, Delhi: Oxford University Press.

S. Shyam, (2003) 'Organizing the Unorganized', in *Seminar*, [Footloose Labour: A Symposium on Livelihood Struggles of the Informal Workforce, 531] pp. 47-53.

S. Chowdhury, (2007) 'Globalization and Labour', in B. Nayar (ed.) *Globalization and Politics in India*, Delhi: Oxford University Press, pp.516-526.

V. Chibber, (2005) 'From Class Compromise to Class Accommodation: Labor's Incorporation into the Indian Political Economy' in R. Ray, and M.F. Katzenstein (eds.) *Social Movements in India*, Delhi: Oxford University Press, pp 32-60.

III. Agrarian development strategy and its impact on social structure

Essential Readings:

A. Desai, (ed.), (1986) *Agrarian Struggles in India After Independence*, Delhi: Oxford University Press, pp. xi-xxxvi

F. Frankel, (1971) *India's Green Revolution: Economic Gains and Political Costs*, Princeton and New Jersey: Princeton University Press.

F. Frankel, (2009) *Harvesting Despair: Agrarian Crisis in India*, Delhi: Perspectives, pp. 161-169.

J. Harriss, (2006) 'Local Power and the Agrarian Political Economy' in Harriss, J. (ed) *Power Matters: Essays on Institutions, Politics, and Society in India*, Delhi. Oxford University Press, pp. 29-32.

K. Suri, (2006) 'Political economy of Agrarian Distress', in *Economic and Political Weekly*, XLI(16) pp. 1523-1529.

P. Joshi, (1979) *Land Reforms in India: Trends and Perspectives*, New Delhi: Allied publishers.

P. Appu, (1974) 'Agrarian Structure and Rural Development', in *Economic and Political Weekly*, IX (39), pp.70 – 75.

P. Sainath, (2010) 'Agrarian Crisis and Farmers', Suicide', *Occasional Publication 22*, New Delhi: India International Centre (IIC).

M. Sidhu, (2010) 'Globalisation vis-à-vis Agrarian Crisis in India', in R. Deshpande and S. Arora, (eds.) *Agrarian Crises and Farmer Suicides (Land Reforms in India Series)*, New Delhi: Sage, pp. 149-174.

V. Sridhar, (2006) 'Why Do Farmers Commit Suicide? The Case Study of Andhra Pradesh', in *Economic and Political Weekly*, XLI (16).

IV. Social Movements

Essential Readings:

G. Haragopal, and K. Balagopal, (1998) 'Civil Liberties Movement and the State in India', in M. Mohanty, P. Mukherji and O. Tornquist, (eds.) *People's Rights: Social Movements and the State in the Third World* New Delhi: Sage, pp. 353-371.

M. Mohanty, (2002) 'The Changing Definition of Rights in India', in S. Patel, J. Bagchi, and K. Raj (eds.) *Thinking Social Sciences in India: Essays in Honour of Alice Thorner*

Patel, New Delhi: Sage.

G. Omvedt, (2012) 'The Anti-caste Movement and the Discourse of Power', in N. Jayal (ed.) *Democracy in India*, New Delhi: Oxford India Paperbacks, sixth impression, pp.481-508.

P. Ramana, (2011) 'India's Maoist Insurgency: Evolution, Current Trends and Responses', in M. Kugelman (ed.) *India's Contemporary Security Challenges*, Woodrow Wilson International Centre for Scholars Asia Programme, Washington D.C., pp.29-47.

A.Ray, (1996) 'Civil Rights Movement and Social Struggle in India', in *Economic and Political Weekly*, XXI (28). pp. 1202-1205.

A.Roy, (2010) 'The Women's Movement', in N.Jayal and P. Mehta (eds.) *The Oxford Companion to Politics in India*, New Delhi: Oxford University Press, pp.409-422.

N. Sundar, (2011) 'At War with Oneself: Constructing Naxalism as India's Biggest Security Threat', in M. Kugelman (ed.) *India's Contemporary Security Challenges*, Woodrow Wilson International Centre for Scholars Asia Programme, Washington D.C., pp.46-68.

M. Weiner, (2001) 'The Struggle for Equality: Caste in Indian Politics', in A.Kohli. (ed.) *The Success of India's Democracy*, Cambridge: CUP, pp.193-225.

S. Sinha, (2002) 'Tribal Solidarity Movements in India: A Review', in G. Shah. (ed.) *Social Movements and the State*, New Delhi: Sage, pp. 251-266.

Additional Readings:

S. Banerjee, (1986) 'Naxalbari in Desai', in A.R. (ed.) *Agrarian Struggles in India After Independence*. Delhi: Oxford University Press, pp.566-588.

B. Nayar, (ed.), (2007) *Globalization and Politics in India*. Delhi: Oxford University Press. S. Roy and K. Debal, (2004) *Peasant Movements in Post-Colonial India: Dynamics of Mobilization and Identity*, Delhi: Sage.

G. Omvedt, (1983) *Reinventing Revolution, New Social Movements and the Socialist Tradition in India*, New York: Sharpe.

G. Shah, (ed.), (2002) *Social Movements and the State*. New Delhi: Sage Publications.

G. Shah, (2004) *Social Movements in India: A Review of Literature*, New Delhi: Sage Publications.

G. Rath, (ed.), (2006) *Tribal development in India: The Contemporary Debate*,

New Delhi: Sage Publications.

J. Harris, (2009) *Power Matters: Essays on Institutions, Politics, and Society in India*. Delhi: Oxford University press.

K. Suresh, (ed.), (1982) *Tribal Movements in India*, Vol I and II, New Delhi: Manohar (emphasis on the introductory chapter).

M. Mohanty, P. Mukherji and O.Tornquist, (1998) *People's Rights: Social Movements and the State in the Third World*. New Delhi: Sage Publications.

M. Rao, (ed.), (1978) *Social Movements in India*, Vol. 2, Delhi: Manohar.

N. Jayal, and P. Mehta, (eds.), (2010) *The Oxford Companion to Politics in India*, Delhi:Oxford University Press.

P. Bardhan, (2005) *The Political Economy of Development in India*, 6th impression, Delhi: Oxford University Press.

R. Mukherji, (ed.), (2007) *India's Economic Transition: The Politics of Reforms*, Delhi: Oxford University Press.

R, Ray and M. Katzenstein, (eds.), (2005) *Social Movements in India*, Delhi: Oxford University Press.

S. Chakravarty, (1987) *Development Planning: The Indian Experience*, Delhi: Oxford University Press.

3.

India's Foreign Policy in a globalizing world

Course objective: This course's objective is to teach students the domestic sources and the structural constraints on the genesis, evolution and practice of India's foreign policy. The endeavour is to highlight integral linkages between the 'domestic' and the 'international' aspects of India's foreign policy by stressing on the shifts in its domestic identity and the corresponding changes at the international level. Students will be instructed on India's shifting identity as a postcolonial state to the contemporary dynamics of India attempting to carve its identity as an 'aspiring power'. India's evolving relations with the superpowers during the Cold War and after, bargaining strategy and positioning in international climate change negotiations, international economic governance, international terrorism and the United Nations facilitate an understanding of the changing positions and development of India's role as a global player since independence.

I. India's Foreign Policy: From a Postcolonial State to an Aspiring Global Power (7 lectures)

II. India's Relations with the USA and USSR/Russia (9

lectures) III. India's Engagements with China (6 lectures)

IV. India in South Asia: Debating Regional Strategies (9 lectures)

V. India's Negotiating Style and Strategies: Trade, Environment and Security Regimes (11 lectures)

VI. India in the Contemporary Multipolar World (6 lectures)

READING LIST

I. India's Foreign Policy: From a Postcolonial State to an Aspiring Global Power

Essential Readings:

S. Ganguly and M. Pardesi, (2009) 'Explaining Sixty Years of India's Foreign Policy', in *IndiaReview*, Vol. 8 (1), pp. 4–19.

Ch. Ogden, (2011) 'International 'Aspirations' of a Rising Power', in David Scott (ed.), *Handbook of India's International Relations*, London: Routledge, pp.3-31

W. Anderson, (2011) 'Domestic Roots of Indian Foreign Policy', in W. Anderson, *Trusts with Democracy: Political Practice in South Asia*, Anthem Press: University Publishing Online.

Additional Reading:

J. Bandhopadhyaya, (1970) *The Making Of India's Foreign Policy*, New Delhi: Allied Publishers.

II: India's Relations with the USA and USSR/Russia

Essential Readings:

S. Mehrotra, (1990) 'Indo-Soviet Economic Relations: Geopolitical and Ideological Factors', in *India and the Soviet Union: Trade and Technology Transfer*, Cambridge University Press: Cambridge, pp. 8-28.

R. Hathaway, (2003) 'The US-India Courtship: From Clinton to Bush', in S. Ganguly (ed.), *India as an Emerging Power*, Frank Cass: Portland.

A. Singh, (1995) 'India's Relations with Russia and Central Asia', in *International Affairs*, Vol. 71 (1): 69-81.

M. Zafar, (1984), 'Chapter 1', in *India and the Superpowers: India's Political Relations with the Superpowers in the 1970s*, Dhaka, University Press.

Additional Readings:

H. Pant, (2008) 'The U.S.-India Entente: From Estrangement to Engagement', in H. Pant, *Contemporary Debates in Indian Foreign and Security Policy: India Negotiates Its Rise in the International System*, Palgrave Macmillan: London.

D. Mistry, (2006) 'Diplomacy, Domestic Politics, and the U.S.-India Nuclear Agreement', in *Asian Survey*, Vol. 46 (5), pp. 675-698.

III: India's Engagements with China

Essential Readings:

H. Pant, (2011) 'India's Relations with China', in D. Scott (ed.), *Handbook of India's International Relations*, London: Routledge, pp. 233-242.

A. Tellis and S. Mirski, (2013) 'Introduction', in A. Tellis and S. Mirski (eds.), *Crux of Asia: China, India, and the Emerging Global Order*, Carnegie Endowment for International Peace: Washington.

S. Raghavan, (2013) 'Stability in Southern Asia: India's Perspective', in A. Tellis and S. Mirski (eds.), *Crux of Asia: China, India, and the Emerging Global Order*, Carnegie Endowment for International Peace: Washington.

Additional Reading:

Li Li, (2013) 'Stability in Southern Asia: China's Perspective', in A. Tellis and S. Mirski (eds.), *Crux of Asia: China, India, and the Emerging Global Order*, Carnegie Endowment for International Peace: Washington.

IV: India in South Asia: Debating Regional Strategies

Essential Readings:

S. Muni, (2003) 'Problem Areas in India's Neighbourhood Policy', in *South Asian Survey*, Vol. 10 (2), pp. 185-196.

S. Cohen, (2002) *India: Emerging Power*, Brookings Institution Press. V. Sood, (2009) 'India and regional security interests', in Alyssa Ayres and C. Raja Mohan (eds), *Power realignments in Asia: China, India, and the United States*, New Delhi: Sage.

Additional Readings:

M. Pardesi, (2005) 'Deducing India's Grand Strategy of Regional Hegemony from Historical and Conceptual Perspectives', IDSS Working Paper, 76, Available at <http://www.rsis.edu.sg/publications/WorkingPapers/WP76.pdf>, Accessed: 19.04.2013.

D. Scott, (2009) 'India's "Extended Neighbourhood" Concept: Power Projection for a Rising Power', in *India Review*, Vol. 8 (2), pp. 107-143

V: India's Negotiating Style and Strategies: Trade, Environment and Security Regimes

Essential Readings:

S. Cohen, (2002) 'The World View of India's Strategic Elite', in S. Cohen, *India: Emerging Power*, Brookings Institution Press, pp. 36-65.

A. Narlikar, (2007) 'All that Glitters is not Gold: India's Rise to Power', in *Third World Quarterly*, Vol. 28 (5) pp. 983 – 996.

N. Dubash, (2012) 'The Politics of Climate Change in India: Narratives of Enquiry and Co-benefits', Working Paper, New Delhi: Centre for Policy Research.

N. Jayaprakash, (2000) 'Nuclear Disarmament and India', in *Economic and Political Weekly*, Vol. 35 (7), pp. 525-533.

Additional Readings:

P. Bidwai, (2005) 'A Deplorable Nuclear Bargain', in *Economic and Political Weekly*, Vol. 40 (31), pp. 3362-3364.

A. Anant, (2011) 'India and International Terrorism', in D. Scott (ed.), *Handbook of India's International Relations*, London: Routledge, pp. 266-277.

VI: India in the Contemporary Multipolar World

Essential Readings:

R. Rajgopalan and V. Sahni (2008), 'India and the Great Powers: Strategic Imperatives, Normative Necessities', in *South Asian Survey*, Vol. 15 (1), pp. 5– 32.

C. Mohan, (2013) 'Changing Global Order: India's Perspective', in A. Tellis and S. Mirski (eds.), *Crux of Asia: China, India, and the Emerging Global Order*, Carnegie Endowment for International Peace: Washington.

A. Narlikar, (2006) 'Peculiar Chauvinism or Strategic Calculation? Explaining the Negotiating Strategy of a Rising India', in *International Affairs*, Vol. 82 (1), pp. 59-76.

Additional Reading:

P. Mehta, (2009) 'Still Under Nehru's Shadow? The Absence of Foreign Policy Frameworks in India', in *India Review*, Vol. 8 (3), pp. 209–233.

Online Resources:

Government of India's Ministry of External Relations website at <http://www.mea.gov.in/> and specially its library which provides online resources at <http://mealib.nic.in/>

The Council of Foreign Relations has a regularly updated blog on India's foreign policy: <http://www.cfr.org/region/india/ri282> Centre for Policy Research's blog on IR and strategic affairs though it is not exclusively on India's foreign policy. <http://www.cprindia.org/blog/international-relations-and-security-blog>

Institute for Defence Studies and Analyses: <http://www.idsa.in/>
Research and Information System: www.ris.org.in/

Indian Council of World Affairs: www.icwa.in/
Institute of Peace and Conflict Studies:
www.ipcs.org/

Indian Council for Research on International Economic Relations: www.icrier.org/

4. Women, Power and Politics

Course objective: This course opens up the question of women's agency, taking it beyond 'women's empowerment' and focusing on women as radical social agents. It attempts to question the complicity of social structures and relations in gender inequality. This is extended to cover new forms of precarious work and labour under the new economy. Special attention will be paid to feminism as an approach and outlook. The course is divided into broad units, each of which is divided into three sub- units.

I. Groundings (6 weeks)

1. Patriarchy (2 weeks)

- a. Sex-Gender Debates
- b. Public and Private
- c. Power

2. Feminism (2 weeks)

3. Family, Community,
State (2weeks)

- a. Family
- b. Community
- c. State

II. Movements and Issues (6 weeks)

1. History of the Women's Movement in India (2 weeks)

2. Violence against women (2 weeks)

3. Work and Labour (2 weeks)

- a. Visible and Invisible work
- b. Reproductive and care work
- c. Sex work

Reading List

I. Groundings

1. Patriarchy

Essential Readings:

T. Shinde, (1993) 'Stree Purusha Tulna', in K. Lalitha and Susie Tharu (eds), *Women Writing in India*, New Delhi, Oxford University Press, pp. 221-234

U. Chakravarti, (2001) 'Pitrasatta Par ek Note', in S. Arya, N. Menon & J. Lokneeta (eds.)

Naarivaadi Rajneeti: Sangharsh evam Muddey, University of Delhi: Hindi Medium Implementation Board, pp.1-7

a. Sex Gender Debates

Essential Reading:

V. Geetha, (2002) *Gender*, Kolkata, Stree, pp. 1- 20 **b.**

Public and Private

Essential Reading:

M. Kosambi, (2007) *Crossing the Threshold*, New Delhi, Permanent Black, pp. 3-10; 40-46 **c.**

Power

Essential Reading:

N. Menon, (2008) 'Power', in R. Bhargava and A. Acharya (eds), *Political Theory: An Introduction*, Delhi: Pearson, pp.148-157

2. Feminism

Essential Readings:

B. Hooks, (2010) 'Feminism: A Movement to End Sexism', in C. Mc Cann and S. Kim (eds), *The Feminist Reader: Local and Global Perspectives*, New York: Routledge, pp. 51-57

R. Delmar, (2005) 'What is Feminism?', in W. Kolmar & F. Bartkowski (eds)

Feminist Theory: A Reader, pp. 27-37

3. Family, Community and State

a. Family

Essential Readings:

R. Palriwala, (2008) 'Economics and Patriliney: Consumption and Authority within the Household' in M. John. (ed) *Women's Studies in India*, New Delhi: Penguin, pp. 414-423

b. Community

Essential Reading:

U. Chakravarti, (2003) *Gendering Caste through a Feminist Lens*, Kolkata, Stree, pp. 139-159.

c. State

Essential Reading:

C. MacKinnon, 'The Liberal State' from *Towards a Feminist Theory of State*, Available at <http://fair-use.org/catharine-mackinnon/toward-a-feminist-theory-of-the-state/chapter-8>, Accessed: 19.04.2013.

Additional Readings:

K. Millet, (1968) *Sexual Politics*, Available at <http://www.marxists.org/subject/women/authors/millett-kate/sexual-politics.htm>, Accessed: 19.04.2013.

N. Menon (2008) 'Gender', in R. Bhargava and A. Acharya (eds), *Political Theory: An Introduction*, New Delhi: Pearson, pp. 224-233

R.Hussain, (1988) 'Sultana's Dream', in *Sultana's Dream and Selections from the Secluded Ones – translated by Roushan Jahan*, New York: The Feminist Press

S.Ray 'Understanding Patriarchy', Available at http://www.du.ac.in/fileadmin/DU/Academics/course_material/hrge_06.pdf, Accessed: 19.04.2013.

S.de Beauvoir (1997) *Second Sex*, London: Vintage.

Saheli Women's Centre, (2007) *Talking Marriage, Caste and Community: Women's Voices from Within*, New Delhi: monograph

II. Movements and Issues

1. History of Women's Movement in India

Essential Readings:

I. Agnihotri and V. Mazumdar, (1997) 'Changing the Terms of Political Discourse: Women's Movement in India, 1970s-1990s', *Economic and Political Weekly*, 30 (29), pp. 1869-1878.

R. Kapur, (2012) 'Hecklers to Power? The Waning of Liberal Rights and Challenges to Feminism in India', in A. Loomba *South Asian Feminisms*, Durham and London: Duke University Press, pp. 333-355

2. Violence against Women

Essential Readings:

N. Menon, (2004) 'Sexual Violence: Escaping the Body', in *Recovering Subversion*, New Delhi: Permanent Black, pp. 106-165

3. Work and Labour

a. Visible and Invisible work

Essential Reading:

P. Swaminathan, (2012) 'Introduction', in *Women and Work*, Hyderabad: Orient Blackswan, pp.1-17

b. Reproductive and care work

Essential Reading:

J. Tronto, (1996) 'Care as a Political Concept', in N. Hirschmann and C. Stephano, *Revisioning the Political*, Boulder: Westview Press, pp. 139-156

c. Sex work

Essential Readings:

Darbar Mahila Samanwaya Committee, Kolkata (2011) 'Why the so-called Immoral Traffic (Preventive) Act of India Should be Repealed', in P. Kotiswaran, *Sex Work*, New Delhi, Women Unlimited, pp. 259-262

N. Jameela, (2011) 'Autobiography of a Sex Worker', in P. Kotiswaran, *Sex Work*, New Delhi: Women Unlimited, pp. 225-241

Additional Readings:

C. Zetkin, 'Proletarian Woman', Available at <http://www.marxists.org/archive/zetkin/1896/10/women.htm>, Accessed: 19.04.2013.

F. Engels, *Family, Private Property and State*, Available at <http://readingfromtheleft.com/PDF/EngelsOrigin.pdf>, Accessed: 19.04.2013.

J. Ghosh, (2009) *Never Done and Poorly Paid: Women's Work in Globalising India*, Delhi: Women Unlimited

Justice Verma Committee Report, Available at <http://nlrd.org/womens-rights-initiative/justice-verma-committee-report-download-full-report>, Accessed: 19.04.2013.

N. Gandhi and N. Shah, (1992) *Issues at Stake – Theory and Practice in the Women's Movement*, New Delhi: Kali for Women.

V. Bryson, (1992) *Feminist Political Theory*, London: Palgrave-MacMillan, pp. 175- 180; 196-200

M. Mies, (1986) 'Colonisation and Housewifisation', in *Patriarchy and Accumulation on a World Scale* London: Zed, pp. 74-111, Available at

<http://caringlabor.wordpress.com/2010/12/29/maria-mies-colonization-and-housewifization/>, Accessed: 19.04.2013.

R. Ghadially, (2007) *Urban Women in Contemporary India*, Delhi: Sage Publications.

S. Brownmiller, (1975) *Against our Wills*, New York: Ballantine.

Saheli Women's Centre (2001) 'Reproductive Health and Women's Rights, Sex Selection and feminist response' in S Arya, N. Menon, J. Lokneeta (eds), *Nariwadi Rajneeti*, Delhi, pp. 284-306

V. Bryson (2007) *Gender and the Politics of Time*, Bristol: Polity Press

Readings in Hindi:

D. Mehrotra, (2001) *Bhartiya Mahila Andolan: Kal, Aaj aur Kal*, Delhi: Books for Change

G. Joshi, (2004) *Bharat Mein Stree Asmaanta: Ek Vimarsh*, University of Delhi: Hindi Medium Implementation Board

N. Menon (2008) 'Power', in R. Bhargava and A. Acharya (eds) *Political Theory: An Introduction*, New Delhi: Pearson

N. Menon (2008) 'Gender', in R. Bhargava and A. Acharya (eds) *Political Theory: An Introduction*, New Delhi, Pearson

R. Upadhyay and S. Upadhyay (eds.) (2004) *Aaj ka Stree Andolan*, Delhi: Shabd Sandhan.

S. Arya, N. Menon and J. Lokneeta (eds.) (2001) *Naarivaadi Rajneeti: Sangharsh evam Muddey*, University of Delhi: Hindi Medium Implementation Board.

(D) Ability Enhancement (Skill Based)-2 1.

Legislative Practices and Procedures

Course objective: To acquaint the student broadly with the legislative process in India at various levels, introduce them to the requirements of peoples' representatives and provide elementary skills to be part of a legislative support team and expose them to real life legislative work. These will be, to understand complex policy issues, draft new legislation, track and analyse ongoing bills, make speeches and floor statements, write articles and press releases, attend legislative meetings, conduct meetings with various stakeholders, monitor media and public developments, manage constituent relations and handle inter-office communications. It will also deepen their understanding and appreciation of the political process and indicate the possibilities of making it work for democracy.

I. Powers and functions of people's representative at different tiers of governance (6 lectures)

Members of Parliament, State legislative assemblies, functionaries of rural and urban local self-government from Zila Parishad, Municipal Corporation to Panchayat/ward.

II. Supporting the legislative process (2 lectures)

How a bill becomes law, role of the Standing committee in reviewing a bill, legislative consultants, the framing of rules and regulations.

III. Supporting the Legislative Committees (6 lectures)

Types of committees, role of committees in reviewing government finances, policy, programmes, and legislation.

IV. Reading the Budget Document (6 lectures)

Overview of Budget Process, Role of Parliament in reviewing the Union Budget, Railway Budget, Examination of Demands for Grants of Ministries, Working of Ministries.

V. Support in media monitoring and communication (4 lectures)

Types of media and their significance for legislators; Basics of communication in print and electronic media.

READING LIST

I. Powers and functions of people's representative at different tiers of governance

Essential Readings:

M. Madhavan, and N. Wahi, (2008) *Financing of Election Campaigns* PRS, Centre for Policy Research, New Delhi, Available at: http://www.prsindia.org/uploads/media/conference/Campaign_finance_brief.pdf, Accessed: 19.04.2013

S. Vanka, (2008) *Primer on MPLADS*, Centre for Policy Research, New Delhi, Available at <http://www.prsindia.org/parliamenttrack/primers/mplads-487/>, Accessed: 19.04.2013

H. Kalra, (2011) *Public Engagement with the Legislative Process* PRS, Centre for Policy Research, New Delhi, Available at: <http://www.prsindia.org/administrator/uploads/media/Conference%202011/Public%20Engagement%20with%20the%20Legislative%20Process.pdf>, Accessed: 19.04.2013.

Government of India (Lok Sabha Secretariat), (2009) *Parliamentary Procedures (Abstract Series)*, Available at <http://164.100.47.132/LssNew/abstract/index.aspx>, Accessed: 19.04.2013

II. Supporting the legislative process

Essential Readings:

Government of India, (Ministry of Parliamentary Affairs), (2009) *Legislation, Parliamentary Procedure*, Available at http://mpa.nic.in/Manual/Manual_English/Chapter/chapter-09.htm, Accessed: 19.04.2013

Government of India, (Ministry of Parliamentary Affairs) (2009), *Subordinate Legislation, Parliamentary Procedure*, Available at: http://mpa.nic.in/Manual/Manual_English/Chapter/chapter-11.htm Accessed: 19.04.2013

D. Kapur and P. Mehta, (2006) 'The Indian Parliament as an Institution of Accountability', *Democracy, Governance and Human Rights*, Programme Paper Number 23, United Nations Research Institute for Social Development, Available at: [http://www.unrisd.org/UNRISD/website/document.nsf/240da49ca467a53f80256b4f005ef245/8e6fc72d6b546696c1257123002fcceb/\\$FILE/KapMeht.pdf](http://www.unrisd.org/UNRISD/website/document.nsf/240da49ca467a53f80256b4f005ef245/8e6fc72d6b546696c1257123002fcceb/$FILE/KapMeht.pdf), Accessed: 19.04.2013

O. Agarwal and T. Somanathan, (2005) '*Public Policy Making in India: Issues and Remedies*', Available at: http://www.cprindia.org/admin/paper/Public_Policy_Making_in_India_14205_TV_SO_MANA_THAN.pdf, Accessed: 19.04.2013

B. Debroy, (2001) 'Why we need law reform' *Seminar* January.

III. Supporting the Legislative Committees

Essential Readings:

P. Mehta, 'India's Unlikely Democracy: The Rise of Judicial Sovereignty', *Journal of Democracy*, Vol. 18(2), pp.70-83.

Government link: <http://loksabha.nic.in/>; <http://rajyasabha.nic.in/>; <http://mpa.nic.in/>

K. Sanyal, (2011) *Strengthening Parliamentary Committees* PRS, Centre for Policy Research, New Delhi, Available at: <http://www.prsindia.org/administrator/uploads/media/Conference%202011/Strengthening%20Parliamentary%20Committees.pdf>, Accessed: 19.04.2013

IV. Reading the Budget Document

Essential Readings

A. Celestine, (2011) *How to Read the Union Budget* PRS, Centre for Policy Research, New Delhi, Available at <http://www.prsindia.org/parliamenttrack/primers/how-to-read-the-union-budget-1023/>, Accessed: 19.04.2013

V. Support in media monitoring and communication

Essential Reading:

G. Rose, (2005) 'How to Be a Media Darling: There's No getting Away From It', *State Legislatures*, Vol. 31(3).

Additional Readings:

N. Jayal and P. Mehta (eds), (2010) *The Oxford Companion to Politics in India*, Oxford University

Press: New Delhi,

B. Jalan, (2007) *India's Politics*, New Delhi: Penguin.

Initiating Discussion on Various Type of Debates in *Rajya Sabha*, Available at http://rajyasabha.nic.in/rsnew/publication_electronic/75RS.pdf, Accessed: 19.04.2013. *Praxis of Parliamentary Committees: Recommendations of Committee on Rules* published by *Rajya Sabha*, available at: http://rajyasabha.nic.in/rsnew/publication_electronic/Praxis.pdf, Accessed: 19.04.2013.

S.J. Phansalkar, *Policy Research in the Indian Context*

N. Singh, '*Some Economic Consequences of India's Institutions of Governance: A Conceptual Framework*', Available at: http://econ.ucsc.edu/faculty/boxjenk/wp/econ_conseq_2003_rev2.pdf, Accessed: 19.04.2013.

R. Guha, (2007), *India After Gandhi*, Macmillan: New Delhi. *Parliamentary Procedures (Abstract Series)* published by *Lok Sabha*, Available at <http://164.100.47.132/LssNew/abstract/index.aspx>, website: www.loksabha.nic.in, Accessed: 19.04.2013.

Committees of Lok Sabha, Available at: http://164.100.47.134/committee/committee_list.aspx Accessed: 19.04.2013. *Ethics Committee of Rajya Sabha*, available at: http://rajyasabha.nic.in/rsnew/publication_electronic/ethics_committee.pdf, Accessed: 19.04.2013.

Committees of Parliament, Parliamentary Procedure, Ministry of Parliamentary Affairs, Available at http://mpa.nic.in/Manual/Manual_English/Chapter/chapter-12.htm, Accessed: 19.04.2013.

Nomination of Members of Parliament on Committees, Councils, Boards and Commissions, etc., set up by the Government, Ministry of Parliament Affairs, Available at http://mpa.nic.in/Manual/Manual_English/Chapter/chapter-14.htm, Accessed: 19.04.2013.

Parliamentary Procedures: Problems and Perspectives 2009 Published by *Rajya Sabha*, Available at http://rajyasabha.nic.in/rsnew/publication_electronic/parl_procedure2009.pdf, Accessed: 19.04.2013.

Primer on the Budget Process published by PRS, Available at <http://www.prsindia.org/parliamenttrack/primers/the-budget-process-484/>, Accessed: 19.04.2013.

Background note on Financial Oversight by Parliament published by PRS, Available at <http://www.prsindia.org/administrator/uploads/media/Conference%20note/Conference%20note%20on%20financial%20oversight.pdf>, Accessed: 19.04.2013.

P. Keefer and S Khemani, (2009) 'When Do Legislators Pass On "Pork"? The Determinants of Legislator Utilization of a Constituency Development Fund in India', in *World Bank Policy Research Working Paper Series* 4929, pp. 1-45, Available at SSRN: <http://ssrn.com/abstract=1405160>, Accessed: 19.04.2013.

Parliamentary Procedures (Abstract Series), Lok Sabha, Available at<http://164.100.47.132/LssNew/abstract/process.htm>
Budget, Parliamentary Procedure, Ministry of Parliamentary Affairs, available athttp://mpa.nic.in/Manual/Manual_English/Chapter/chapter-07.htm, Accessed: 19.04.2013. <http://mpa.nic.in/mpahandbook/parlia13.pdf>

2. Peace and Conflict Resolution

Course Objective: The objective of an undergraduate application course for common students in Peace and Conflict Studies will cover in-depth knowledge of conflict analysis, conflict resolution, conflict prevention, as well as the historical and cultural context of organized violence. Peace and Conflict Resolution addresses the sources of war, social oppression and violence and the challenges of promoting peace and justice internationally and domestically. It also introduces more equitable, cooperative and nonviolent methods that can be used to transform unjust, violent or oppressive world situations. This course provides students with an overview of the Peace and Conflict Studies discipline, including key concepts and related theories. The course is designed to familiarize students with the historical background of various peace movements, to analyze principles used to resolve conflict, and to provide a view of how peace and conflict resolution are being pursued today. The course will also cover extensive understanding of current research and development within the field of peace and conflict studies and perspective of the environment, gender, migration, and ethnicity.

Unit-1 International Peace and Conflict Resolution: Sources of War: International and Domestic Issues and Trends

Unit-2-What is Conflict: Introduction to International Conflict Resolution

Unit-3 International Conflict Resolution Theory: Models developed by Johan Galtung, Joseph Montville, Morton Deutsch, William Zartman, Levy Jack

Unit-4-Conflict resolution: Back ground of Various Peace Movements and Concepts, Principles used to resolve conflict

Unit-5-Cross-boarder relationships between the world's peaceful and war-torn zones (migration and information flows, economic transactions, international rules and regulations, normative concepts and political decisions)

Unit-6 -Conflict Transformation: is Peace Possible? Resolve problems through conflict analyses and instrumentation of peace concepts

Unit-7 -Current perspective of peace and conflict resolution: Grass-roots level perspective on war and Peace

READING LIST

Essential Readings

International Conflict Resolution: Sources of War: International and Domestic Issues and Trends

Kriesberg, Louis, *Constructive Conflicts: From Escalation to Resolution*, Rowman & Littlefield, Maryland, 1998, pp. 58-150

Starkey, Boyer, and Wilkenfield, *Negotiating a Complex World*. Rowman & Littlefield, Maryland, 1999, pp. 1-74

Desirable Readings:

Zartman, William (ed.), *Collapsed States: The Disintegration and Restoration of Legitimate Authority*, Reiner, Boulder, 1995, pp. 1-14 and 267-273

Zartman, William & Touval, Saadia "International Mediation in the Post- Cold War Era", in Crocker et al., *Managing Global Chaos*, USIP, 1996, pp. 445-461

Essential Readings

What is Conflict: Introduction to International Conflict Resolution

Zartman, William, "Dynamics and Constraints in Negotiations in Internal Conflicts", in Zartman, William (ed), *Elusive Peace: Negotiating an End to Civil Wars*, The Brookings Institution, Washington, 1995, pp. 3-29

Desirable Readings

Zartman, William (ed.), *Collapsed States: The Disintegration and Restoration of Legitimate Authority*, Reiner, Boulder, 1995, pp. 1-14 and 267-273

Zartman, William & Touval, Saadia "International Mediation in the Post- Cold War Era", in Crocker et al., *Managing Global Chaos*, USIP, 1996, pp. 445-461

Essential Readings

International Conflict Resolution Theory: Models developed by Johan Galtung, Joseph Montville, Morton Deutsch, William Zartman, Levy Jack

Levy, Jack, "Contending Theories of International Conflict: A Levels-of- Analysis Approach" in Crocker et al, *Managing Global Chaos*, USIP, 1995, pp. 3-24

Carr, Edward H., "Realism and Idealism," Richard Betts (ed), *Conflict After the Cold War*, Boston: Simon & Schuster, 1994.

Desirable Readings

Carr, Edward H., "Realism and Idealism," Richard Betts (ed), *Conflict After the Cold War*, Boston: Simon & Schuster, 1994.

Waltz, Kenneth N., "Structural Causes and Economic Effects," Richard Betts (ed), *Conflict After the Cold War*, Boston: Simon & Schuster, 1994.

Conflict resolution: Back ground of Various Peace Movements and Concepts, Principles used to

resolve conflict

Essential Readings

Hampson, Fen Osler, Nurturing Peace, USIP, 1996, pp. 3-25

Galtung, Johan, There Are Alternatives: Four Roads to Peace and Security, Nottingham, Spokesman, 1984, pp. 162-205

Desirable Readings

Galtung, Johan, Peace by Peaceful Means: Peace and conflict, Development and Civilization, Sage, London, 1996, pp. 9-114

Galtung, Johan, The True Worlds: A Transnational Perspective, New York, Free Press, 1980, pp. 107-149

Cross-boarder relationships between the world's peaceful and war-torn zones (migration and information flows, economic transactions, international rules and regulations, normative concepts and political decisions)

Essential Readings

Kelman, Herbert C., "Interactive Problem Solving", in Fisher, Ronald J. (ed.) Interactive Conflict Resolution, Syracuse University Press, 1997, pp. 56-74

Kritz, Neil J., "The Rule of Law in the Post-conflict Phase: Building a Stable Peace", in Crocker et al, Managing Global Chaos, USIP, 1996, pp. 587-606

Desirable Readings

Galtung, Johan, "The Basic Need Approach", in Human Needs: a Contribution to the Current Debate, Verlag, Cambridge, 1980, pp. 55-126

Saunders, Harold H., A Public Peace Process: Sustained Dialogue to Transform Racial and Ethnic Conflicts, New York, 1999, pp. 1-80

Conflict Transformation: is Peace Possible: Resolve problems through conflict analyses and instrumentation of peace concepts

Essential Readings

Galtung, Johan, There Are Alternatives: Four Roads to Peace and Security, Nottingham, Spokesman, 1984, pp. 162-205

Galtung, Johan, "The Basic Need Approach", in Human Needs: a Contribution to the Current Debate, Verlag, Cambridge, 1980, pp. 55-126

Desirable Readings

Galtung, Johan, Peace by Peaceful Means: Peace and conflict, Development and Civilization, Sage, London, 1996, pp. 9-114

Galtung, Johan, The True Worlds: A Transnational Perspective, New York, Free Press, 1980, pp. 107-149

1980, pp. 107-149

Current perspective of peace and conflict resolution: Grass-roots level perspective on war and Peace: Grass-roots level perspective on war and Peace

Essential Readings

Deutsch, Morton, *The Resolution of Conflict: Constructive and Destructive Processes*, New Haven, Yale University Press, 1973, pp. 1-123

Galtung, Johan, *Peace by Peaceful Means: Peace and conflict, Development and Civilization*, Sage, London, 1996, pp. 9-114

Desirable Readings

Zartman, William, "Dynamics and Constraints in Negotiations in Internal Conflicts", in Zartman, William (ed), *Elusive Peace: Negotiating an End to Civil Wars*, The Brookings Institution, Washington, 1995, pp. 3-29

Kelman, Herbert C., "Interactive Problem Solving", in Fisher, Ronald J. (ed.) *Interactive Conflict Resolution*, Syracuse University Press, 1997, pp. 56-74

PSYCHOLOGY(HONOURS)

SEMESTER-I

C:1-INTRODUCTORY PSYCHOLOGY

(Credits:6, Theory-4, Practical-2) Lectures:
60 (Theory:40, Practical:20) Max.
Marks:100(Theory:70, Practical:30)

Introduction:

The course is designed to give the student a basic understanding of the psychology of human behavior. The students will be given exposure to concepts, terminology, principles, and theories that comprise an introductory course in psychology.

Learning Objectives:

1. To help the students to know the sources and processes of development of modern scientific psychology.
2. To help the students to develop a scientific temperament in studying and understanding human behavior.

Expected outcomes: Students will be able to

1. Define the term psychology and demonstrate command of the basic terminology, concepts, and principles of the discipline.
2. Gain knowledge of scientific methodology the variety of ways in which psychological data are gathered and evaluated / interpreted.
3. Identify and compare the major perspectives in psychology: Recognize how each approach views human thought and behavior.
4. Understand the physiological and biochemical links of human behavior.

UNIT-I: Introducing Psychology

- (i) Concept and definition of psychology, Roots of psychology, Psychology as a scientific discipline.
- (ii) Key Perspectives in Psychology- Behavioral, Cognitive, Humanistic, Psychodynamic, and Sociocultural

UNIT-II: Methods in Psychology

- (i) Natural Observation, Survey and Case Study- Nature, advantages and limitations.
- (ii) Experimental and Correlational methods-Nature, advantages and limitations.

UNIT-III: Biological Bases of Behavior

- (i) Structure and functions of the neurons, Communication within and between neurons, Chemical regulation of the endocrine glands.
- (ii) Structure and functions of the Central nervous system and Autonomic nervous system.

UNIT-IV: States of Mind

- (i) Nature of consciousness; changes in consciousness- sleep-wake schedules
- (ii) Extended states of Consciousness- Hypnosis, Meditation and Hallucinations

PRACTICAL

(i) R.L. by Method of Limits: To find out the R. L. of volar surface of the right arm of a subject by method of limits.

(ii) D.L. by Method of Constant Stimuli: To find out the D.L. for lifted weight of your subject by method of constant stimuli.

Recommended Books

1. Baron, R. A. (2002). Psychology (5th Edition), New Delhi: Pearson Education.
2. Dash, U.N., Dash, A.S., Mishra, H.C., Nanda, G.K. & Jena, N. (2004). Practical Exercises in Psychology: Learning about Yourself and Others. Panchasila, Bhubaneswar
3. Feldman, R.S. (2004). Understanding Psychology (6th Edition), New Delhi, Tata-McGraw Hill.
4. Gerrig, R.J. & Zimbardo, P.G. (2010). Psychology and Life (19th Ed.). Delhi: Allyn & Bacon.
5. Hilgard & Atkinson- Introduction to Psychology (2003) 14th Edition, Thomson Learning Inc.
6. Mohanty, N., Varadwaj, K. & Mishra, H.C. (2014). Explorations of Human Nature and Strength: Practicals in Psychology, Divya Prakashani, Samantarapur, Bhubaneswar.
7. Morgan, C.T., King, R.A., Weisz, J.R., & Schopler, J. (2008). Introduction to psychology (7th edition) Bombay: Tata-McGraw Hill.
8. Morris, C. G. (1990). Psychology: An Introduction. New Delhi: Prentice Hall.
9. Passer, M.W. & Smith, R.E. (2007). Psychology: The Science of Mind and Behaviour (3rd Ed.). New Delhi: Tata McGraw-Hill
10. Zimbardo, P.G. & Weber, A.L. (1997 Ed.)- Psychology- New York, Harper Collins College Publishers

C:2-BASIC DEVELOPMENTAL PROCESSES

(Credits:6, Theory-4, Practical-2) Lectures:
60 (Theory:40, Practical:20) Max.
Marks:100(Theory:70, Practical:30)

Introduction:

The course is designed to expose students to a basic understanding about the fundamental concerns of developmental psychology and provide examples of the following three dimensions of development: growth, differentiation, and orderly progression.

Learning Objectives:

1. To help students gain some key ideas about human development and the perspectives to understand and explain such developments.
2. To help the students to understand the significance of prenatal period for human development.
3. To help the students to understand the developmental preparations of the childhood and the implications of developmental milestones for the normal human development.

Expected outcomes: Students will be able to

1. Understand the nature, types, and principle of development.
2. Understand the processes of formation of life and development during pre- and post-natal periods.
3. Understand about the different aspects of preparation for future life.

UNIT-I: Basics of development

- (i) Meaning, nature, and types of development; Principles of development; Factors influencing development
- (ii) Perspectives of development- Psychoanalytic; Mechanistic; Organismic; Humanistic

UNIT-II: Life in formation

- (i) Fertilization, determination of sex, multiple birth; Prenatal development- germinal stage, embryonic stage, fetal stage; Factors influencing prenatal development
- (ii) Physical and motor developments, Social and emotional developments during childhood.

UNIT-III: Life in preparation

- (i) Physical and motor developments, Social and emotional developments during adolescence.
- (ii) Piagets stage of cognitive development; Kohlbergs stages of moral development

UNIT-IV: Self and identity

- (i) Emergence of self; Structure of the self; Development of personal identity

- (ii) Development of self control; Development of gender differences and gender roles

PRACTICAL

- (i) **Locus of Control:** To assess the Locus of Control of four college students by using Rotter's Locus of Control Scale.
- (ii) **Emotional Intelligence:** To measure the emotional intelligence of four college students by using the Schutte's Emotional Intelligence Scale

Recommended Books

1. Baron, R. A. (2002). Psychology (5th Edition), New Delhi, Pearson Education.
2. Berk, L. E. (2010). Child Development (8th Ed.). New Delhi: Prentice Hall.
3. Dash, U.N., Dash, A.S., Mishra, H.C., Nanda, G.K. & Jena, N. (2004). Practical Exercises in Psychology: Learning about Yourself and Others. Panchasila, Bhubaneswar
4. Hurlock, E. Developmental Psychology (1995). IV Edition. New Delhi: Tata McGraw Hill.
5. Mohanty, N., Varadwaj, K. & Mishra, H.C. (2014). Explorations of Human Nature and Strength: Practicals in Psychology, DivyaPrakashani, Samantapur, Bhubaneswar.
6. Papalia, Diane E., Sally Wendos Olds (2006). Human Development. 9th Edition. New Delhi: Tata McGraw Hill
7. Santrock, J. W. (2008). Child Development (11th Ed.). New Delhi: Tata McGraw Hill.
8. Sigelman, G.K. & Schaffer, D.R. (1995). Life-span Human Development, Brooks / Cole Publishing Co. Pacific Grove, California

GE:1-INTRODUCTORY PSYCHOLOGY

(Credits:6, Theory-4, Practical-2) Lectures:
60 (Theory:40, Practical:20) Max.
Marks:100(Theory:70, Practical:30)

Introduction:

The course is designed to give the student a basic understanding of the psychology of human behavior. The students will be given exposure to concepts, terminology, principles, and theories that comprise an introductory course in psychology.

Learning Objectives:

1. To help the students to know the sources and processes of development of modern scientific psychology.
2. To help the students to develop a scientific temperament in studying and understanding human behavior.

Expected outcomes: Students will be able to

1. Define the term psychology and demonstrate command of the basic terminology, concepts, and principles of the discipline.
2. Gain knowledge of scientific methodology the variety of ways in which psychological data are gathered and evaluated / interpreted.
3. Identify and compare the major perspectives in psychology: Recognize how each approach views human thought and behavior.
4. Understand the physiological and biochemical links of human behavior.

UNIT-I: Introducing Psychology

- (i) Concept and definition of psychology, Roots of psychology, Psychology as a scientific discipline.
- (ii) Key Perspectives in Psychology- Behavioral, Cognitive, Humanistic, Psychodynamic, and Sociocultural

UNIT-II: Methods in Psychology

- (i) Natural Observation, Survey and Case Study- Nature, advantages and limitations.
- (ii) Experimental and Correlational methods- Nature, advantages and limitations.

UNIT-III: Biological Bases of Behavior

- (i) Structure and functions of the neurons, Communication within and between neurons, Chemical regulation of the endocrine glands.
- (ii) Structure and functions of the Central nervous system and Autonomic nervous system.

UNIT-IV: States of Mind

- (i) Nature of consciousness; changes in consciousness- sleep-wake schedules
- (ii) Extended states of Consciousness- Hypnosis, Meditation and Hallucinations

PRACTICAL

- (i) R.L. by Method of Limits:** Students are required to find out the R. L. of volar surface of the right arm of a subject by method of limits
- (ii) D.L. by Method of Constant Stimuli:** To find out the D.L. for lifted weight of your subject by method of constant stimuli.

Recommended Books

1. Baron, R. A. (2002). Psychology (5th Edition), New Delhi: Pearson Education.

2. Dash, U.N., Dash, A.S., Mishra, H.C., Nanda, G.K. & Jena, N. (2004). Practical Exercises in Psychology: Learning about Yourself and Others. Panchasila, Bhubaneswar
3. Feldman, R.S. (2004). Understanding Psychology (6th Edition), New Delhi, Tata-McGraw Hill.
4. Gerrig, R.J. & Zimbardo, P.G. (2010). Psychology and Life (19th Ed.). Delhi: Allyn & Bacon.
5. Hilgard & Atkinson- Introduction to Psychology (2003) 14th Edition, Thomson Learning Inc.
6. Mohanty, N., Varadwaj, K. & Mishra, H.C. (2014). Explorations of Human Nature and Strength: Practicals in Psychology, Divya Prakashani, Samantarapur, Bhubaneswar.
7. Morgan, C.T., King, R.A., Weisz, J.R., & Schopler, J. (2008). Introduction to psychology (7th edition) Bombay: Tata-McGraw Hill.
8. Morris, C. G. (1990). Psychology: An Introduction. New Delhi: Prentice Hall.
9. Passer, M.W. & Smith, R.E. (2007). Psychology: The Science of Mind and Behaviour (3rd Ed.). New Delhi: Tata McGraw-Hill
10. Zimbardo, P.G. & Weber, A.L. (1997 Ed.)- Psychology- New York, Harper Collins College Publishers

SEMESTER-II

C:3-BASIC PSYCHOLOGICAL PROCESSES

(Credits:6, Theory-4, Practical-2) Lectures:
60 (Theory:40, Practical:20) Max.
Marks:100(Theory:70, Practical:30)

Introduction:

The course is designed to provide the student a basic understanding of the psychological processes from sensation to thought and communication. The student will be given exposure to the concepts, terminology, principles, and theories relating to each of the mental processes that constitute human psychology.

Learning Objectives:

1. To help the students to understand the mental processes to begin with sensation and perception up to how it results in thoughts and communication.
2. To help the students gather knowledge about the structural and functional dynamics of each of the mental processes and their interconnectedness.

Expected outcomes: Students will be able to

1. Understand the bases sensory actions and the processes of integration of sensory actions in creating and interpreting perceptual events.

2. Gain knowledge of the important processes and principles of human learning as well as the structural functional attributes of human memory to help conserve the learning outcomes.
3. Understand the structural and functional properties of language and the way it helps thought, communication, problem solving and decision making through development of concepts, ideas, images, and so on.

UNIT-I: Sensation and Perception

- (i) Basics of sensation- Sensory receptors (eye and ear), transduction, sensory thresholds, and sensory adaptation
- (ii) Nature of perceptual process- Figure and ground, Grouping (Gestalt laws), Perceptual constancies, and illusions, Perception of distance and depth.

UNIT-II: Learning and Memory

- (i) Nature and principles of Classical conditioning, Operant conditioning, and Observational learning
- (ii) The Atkinson and Shiffrin Model of Memory; Types of Memory- episodic, semantic and procedural; Causes of Forgetting- interference, repression, and amnesia

UNIT-III: Language and Communication

- (i) Properties and structure of language, Linguistic hierarchy, Language acquisition-predisposition, Nature of effective communication
- (ii) Stages of language development; critical period controversy; speech error and its implications

UNIT-IV: Thinking and Reasoning

- (i) Thinking process; concepts, categories and prototypes, Decision making and factors of influencing decision making.
- (ii) Inductive and deductive reasoning; Problem solving approaches; Steps in problem solving

PRACTICAL

- (i) Learning Curve:** To demonstrate the Learning Curve as a function of Learning trials using Nonsense Syllables.
- (ii) Serial Position Effect:** To demonstrate the serial position effect on memory in learning a list of nonsense syllables.

Recommended Books

1. Baron, R. A. (2002). Psychology (5th Edition), New Delhi, Pearson Education.
2. Dash, U.N., Dash, A.S., Mishra, H.C., Nanda, G.K. & Jena, N. (2004). Practical Exercises in Psychology: Learning about Yourself and Others. Panchasila, Bhubaneswar
3. Feldman, R.S. (2004). Understanding Psychology (6th Edition), New Delhi, Tata Mc. Graw Hill.
4. Gallotti, K.M.: Cognitive Psychology In and Out of the Laboratory. 3rd Ed, Int. Thomson Pub. Co. Bangalore, 2004

5. Gerrig, R.J. & Zimbardo, P.G. (2010). Psychology and Life (19th Ed.). Delhi: Allyn & Bacon.
6. Mohanty, N., Varadwaj, K. & Mishra, H.C. (2014). Explorations of Human Nature and Strength: Practicals in Psychology, DivyaPrakashani, Samantarapur, Bhubaneswar.
7. Morgan, C.T., King, R.A., Weisz, J.R., & Schopler, J. (2008). Introduction to psychology (7th edition) Bombay: Tata-McGraw Hill.
8. Morris, C. G. (1990). Psychology: An Introduction. New Delhi: Prentice Hall.
9. Passer, M.W. & Smith, R.E. (2007). Psychology: The Science of Mind and Behavior (3rd Ed.). New Delhi: Tata McGraw-Hill
10. Solso, R.L. (2000). Cognitive Psychology (6th Edition), USA, Allyn Bacon.
11. Zimbardo, P.G. & Weber, A.L. (1997 Ed.)- Psychology- New York, Harper Collins College Publishers

C:4-PROCESSES OF HUMAN EMPOWERMENT

(Credits:6, Theory-4, Practical-2) Lectures:
60 (Theory:40, Practical:20) Max.
Marks:100(Theory:70, Practical:30)

Introduction:

Human empowerment is ultimately an individual condition of gaining the power to control and modulate changes in one's own life those are considered important to one's identity and adjustment. The purpose of the course is to introduce students to the basics of human empowerment and how the empowerment processes are strengthened and improved.

Learning Objectives:

1. To help students gain ideas about intelligence and personality as foundations of human empowerment.
2. To make students understand how motivation and emotion are empowering processes to human development.
3. To help students gain insight into human behavior as products of empowerment

Expected outcomes: Students will be able to

1. Know the structural components and functional dynamics of both intelligence and personality.
2. Understand the significance of emotion and motivation in behavior management.
3. Understand significant aspects of social behavior as resulting in happiness, well-being and personal growth.

UNIT-I: Basics of empowerment

- (i) Intelligence- Theories of Gardner, and Stenberg; Heredity, environment, and intelligence

- (ii) Measuring Intelligence: intelligence tests; Interpretation of test score, Cross-cultural issues in testing intelligence

UNIT-II: Sources of Power (1)

- (i) Personality- Freuds theory, Humanistic theories, and Social cognitive theory
- (ii) Personality-Trait and type approach, Biological and sociocultural determinants, Psychometric and projective assessment.

UNIT-III: Sources of Power(2)

- (i) Motivation-Drive theory, Arousal theory, Expectancy theory, Maslows need hierarchy
- (ii) Emotion-Theories of James-Lange, Cannon-Bard, Schachter-Singer, and Opponent-Process

UNIT-IV: Proving empowered

- (i) Social behavior- Meaning of attribution and errors in attribution, Meaning of social cognition and processing of social information Motivation-Drive theory, Arousal theory, Expectancy theory, Maslows need hierarchy
- (ii) Positive Psychology-Scope and aims, Nature and characteristics of happiness, Subjective well-being and personal growth

PRACTICAL

- (i) Intelligence test-** To test the non-verbal intelligence of Two college students using Ravens Standard Progressive Matrices
- (ii) Personality Type-** To assess the personality type of a student obtaining responses from the student and two other significant persons in his /her life by using Glazers test of Personality Type

Recommended Books

1. Baron, R. A. & Byrne, D. (2003). Social Psychology, 10th Edition, Prentice Hall
2. Baron, R.A. (1995). Psychology- The Essential Science, Pearson Education Company of India Pvt. Ltd.
3. Dash, U.N., Dash, A.S., Mishra, H.C., Nanda, G.K. & Jena, N. (2004). Practical Exercises in Psychology: Learning about Yourself and Others. Panchasila, Bhubaneswar
4. Gerrig, R.J. & Zimbardo, P.G. (2010). Psychology and Life (19th Ed.). Delhi: Allyn & Bacon
5. Hilgard & Atkinson. Introduction to Psychology (2003). 14th Edition Thomson Learning Inc.
6. Misra, G. (2009). Psychology in India, Vol 1: Basic Psychological Processes and Human Development. India: Pearson

7. Mohanty, N., Varadwaj, K. & Mishra, H.C. (2014). Explorations of Human Nature and Strength: Practicals in Psychology, DivyaPrakashani, Samantarapur, Bhubaneswar.
8. Sigelman, G.K. & Schaffer, D.R. (1995 Eds.) Lifespan Human Development, Brooks/ Cole Publishing Co. , Pacific Group
9. Snyder, C.R. & Shane, J.L. (2005) Handbook of Positive Psychology: Oxford University Press.

GE:2-BASIC PSYCHOLOGICAL PROCESSES

(Credits:6, Theory-4, Practical-2) Lectures:
60 (Theory:40, Practical:20) Max.
Marks:100(Theory:70, Practical:30)

Introduction:

The course is designed to provide the student a basic understanding of the psychological processes from sensation to thought and communication. The student will be given exposure to the concepts, terminology, principles, and theories relating to each of the mental processes that constitute human psychology.

Learning Objectives:

1. To help the students to understand the mental processes to begin with sensation and perception up to how it results in thoughts and communication.
2. To help the students gather knowledge about the structural and functional dynamics of each of the mental processes and their interconnectedness.

Expected outcomes: Students will be able to

1. Understand the bases sensory actions and the processes of integration of sensory actions in creating and interpreting perceptual events.
2. Gain knowledge of the important processes and principles of human learning as well as the structural functional attributes of human memory to help conserve the learning outcomes.
3. Understand the structural and functional properties of language and the way it helps thought, communication, problem solving and decision making through development of concepts, ideas, images, and so on.

UNIT-I: Sensation and Perception

- (i) Basics of sensation- Sensory receptors (eye and ear), transduction, sensory thresholds, and sensory adaptation
- (ii) Nature of perceptual process- Figure and ground, Grouping (Gestalt laws), Perceptual constancies, and illusions, Perception of distance and depth.

UNIT-II: Learning and Memory

- (i) Nature and principles of Classical conditioning, Operant conditioning, and Observational learning
- (ii) The Atkinson and Shiffrin Model of Memory; Types of Memory- episodic, semantic and procedural; Causes of Forgetting- interference, repression, and amnesia

UNIT-III: Language and Communication

- (i) Properties and structure of language, Linguistic hierarchy, Language acquisition-predisposition, Nature of effective communication
- (ii) Stages of language development; critical period controversy; speech error and its implications

UNIT-IV: Thinking and Reasoning

- (i) Thinking process; concepts, categories and prototypes, Decision making and factors of influencing decision making.
- (ii) Inductive and deductive reasoning; Problem solving approaches; Steps in problem solving

PRACTICAL

(i) Learning Curve: To demonstrate the Learning Curve as a function of Learning trials using Non-sense Syllables.

(ii) Serial Position Effect: To demonstrate the serial position effect on memory in learning a list of nonsense syllables.

Recommended Books

1. Baron, R. A. (2002). Psychology (5th Edition), New Delhi, Pearson Education.
2. Dash, U.N., Dash, A.S., Mishra, H.C., Nanda, G.K. & Jena, N. (2004). Practical Exercises in Psychology: Learning about Yourself and Others. Panchasila, Bhubaneswar
3. Feldman, R.S. (2004). Understanding Psychology (6th Edition), New Delhi, Tata Mc. Graw Hill.
4. Gallotti, K.M.: Cognitive Psychology In and Out of the Laboratory. 3rd Ed, Int. Thomson Pub. Co. Bangalore, 2004
5. Gerrig, R.J. & Zimbardo, P.G. (2010). Psychology and Life (19th Ed.). Delhi: Allyn & Bacon.
6. Mohanty, N., Varadwaj, K. & Mishra, H.C. (2014). Explorations of Human Nature and Strength: Practicals in Psychology, DivyaPrakashani, Samantarapur, Bhubaneswar.
7. Morgan, C.T., King, R.A., Weisz, J.R., & Schopler, J. (2008). Introduction to psychology (7th edition) Bombay: Tata-McGraw Hill.
8. Morris, C. G. (1990). Psychology: An Introduction. New Delhi: Prentice Hall.
9. Passer, M.W. & Smith, R.E. (2007). Psychology: The Science of Mind and Behavior (3rd Ed.). New Delhi: Tata McGraw-Hill
10. Solso, R.L. (2000). Cognitive Psychology (6th Edition), USA, Allyn Bacon.
11. Zimbardo, P.G. & Weber, A.L. (1997 Ed.)- Psychology- New York, Harper Collins College Publishers

SEMESTER-III

C:5-PSYCHOLOGICAL STATISTICS

(Credits:6, Theory-4, Practical-2) Lectures:
60 (Theory:40, Practical:20) Max.
Marks:100(Theory:70, Practical:30)

Introduction:

The course is designed to equip students with knowledge in the fundamentals of statistics and research methods so that they understand the application of statistics to different research problems in psychology.

Learning Objectives:

1. To help students develop knowledge and understanding of the application of Statistics within Psychology
2. To help students develop Critical Thinking for application of appropriate statistical analysis in Psychological research

Expected outcomes: Students will be able to

1. The nature psychological variables and how to measure them with appropriate scale.
2. The processes of describing and reporting statistical data.
3. The methods of drawing inferences and conclusions for hypothesis testing by using appropriate statistical analysis.

UNIT-I: Fundamentals of statistics

- (i) Meaning and scope of statistics, Nature of variables- Categorical and Continuous, Levels of Measurement- Nominal, Ordinal, Interval, and Ratio
- (ii) Drawing frequency distribution; Graphical representation of grouped data-Polygon, Histogram, Ogive.

UNIT-II: Measures of Statistics

- (i) Measures of Central Tendency- Characteristics of mean, median and mode; Computation of mean, median, and mode
- (ii) Measures of Variability- Concept of variability, computation of semi-inter quartile range, Standard deviation and variance, Co-efficient of variation

UNIT-III: Sources and Applications

- (i) Concept of Probability; Characteristics of Normal Probability curve, Applications of NPC, Deviation from NPC- Skewness and Kurtosis
- (ii) Concept of correlation, Product-moment correlation (ungrouped data), Rank order correlation, Chi-square test (Contingency Table)

UNIT-IV: Hypothesis Testing

(i) Level of significance; Type I and Type II error; Computation of t for independent and dependent samples, The Mann-Whitney U test

(ii) Purpose and assumptions of ANOVA; One-way and two-way ANOVA; Kruskal-Wallis H test

PRACTICAL

(i) **Reporting of Statistical Results:** To collect data of 60 (30 boys and 30 girls) High School students about their Annual examination marks in four subjects and to report by descriptive statistical analyses.

(ii) **Computer Awareness:** To be familiar with software packages of statistics and their applications.

Recommended Books

1. Aron, A., Aron, E.N., & Coups, E.J. (2007). Statistics for Psychology. (4thEd.) India: Pearson Education, Prentice Hall.
2. Dash, U.N., Dash, A.S., Mishra, H.C., Nanda, G.K. & Jena, N. (2004). Practical Exercises in Psychology: Learning about Yourself and Others. Panchasila, Bhubaneswar
3. Ferguson, G.A. & Takane, Y. (1989). Statistical Analysis in Psychology & Education, Tata McGraw Hill Publishing Company, New Delhi
4. Garrett, H. E. & Woodworth, R.S. (1985). Psychology in Statistics and Education, Vakils, Feffer & Simons Ltd. Mumbai
5. Mangal, S.K. (2002) Statistics in Psychology and Education. (2ndedt). New Delhi: Prentice Hall of India.
6. Mohanty, N., Varadwaj, K. & Mishra, H.C. (2014). Explorations of Human Nature and Strength: Practicals in Psychology, DivyaPrakashani, Samantarapur, Bhubaneswar.
7. Siegal, S. (1994). Nonparametric Statistics. McGraw Hill, New Delhi
8. Singh, A.K. (1986). Tests, Measurements, & Research Methods in Behavioral Sciences, Tata McGraw Hill Publishing Company, New Delhi
9. Walaram, G. Statistics for Behavioral Sciences

C:6-SOCIAL PSYCHOLOGY

(Credits:6, Theory-4, Practical-2) Lectures:
60 (Theory:40, Practical:20) Max.
Marks:100(Theory:70, Practical:30)

Introduction:

Social psychology is the scientific study of the nature and causes of human behavior in a social context. This course is designed to introduce the students to the field of social psychology, to explain how social psychologists think about and study human behavior; to introduce the body of knowledge and underlying principles that currently exist in the field and to encourage reflection about the implications of social psychology for the situations we encounter in everyday life.

Learning Objectives:

1. To help students develop awareness of the concepts, problems and issues in the discipline of social psychology

2. To make students understand the individuals and groups in respect to patterns of social behavior and attitudes
3. To help students gain insight into the dynamics of intergroup relationships, conflict, prejudice and cooperation.

Expected outcomes: Students will be able to

1. Know the scope of studying social psychology and the methods to gather data in the social context to explain them.
2. Understand the significance of social cognition, attitudes, stereotypes and prejudices in explaining human behavior in the social contexts.
3. Understand the significant aspects group behavior and social influence that constitute the core of human relationships.

UNIT-I: Introduction

- (i) Nature, goal, and scope of Social Psychology; Methods of Social Psychology- Observation; Questionnaire, Interview, and Experiment
- (ii) Social Cognition- Perceiving ourselves: self-concept, self-esteem, self-presentation and self expression; Perceiving others and forming impressions

UNIT-II: Attitude, Prejudice and Stereotypes

- (i) Attitudes- Nature, characteristics and functions of attitude; Attitude formation and change; Attitude measurement
- (ii) Measures of Variability- Concept of variability, computation of semi-inter quartile range, Standard deviation and variance, Co-efficient of variation

UNIT-III: Group and Leadership

- (i) Group- Group structure and function, Task performance: Social facilitation, Social loafing; Conformity, Obedience and social modeling; Group cohesiveness-
- (ii) Leadership- Definitions and functions, Trait, situational, interactional and contingency approaches to leadership; Leadership effectiveness, The charismatic leadership

UNIT-IV: Social Behavior

- (i) Prosocial behavior-Cooperation and helping, personal, situational and socio-cultural determinants, Theoretical explanations of prosocial behavior.
- (ii) Aggression- Theoretical perspectives, Trait, situational and social learning approaches, social and personal determinants of aggression, prevention and control of aggression.

PRACTICAL

- (i) Ethical Values:** To assess the ethical values of five adolescents by using Donelsons Ethical Position Questionnaire (EPQ)
- (ii) Attitude towards Women:** To measure the attitude of three boys and three girls towards Women by using Spence, Helmrich & Stapps Attitude towards Women scale.

Recommended Books

1. Baron R. A & Byrne. D. (2003). Social Psychology. 10th Edition, Prentice Hall
2. Baron. R.A., Byrne, D. & Bhardwaj. G (2010). Social Psychology (12th Ed). New Delhi: Pearson
3. Dash, U.N., Dash, A.S., Mishra, H.C., Nanda, G.K. & Jena, N. (2004). Practical Exercises in Psychology: Learning about Yourself and Others. Panchasila, Bhubaneswar
4. Developments (ICSSR survey of advances in research). New Delhi: Pearson.
5. Misra, G. (1990) .Applied Social Psychology. New Delhi: Sage.
6. Misra, G. (2009). Psychology in India, Volume 4: Theoretical and Methodological
7. Mohanty, N., Varadwaj, K. & Mishra, H.C. (2014). Explorations of Human Nature and Strength: Practicals in Psychology, DivyaPrakashani, Samantarapur, Bhubaneswar.
8. Myers, David G. (2002). Social Psychology. 7th Edition, McGraw Hill Book Co.
9. Taylor, S.E., Peplau, L.A. & Sears, D.O. (2006). Social Psychology (12th Ed). New Delhi: Pearson

C:7-ENVIRONMENTAL PSYCHOLOGY

(Credits:6, Theory-4, Practical-2) Lectures:
60 (Theory:40, Practical:20) Max.
Marks:100(Theory:70, Practical:30)

Introduction:

Environmental psychology is an interdisciplinary field focused on the interplay between individuals and their surroundings. The field defines the term environment broadly, encompassing natural environments, social settings, built environments, learning environments, and informational environments. The course is designed to introduce to the students about all these aspects of environment.

Learning Objectives:

1. To highlight the simultaneous mutual interaction of environment and behavior.
2. To delineate psychological approaches to the study of environment.
3. To discuss the impact of ecological degradation and the need for enhanced awareness programs

Expected outcomes: Students will be able to

1. understand the interactional relationships between environment and behavior
2. understand the problems occurring to ecology and environment at the present time
3. understand different psychological approaches to the study of man-environment relationship.

UNIT-I: Environment and Behavior

- (i) Earth as a living system: The gala hypothesis, Deep ecology; Man-environment relationship-physical, social, cultural, orientation and product.
- (ii) Effects of Environment on behavior: Noise pollution, Air pollution, Crowding and population explosion.

UNIT-II: Ecology and Development

- (i) Human behavior Environmental Problems: Global warming, Greenhouse effect, energy depletion; Pro-environmental behaviors.
- (ii) Ecosystem and their components; Sustainable development; Resource use: Common property resources. Ecology: Acculturation and psychological adaptation

UNIT-III: Psychological Approaches to environment

- (i) Field theory approach; Eco-cultural Psychology (Berry); Biosocial Psychology (Dawson);
- (ii) Person environment transaction (Sokols & Ittelson); Ecological Psychology (Barker); Ecological system approach (Bronfenbrenner)

UNIT-IV: Environmental Assessment

- (i) Socio-psychological dimensions of environmental impact; Environmental deprivation-nature and consequences.
- (ii) Creating environmental awareness; Social movements- Chipko, Tehri, Narmada.

PRACTICAL

- (i) To assess the environmental literacy of 4 college students using Bob Simpsons Environment literacy and awareness survey questionnaire.
- (ii) To assess the environmental attitude, concern and sensitivity of 4 college students using Bob Simpsons Environment literacy and awareness survey questionnaire.

Recommended Books

1. Dash, U.N., Dash, A.S., Mishra, H.C., Nanda, G.K. & Jena, N. (2004). Practical Exercises in Psychology: Learning about Yourself and Others. Panchasila, Bhubaneswar
2. Dreze, J. and Sen, A. (1992). Indian Development. Delhi: Oxford University Press.
3. Gadgil, M. and Guha. R. (1995). Ecology and Equity. New Delhi, Penguin Books
4. Goldsmith, E. (1991). The way: The ecological World View. Boston: Shambhala
5. Mohanty, N., Varadwaj, K. & Mishra, H.C. (2014). Explorations of Human Nature and Strength: Practicals in Psychology, DivyaPrakashani, Samantarapur, Bhubaneswar.

GE:3-PSYCHOLOGICAL STATISTICS

(Credits:6, Theory-4, Practical-2) Lectures:
60 (Theory:40, Practical:20) Max.
Marks:100(Theory:70, Practical:30)

Introduction:

The course is designed to equip students with knowledge in the fundamentals of statistics and research methods so that they understand the application of statistics to different research problems in psychology.

Learning Objectives:

1. To help students develop knowledge and understanding of the application of Statistics within Psychology
2. To help students develop Critical Thinking for application of appropriate statistical analysis in Psychological research

Expected outcomes: Students will be able to

1. The nature psychological variables and how to measure them with appropriate scale.
2. The processes of describing and reporting statistical data.
3. The methods of drawing inferences and conclusions for hypothesis testing by using appropriate statistical analysis.

UNIT-I: Fundamentals of statistics

- (i) Meaning and scope of statistics, Nature of variables- Categorical and Continuous, Levels of Measurement- Nominal, Ordinal, Interval, and Ratio
- (ii) Drawing frequency distribution; Graphical representation of grouped data-Polygon, Histogram, Ogive.

UNIT-II: Measures of Statistics

- (i) Measures of Central Tendency- Characteristics of mean, median and mode; Computation of mean, median, and mode
- (ii) Measures of Variability- Concept of variability, computation of semi-inter quartile range, Standard deviation and variance, Co-efficient of variation

UNIT-III: Sources and Applications

- (i) Concept of Probability; Characteristics of Normal Probability curve, Applications of NPC, Deviation from NPC- Skewness and Kurtosis
- (ii) Concept of correlation, Product-moment correlation (ungrouped data), Rank order correlation, Chi-square test (Contingency Table)

UNIT-IV: Hypothesis Testing

- (i) Level of significance; Type I and Type II error; Computation of t for independent and dependent samples, The Mann-Whitney U test
- (ii) Purpose and assumptions of ANOVA; One-way and two-way ANOVA; Kruskal-Wallis H test

PRACTICAL

- (i) **Reporting of Statistical Results:** To collect data of 60 (30 boys and 30 girls) High School students about their Annual examination marks in four subjects and to report by descriptive statistical analyses.

(ii) Computer Awareness: To be familiar with software packages of statistics and their applications.

Recommended Books

1. Aron, A., Aron, E.N., & Coups, E.J. (2007). Statistics for Psychology. (4thEd.) India: Pearson Education, Prentice Hall.
2. Dash, U.N., Dash, A.S., Mishra, H.C., Nanda, G.K. & Jena, N. (2004). Practical Exercises in Psychology: Learning about Yourself and Others. Panchasila, Bhubaneswar
3. Ferguson, G.A. & Takane, Y. (1989). Statistical Analysis in Psychology & Education, Tata McGraw Hill Publishing Company, New Delhi
4. Garrett, H. E. & Woodworth, R.S. (1985). Psychology in Statistics and Education, Vakils, Feffer & Simons Ltd. Mumbai
5. Mangal, S.K. (2002) Statistics in Psychology and Education. (2ndedt). New Delhi: Prentice Hall of India.
6. Mohanty, N., Varadwaj, K. & Mishra, H.C. (2014). Explorations of Human Nature and Strength: Practicals in Psychology, DivyaPrakashani, Samantarapur, Bhubaneswar.
7. Siegal, S. (1994). Nonparametric Statistics. McGraw Hill, New Delhi
8. Singh, A.K. (1986). Tests, Measurements, & Research Methods in Behavioral Sciences, Tata McGraw Hill Publishing Company, New Delhi
9. Walaram, G. Statistics for Behavioral Sciences

C:8-PSYCHOPATHOLOGY

(Credits:6, Theory-4, Practical-2) Lectures:
60 (Theory:40, Practical:20) Max.
Marks:100(Theory:70, Practical:30)

Introduction:

Psychopathology refers to the study of mental illness. This course is designed to expose students to the key concepts in psychopathology as well as the major theories associated with the etiology and treatment of psychological disorders and disabilities. Students will be able to understand the distinction between normal and abnormal and the qualities that are used to differentiate what is typical versus atypical through citations of different disorders.

Learning Objectives:

1. To help students define and understand the basic concepts underlying psychopathology and the perspectives which contributed to the development of modern psychopathology.
2. To help students understand the assessment techniques for identifying and classifying maladaptive behavior and mental disorders.

3. To guide students to gain specific knowledge about different types of mental disorders.

Expected outcomes: Students will be able to

1. Understand the differences between normality and abnormality along with the perspectives explaining them.
2. Know the importance and the use of assessment techniques in identifying different forms of maladaptive behavior.
3. Learn the symptoms, causes and treatment of anxiety disorders, mood disorders and schizophrenia.

UNIT-I: Basics of Pathology

- (i) Concept of abnormality; Perspectives of abnormal behavior- Psychodynamic, Behavioral, Cognitive, Humanistic-Existential, and Sociocultural
- (ii) Classification of maladaptive behavior-DSM-IV; Assessment techniques- Diagnostic tests, Rating scales, History taking interview, Projective tests

UNIT-II: Anxiety and Mood disorder

- (i) Symptoms, causes and treatment of Generalized anxiety disorder, Phobic disorder, Obsessive-Compulsive disorder
- (ii) Depressive disorder Symptoms, causes and treatment of Bipolar affective disorder, and Dysthymia

UNIT-III: Personality Disorders

- (i) Paranoid, Schizoid, Dissociative, Impulsive
- (ii) Borderline, Anxious, Avoidance, Dependent personality

UNIT-IV: Schizophrenia and Therapies

- (i) Characteristics, Major subtypes, Causes and treatment of Schizophrenia
- (ii) Psychodynamic, and Cognitive Behavior therapy.

PRACTICAL

(i) Anxiety: Assessment of Anxiety of a subject by Hamilton Anxiety Rating Scale (HARS)

(ii) Depression: Assessment of Depression Profile of a subject by Becks Depression Inventory (BDI)

Recommended Books

1. Ahuja N. (2011). A Short Textbook of Psychiatry (7th Ed). New Delhi: Jaypee

2. Barlow D.H. and Durand V.M. (2005). Abnormal Psychology: An Integrated Approach (4th Ed.).Wadsworth: New York.
3. Baron, R.A. (1995 Edition)-Psychology- The Essential Science, Pearson Education Company of India Pvt. Ltd.
4. Carson R.C., Butcher J.N., Mineka, S., & Hooley J.M. (2007). Abnormal Psychology (13th Ed.).ND: Pearson Education.
5. Dash, U.N., Dash, A.S., Mishra, H.C., Nanda, G.K. & Jena, N. (2004). Practical Exercises in Psychology: Learning about Yourself and Others. Panchasila, Bhubaneswar
6. Irwin G. Sarason, Barbara Sarason (2005). Abnormal Psychology. New Delhi: Prentice Hall Publication
7. James C. Coleman (1981). Abnormal Psychology and Modern Life. D.B. Taraporevala with Scott, Foresman and Company, Mumbai
8. Kring,A.M.,Johnson,S.L.,Davison G.C. & Neale J.M. (2010). Abnormal Psychology (11th Ed.).NY: John Wiley
9. Mohanty, N. (2008). Psychological Disorders: Text and Cases. New Delhi: Neelkamal Publications Pvt. Ltd.
10. Mohanty, N., Varadwaj, K. & Mishra, H.C. (2014). Explorations of Human Nature and Strength: Practicals in Psychology, DivyaPrakashani, Samantarapur, Bhubaneswar.

C:9-EDUCATIONAL PSYCHOLOGY

(Credits:6, Theory-4, Practical-2) Lectures:
60 (Theory:40, Practical:20) Max.
Marks:100(Theory:70, Practical:30)

Introduction:

This course provides an introduction to concepts, theories, and research in educational psychology. The topics covered include cognitive development during the school years, classroom management, instructional approaches, motivation, assessment, and individual differences.

Learning Objectives:

1. To provide students with an overview of the purposes and uses of educational psychology.
2. To help students understand human development focusing mainly on the years of formal education including those with ability differences
3. To make students understand the ways that educators motivate their students to learn and strive for excellence
4. To make students explore the ways that educators manage learning environments to maximize learning and social cohesion

Expected outcomes: Students will be able to

1. Define educational psychology and give examples of the different topics educational psychologists study.
2. Describe the developmental issues faced by school age children.
3. Describe the challenges presented by children with ability differences.
4. Explain the role of motivation on learning and classroom behavior.
5. Describe classroom management techniques.
6. Identify commonly used standardized tests, their strengths and limitations, and use in school settings.

UNIT-I Foundations of Educational Psychology

(i) Concepts and principles of educational psychology, The teaching-learning process, Goals of teaching and objectives for learning.

(ii) Theories of cognitive development-Piaget, Bruner and Vygotsky.

UNIT- II Motivation and Classroom Management

(i) Meaning of motivation, Intrinsic and extrinsic motivation, Approaches to understand classroom motivation, Motivational techniques in classroom teaching.

(ii) The goals of classroom management, Creating a positive learning environment, Characteristics of an effective teacher, Teacher expectation and students performance.

UNIT III Creativity and Aptitude

(i) Nature and characteristics of creativity; Theories of creativity; Fostering creativity among children.

(ii) Nature and characteristics of aptitude; Types of aptitude; Measurement of aptitude; Utility of aptitude tests.

UNIT -IV Dealing with ability differences and Testing

(i) Teaching children with mental retardation, learning disability, social class differences, and attention deficit Hyperactive disorder.

(ii) Types of standardized tests- Achievement test, and aptitude tests, Advantages and limitations of standardized test.

PRACTICAL

(i) Academic Behavior: To assess the academic attitude and behavior of college students by using Sias Academic Behavior Scale.

(ii) Academic Stress: To assess the academic stress of two higher Secondary students using Raos Academic Stress Scale.

Recommended Books

1. Agrawal, J.C. (2009). Essentials of Educational Psychology (2ndEdn.) Vikas Publishing House, New Delhi.
2. Dash, U.N., Dash, A.S., Mishra, H.C., Nanda, G.K. & Jena, N. (2004). Practical Exercises in Psychology: Learning about Yourself and Others. Panchasila, Bhubaneswar

3. Gage, N. L., & Berliner, D. C. (2009) Educational psychology (5th ed.). Boston, MA: Houghton Mifflin.
4. Mangal, S.K. (2013). Advanced Educational Psychology (2ndEdn.) PHI Learning Pvt. Ltd., New Delhi
5. Mohanty, N., Varadwaj, K. & Mishra, H.C. (2014). Explorations of Human Nature and Strength: Practicals in Psychology, DivyaPrakashani, Samantarapur, Bhubaneswar.
6. Slavin, Robert E. (2012). Educational Psychology: Theory and Practice. Delhi, Pearson,
7. Woolfolk, A.E. (2004). Educational Psychology (9th Ed.), Allyn & Bacon, London / Boston.

C:10-PSYCHOLOGICAL ASSESSMENT

(Credits:6, Theory-4, Practical-2) Lectures:
60 (Theory:40, Practical:20) Max.
Marks:100(Theory:70, Practical:30)

Introduction:

The course is designed to expose students to a basic understanding about approaches to psychological assessment and develop skill in the administration and interpretation of psychological tests.

Learning Objectives:

1. To train students in various psychological assessment techniques
2. To impart skills necessary for selecting and applying different tests for different purposes such as evaluation, training, rehabilitation etc.

Expected outcomes: Students will be able to

1. Understand the basic facts about psychological assessment.
2. Understand the processes of test construction and standardization.
3. Understand about the assessment of different types of skills and abilities.

UNIT-I Introduction

- (i) Nature and Scope of human assessment;Parameters of assessment.
- (ii) Psychological scaling, Methods of scaling.

UNIT- II Psychological Tests

- (i) Principles of test construction and standardization- Item analysis, reliability, validity and development of norms.
- (ii) Types of psychological tests- Individual, group, performance, verbal, nonverbal.

UNIT III Assessment of Ability

- (i) Assessment of general abilities- Intelligence, interest, interpersonal interaction.
- (ii) Assessment of personality- Use of self report inventories, interview, projective and non-projective tests.

UNIT IV Classroom Assessment

- (i) Classroom as assessment context, Traditional tests, Alternative assessment.
- (ii) Grading and reporting of performance, Computer and assessment.

PRACTICAL

(i) Empathy: To assess the empathy behavior of Five college students using Sprengs Empathy questionnaire.

(ii) Sense of Humor: To assess the Sense of Humor of 4 College Students Using McGhees Scale of Sense of Humor (MSSH).

Recommended Books

1. Baron, R. A. (2002). Psychology (5th Edition), New Delhi, Pearson Education.
2. Berk, L. E. (2010). Child Development (8th Ed.). New Delhi: Prentice Hall.
3. Dash, U.N., Dash, A.S., Mishra, H.C., Nanda, G.K. & Jena, N. (2004). Practical Exercises in Psychology: Learning about Yourself and Others. Panchasila, Bhubaneswar
4. Hurlock, E. Developmental Psychology (1995). IV Edition. New Delhi: Tata McGraw Hill.
5. Mohanty, N., Varadwaj, K. & Mishra, H.C. (2014). Explorations of Human Nature and Strength: Practicals in Psychology, DivyaPrakashani, Samantarapur, Bhubaneswar.
6. Papilia, Diane E., Sally Wendos Olds (2006). Human Development. 9th Edition. New Delhi: Tata McGraw Hill
7. Santrock, J. W. (2008). Child Development (11th Ed.). New Delhi: Tata McGraw Hill.
8. Sigelman, G.K. & Schaffer, D.R. (1995). Life-span Human Development, Brooks / Cole Publishing Co. Pacific Grove, California

GE:6-PSYCHOPATHOLOGY

(Credits:6, Theory-4, Practical-2) Lectures:
60 (Theory:40, Practical:20) Max.
Marks:100(Theory:70, Practical:30)

Introduction:

Psychopathology refers to the study of mental illness. This course is designed to expose students to the key concepts in psychopathology as well as the major theories associated with the etiology and treatment of psychological disorders and disabilities. Students will be able to understand the distinction between normal and abnormal and the qualities that are used to differentiate what is typical versus atypical through citations of different disorders **Learning Objectives:**

1. To help students define and understand the basic concepts underlying psychopathology and the perspectives which contributed to the development of modern psychopathology.
2. To help students understand the assessment techniques for identifying and classifying maladaptive behavior and mental disorders.
3. To guide students to gain specific knowledge about different types of mental disorders.

Expected outcomes: Students will be able to

1. Understand the differences between normality and abnormality along with the perspectives explaining them.
2. Know the importance and the use of assessment techniques in identifying different forms of maladaptive behavior.
3. Learn the symptoms, causes and treatment of anxiety disorders, mood disorders and schizophrenia.

UNIT-I Basics of Pathology

- (i) Concept of abnormality; Perspectives of abnormal behavior- Psychodynamic, Behavioral, Cognitive, Humanistic-Existential, and Sociocultural.
- (ii) Classification of maladaptive behavior-DSM-IV; Assessment techniques- Diagnostic tests, Rating scales, History taking interview, Projective tests.

UNIT- II Anxiety and Mood disorder

- (i) Symptoms, causes and treatment of Generalized anxiety disorder, Phobic disorder, Obsessive-Compulsive disorder.
- (ii) Depressive disorder Symptoms, causes and treatment of Bipolar affective disorder, and Dysthymia.

UNIT III Personality Disorders

- (i) Paranoid, Schizoid, Dissociative, Impulsive. (ii)Borderline, Anxious, Avoidance, Dependent personality.

UNIT IV Schizophrenia and Therapies

- (i)Characteristics, Major subtypes, Causes and treatment of Schizophrenia.
- (ii)Psychodynamic, and Cognitive Behavior therapy.

PRACTICAL

- (i) Anxiety: Assessment of Anxiety of a subject by Hamilton Anxiety Rating Scale (HARS).
- (ii) Depression: Assessment of Depression Profile of a subject by Becks Depression Inventory (BDI).

Recommended Books

1. Ahuja N. (2011). A Short Textbook of Psychiatry (7th Ed). New Delhi: Jaypee.
2. Barlow D.H. and Durand V.M. (2005). Abnormal Psychology: An Integrated Approach (4th Ed.).Wadsworth: New York.
3. Baron, R.A. (1995 Edition)-Psychology- The Essential Science, Pearson Education Company of India Pvt. Ltd.
4. Carson R.C., Butcher J.N., Mineka, S., & Hooley J.M. (2007). Abnormal Psychology (13th Ed.).ND: Pearson Education.
5. Dash, U.N., Dash, A.S., Mishra, H.C., Nanda, G.K. & Jena, N. (2004). Practical Exercises in Psychology: Learning about Yourself and Others. Panchasila, Bhubaneswar.
6. Irwin G. Sarason, Barbara Sarason (2005). Abnormal Psychology. New Delhi: Prentice Hall Publication.
7. James C. Coleman (1981). Abnormal Psychology and Modern Life. D.B. Taraporevala with Scott, Foresman and Company, Mumbai.
8. Kring,A.M.,Johnson,S.L.,Davison G.C. & Neale J.M. (2010). Abnormal Psychology (11th Ed.).NY: John Wiley.
9. Mohanty, N. (2008). Psychological Disorders: Text and Cases. New Delhi: Neelkamal Publications Pvt. Ltd.

10. Mohanty, N., Varadwaj, K. & Mishra, H.C. (2014). Explorations of Human Nature and Strength: Practicals in Psychology, DivyaPrakashani, Samantarapur, Bhubaneswar.
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SEMESTER-V

C:11-ORGANIZATIONAL BEHAVIOR

(Credits:6, Theory-4, Practical-2) Lectures:
60 (Theory:40, Practical:20) Max.
Marks:100(Theory:70, Practical:30)

Introduction:

The course provides an overview of the main fields of organizational and personnel psychology. It focuses on topics such as organizational system; work behavior, attitudes and motivation as related to organizational set up; management of power and politics in the organizations; and finally development and evaluation of human resources for sustainable growth of an organizations. **Learning Objectives:**

1. To help students able to understand the structure, functions, and designs of different organizations.
2. To make students understand the processes of group decision making and leadership functions in different organizations.
3. To make students understand the theories of work motivation and related issues of power and politics in the organizational set up.
4. To help students demonstrate professional skills in the evaluation, management, and development of human resources in the organizations.

Expected outcomes: Students will be able to

1. Understand different concepts and dynamics related to organizational system, behavior, and management.
2. Identify steps managers can take to motivate employees in the perspectives of the theories of work motivation.
3. Understand the tricks of power and politics management in the organizations.
4. Understand significance of human resource development, evaluation and management for the interest and benefit of the organization.

UNIT-I Historical context of organizational behavior

- (i) Contributions of Taylor, Weber and Fayoll; Challenges, Scope and opportunities for OB.
- (ii) OB perspectives-Open system approach, Human relations perspective, Socio-technical approach, OB model responsive to Indian realities.

UNIT- II Organization System

- (i) Structure and functions of organization, Common organizational designs, Management roles, functions and skills.
- (ii) Group decision making processes in organizations, Organizational leadership and types of leadership in organizations.

UNIT III Work, Power and Politics

- (i) Contemporary theories of work motivation- ERG theory, McClelland's theory of needs, Cognitive evaluation theory, Goal-setting theory, Reinforcement theory.
- (ii) Defining power in organization, Bases of power, Power tactics, Nature of organizational politics, Impression management, and defensive behavior.

UNIT IV Human resource development and Evaluation

- (i) Human Skills and Abilities, Selection Practices for Optimal Use of Human Resources; Training Programs for the Development of Human Resources.
- (ii) Performance Evaluation- Purpose, Methods, Potential Problems and methods to overcome them.

PRACTICAL

- (i) **Leadership Style:** To measure his basic leadership style of 4 college students by using Green- berg Basic Leadership Style scale.
- (ii) **Conflict-Handling:** To measure the conflict-handling style of 4 college students by using Rahims scale to identify their conflict handling style.

Recommended Books

1. Dash, U.N., Dash, A.S., Mishra, H.C., Nanda, G.K. & Jena, N. (2004). Practical Exercises in Psychology: Learning about Yourself and Others. Panchasila, Bhubaneswar.
2. Greenberg, J. & Baron, R.A. (2007). Behaviour in Organizations (9th Ed.). India: Dorling Kindersley.
3. Luthans, F. (2009). Organizational behavior. New Delhi: McGraw Hill.
4. Mohanty, N., Varadwaj, K. & Mishra, H.C. (2014). Explorations of Human Nature and Strength: Practicals in Psychology, DivyaPrakashani, Samantarapur, Bhubaneswar.
5. Pareek, U.(2010). Understanding organizational behaviour. Oxford: Oxford University Press.
6. Robbins, S.P.; Timothy, A.J. & Vohra, N. (2012). Organizational Behavior, 15th Edn. Pearson Education: New Delhi
7. Schultz, D. and Schultz, S.E. (2004). Psychology and Work Today. Delhi: Pearson Inc.
8. Singh, K. (2010). Organizational Behaviour: Texts & Cases. India: Dorling Kindersley.

C:12-HEALTH PSYCHOLOGY

(Credits:6, Theory-4, Practical-2) Lectures:
60 (Theory:40, Practical:20) Max.
Marks:100(Theory:70, Practical:30)

Introduction:

Health psychology is a specialty area that focuses on how biology, psychology, behavior and social factors influence health and illness. This course is designed to provide an introduction to the area of health psychology to help students understand how Health Psychology as a specialty within psychology addresses the role of behavioral factors in health and illness. Basic theories, models and applications are also included.

Learning Objectives:

1. To help the students understand the issues of Health Psychology and how to address them by the bio-psychosocial model of health and illness.
2. To help the students to describe behavioral factors that influence health and illness.
3. To guide the students understand about health enhancing behaviors including coping with illness.

Expected outcomes: Students will be able to

1. Know the basics of health and illness from the Bio-psychosocial perspectives.
2. Understand the significance of behavioral and psychological correlates of health and illness.
3. Understand the significant aspects coping and importance of health enhancing behavior.

UNIT-I Introduction

- (i) Goals of Health Psychology, , Biopsychosocial model of health and illness.
- (ii) Basic nature of stress, Cognitive appraisal of stressors, Some major causes of stress, Management of stress.

UNIT- II Health and Illness

- (i) Behavioral and psychological correlates of illness, Approaches to promoting wellness, Some common health beliefs and their implications.
- (ii) Models of health- The cognition models- The health belief model, The protection motivation model, Leventhals self regulatory model.

UNIT III Health and Coping

- (i) Individual differences in symptom perception, Coping with the crises of illness; Compliance behavior and improving compliance.
- (ii) Health enhancing behavior- Diet management, Yoga and Exercise.

UNIT IV Health Issues

- (i) Children health issues- Malnutrition, Immunization, Autism, ADHD.
- (ii) Health issues of women and elderly:Diabetes,Osteoporosis, Alzheimers Disease, Depression.

PRACTICAL

- (i) **Sleep Quality:** To assess the Sleep quality of 4 college students The Pittsburgh Sleep Quality Index (PSQI).
- (ii) **Coping Strategies:** To assess of the Coping Strategies of 4 college students by Tobins Coping Strategy Inventory (TCSI).

Recommended Books

1. Baron, R.A. (1995 Edition)-Psychology- The Essential Science, Pearson Education Company of India Pvt. Ltd.
2. Brannon and Feist. Health Psychology.
3. Carr, A. (2004). Positive Psychology: The science of happiness and human strength.UK: Routledge.
4. Dash, U.N., Dash, A.S., Mishra, H.C., Nanda, G.K. & Jena, N. (2004). Practical Exercises in Psychology: Learning about Yourself and Others. Panchasila, Bhubaneswar
5. Edward P.Sarafino (1994). Health Psychology. John Wiley and Sons
6. Khatoon, N. (2012). Health Psychology, Dorling Kindersley (India) Pvt. Ltd. New Delhi
7. Mohanty, N., Varadwaj, K. & Mishra, H.C. (2014). Explorations of Human Nature and Strength: Practicals in Psychology, DivyaPrakashani, Samantarapur, Bhubaneswar.
8. Sarafino, E.P. (2002). Health psychology: Bio psychosocial interactions (4th Ed.).NY: Wiley.
9. Snyder, C.R., & Lopez,S.J.(2007).Positive psychology :The scientific and practical explorations of human strengths. Thousand Oaks, CA: Sage.
10. Taylor, S.E. (2006). Health Psychology (6th Ed.). New York: Tata McGraw Hill

DISCIPLINE SPECIFIC ELECTIVES

DSE-1: PSYCHOLOGICAL RESEARCH & MEASUREMENT

(Credits:6, Theory-4, Practical-2) Lectures:
60 (Theory:40, Practical:20) Max.
Marks:100(Theory:70, Practical:30)

Introduction:

The research methods course is among the most frequently required in the psychology and with good reason. It helps the students know about the difference between an experiment and a correlational study, the function of independent and dependent variables, the importance of reliability and validity in psychological measurement, and the need for replication in psychological research. In other words, psychologists research methods are at the very core of their discipline. The course is designed to train the students in psychological research and measurement. **Learning Objectives:**

1. To provide an overview of scientific approaches to psychological research in term of sampling techniques, scientific method, and experimental designs.
2. To acquaint the students with respect to psychometric, projective techniques and non-testing approaches like interview.

Expected outcomes: Students will be able to

UNIT-I Psychological Research

- (i) Assumptions of science, Characteristics of scientific methods, Psychological research: Correlational and experimental.
- (ii) Sampling frame: probability and non-probability samples, sample size, sampling error.

UNIT- II Psychological Scaling and Construction of test

- (i) Purpose of scaling and types of psychological data, Psychological scaling methods: Familiarity with Thurstone, Likert and Guttman scale.
- (ii) Construction of test: Theory of measurement error; Operationalizing a concept, Generating items, Item analysis, Item response theory.

UNIT III Experimental Designs

- (i) Pretest- post-test design, Factorial designs, RandomizedBlock design Standardization of tests.
- (ii) Reliability and validity of tests, Development of norms and interpreting test scores.

UNIT IV Assessment of Personality

- (i) Psychometric and projective techniques, Familiarity with MMPI, Rorachs, WAT, and TAT Interviewing.
- (ii) Principles and procedures of interviewing, gaining cooperation, motivating respondents, training of interviewers, ethics of interviewing.

PRACTICAL

- (i) **TAT**: To administer the TAT on a subject and give summary report.
- (ii) **Word Association test**: To administer the Jung / Kent-Rosanoff list of WAT on a subject and report on his areas of emotional difficulties.

Recommended Books

1. Anastasi, A. (1988). Psychological Testing. New York: MacMillan.
2. Minium, E.W., King, B.M. & Bear, G. (1993). Statistical Reasoning in Psychology and Education. New York: John Willey.
3. Kerlinger, F.N. (1983). Foundations of Behavioral Research. New York: Surjeet Publications.
4. Freeman, F.S. (1972). Theory and Practice of Psychological Testing. New Delhi: Oxford & IBH.

DSE-2: PSYCHOLOGY & SOCIAL ISSUES

(Credits:6, Theory-4, Practical-2) Lectures:
60 (Theory:40, Practical:20) Max.
Marks:100(Theory:70, Practical:30)

Introduction:

Psychologists can play a larger role in the solution of important social problems. Psychology brings two important qualities to the study of social problems: attention to psychological process and rigorous methodology. The key task in the designed course is to define social problems in part as psychological problems.

Learning Objectives:

1. The course will provide social psychological analysis of some major social issues in India.

Expected outcomes: Students will be able to

UNIT-I Understanding Social Systems

- (i) Indian Family System; Social stratification; caste, class, power, Religious ethics Poverty and Deprivation.
- (ii) Theories of poverty, Concomitants of poverty, Sources of deprivation, inequality and social justice.

UNIT- II Health and wellbeing

- (i) Role of behavior in health problems, Shortcomings of the biomedical model, Behavioral sciences in disease prevention and control, India's health scenario.

Political Behavior

- (ii) Development of ideology, Use of small groups in politics, Issues of human and social development, Quality of life and development.

UNIT III Antisocial Behavior

- (i) Corruption and bribery, Juvenile delinquency, terrorism, Crime and criminal behavior, Alcoholism and drug abuse.

(ii) Crime and criminal behavior, Alcoholism and drug abuse, Psychopath.

UNIT IV Social integration

(i) The concept of social integration; Causal factors of social conflicts and prejudices; Psychological strategies for handling the conflicts and prejudices; Measures to achieve social integration.

Violence

(ii) Nature and categories of violence, violence in family and marriage, rape, Collective violence for social change.

PRACTICAL

(i) **Quality of Life:**To assess the quality of life family of 4 families using Beach Center Family Quality of Life Scale.

(ii) **Community Integration:**To assess the community integration of a village by using Community integration questionnaire (CIQ) of Barry Willer.

Recommended Books

1. Banerjee, D. (1998). Poverty, class and health culture in India, Vol. I, Delhi Prachi Prakashan
2. Dube, S.C. (1987) Modernization and Development. ND: Sage
3. Fonseca, M. (1998). Family and Marriage in India. Jaipur: Sachin
4. Mishra, G. (1990). Applied Social Psychology in India. ND: Sage
5. Mishra, G. (1999). Psychological perspectives on stress and Health. New Delhi: Concept
6. Mishra, H.C. and Misra, S. (2009). Psychology of Deviants, Divya Prakashani, Bhubaneswar
7. Mohanty, A .K. and Mishra, G. (Eds.) (2000). Psychology of Poverty and Disadvantage. New Delhi: Concept
8. Sen, A. & Sen A.K. (Eds.). (1998). Challenges of contemporary Realities: A psychological Perspective. New Delhi: New Age International
9. Srinivas, M.N. (1966). Social change in modern India. Bombay: Allied.

SEMESTER-VI

C:13-COUNSELING PSYCHOLOGY

(Credits:6, Theory-4, Practical-2) Lectures:
60 (Theory:40, Practical:20) Max.
Marks:100(Theory:70, Practical:30)

Introduction:

The course is designed to develop entry level counseling psychologists who will be capable of understanding and demonstrating behavior and attitudes in the basic areas of professional counseling.

Learning Objectives:

1. To help students able to understand and integrate current scientific knowledge and theory into counseling practice.
2. To make students learn the history and professional issues related to counseling psychology.
3. To help students integrate and convey information in the core areas of counseling practice.
4. To help students demonstrate professional behavior in their various roles as counseling psy³²⁹

chologists.

Expected outcomes: Students will be able to

1. Understand the purpose of counseling and practice counseling ethically following different approaches.
2. Understand the basics of counseling process and use them for counseling students, families, couples, distressed, and handicaps.

UNIT-I Basics of Counseling

(i) Meaning, scope and purpose of counseling with special reference to India; The counseling process, counseling relationship, counseling interview.

(ii) Characteristics of a good counselor, Ethics and values in counseling; Education and training of the counselor.

UNIT- II Theories and Techniques of Counseling

(i) Psychodynamic approach-Freud and Neo Freudians; Humanistic approach-Existential and Client centered. (ii) Cognitive approach- Rational-emotive and transaction analysis; Behavioral approach- Behavior modification; Indian contribution- yoga and meditation.

UNIT III Counseling Programs

(i) Working in a counseling relationship, transference and counter transference, termination of counseling relationship, Factors influencing counseling.

(ii) Student counseling, Emphases, roles and activities of the school, and college counselor.

UNIT IV Counseling application

(i) Family and Marriage Counseling, Family life and family cycle, Models and methods of family counseling.

(ii) Alcohol and drug abuse counseling; Counseling the persons with Suicidal tendencies, and Victims of Harassment and Violence.

PRACTICAL

(i) **Marital Relationship-** To assess the marital relationship of 2 couples using Lerner's Couple adjustment scale.

(ii) **Case Reporting:** To complete four case studies of high school students with problem behavior in the appropriate case record proforma.

Recommended Books

1. Burnard Philip. (1995). Counselling Skills Training A sourcebook of Activities. New Delhi: Viva Books Private Limited.
2. Dash, U.N., Dash, A.S., Mishra, H.C., Nanda, G.K. & Jena, N. (2004). Practical Exercises in Psychology: Learning about Yourself and Others. Panchasila, Bhubaneswar
3. Feltham, C and Horton, I. (2000). Handbook of Counseling and Psychotherapy. London: Sage.
4. Gibson, R.L & Mitchell M.H. (2003). Introduction to counseling and Guidance. 6th edn. Delhi: Pearson Education
5. Gladding, S.T. (2009). Counselling: A comprehensive profession (6th Ed.). New Delhi: Pearson India
6. Mishra, H.C. & Varadwaj, K. (2009). Counseling Psychology: Theories, Issues and Applications, DivyaPrakashini, Samantarapur, Bhubaneswar, Odisha

7. Misra, G. (Ed) (2010). Psychology in India, Volume 3: Clinical and Health Psychology. New Delhi: Pearson India.
8. Mohanty, N., Varadwaj, K. & Mishra, H.C. (2014). Explorations of Human Nature and Strength: Practicals in Psychology, DivyaPrakashani, Samantarapur, Bhubaneswar.
9. Nelson-Jones. (1995). The theory and practice of counseling. 2ndEdn. London: Holt, Rinehart and Winston Ltd
10. Rao, S. (2002). Counselling and Guidance (2nd Ed.). New Delhi: McGraw Hill.

C:14-POSITIVE PSYCHOLOGY

(Credits:6, Theory-4, Practical-2) Lectures:
60 (Theory:40, Practical:20) Max.
Marks:100(Theory:70, Practical:30)

Introduction:

Positive psychology is the scientific study of optimal human functioning to help people flourish. This is a foundation course in positive psychology to help students not only to understand the core themes of positive psychology, but also to equip them with the helpful positive interventions in various areas of professional psychology, such as clinical, health, education, organization and community.

Learning Objectives:

1. To help students to understand the rationale behind positive psychology.
2. To guide students to identify and analyze the key conceptual and theoretical frameworks underpinning positive psychology.
3. To encourage students to appreciate the contributions of scholars from a range of disciplines and their influence on developing a positive approach to mental health.
4. To make students understand and apply a strengths-based approach to mental health issues.

Expected outcomes: Students will be able to

1. The goal of positive psychology and the basic behavior patterns that result in positive human growth from the point of view of leading positive psychologists
2. The concepts of flow and happiness and the related theories and models explaining happiness behavior and its consequences.
3. All the precursors to positive psychology from character strength and altruism to resilience.

UNIT-I: Foundations

- (i) Historical roots and goals of positive psychology, Positive emotions, Positive Individual traits, and positive subjective experience.
- (ii) Contribution of Martin Seligman, Albert Bandura, Carol Dweck and Abraham Maslow to positive psychology

UNIT-II: Flow and Happiness

- (i) Components of flow, Conditions and mechanisms of flow, Positive and negative consequences of flow experience.
- (ii) Meaning and nature of happiness, Sources of happiness, Theories of happiness- Set-point theory, Life satisfaction and Affective state theories.

UNIT-III: Precursors to Positive Psychology

- (i) Character strength, Altruism, Hope and Optimism, Positive thinking, Resilience
- (ii) Psychology of well-being: Meaning of well-being, The well-being models, Factors affecting well-being, Promoting well-being among people

UNIT-IV: Ways to Positive Psychology

- (i) Discovering strength, Increasing optimism, Self-direction, Purpose, gratitude, Mindfulness, and Activities and experience
- (ii) Effects of exercise, Yoga, meditation and spiritual intelligence on development of positive psychology; Positive psychology in building relationship

PRACTICAL

(i) Happiness: To measure the happiness of 4 adults using Oxford Happiness questionnaire

(ii) Spiritual Intelligence: To measure the spiritual intelligence of 4 adults using Kings Spiritual Intelligence test.

Recommended Books

1. Carr, A. (2004). Positive Psychology: The science of happiness and human strength.UK: Routledge.
2. Dash, U.N., Dash, A.S., Mishra, H.C., Nanda, G.K. & Jena, N. (2004). Practical Exercises in Psychology: Learning about Yourself and Others. Panchasila, Bhubaneswar
3. Mohanty, N., Varadwaj, K. & Mishra, H.C. (2014). Explorations of Human Nature and Strength: Practicals in Psychology, DivyaPrakashani, Samantarapur, Bhubaneswar.
4. Peterson, C. (2006). A Primer in Positive Psychology; Oxford University Press
5. Seligman, M.E. (2002).Authentic Happiness: Using the New Positive Psychology to Realize Your Potential for Lasting Fulfillment: Oxford University Press
6. Seligman, M.E. (2012). Flourish:A Visionary New Understanding of Happiness and Well-being. Oxford University Press
7. Snyder, C.R. & Shane, J.L. (2005). Handbook of Positive Psychology. .Oxford University Press
8. Snyder, C.R., & Lopez,S.J.(2007).Positive psychology :The scientific and practical explorations of human strengths. Thousand Oaks, CA: Sage.

DSE-3: CONTEMPORARY APPLIED PSYCHOLOGY

(Credits:6, Theory-4, Practical-2) Lectures:
60 (Theory:40, Practical:20) Max.
Marks:100(Theory:70, Practical:30)

Introduction:

Applied psychology is the use of psychological principles and theories to overcome problems in real life situations. Mental health,organizational psychology, counseling psychology, clinical psychology, business management, education, and law are just a few of the areas that have been influenced by the application of psychological principles and findings. Some of the current areas of applied psychology include community psychology, Psychology of the disadvantaged, psychology of economic development, population psychology, gender psychology, and defense psychology. The course is designed to help students understand the application of psychology to these new fields. 332

Learning Objectives:

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Expected outcomes: Students will be able to

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UNIT-I: Community Psychology:

- (i) Definition and concept of Community Psychology; Use of small groups in social action, Arousing community consciousness, Effective strategies for social change.
- (ii) **Rehabilitation Psychology:** Primary, secondary, tertiary rehabilitation programs, Rehabilitation of physically, mentally and socially challenged persons including the old persons

UNIT-II:

- (i) **Helping the disadvantaged:** Concept of disadvantaged and deprivation, social, physical, cultural and economic consequences of disadvantaged groups, Educating and motivating the disadvantaged
- (ii) **Psychology and IT:** Psychological consequences of the developments in IT; Role of psychologists in the present scenario of IT

UNIT-III:

- (i) **Psychology in economic development:** Achievement motivation and Economic development; Characteristics of entrepreneurial behavior, Consumer rights and awareness
- (ii) **Population psychology:** Psychological consequences of population explosion and high population density; Psychosocial effects of crowding; motivating for small family norms

UNIT-IV

- (i) **Psychology of Gender:** Issues of discrimination; Glass ceiling effect, Self-fulfilling prophecy, Management of diversity
- (ii) **Defense psychology:** Psychological tests for defense personnel; Promoting positive mental health of defense personnel, Human engineering in defense

PRACTICAL

- (i) To assess the sense of gender equality of 8 college students by using Student Gender equality Questionnaire
- (ii) To assess the attitude and knowledge of 4 women towards family planning using the Family Planning Knowledge Attitude Survey Questionnaire.

Recommended Books

1. Banerjee, D. (1998). Poverty, class and health culture in India, Vol. I, Delhi Prachi Prakashan
2. Dalton, J.H. (2006). Community Psychology: Linking Individuals and Communities: :Oxford University Press
3. Dube, S.C. (1987) Modernization and Development. ND: Sage
4. Fonseca, M. (1998). Family and Marriage in India. Jaipur: Sachin

5. Mishra, G. (1990). Applied Social Psychology in India. ND: Sage
6. Mishra, G. (1999). Psychological perspectives on stress and Health. New Delhi: Concept
7. Mishra, H.C. , Mishra, G.C. & Varadwaj , K. (2014). Fundamentals of Applied Psychology, Divya Prakashani, Bhubaneswar
8. Mishra, H.C. and Misra, S. (2009). Psychology of Deviants, Divya Prakashani, Bhubaneswar
9. Mohanty, A .K. and Mishra, G. (Eds.) (2000). Psychology of Poverty and Disadvantage. New Delhi: Concept
10. Sen, A. & Sen A.K. (Eds.). (1998). Challenges of contemporary Realities: A psychological Perspective. New Delhi: New Age International
11. Srinivas, M.N. (1966). Social change in modern India. Bombay: Allied
12. Swain, S. Applied Psychology

DSE-4: RESEARCH PROJECT

(Credits:6, Theory-4, Practical-2) Lectures:
60 (Theory:40, Practical:20) Max.
Marks:100(Theory:70, Practical:30)

Introduction:

The research experience of students is greatly enriched by early exposure to conducting research. There are numerous benefits of undergraduate students who get involved in research. They are better off in understanding published works, determine an area of interest, can discover their passion for research and may start their career as a researcher. Further students will be able develop ability for scientific inquiry and critical thinking, ability in the knowledge base and communication of psychology. This course is included to promote above mentioned abilities among the students.

Learning Objectives:

1. To help students to learn how to develop scientific research designs in the study of psychology.
2. To guide students to understand the previous research in their field of interest and review them to arrive at a research problem
3. To encourage the students to learn ways to describe and measure human behavior.
4. To help students understand the logic of hypothesis testing and application of appropriate statistical analysis.
5. To make students to learn the methods of writing a research report.

Expected outcomes: Students will be able to

1. Independently prepare a research design to carry out a research project
2. Review the related research papers to find out a research problem and relevant hypotheses
3. Understand the administration, scoring and interpretation of the appropriate instrument for measurement of desired behavior
4. Learn the use of statistical techniques for interpretation of data.
5. Learn the APA style of reporting a research project.

UNIT-I: A student is required to carry out a project on an issue of interest to him / her under the guidance and supervision of a teacher. In order to do so s/he must have the knowledge in research methodology and of steps in planning and conducting a research. The supervisors may help the students to go on field study / study tour relevant to their work. Thirty hours of class may be arranged in the routine to help students understand research methodology, and planning, conduction and reporting on the research. An external examiner with the supervisor as the internal examiner will evaluate the research project on the basis of scientific methodology in writing the report, and presentation skill and performance in the viva.

Format

1. **Abstract** 150 words including problem, method and results.
2. **Introduction** Theoretical considerations leading to the logic and rationale for the present research
3. **Review-** Explaining current knowledge including substantive findings and theoretical and methodological contributions to the topic, objectives and hypotheses of the present research
4. **Method** Design, Sample, Measures, Procedure
5. **Results-** Quantitative analysis of group data (Raw data should not be attached in Appendix) Graphical representation of data wherever required. Qualitative analysis wherever done should indicate the method of qualitative analysis.

6. Discussion

7. References (APA Style) & Appendices

1. Project should be in Soft binding. It should be typed in Times New Roman 14 letter size with 1.5 spacing on one sides of the paper. Total text should not exceed 50 pages (References & Appendices extra).
2. Two copies of the project should be submitted to the College.

3. Project - American Psychological Association (APA) Publication Manual 2006 to be followed for project writing

**SYLLABUS FOR B.A. (HONORS) SANSKRIT UNDER
CHOICE BASED CREDIT SYSTEM OF UTKAL UNIVERSITY,
BHUBANESWAR**

1st YEAR

SEMESTER-I

CC- 1 MORAL TEACHINGS AND BASICS OF SANSKRIT

1. *Hitopodeśa Mitralabha* (From *Kathāmukha* to *Gr̥dhravidalakatha*) 30Marks
2. *Yaksaprasna of Mahabharata*(*Aranyakaparva, ch.313*
from Verses no. 41 to 133) 30Marks
3. *Śabdarupa&Dhaturupa* 20 Marks

('a' karanta, 'i' karanta, 'ī'karanta, 'u'karanta, 'ū' karanta, 'in' bhaganta, Mātr̥, Pitṛ, Asmad, Yusmad, Tad(sabdarupas).Lat, Lañ, Vidhiliñ, Lṛt, Lot and Litlkaras dPath, Ni, Kṛ, Sev, Han, Pā, Dā, Śru, Śī and Krīñ in the form of Ātmanepada, Parasmaipada or Ubhayapada whichever is applicable. (Dhaturupas)

- Unit-I & II *HitopodeśaMitralabha* (From *Kathamukha* to *Gr̥dhravidalakatha*) 30 Marks
- Long Questions -1 15 Marks
- Short Questions -3 5×3=15 Marks
- Unit-III & IV *Yaksaprasna of Mahabharata* 30 Marks
- Long Questions-1 15 Marks
- Explanation - 1 8 Marks
- Translation of a textualVerse 7 Marks

- Unit-V *Śabdarupa&Dhaturupa* 20 Marks
- Śabdarupa* - 5 2×5= 10 Marks
- Dhaturupa* - 5 2×5= 10 Marks

Books for Reference:

3. *Hitopadesah*(*Mitralabhah*) (Ed.) Kapildev Giri, Chaukhamba Publications, Varanasi.
4. *Hitopadesah* (*Mitralabhah*) (Ed.) N.P. Dash and N.S. Mishra, Kalyani Publishers, New Delhi
5. *Vyakaranadarpana*, The Odisha State Bureau of Text Book Preparation and Production, Bhubaneswar, 2013
6. Critical edition of the *Mahabharata*, (Ed.) V.S. Sukthankar, BORI, Pune
7. *Mahabharata*, Gitapress, Gorakhpur (Prescribed Text)
8. *Yaksaprasna*, T. K. Ramaayiyar, R. S. Vadhyar & Sons. Palkad, Kerala

CC-2 . DRAMA-I & HISTORY OF SANSKRIT LITERATURE - I

1. *Abhijnanasakuntalam* (Act I-IV) 50 Marks
2. *History of Sanskrit Literature-I* 30 Marks

(*Ramayana, Mahabharata*, General out lines of *Puranas* and Sanskrit Drama)

1. **Abhijnanasakuntalam (Act I-IV)**

Unit-I	Long Questions -1	14 Marks
Unit- II	Short Questions -2	7×2=14 Marks
	Explanation of Verse- 1	8 Marks
Unit-III	Textual Grammar	14 Marks
	i) <i>Sandhi</i>	1×2= 2 Marks
	ii) <i>Prakṛti- Pratyaya</i>	2×2= 4 Marks
	iii) <i>Karaka&Vibhakti</i>	2×2= 4 Marks
	iv) <i>Samasa</i>	2×2= 4 Marks

2. **History of Sanskrit Literature-I**

30 Marks

Unit- IV *Ramayana & Mahabharata*

Long Questions -1	10 Marks
Short Questions -1	05 Marks

3. **General Outlines of Puranas and Sanskrit Drama**

Unit- V General Outlines of *Puranas* and Sanskrit Drama

(Defination and Classification of *Puranas*, Bhasa, Kalidasa, Sudraka, Visakhadatta, Bhavabhuti, Bhattanarayana)

Long Questions -1	10 Marks
Short Questions -1	05 Marks

Books for Reference:

1. *Abhijnanasakuntalam* (Ed.) R.M. Bose, Modern Book Agency Pvt. Ltd., 10 BankimChatterjee Street, Calcutta
2. *Abhijnanasakuntalam* (Ed.) M.R. Kale, Motilal Banarsidass Publishers Pvt. Ltd., NewDelhi-11007, 8th Reprint-2010
3. *Abhijnanasakuntalam* (Ed.) R.M Mohapatra, Books & Books, Cuttack
4. *Abhijnanasakuntalam* (Ed.) H.K. Satapathy, Students Store, Cuttack
4. *History of Sanskrit literature*, Baladev Upadhyay, Chaukhamba Publications, Varanasi.
5. *Sanskrit Drama*, A.B.Keith, Oxford University Press, London
6. *Samskrta Sahiytara Itihasa*, (Odia) H.K. Satapathy, Kitab Mahal, Cuttack- 753003.

SEMESTER-II

CC - 3 DRAMA - II & DRAMATURGY

1. *Abhijnanasakuntalam* (Acts V-VII) 50 Marks

2. *Dramaturgy* 30 Marks

(*Nandi, Prastavana, Purvaranga, Pancha-arthaprakṛti, Panchasandhi, Pancha-arthopaksepaka, Natika, Prakarana.*)

1. **Abhijnanasakuntalam (Acts V-VII)**

Unit-I	Long Questions - 1	14 Marks
Unit- II	Short Questions - 2	8×2= 16 Marks
Unit-III	i) Explanation of Verse- 1	8 Marks
	ii) Verse/ Dialogue Translation-1	7 Marks
	iii) Translation from Prakṛit to Sanskrit	5 Marks

2. Dramaturgy (Sahityadarpana, Chapter- VI)	30 Marks
Unit-IV	
Nandi, Prastavana, Purvaranga, Nataka, Prakarana, Pancasandhi	
Short Notes on any three	5× 3= 15 Marks
Unit-V	
Panca - arthaprakrti and Panca- arthopaksepaka	
(Short Notes on any three))	5×3= 15Marks

Books for Reference:

4. *Abhijnanasakuntalam* (Ed.) R.M. Bose, Modern Book Agency Pvt. Ltd., 10 BankimChatterjee Street, Calcutta
5. *Abhijnanasakuntalam* (Ed.) M.R. Kale, Motilal Banarsidass Publishers Pvt. Ltd., NewDelhi-11007, 8th Reprint-2010
6. *Abhijnanasakuntalam* (Ed.) R.M.Mohapatra, Books &Books , Cuttack
4. *Abhijnanasakuntalam* (Ed.) H.K. Satapathy, Students Store, Cuttack
4. For Dramaturgy- *Sahitya Darpana* (Ed.) P.V.Kane, Motilal Banarsidass Publishers Pvt. Ltd., New Delhi
5. *Odia Translation of Sahityadarpana* by Narayana Mohapatra, Odisha Sahitya Academy, Bhubaneswar.
6. *Sahitya Darpana* with Laksmi Tika (Sanskrit) and Vimala Tika, (Hindi) (Ed.) K.M.Sastri, Chaukhamba Publications, Varanasi.
7. *Sahityadarpana* evam Chanda (Ed.) Dr. Braja Sundar Mishra, Satyanarayan Book Store, Cuttack
9. *Sahityadarpanao Chanda* (Ed.) Niranjan Pati, Vidyapuri, Cuttack

CC- 4 AN INTRODUCTION TO THE TECHNIQUE OF PANINIAN GRAMMAR & PROSODY

1. **Vocabulary relevant to Sanskrit Grammar and Arrangement of Paninian Grammar** 15 Marks
2. **Samjna-prakaranam** 45 Marks
3. **Chanda** 20 Marks

1. Vocabulary relevant to Sanskrit Grammar and Arrangement of Paninian Grammar

Unit- I 15 Marks

(Astadyayi, Siddhantakaumudi, Ganapatha, Dhatupatha, Dhatu, Antaranga, Bahiranga, Apavada, Agama, Adesa, Nadi, Nistha, Krdanta, Taddhita, Tinanta, Nijanta, Sananta, Yananta, Namadhatu, Vikarana, Luk, Lopa, Sarvadhataka, Ardhadhataka, ti & Upadha = 26)

Short Notes on any – 5 3×5= 15Marks

2. Samjnaprakaranam 45Marks

Unit- II Two Sutras / Vrttis out of 1st 10 Sutras (Upto *tulyasyaprayatnam savarnam*) to be explained. 7½ ×2=15 Marks

Unit- III Two Sutras / Vrttis out of 2nd 10Sutras (From *a a* upto *cadayo'sattve*) to be explained. 7½ ×2= 15 Marks

Unit- IV Two Sutras / Vrttis out of rest Sutras (From *pradayah* upto *dirgham ca*) to be explained. 7½ ×2= 15 Marks

3. Chanda (Prosody)-Srutabodhah

20Marks

Unit- V Definition and Examples of 4 Chandas - out of 7

5×4=20 marks

(Chandas such as -: Arya, Anustubh, Indravajra, Upendravajra, Upajati, Vamsastha, Vasantatilaka, Mandakranta, Malini, Shikharini, Shardula-vikridita, Sragdhara.)

Books for Reference:

1. Siddhanta-kaumudi with Balamanorama and Tattvabodhini, Vol.I (Ed.) Giridhara Sharma Chaturveda, Motilal Banarsidass
2. Siddhanta-kaumudi with Mitabhasini Com., (Ed.) S.R. Ray, Sanskrit Pustak Bhandar, 38 Cornwallis St., Calcutta
3. Siddhanta-kaumudi with Eng Tr. (Ed.), S.C. Basu, Motilal Banarsidass, New Delhi-110007, Rpt-1995
4. Vaiyakarana Siddhanta Kaumudi (Ed.) M.V. Mahashabde, Dadar Book depot, Bombay.
5. Siddhanta-kaumudi (Ed.) Prof. G.K. Dash & Dr(Mrs) K.Dash with Navanita tika, A.K.Mishra Publishers Pvt. Ltd, Cuttack.
6. Siddhanta-kaumudi (Ed.) Minati Mishra, Vidyapuri, Cuttack
7. Siddhanta-kaumudi (Ed.) Dr. Niranjana Pati, Kalyani Publishers, New Delhi
8. Siddhanta-kaumudi (Ed.) P.R.Ray, Sailabala Womens College, (Skt.Deptt.) Cuttack.
9. Vyakaranadarpana, The Odisha State Bureau of Text Book Preparation and Production, Bhubaneswar- 2013
10. Shrutabodha, Hari Prasad Sharma, Nirnaya Sagar Press
11. Sahityadarpana Evam Chhanda (Ed.) Dr. Brajasundar Mishra, Satyanarayana Book Store, Cuttack.

2nd YEAR

SEMESTER-III

CC-5 POETRY & HISTORY OF SANSKRIT LITERATURE- II

1. Meghadutam- (Purvamegha) 50 Marks
 2. History of Sanskrit Literature-II 30 Marks
- (Gitikavyas, Khandakavyas, Gadyakavyas and Kathasahitya)

1. Meghadutam- (Purvamegha) 50 Marks

- Unit-I Long Questions - 1 15 Marks
- Unit- II Short Questions - 2 7 ½ × 2 = 15 Marks
- Unit-III i) Explanation of One Verse 12 Marks
- ii) Translation of One Verse 8 Marks

2. History of Sanskrit Literature-II 30 Marks

- Unit-IV (Gitikavyas & Khandakavyas)
- Long Questions -1 10 Marks
- Short Questions -1 05 Marks
- Unit- V (Gadyakavyas, Kathasahitya)
- Long Questions -1 10 Marks
- Short Questions -1 05 Marks

Books for Reference:

1. *Meghadutam* (Ed.) S.R. Ray, Sanskrit Pustak Bhandar, 38 Cornwallis St., Calcutta
2. *Meghadutam* (Ed.) M.R. Kale, Motilal Banarsidass, Delhi
3. *Meghadutam* (Ed.) Radhamohan Mahapatra, Books and Books, Vinodvihari, Cuttack, 1984
4. *Meghadutam* (Ed.) Dr. Braja Sundar Mishra, Vidyapuri, Cuttack, 1st Edn-1999
5. *Samskrta Sahitya ka Itihasa*, Baladeva Upadhyaya, Choukhamba, Varanasi.
6. *Samskrta Sahitya ka Ruparekha*, Vacaspati Goreilla, Choukhamba Vidyabhavan, Varanasi.
4. *Samskrta Sahitya Itihasa*, H.K. Satapathy, Kitab Mahal, Cuttack
5. *Samskrta Sahitya Itihasa*, Text Book Bureau, Govt. of Odisha, Bhubaneswar

CC-6 META - RULES OF PANINIAN GRAMMAR, POETICS & FIGURES OF SPEECH

1. *Paribhasaprakaranam of Siddhantakaumudi* 30 Marks
2. *Sahityadarpanah(Ch.I &II)* 30 Marks
3. *Sahityadarpanah (Selected Alamkaras from Ch.X)* 20 Marks

1. **Paribhasaprakaranam** 30 Marks
Unit- I Four *Sutras* to be explained. 5×4= 20 Marks
Unit- II Two *Vrttis/ Vartikas* to be explained. 5×2= 10 Marks

2. Poetics

- Unit- III *Sahityadarpana Ch. I*
Long Questions -1 10 Marks
Short Questions -1 05 Marks
- Unit- IV *Sahityadarpana Ch. II (Vakya, Pada, Abhidha, Laksana, Vyanjana)*
Long Questions -1 10 Marks
Short Questions -1 05 Marks

3. Figures of speech (without Sub-division)

- Unit- V *Sahityadarpana(Ch.X)* 5×4= 20 Marks

(Alamkarassuch

as *Anuprasa, Yamaka, Slesa, Upama, Rupaka, Utpreksa, Bhrantiman, Nidarsana, Arthantaranyasa, Aprastuta-prasamsa, Apahnuti, Vyatireka, Vibhavana, Visesakti, Samasakti, Svabhavokti*)

Definition and Examples of **Four Alamkaras** (figures of speech) out of **seven**.

Books for Reference:

1. *Siddhanta-kaumudi* with Balamanorama and Tattvabodhini, Vol.I (Ed.) Giridhara Sharma Chaturveda, Motilal Banarsidass
2. *Siddhanta-kaumudi* with Mitabhasini Com., (Ed.) S.R. Ray, Sanskrit Pustak Bhandar, 38 Cornwallis St., Calcutta
3. *Siddhanta-kaumudi* with Eng Tr. (Ed.), S.C. Basu, Motilal Banarsidass, New Delhi-110007, Rpt-1995
4. *Vaiyakarana Siddhanta Kaumudi* (Ed.) M.V. Mahashabde, Dadar Book depot, Bombay.
5. *Siddhanta-kaumudi* (Ed.) Prof. G.K. Dash & Dr(Mrs) K.Dash with Navanita tika, A.K. Mishra Publishers Pvt. Ltd, Cuttack.

4. Siddhanta-kaumudi (Ed.) Minati Mishra, Vidyapuri, Cuttack
5. Siddhanta-kaumudi (Ed.) Dr. Niranjan Pati, Kalyani Publishers, New Delhi
6. Siddhanta-kaumudi (Ed.) P.R.Ray, Sailabala Womens College,(Skt.Deptt.) Cuttack.
7. Sahitya Darpana (Ed.) P.V. Kane, Motilal Banarsidass Publishers Pvt. Ltd., New Delhi
8. Odia Translation of Sahityadarpana by Narayana Mohapatra, Odisha Sahitya Academy, Bhubaneswar.
9. Sahitya Darpana with Laksmi Tika (Sanskrit) and Vimala Tika, (Hindi) (Ed.) K.M. Sastri, Chaukhamba Publications, Varanasi.
10. Sahityadarpana evam Chhanda (Ed.) Braja Sundar Mishra, Satyanarayan Book Store, Cuttack
11. Sahityadarpana o Chhanda (Ed.) Niranjan Pati, Vidyapuri, Cuttack
12. Samskrta Kavyatattva Vicara, Ketaki Nayak, Odisha Text Book Bureu, Bhubaneswar.

CC-7 CASES AND CASE ENDINGS IN PANINIAN GRAMMAR & TRANSLATION - I

1. *Siddhantakaumudi(Karaka-Vibhakti I-IV)* 50 Marks
2. Translation from Sanskrit unseen passage to Odia/ English 30 Marks

1. *Siddhantakaumudi(Karaka-Vibhakti I-IV)* 50 Marks

- Unit- I & II (*Prathama&Dvitiya*)
 Four *Sutras/ Vrtti/ Vartika* to be explained. 5×4= 20 Marks
- Unit- III (*Trtiya*)
 Two *Sutras/ Vrtti/ Vartika* to be explained 5×2= 10 Marks
- Unit- IV (*Caturthi*)
 Four *Sutras/ Vrtti/ Vartika* to be explained. 5×4= 20 Marks
- Unit -V *Translation from Sanskrit unseen passage into Odia/ English*
 One unseen Sanskrit Passage is to be given for Translation into Odia/ English
 (At least 10 sentences) 10×3= 30 Marks

Books for Reference:

1. Siddhanta-kaumudi with Balamanorama and Tattvabodhini, Vol.I (Ed.) Giridhara Sharma Chaturveda, Motilal Banarsidass
2. Siddhanta-kaumudi with Mitabhasini Com., (Ed.) S.R. Ray, Sanskrit Pustak Bhandar, 38 Cornwallis St., Calcutta
3. Siddhanta-kaumudi with Eng Tr. (Ed.), S.C. Basu, Motilal Banarsidass, New Delhi- 110007, Rpt-1995
4. Vaiyakarana Siddhanta Kaumudi (Ed.) M.V. Mahashabde, Dadar Book depot, Bombay.
5. Siddhanta-kaumudi (Ed.) Prof. G.K. Dash & Dr(Mrs) K.Dash with Navanita tika, A.K. Mishra Publishers Pvt. Ltd, Cuttack.
6. Siddhanta-kaumudi (Ed.) Minati Mishra, Vidyapuri, Cuttack
7. Siddhanta-kaumudi (Ed.) Dr. Niranjan Pati, Kalyani Publishers, New Delhi
8. Siddhanta-kaumudi (Ed.) P.R.Ray, Sailabala Womens College,(Skt.Deptt.) Cuttack.
9. *Vyakaranadarpana*, The Odisha State Bureau of Text Book Preparation and Production, Bhubaneswar- 2013
A Guide to Sanskrit Composition and Translation, M.R.Kale, Motilal Banarsidass, New Delhi
11. *Brhat Anuvada Candrika*, Chakradhara Hamsa Nautial Shastri, Motilal Banarsidass, New Delhi

CC-8 INSCRIPTIONS , UPANISAD&BHAGAVADGITA

1. Incriptions	30 Marks
2. Kathopanisad(Vallis-I,II&III)	30 Marks
3. Bhagavadgita (Chap.XV)	20 Marks

1. Incriptions	30 Marks
(Girnar inscription of Rudradaman, Allahabad Stone Pillar Inscription of Samudragupta and Mandasore Inscription of Yasodharman)	
Unit- I Long Questions -1	15 Marks
Unit- II Short Questions -3	5×3= 15 Marks

2. Kathopanisad(Adhyaya I, Vallis-I,II&III)	30 Marks
Unit- III Long Questions -1	15 Marks
Unit- IV i) Explanation - 1 Mantra	08 Marks
ii) Translation- 1 Mantra	07 Marks
3. Bhagavadgita(Ch.XV)	20 Marks
Unit- V Long Questions -1	12 Marks
Translation- 1 Verse	08 Marks

Books for Reference:

1. *Selected Sanskrit Incriptions* (Ed.) D.B. Pusalkar, Classical Publishers, New Delhi
2. *Abhilekhamala* (Ed.) Sarojini Bhuyan, Cuttack
3. *Abhilekhamala* (Ed.) Sujata Dash, Cuttack
4. *Abhilekhamala* (Ed.) Jayanta Tripathy, Vidyapuri, Cuttack
5. *Isadi Nau Upanisad* with Sankarabhasya - Gita Press, Gorakhpur
6. *Kathopanisad* with *Sankarabhasya*(Ed.) V.K. Sharma, Sahitya Bhandar, SubhasBazar, Meerut
7. *The Message of the Upanisad* , Swami Ranganathananda, Bharatiya VidyaBhavan,K.M. Munsii Marg Mumbai.
8. *Shrimad-bhagavad-gita* (Ed.) S. Radhakrishnan, Bharatiya Vidya Bhavan
9. *Shrimad-bhagavad-gita* (Ed.) Gambhirananda, Ramakrishna Mission
10. *Shrimad-bhagavad-gita*, Gita Press, Gorakhpur

CC-9 CASE AND CASE ENDINGS OF PANINIAN GRAMMAR, TRANSLATION- I IAND LEXICON

1. Siddhantakaumudi(Karaka-Vibhakti V-VII)	40 Marks
2. Translation of an unseen Odia/ English passage into Sanskrit	30Marks
3. Amarakosa	10 marks

1. Siddhantakaumudi(Karaka- Vibhakti V-VII)	
Unit-I (CASE-V) Answer any two Sutras/ Vrtti/ Vartika	5×2= 10 Marks
Unit-II (CASE-VI) Answer any four Sutras/ Vrtti/ Vartika	5×4= 20 Marks
Unit-III (CASE-VII) Answer any two Sutras/ Vrtti/ Vartika	5×2= 10 Marks
2. Translation- II	30 Marks
Unit-IV	30 Marks

One unseen Passage of Odia is to be translated into Sanskrit.

(At least Ten sentences)

3. Amarakosa (Devata, Svarga, Visnu, Laksmi, Durga, Surya, Brahma,Siva, Kartikeya, Ganesa, Sarasvati from Svargavarga)

Unit- V Answer any Two Questions s 5×2= 10 Marks

Books for Reference:

1. Siddhanta-kaumudi with Balamanorama and Tattvabodhini, Vol.I (Ed.) Giridhara Sharma Chaturveda, Motilal Banarsidass
2. Siddhanta-kaumudi with Mitabhasini Com., (Ed.) S.R. Ray, Sanskrit Pustak Bhandar, 38 Cornwallis St., Calcutta
3. Siddhanta-kaumudi with Eng Tr. (Ed.), S.C. Basu, Motilal Banarsidass, New Delhi-110007, Rpt-1995
4. Vaiyakarana Siddhanta Kaumudi (Ed.) M.V. Mahashabde, Dadar Book depot, Bombay.
5. Siddhanta-kaumudi (Ed.) Prof. G.K. Dash & Dr(Mrs) K.Dash with Navanita tika, A.K. Mishra Publishers Pvt. Ltd, Cuttack.
6. Siddhanta-kaumudi (Ed.) Minati Mishra, Vidyapuri, Cuttack
7. Siddhanta-kaumudi (Ed.) Dr. Niranjan Pati, Kalyani Publishers, New Delhi
8. Siddhanta-kaumudi (Ed.) P.R.Ray, Sailabala Womens College,(Skt.Deptt.) Cuttack.
9. *Vyakaranadarpana*, The Odisha State Bureau of Text Book Preparation and Production, Bhubaneswar- 2013
10. *A Guide to Sanskrit Composition and Translation*, M.R.Kale, Motilal Banarsidass, New Delhi
11. *Brhat Anuvada Candrika*, Chakradhara Hamsa Nautial Shastri, Motilal Banarsidass, New Delhi
12. *Namalinganuasanam (Amarakosa)*, D.G. Padhye et al. Choukhamba Sanskrit Series, New Delhi
13. *Amarakosa* with Ramasrami tika, Choukhamba Sanskrit Series office, Varanasi

CC-10 ORNATE PROSE & PROSE WRITING

- | | |
|--|-----------------|
| 1. <i>Dasakumaracaritam</i> (<i>Purvapithika, Dvitiya Ucchvasa</i>) | 25 Marks |
| 2. <i>Sukanasopadesa</i> | 25 Marks |
| 2. <i>Essay in Sanskrit</i> | 20 Marks |
| 3. <i>Expansion of Idea in Sanskrit</i> | 10 Marks |
| 1. <i>Dasakumaracaritam</i>(<i>Purvapithika Dvitiya Ucchvasa</i>) | 25 Marks |
| Unit-I Long Questions – 1 | 15 Marks |
| Unit-II Short Questions – 2 | 5×2=10Marks |
| 2. <i>Sukanasopadesa</i> | 25 Marks |
| Unit-III One Long Question | 15 Marks |
| Unit-IV One Explanation | 10Marks |
| 3. <i>Essay in Sanskrit</i> | 20 Marks |
| Unit-V Essay in Sanskrit (One) | 20 Marks |
| 4. <i>Expansion of Idea in Sanskrit</i> | 10 Marks |
| Expansion of Idea in Sanskrit- One | 10 Marks |

Books for Reference:

1. *Dasakumaracarita* (Ed.) M.R. Kale, Motilal Banarsidass, Delhi
2. *Dasakumaracarita*, Chaukhamba Publications, Varanasi.
3. *Samskrta-nibandha-shatakam*, Kapila Dev Dvivedi
4. *Brhat Anuvada Shiksha*. Chakradhara Hansa Nautiyal, MLBD, Delhi
5. *Samskrta-nibandhadarshah*, Ramamurti Sharma, Sahitya Niketan, Kanpur
6. *Sukanasopadesa*, (Ed.) Ramakanta Jha, Choukhamba Vidyabhavan, Varanasi
7. *Sukanasopadesa* (Ed.) Nimal Sundar Mishra, Kalyani Publishers, New Delhi
8. *Kadambari (Purvardham)* with the Com. of Bhanuchandra Siddhanjani, MLBD, New Delhi

3rd YEAR**SEMESTER-V****CC-11 ORNATE POETRY IN SANSKRIT & HISTORY OF SANSKRIT LITERATURE -III**

1. <i>Sisupalabadham</i> (Canto-I Verses 01-48)	30 Marks
2. <i>Kiratarjuniyam</i> (Canto-I)	30 Marks
3. History of Sanskrit literature- III (<i>Mahakavya and Campu</i>).	20 Marks
1. <i>Sisupalabadham</i> (Canto-I Verses 01-48)	30 Marks
Unit-I Long Questions -1	15 Marks
Unit- II i) Explanation of One Verse	10 Marks
ii) Translation of One Verse	05 Marks
2. <i>Kiratarjuniyam</i> (Canto-I)	30 Marks
Unit-III Long Questions -1	15 Marks
Unit- IV i) Explanation of One Verse	10 Marks
ii) Translation of One Verse	05 Marks
3. <i>History of Sanskrit literature- III (Mahakavya and Campu)</i>	20 Marks
Unit- V i) Long Questions -1	12 Marks
ii) Short Notes- 2	4×2= 8 Marks

Books for Reference:

1. *Sisupalabadham* (Ed.) S.R. Ray/ Vallabhatika, Bharatiya Vidya Prakashan, New Delhi.
2. *Sisupalabadham - Canto-I* (Ed.), Devanarayan Mishra, (With *Sarvankasa-tika* of Mallinatha) Sahitya Bhandar, Meerut
3. *Kiratarjuniyam* (Cantos I-III) (Ed.) M.R. Kale, Motilal Banarsidass Publishers Pvt. Ltd., Delhi, 4th Edn-1966, Rpt-1993
4. *Kiratarjuniyam* (Canto- I) (Ed.) Niranjan Pati, Vidyapuri, Cuttack.
4. *History of Sanskrit Literature*, H.R. Agarwal, Mohanlal Munsiram, Delhi
5. *History of Indian Literature* (Vol. III) M. Winternitz, Motilal Banarsidass Publishers Pvt. Ltd.

CC- 12 VEDA,VEDIC GRAMMAR & HISTORY OF VEDIC LITERATURE

1. *Vaidika Suktas* 30 Marks
2. *Vedic Grammar* 20 Marks
3. *History of Vedic Literature* 30 Marks

1. *Veda* 30 Marks

Vedic Suktas from different *Samhitas*

Agni (RV- I.1), Indra (RV- II.12) , Savitr (RV- I.35), Usas (RV- I.48), Purusa-sukta (YV XXXI.1.16), Siva-samkalpa (YV-XXX.1.6), Samjnana(RV X.191), Vak(RV X.125)

- | | | |
|----------|--|------------------------------|
| Unit-I | i) Long Questions -1 | 12 Marks |
| | i) Explanation - 1 Mantra | 08 Marks |
| Unit- II | i) Translation -1 Mantra | 05 Marks |
| | ii) Grammar from the text- 2 Questions | 2 ^{1/2} ×2=05 Marks |

2. *Vedic Grammar* 20 Marks

The following Sutras are to be taught:

Chandasi pare'pi, Vyavahitasca, Caturthyarthe bahulam chandasi, Chandasi lun-lan-litah, Linarthe let,Leto'datau, Sibbahulam leti, Itasca lopah parasmaipadesu, Sa uttamasya, Ata ai, Vaito'nyatra, Hr-grahor bhaschandasi, Chandasi ubhayatha, Tumarthe se-sen-ase-asen- kse-kasen-adhyai-adhyain-kadhyai-kadhyain-shadhyai-shadhyain-tavai-taven-tavenah, Va chandasi, Ses chandasi bahulam, Prakrtya'ntapadam avyapare, Nipatasya ca, Supam suluk purva-savarnac che-ya-da-dya- ya-jalah, Idanto masi, Ajjaserasuk, Dirghadati samanapade

- | | | |
|-----------|--------------------------------|--------------|
| Unit- III | Two sutras to be explained | 5×2=10Marks |
| | Two <i>sadhanas</i> to be done | 5×2=10 Marks |

3. *History of Vedic Literature* 30Marks

(*Samhita, Brahmana, Aranyaka, Upanisad*)

- | | | |
|---------|---------------------|------------------|
| Unit-IV | Long Questions -1 | 15 Marks |
| Unit- V | Short Questions - 2 | 7 ½ ×2= 15 Marks |

Books for Reference:

1. *New Vedic Selection* (Part-I) (Ed.) Telang and Chaubey, Bharatiya Vidya Prakashan, NewDelhi
2. *Veda O Vaidika Prakarana*,(Ed) Niranjan Pati, Vidyapuri, Cuttack.
- 3.*History of Indian Literature* Vol. I, M.Winternitz, MLBD, New Delhi
4. *Vaidika Sahitya aur Samskriti*, Baladeva Upadhyaya, Chaukhamba, Varanasi
- 5.*Vaidik sahyaki Ruparekha*,Umashankar Sharma Rsi,Chawkhamba Vidyaprkashan, Varanasi
6. *Vaidika sahyta o Samskriti* , A.C. Das, Grantha Mandira, Cuttack
7. *Vaidika Sahitya O Samskriti*, Bholanath Rout, Chitrotpala Publication, Salipur

SEMESTER-VI

CC-13 ARTHASASTRA, DHARMASASTRA AND AYURVEDA

1. *Arthasastra* (*Vinayadhikarana* Ch., II - VIII) from *Vidyasamuddesa* to *Amatyotpatti*. 30Marks
2. *Manusmṛti* (Chap- II. Verses from 1 to 52) 30 Marks
- 3.*Ayurveda* (*Carakasamhita, Dirghamjivitiyadhyaya*-Verses 53-103) 20 Marks
1. *Arthasastra* (*Adhikarana* I. II–VIII) 30 Marks

Unit I & Unit- II *Arthasastra* from the beginning up to *Vinayadhikarana, Adhikarana* I.1-4 Short Notes-4 7½ ×4= 30 Marks

2. Manusmṛti (Chap- II. Verses from 1 to 52)	30 Marks
Unit- III & IV Manusmṛti Chap.II, Verses 1-52	
Short Notes-4	7½ ×4=30 Marks
3.Ayurveda (Carakasamhita, Dirghajivitiyadyaya-Verses 53-103)	20 marks
Unit- V Long Questions -1	10 Marks
Short Questions -2	5 ×2= 10 Marks

Books for reference:

1. *Kautilya Arthashastra*, (Ed. &Trans.) R.P. Kangle, 3 Vols., Motilal Banarsidass, New Delhi
2. *TheArthashastra*. (Ed.& Trans),L.N. Rangarajan, Penguin Classics, India, 1992
3. *TheArthashastra*. (Ed.) N.P. Unni, Bharatiya Vidya Prakashan, New Delhi
4. *Arthashastra* (Odia Trans.) Anantarma Kar, Odisha Sahitya Academy, Bhubaneswar
 - *Manu's Code of Law: A Critical Edition and Translation of the Mānava-Dharmaśāstra*.(Ed. Olivelle, Patrick, Oxford: Oxford University Press
 - *Kautilya Arthashastra*, (Ed.) Vachaspati Gairala, Chaukhamba publication,Varansi
7. *Manusmṛti*, (Ed.) Braja Kishor Swain, Sadgrantha Niketan, Srimandira,Puri
8. *The Charaka Samhita*, (Trans.) A.C. Kaviratna and P. Sharma, 5 Vols., Indian Medical Science Series, Sri Sadguru Publications, a division of Indian Books Centre, Delhi 81
9. *Caraka-Samhitā: Agniveśa's Treatise Refined and annotated byCaraka and Redactedby Drdhabala* (text with English translation), Sharma, P. V. , Chaukhambha Orientalia, 1981--1994.
10. *Agniveśa's Caraka Samhitā* (Text with English Translation & Critical Exposition Based on Cakrapāṇi Datta's Āyurveda Dīpikā), R.K. Sharma & Bhagwan Dash, Chowkhamba Sanskrit Series Office, 1976--2002. Another good English translation of the whole text, with paraphrases of the commentary of Cakrapānidatta.

CC – 14 TECHNICAL LITERATURE IN SANSKRIT (JYOYISA & VASTU)

1. Jyotisa (Jyotihsara-ratnavali, Chap I)	40 Marks
(Graha-naksatra-paricaya-prakaranam)	
2. Vastu (Vasturatnakara, Chap-I)	40 Marks
(Bhuparigraha-prakaranam)	
1. Jyotisa	40 Marks
Unit-I,II& III Four Questions	10×4= 40 Marks
2. Vastu	40 Marks
Unit-IV & V Four Questions	10 ×4= 40 Marks

Books for Reference:

1. *Jyotihsara-ratnavali*(Part-I) (Ed.) Pandit Baikoli Mahapatra, Radhakrishna Pustakalaya, Satyanarayan Temple Road, Berhampur,Ganjam,Odisha
2. *Vasturatnakar* (Ed.) Vindhreshwari Prasad Dwivedi, Chowkhamba Krishnadas Academy, Varanasi

DETAILS OF ABILITY ENHANCEMENT COMPULSORY COURSE (AECC)

50 Marks /02 Credits each

SEMESTER-II

AECC-2 M.I.L.(SANSKRIT) (10 Mid+40 End) 02 Credits

M.I.L. (ALTERNATIVE SANSKRIT) 40 Marks 3 Credits

UNIT- I : SANSKRIT PROSE

10 Marks

- Shri-bhojarajasya rajyapraaptih* from the text *Bhojaprabandhah, Samskrta Pravesa*, Utkal University
- Yasya bhavah tasya devah* from the text *Madhurah kathah*, Samskrtabharati, Bangaluru
- Ambarisha-charitam, Samskrta pravesa*, Utkal University

2 Questions to be answered out of 4 asked

5 ×2= 10 Marks

UNIT-II: SANSKRIT POEMS (The following Poems)

10 Marks

1. *Canakyanitih* 3rd Chapter from the text *Chanakya-niti-darpanah*, Swami JagadishaParananda Saraswati, Vijaya Kumar Govindaram Ashananda, 4408, Newsadak, Delhi- 110006, 2014. (Prescribed Text)
2. *Raksa raksa bharamam* by Prof. Srinivasa Rath from the Anthology *Tadeva gaganam saiva dhara*, Rashtriya Sanskruta Samsthan, New Delhi, 1995
3. *Samyogah* by Prof. Radhavallabh Tripathi, from the Anthology *Kavyagodavari*, (Ed.)P.K. Mishra, Rashtriya Sanskrit Sansthan, New Delhi, 2011
4. *Krusakasyakatha (Verses 1-15)* by Prof. Prafulla Kumar Mishra from the anthology *Kavita bhuvanesvari*, P.G. Dept. of Sanskrit, Utkal University, Vanivihar, Bhubaneswar
5. *Jangama-dura-bhasini* by Sri Sundararaja from the anthology *Kavita bhuvanesvari*, P.G. Dept. of Sanskrit, Utkal University, Vanivihar, Bhubaneswar
6. *Dhanurbhanga* by Sri Bhubaneswar Kar, from the anthology *Kavya-vaitarani*, Vidyapuri, Cuttack
7. *Arunapranamah (Verses 10-21 of Kargil Kavyam)* by Dr. Braja Sundar Mishra, Adisaila Publications, Kendrapada, 2008.

2 Questions to be answered out of 4 asked

5×2= 10 Marks

UNIT-III : TRANSLATION

20 Marks

Translation from Odia/ English to Sanskrit

5 sentences to be translated out of 8 asked

4 × 5 =20 Marks

**DETAILS OF SKILL ENHANCEMENT COURSES (50 Marks /02 Credits each) (A
Students has to choose any two Papers out of these four groups namely P, Q, R & S)
Group- P YOGA (10 Mid +40 End)**

(Patanjalayogasutram ch.I sutra 1-25)		
Unit-I& II (Sutra 1-15)	03 Questions	8×3= 24 Marks
Unit-III (Sutra 16-25)	02 Questions	8×2= 16 Marks

Books for References

1. *Pātañjalayogadarśanam* (Ed.) Narayana Mishra, Choukhamba Prakashan, NewDelhi
2. *Yogasūtra of Patañjali*, (Ed.) M.R. Yardi, BORI, Poona
3. *Pātañjalayogadarśana* (Odia Tr.) Priyabratya Das, Arya samaj, Bhubaneswar

**Group- Q PRIESTLY TRAINING IN SANSKRIT LITERATURE (KARMAKĀṆḌA)
(10 Mid +40 End)**

Unit-I <i>Ācamanavidhi, Saṁkalpa, Snāna, Tarpaṇa, Aṅganyāsa</i> and <i>Karanyāsa</i>	4'2= 8 Marks
<u>Two</u> Questions s	4*2= 8 Marks
<i>Sandhyā (Gāyatrī, Prāṇāyāma), Dhyāna, mantras</i> of Gaṇeśa, Viṣṇu, Śiva, Bhāskara, Durgā, Sarasvatī and Lakṣmī	
<u>Two</u> Questions s	4*2= 8 Marks
Unit-II <i>Ṣoḍaśopacārapūjā</i>	
<u>Two</u> Questions	4*2= 8 Marks
<i>Vivāhapaddhati</i> from <i>Biharilal Karmakāṇḍa</i> –topics such as <i>Vivāha-bheda</i> (Verse 378), <i>Vivāha-lakṣaṇa</i> (416), <i>Svikaraṇavidhi</i> (417), <i>Varunapuja</i> (419)	
<u>Two</u> Questions	4*2= 8 Marks
Unit-III <i>Vivāhapaddhati</i> from <i>Biharilal Karmakāṇḍa</i> - <i>Mahāvākya</i> (422), <i>Kanyādāṇa</i> (442) <i>Hastagranthi</i> (443), <i>Lajāhoma</i> (461) and <i>Saptapadi</i> (465) <u>Two</u> Questions	

Books for References

1. *Nityakarma-pujā-prakasa*, Sriramabhabanji Mishra and Lalbihariji Mishra, Gitapress, Gorakhpur
2. *Ṣoḍaśa-upacāra*, Gitapress, Gorakhpur
3. *Biharilal Karmakāṇḍa*, Dharmagrantha Store, Cuttack

Group- R VASTU (VASTU RATNAKAR) (10 Mid +40 End)

(<i>Vastupurusa, Vastuyantra, Subhasubhavrksanirupana, Grhacchadanavyavasta, Prakosthasthananirupana, Jalasayakhodana</i>)	
Unit-I & II(<i>Vastupurusa, Vastuyantra, Subhasubhavrksanirupana, Grhacchadanavyavasta</i>)	
03 Questions.	8×3=2 4 Marks
Unit-III (<i>Prakosthasthananirupana, Jalasayakhodana</i>)	
02 Questions.	8×2=16 Marks

Books for References

1. *Vasturatnakar* (Ed.) Vindhreshwari Prasad Dwivedi, Chowkhamba KrishnadasAcademy, Varanasi
2. *Brhatsamhita* varahmihira,(Ed.) N. Chidambaram Iyer, Divine Books, New Delhi.

Group- S TRANSLATION AND EDITING SKILL

(10 Mid +40 End)

- Unit-I Anuvada Kala- 10 Marks
Translation of one Odia/ English Paragraph in to Sanskrit
- Unit-II Precises Writing- 10 Marks
One Sanskrit Paragraph is to be precised in 1/3rd words and a suitable title is to be suggested.
- Unit-III Proof Correction and Transliteration 20 Marks
i. Proof Correction-
Two wrongly printed Sanskrit Verses from the Prescribe text are to set for necessary Proof Correction- 5*2= 10 Marks
ii. Two Sanskrit Verses from Prescribe text are to be written in Roman/ Italic script with diacritical marks. 5*2= 10 Marks

Books for References

1. Samskrta Vyakaranadarpana, Odisha Text Book Bureau, Bhubaneswar

DETAILS OF THE DSE COURSES (80 Term-end + 20 Mid-Term)

(A Student has to choose two DSE Papers in 5th Semester and two DSE Papers in 6th Semester including one Project work)

SEMESTER-V (A Student has to opt two DSE papers out of Groups- A, B, C & D)

Group- A

THE SCIENCE OF VĀSTU AND VṚKṢĀ

80+20 = 100

1. Vāstuvidyā in Bṛhatsamhitā (Chap-53) 50 Marks
 2. Vṛkṣāyurveda in Bṛhatsamhitā (Chap- 52) 30 Marks
- Units I, II & III – (Vāstuvidyā in Bṛhatsamhitā) Five Questions 10*5= 50 Marks
2. Vṛkṣāyurveda in Bṛhatsamhitā (Chap- 52) 30 Marks
- Units IV & V - Three Questions 10*3= 30 Marks

Books for References

1. Bṛhatsamhitā of Varāhamihira, (Ed.) N. Chidambaram Iyer, Divine Books, New Delhi
2. Bṛhatsamhitā with Vattapaliya vivrti (Ed.) Sudhakar Dwivedi and (re-edited by) Krushnachandra Dwivedi, Sampurnananda Samskrta Viswavidyalaya, Varanasi
3. Bṛhatsamhitā (Hindi Trans.), Achyutananda Jha, Choukhamba Prakashan, Varanasi
4. Vṛkṣāyurveda in Ancient India (with original text and translation), Lallanji Gopal, Sandeep Prakashan, New Delhi
5. Vṛkṣāyurveda of Bṛhatsamhitā, (Ed.), N.P. Dash, Vidyapuri, Cuttack

Group- B

SOCIO-POLITICAL THOUGHT IN ANCIENT INDIA

80+20 = 100

1. *Yājñavalkyasmṛti* (Vyavahārādhyāya verses 1-65) 40 marks
2. *Manusmṛti* (Chap- VII Verses 1-60) 40 marks
- Units- I & II - *Yājñavalkyasmṛti* Five Short Questions 7'5= 35 marks
- Units III & IV - *Manusmṛti* Five Short Questions 7'5=35 marks
- Unit- V Translation of Two verses from the above Units 5'2= 10 marks

Books for References

1. *Yājñavalkyasmṛti*, (Ed.) M.N. Dutta, Parimal Publications, New Delhi
2. *Yājñavalkyasmṛti* (Vyavahārādhyāya), (Ed.) Kishore Chandra Mahapara, Jageswarilane, Balighat, Puri
3. *Manusmṛti*, (Ed.) Braja Kishore Swain, Sadgrantha Niketana, Puri
4. *Manu's Code of Law: A Critical Edition and Translation of the Mānava Dharmasāstra*, (Ed.) Ollivele, Patrick, Oxford University Press

Group- C

YOGA : THEORY AND PRACTICE

80+20 = 100 MARKS

1. *Pātañjalayogadarśana* (Chap-I upto Iswara) 40marks
2. *Haṭhayogapradīpikā* of Svātmārāma (Chap-II) 40marks

1. *Aṣṭāṅgayoga*

Unit-I One Long Questions 15 marks

Unit-II Two Short Questions 7.5'2= 15 marks

2. *Haṭhayogapradīpikā*

Unit-III One Long Questions 15 marks

Unit-IV Two Short Questions 7.5'2= 15 marks

Unit-V Demonstration of Two *Yogāsanas* 10'2= 20 marks

Books for References

1. *Pātañjalayogadarśanam* (Ed.) Narayana Mishra, Choukhamba Prakashan, New Delhi
2. *Yogasūtra of Patañjali*, (Ed.) M.R. Yardi, BORI, Poona
3. *Pātañjalayogadarśana* (Odia Tr.) Priyabratya Das, Arya samaj, Bhubaneswar.
4. *Hathayogapradipika*, with *jyotsna Vyakhya*, chowkhamba Sanskrit series office, Varanasi.

Group- D

TRENDS OF INDIAN PHILOSOPHY

80+20 = 100 Marks

1. *Āstikas* 45 marks
2. *Nāstikas* 35 marks

1. *Astikas*

45 marks

Unit-I *Sāṃkhya* and *Yoga*

Twenty-five elements of *Sāṃkhya* and *Aṣṭāṅgayoga* of *Yogadarśana*

Two Short Questions s

7.5'2= 15 marks

Unit-II *Nyāya-Vaiśeṣika*
Asatkāryavāda, Saptapadārthas
Two Short Questions s

7.5*2= 15 marks

Unit-III *Vedānta* and *Mīmāṃsā*
Śaktidvaya of *Māyā* in *Vedānta* and *Karma* in *Mīmāṃsā*
Two Short Questions s

7.5*2= 15 marks

2. *Nāstikas*

35 marks

Unit-IV *Nāstikas* : *Cārvāk* and *Jaina*

Yadrcchāvāda and *Nairātmyavāda* of *Cārvāka*, *Sapta-bhaṅga-nyāya* of *Jaina*

Two Short Questions s

7.5*2= 15 marks

Unit-V *Bauddhadarśana Āryasatyas*

and Eight Noble-paths

Four Short Questions s

5*4= 20 marks

Books for References

1. *History of Indian Philosophy*, S.N. Dasgupta, MLBD, New Delhi
2. *Indian Philosophy*, S. Radhakrishnan, George Allen and Unwin Ltd., New York
3. *A Critical Survey of Indian Philosophy*, MLBD, New Delhi
4. *Outlines of Indian Philosophy*, M. Hiriyana, MLBD, New Delhi
5. *Bharatiya Darshana* (Odia), Gouranga Charan nayak, The Odisha State Bureau of Text Book Preparation and Production, Bhubaneswar

SEMESTER-VI (A Student has to opt one DSE paper out of Groups- E, F, G and one project work of 100 marks)

Group- E

ETHICAL LITERATURE IN SANSKRIT

80+20 = 100 Marks

1. *Cāṅkyaṇīti* (Chaps- I, II and III from *Cāṅkyaṇītidarpaṇa*) 30 marks
 2. *Nītiśataka* of *Bhartrhari* (Verses 1-30) 30 marks
 3. *Viduranīti* (Ch.I Verse 20-60) 20 marks
- Units-I & II *Cāṅkyaṇīti* -Four Verses are to be explained - 7^{1/2}*4= 30 marks
- Units -III & IV *Nītiśataka* -Four Verses are to be explained - 7^{1/2}*4= 30 marks
- Unit-V *Viduranīti* Short Questions - 4 5x4= 20 marks

Books for References

1. *Cāṅkyaṇītidarpaṇa* (Ed.) Gunjeswar Choudhury, Choukhamba SurabharatiPrakashan, Varanasi
2. *Nītiśataka* (Ed.) M.R. Kale, MLBD, New Delhi(Text)
3. *Nītiśataka* (Ed.) Naresh Jha, Choukhamba Prakashan, New Delhi
4. *Viduranīti*, Gunjeswar Choudhury, Chawkhamba Surabharati Prakashan, Varanasi
5. *Viduranīti*, Gitapress, Gorakh Pur, *Bhartrhari Satakatrāyam*, B. S. Mishra, Vidyapuri, Cuttack.

Group- F**SCIENTIFIC LITERATURE IN SANSKRIT****80+20 = 100 Marks**

Unit- I	(i) <i>Bhūmidevyāḥkimivayaḥ</i> by A.R. Vasudevamurty (ii) <i>Bhāratasya vaijñāniketiḥāsaḥ</i> by M.M. Joshi <u>One</u> long Questions	15 marks
Unit-II	(iii) <i>Mahābhārata vaijñānikaḥamśaḥ</i> by A.R. Vasudevamurti (iv) <i>Vaidika-saṁskṛteḥ jagadvyāpyatvam</i> by M.R. Rao <u>One</u> long Questions	15 marks
Unit-III	(v) <i>Vṛkṣāyurvedaḥ -I</i> by Aurobindo Ghose (vi) <i>Vṛkṣāyurvedaḥ -I I</i> by V. Nagraj <u>One</u> long Questions	15 marks
Unit-IV	(vii) <i>Pūrvajaiḥparigaṇitam āsīt paramāṇoḥ parimāṇam</i> by A.R. Vasudevamurti (viii) <i>Prācīnaṁ rasāyanaśāstram</i> by K. Venkatesha Murty <u>One</u> long Questions	15 marks
Unit-V	<u>Four</u> short Questions s from the above four units -	5*4= 20 marks

Books for References

1. *Bhāratasya vaijñānika-paramparā*, V. Nagraj & others, Samskratabharati, MataManira Gali, Jhandewalan, New Delhi, 110055
2. *Ancient Indian Science and its Relevance to the Modern World*, (Eds.) K.E.Govindan & Others, Rashtriya Sanskrit Vidyapitha, Tirupati- 517507
3. *Scientific Knowledge in the Vedas*, P.V. Vartak, Dharam Hinduja International Centre of Indic Research, Delhi, Nag Publishers, 11 A/UA, Jawahar Nagar, Delhi-110007
4. *Science in Sanskrit*, Samskratabharati, Mata Manira Gali, Jhandewalan, New Delhi,110055
5. *Saṁskṛta-vijñāna-Dīpikā*, Nirmal Trikha, Eastern Book Linkers, 5825, NewChandrabala, Jawahar Nagar, Delhi- 110007

Group- G**GENERAL LINGISTICS AND PHILOLOGY****80+20 = 100 Marks**

Unit-I	Bhāṣā-lakṣaṇa, Bhāṣā-svarūpa, bhāṣā-prakārabheda, Bhaṣoṭpatti	One long Questions	15 marks
Unit-II	Bhāṣā-vijñānasya mukhyāṅgāni, Gauṇāṅgāni, Dhvanivijñānam, Rūpavijñānam, Vākyavijñānam, Arthavijñānam	One long Questions	15 marks
Unit-III	Dhvaniparivattanasya karaṇāni, Dhanivijñānasya prasiddha-niyamāḥ, Arthaparivarttanasya prakāraḥ, Arthaparivarttanasya karaṇāni	One Long Questions	15 marks

Unit-IV Bhāṣāṇām vargīkaraṇam- Parivārika, Rūpagata, Vividha-bhāṣā-parivārāḥ One long Questions

15 marks

Unit-V Bharopīya-bhāṣāparivārānam sāmānya-paricayaḥ, Āryabhāṣā-parivārasya bhedadvayam- bhāratīya-īrānīyau, Vaidika-laukika-saṁskṛtam, Avesta

Four short Questions

5*4= 20 marks

Books for References

1. Elements of Science of Language, I.J.S. Taraporewalla, Samskrta Pustaka Bhandara, Kolkata
2. An Introduction to Comparative Philology, Chapters-I, II and III, P.D. Gune,
3. Bhāṣāvijñāna o bhāṣāsastra, Kapildev Dwivedi, Vishvavidyalaya Prakashan, Varanasi, Fourth Edn 1994
4. Linguistic Introduction to Sanskrit Chaps I, II & IV, B.K. Ghosh
5. Dhvanivijñāna, G.B. Dhal, The Odisha State Bureau of Text Book Preparation and Production, Bhubaneswar

DETAILS OF THE GENERIC ELECTIVE (G E) COURSES (80 Term - End + 20

Mid-Term) SEMESTER - I GE - I (A student has to opt one paper from group H & I)

Group: H Grammar, History of Sanskrit Literature, Drama & Prose - 100 Marks

(Mid Term 20 Marks + End Term 80 Marks)

Unit I-Śabdarūpa & Dhāturūpa-10 Marks

Śabda :Bālaka, Kavi, Bhānu, Piṭṛ, Latā, Mati, Nadī, Dhenū, Vadhū, Mātr, Phala, Karman, Vāri, Madhū, Marut, Ātman, Guṇin, Vāk, Sarit, Sarva, Tad, Etad, Yad, Idam, Jagat, Asmad and Yuṣmad.

Dhātu :Bhū, Paṭh, pac, Kṛ, As, Ad, Han, Śī Cur, Sev, Śī, Kri, Bhī, Dīś, Vad.

Form of 5 Śabda 5 Marks

Form of 5 Dhātu 5 Marks

Unit II- History of Sanskrit Literature (Rāmāyaṇa&Mahābhārata) - 20 Marks

One Long Questions 12 Marks

Two Short Questions 08 Marks

Unit III- Hitopadeśa Mitralābha 20 Marks

Hitopadeśa Mitralābha : Kathāmukha with the following Stories :

Vṛddhavyāghra pathika kathā, Mṛga kāka śṛgāla kathā , Gṛdhra mārjāra kathā,

Ati lobhi śṛgāla kathā , Hastī dhūrtta śṛgāla Kathā

One Long Questions 12 Marks

One Explanation

08 Marks

Unit IV & V - Abhijñānaśākuntalam (Act 1- 4) - 30 Marks

Unit IV - One Long Questions - 12 Marks

One Explanation - 06 Marks

Unit V - Two Short Questions 12

Marks

Books Recommended :

1. Vyākaraṇadarpaṇa, Published by Odisha State Bureau of Text Book Preparation and production, Pustak Bhavan, Bhubaneswar, 2013.
2. History of Indian Literature (Vol.III), M. Winternitz, MLBD, Delhi.
3. History of Classical Sanskrit Literature, M. Krishnamachariar, MLBD, Delhi.
4. Saṃskṛta Sāhitya kā Itihāsa, Baladev Upadhyaya, Sarada Niketan, Varanasi.
5. Saṃskṛta Sāhitya Itihāsa, Prof. Harekrushna Satapathy, Kitab Mahal, Cuttack.
6. Hitopadeśa of Nārāyaṇa, M.R. Kale, Motilal Banarsidass, Delhi.
7. Hitopadeśa Mitralābha, Kapil Dev Giri, Chowkhamba Publications, Varanasi, 1988.
8. Hitopadeśa Mitralābha, Dr. Braja Sundar Mishra, Vidyapuri, Cuttack.
9. Abhijñānaśākuntalam, M.R. Kale, MLBD, New Delhi.
10. Abhijñānaśākuntalam, R.M. Bose, Modern Book Agency Private Limited, Calcutta - 12, 1976.
11. Abhijñānaśākuntalam, Dr. Ganga Sagar Rai, Chowkhamba Sanskrit Bhawan, Varanasi, 2000.
11. Abhijñānaśākuntalam, Prof. Hare Krushna Satpathy, Kitab Mahal, Cuttack.

Group: I

Mastering Sanskrit Language - 100 Marks

(Mid Term 20 Marks + End Term 80 Marks)

Unit I : History of Sanskrit Literature (Mahākāvya & Gītikāvya)- 20 Marks

Origin and development of Sanskrit *Mahākāvyas* and *Gītikāvyas* with special reference to the following :

Mahākāvya: *Kumārasambhava, Raghuvamśa, Kirātārjunīya, Śīsupālavadhā* and *Naiṣadhīyacarita*.

Gītikāvya : *Meghadūta, Ṛtusamhāra, Nitiśataka, Śṛṅgāraśataka, Vairāgyaśataka, Caṇḍīśataka, Sūryaśataka, Amaruśataka, Mohamudgara* and *Gītagovinda*.

One Long Questions from <i>Mahākāvya</i> -	12 Marks
Two short Questions from <i>Gītikāvya</i> -	08 Marks
Unit II- Śukanāśopadeśa from Kādambarī-	20 Marks
One Long Questions -	12 Marks
One Explanation	08
Marks	
Unit III & IV - Abhijñānaśākuntalam (Act5- 7) - 30 Marks	
Unit III - One Long Questions	12 Marks
One Explanation	06 Marks
Unit IV - Two Short Questions	12 Marks
Unit V - Dramaturgy -	10 Marks
The following Portions to be studied from Sāhityadarpaṇa Chapter VI:	
<i>Nāṭaka , Prakaraṇa , Prastāvanā , Pūrvaraṅga , Nāndī and Pañca sandhi.</i>	
Two Short Notes -	2 X 5= 10 Marks

Books Recommended :

11. History of Indian Literature (Vol.III), M. Winternitz, MLBD, Delhi.
12. History of Classical Sanskrit Literature, M. Krishnamachariar, MLBD, Delhi.
13. Saṁskṛta Sāhitya kā Itihāsa, Baladev Upadhyaya, Sarada Niketan, Varanasi.
14. Saṁskṛta Sāhitya Itihāsa, Prof. Harekrushna Satapathy, Kitab Mahal, Cuttack.
15. Śukanāśopadeśaḥ, Mohandev Panth and Harishcandra Vidyalamkara, Motilal Banarsidass, Delhi, 2010.
16. Kādambarī - Śukanāśopadeśaḥ, Ramakanta Jha and Harihara Jha, Chowkhamba Vidya Bhavan, Varanasi, 2011.
17. Śukanāśopadeśaḥ, Dr. Nirmal Sundar Mishra, Kalyani Publishers, New Delhi.
18. Abhijñānaśākuntalam, M.R. Kale, MLBD, New Delhi.
19. Abhijñānaśākuntalam, R.M. Bose, Modern Book Agency Private Limited, Calcutta - 12, 1976.
20. Abhijñānaśākuntalam, Dr. Ganga Sagar Rai, Chowkhamba Sanskrit Bhawan, Varanasi, 2000.
21. Abhijñānaśākuntalam, Prof. Hare Krushna Satpathy, Kitab Mahal, Cuttack.
22. Sāhityadarpaṇa, Sheshraja Sharma Regmi, Chowkhamba Krishnadasa Academy, Varanasi.
23. Sāhityadarpaṇa, Odisha Sahitya Akademi, Bhubaneswar.

14. Sāhityadarpaṇa evaṁ Chanda, Dr. Braja Sundar Mishra, Satyanarayan BookStore, Binod Behari, Cuttack -2.

SEMESTER – II GE - 2 (A student has to opt one paper from group J & K)

Group: J Functional Sanskrit– 100 Marks

(Mid Term 20 Marks + End Term 80 Marks)

Unit I - Sanskrit conversation - 20 Marks

A Specific incident/ Occurrence will be given in the Questions Paper (in Sanskrit) and the students will be asked to present that in Sanskrit with Conversation style.

Unit II - General idea about Vācya. The divisions of Vācya like Karttṛvācya, Karma Vācya and Bhāvavācya. - 20 Marks

The students will be asked to change the voice (Vācya) of any 10 sentences as directed. 10 x 2 = 20 Marks

Unit III - Saṁjñā Prakaraṇam from Laghu Siddhānta kaumudī- 20 Marks

Four Sūtras. 4 x 5 = 20 Marks

Unit IV & V - Nītiśataka of Bhartṛhari (Verses 1 - 20) - 20

Marks Four Short Questions

4 x 5 = 20 Marks

Books Recommended :

1. Functional Sanskrit: Its Communicative Aspect, Dr. Narendra, Sri Aurovindo Ashram, Pondicherry.
2. Vyākaraṇadarpaṇa, Published by Odisha State Bureau of Text Book Preparation and production, Pustak Bhavan, Bhubaneswar, 2013.
3. Laghu Siddhānta Kaumudī , Sridharananda Sashtri , MLBD , New Delhi.
4. Laghu Siddhānta Kaumudī, Isvara Chandra, Samskrta Granthagara, New Delhi, 2007.
5. Laghu Siddhānta Kaumudī , Sadasiva Shastri, Chowkhamba Sanskrit Office, Varanasi.
6. The Nīti and Vairāgya Śataka of Bhartṛhari, M.R. Kale, MLBD, New Delhi.
7. Śatakatraya , Dr. Braja Sundar Mishra, Vidya puri, Cutack , 2010.

Group: K History of Sanskrit Literature, Poetry, Philosophy and Poetics. - 100 Marks

(Mid Term 20 Marks + End Term 80 Marks)

Unit I & II - History of Sanskrit Literature - 20 Marks

(Gadyakāvya, Fairy Tales & Fables, Campū)

Unit I - One Long Questions - 12 Marks

Unit II - Two Short Notes - 08 Marks

Unit III - Meghadūta :Pūrvamegha(Verses 1 - 39) - 20 Marks

One Long Questions - 12 Marks

Two Short Questions - 08 Marks

Unit IV - Śrīmad Bhagavad Gītā : (Chapter XV)- 20 Marks

One Long Questions - 12 Marks

Two Short Questions - 08 Marks

Unit V - Alamkāra (FromSāhityadarpaṇaCh -x) - 20 Marks

Anuprāsa, Yamaka, Śleṣa, Upamā, Rūpaka, Utprekṣā, Apahnuti, Samāsokti, Vyājastuti and Arthāntaranyāsa.

Lakṣa-lakṣaṇa-samanvaya of any four. 4x5 = 20 Marks

Books Recommended :

1. History of Indian Literature (Vol.III), M. Winternitz, MLBD, Delhi.
2. History of Classical Sanskrit Literature, M. Krishnamachariar, MLBD, Delhi.
3. Saṁskṛta Sāhitya kā Itihāsa, Baladev Upadhyaya, Sarada Niketan, Varanasi.
4. Saṁskṛta Sāhitya Itihāsa, Prof. Harekrushna Satapathy, Kitab Mahal, Cuttack.
5. Meghadūta of Kālidasa , M.R. Kale, MLBD, New Delhi.
6. Meghasandeśa, N. P. Unni, Bharatiya Vidya Prakashan, New Delhi.
7. Meghadūta, Dr. Braja Sundar Mishra, Vidyapuri, Cuttack.
8. Śrīmad Bhagavad Gītā (With Sāṅkara Bhāṣya), Gita Press, Gorakh Pur.
9. Sāhityadarpaṇa evaṁ Chanda, Dr. Braja Sundar Mishra, Satyanarayan Book Store, Binod Behari, Cuttack.
10. Sāhityadarpaṇa , P. V. Kane , MLBD , New Delhi.

SEMESTER - III GE - 3 (A student has to opt one paper from group L & M)

Group: L Poetry, Grammar and Composition - 10 Marks

(Mid Term 20 Marks + End Term 80 Marks)

Unit I -Kirātārjunīyam : Canto I- 20

Marks

One Long Questions - 12 Marks

One Explanation - 08 Marks

Unit II - Vibhaktyartha Prakaraṇa from Laghu Siddhāntakaumudī- 15Marks

Three *Sūtras*. 3 X 5 = 15 Marks

Unit III - Essay in Sanskrit - 20 Marks

Unit IV - Translation from Odia/ English to Sanskrit-15 Marks

Unit V - Retranslation from Sanskrit to Odia/ English - 10 Marks

Books Recommended :

1. Kirātārjunīyam (Canto - I- III), M.R.Kale, MLBD, Delhi.
2. Kirātārjunīyam (Canto - I) Kanta Bhatia and Amaldhari Singh, Bharatiya Vidya Prakashan, Delhi.
3. Kirātārjunīyam O Nātyatattava, Dr. Niranjan Pati, Kalyani Publishers, New Delhi.
4. Laghu Siddhānta Kaumudī , Sridharananda Sashtri , MLBD , New Delhi.
5. Laghu Siddhānta Kaumudī, Isvara Chandra, Samskrta Granthagara, New Delhi, 2007.
6. Laghu Siddhānta Kaumudī , Sadasiva Shastri, Chowkhamba Sanskrit Office, Varanasi.
7. Laghusiddhanta Kaumudi, Ghanashyama Dora, A.K.Mishra Agency, Cuttack.
8. Vyākaraṇadarpaṇa, Published by Odisha State Bureau of Text Book Preparation and production, Pustak Bhavan, Bhubaneswar, 2013.
9. Saṃskṛta nibandhaśatakam, Kapildev Dwivedi.

Group: M Darśana, Prosody and Poetics - 100 Marks

(Mid Term 20 Marks + End Term 80 Marks)

Unit I - Pātañjala Yogadarśana- 20 Marks

The following *sūtras* from *Samādhipāda* :

Atha yogānusāsanam (1), *Yogaścittavṛtti-nirodhaḥ* (2), *Pratyakṣānumānāgamāḥ pramāṇāni* (7), *Anubhūtaṅgāyāsāṃpramoṣaḥ smṛtiḥ* (11), *Abhyāsavairāgyābhyām tannirodhaḥ* (12), *diṣṭānuśravikaviśayavitrṣṇasya vaśīkārasamjñā vairāgyam* (15), *tatparam puruṣakhyāter guṇavairṣṇyam* (16) and *kleśakarmavipākāśayair aparāmiṣṭaḥ puruṣaviśeṣa īśvaraḥ* (24).

Four Sutras to be explained. 4 X 5 = 20 Marks

Unit II - Prosody - 20 Marks

The following Chandas from *Śrutabodha*.

Āryā, Śloka, Indravajrā, Upendra vajrā, Upajāti, Varṣastha, Vasanta tilakā, Mālinī, sikhariṇī and *Mandākrāntā*.

4 Chandas to be explained with expmpals. 4 X 5 = 20 Marks

Unit III - General idea about *Kāvya prayojana, Kāvyalakṣaṇa,*

Kāvya hetu and Kāvya bheda from *Sāhityadarpaṇa* - 10 Marks

Two Short Notes - 2 X 5 = 10 Marks

Unit IV - General idea about *Abhidhā,*

Lakṣaṇā and Vyañjanā from *Sāhityadarpaṇa* -10

Marks

Two Short Notes - 2 X 5 = 10

Marks Unit V - Comprehension - 20 Marks

One Sanskrit passage will be given and the students will be asked to answer five Questions s in Sanskrit that follow the passage. 5 X 4 = 20

Marks

Books Recommended :

- Pātañjala yogasutratīṭh, Vimala Karnataka, Krishnadas Academy, Varanasi.
- Siddhāntakaumudī, Dr. Minati Mishra, Vidyapuri, Cuttack.
- Siddhāntakaumudī, Dr. Gopal Krishna Dash & Dr. Kadambini Dash, A.K.Mishra Agency, Cuttack.
- Sāhityadarpaṇa, P.V.Kane, MLBD, New Delhi.
- Sāhityadarpaṇa evaṃ Chanda, Dr. Braja Sundar Mishra, Satyanarayan Book Store, Binod Behari, Cuttack.
- Vyākaraṇadarpaṇa, Published by Odisha State Bureau of Text Book Preparation and production, Pustak Bhavan, Bhubaneswar, 2013.

SEMESTER – IV GE - 4 (A student has to opt one paper from group N & O)

Group: N SOCIO-POLITICAL THOUGHT IN ANCIENT INDIA

80+20 = 100

1. *Yājñavalkyasmṛti* (Vyavahārādhyāya verses 1-65) 40 marks
2. *Manusmṛti* (Chap- VII Verses 1-60) 40 marks
- Units- I & II - *Yājñavalkyasmṛti* Five Short Questions 7*5= 35 marks
- Units III & IV - *Manusmṛti* Five Short Questions 7*5= 35 marks
- Unit- V Translation of Two verses from the above Units 5*2= 10 marks

Books for References

- D. *Yājñavalkyasmṛti*, (Ed.) M.N. Dutta, Parimal Publications, New Delhi
- E. *Yājñavalkyasmṛti* (Vyavahārādhyāya), (Ed.) Kishore Chandra Mahapara, Jageswari lane, Balighat, Puri
- F. *Manusmṛti*, (Ed.) Braja Kishore Swain, Sadgrantha Niketana, Puri
- G. *Manu's Code of Law: A Critical Edition and Translation of the Mānava Dharmaśāstra*, (Ed.) Ollivele, Patrick, Oxford University Press

Group: O ETHICAL LITERATURE IN SANSKRIT

1. *Cāṇakyanīti* (Chaps- I, II and III from *Cāṇakyanītidarpaṇa*) 30 marks
 2. *Vairagyaśataka* of Bhartrhari (Verses 1-30) 30 marks
 3. *Viduranīti* (Ch.I Verse 20-60)
- Units-I & II *Cāṇakyanīti*-Four Verses are to be explained - $7^{1/2} \cdot 4 = 30$ marks Units –
- III & IV *Nītiśataka*-Four Verses are to be explained - $7^{1/2} \cdot 4 = 30$ marks Unit-V Short
- Questions - 4 5x4= 20 marks

Books for References

- M. *Cāṇakyanītidarpaṇa* (Ed.) Gunjeswar Choudhury, Choukhamba Surabharati Prakashan, Varanasi
- N. *Vairagyaśataka* (Ed.) M.R. Kale, MLBD, New Delhi (Text)
- O. *Viduranīti*, Gunjeswar Choudhury, Chawkhamba Surabharati Prakashan, Varanasi
- P. *Viduranīti*, Gitapress, Gorakh Pur
- Q. *Bhartrhari Satakātrayam* B.S. Mishra, Vidyapuri, Cuttack.

**SYLLABUS FOR B.A. (HONORS) SOCIOLOGY UNDER CHOICE
BASED CREDIT SYSTEM OF UTKAL UNIVERSITY,
BHUBANESWAR**

CORE PAPERS

(SOC-1) Introduction to Sociology

This introductory paper intends to acquaint the students with Sociology as a social science and the basic concepts used in the discipline. It also focuses on the social processes and the social institutions that man encounters as a member of the society.

Objectives: After studying these two papers, the student can

- Can get to know the convergence and divergence of Sociology with other social science disciplines in terms of the subject matter, nature and scope of the discipline and its approach.
- Develop knowledge about its historicity.
- Can get acquainted with the basic concepts used in the subject.
- Can generate ideas about the social processes and social institutions man encounters as a member of the society.

Learning Outcomes: This paper is expected to clarify and broaden the student's notion about the subject, the basic concepts used and some universal societal processes. This will provide a wholesome picture about what the subject is all about.

Unit-1: Sociology: Definition and Subject matter, Nature and Scope, Emergence of Sociology, Sociology and its relationship with Anthropology, Political Science, Economics, and History

Unit-2: Basic Concepts: Society, Culture, Community, Institutions, Association, Social Structure, Status and Role, Norms and Values, Folkways and Mores, Associative and Dissociative processes – Cooperation, Assimilation, Accommodation, Competition, and conflict

Unit-3 : Individual and Society : Individual and society, Socialization, Stages and Agencies of Socialization, Development of Self – Contributions of George Herbert Mead, C.H. Cooley's Looking Glass Self The Concept of Group : Types of Groups – Primary and Secondary groups, In-Group and Out-group, Reference Group

Unit-4: Social Stratification: Meaning and definition, Dimensions of Stratification, Theories of Stratification – Functionalist, Marxist, Weberian. Social mobility and its determinants.

Unit-5: Social Control: Meaning and types, Formal and Informal social control, Agencies of Social control

Essential readings:

1. Bottommore. T.B. 1972, Sociology: A guide to problems and literature. Bombay :George Allen and Unwin (India)
2. Harlambos, M.1998. Sociology: Themes and perspectives. New Delhi Oxford University Press
3. Inkeles, Alex, 1987. What is Skociology? New Delhi: Prentice-Hall of India
4. Jaaram, No. 1988 . What is Sociology .Madras:Macmillan, India :
5. Johnson, Harry M. 1995. Sociology: A Systematic Introduction. New Delhi , Allied Publishers
- 6.Schaefer, Richard T. and Robert P. Lamm. 1999 Sociology. New Delhi Tata-Mac Graw Hill.

(SOC-2) Indian Society

Every society has its own peculiar structure and there are some institutions universal to every society, but with their unique manifestations in each society. There are some change agents and initiatives that enable the society to change with the passage of time. This paper focuses on the structure of the Indian society and the changing aspects with the processes operating, change agents and initiatives.

Objectives: After studying these two papers on Indian society, the student can

- Get an impression about the basic composition of Indian society, its historical moorings, basic philosophical foundations of the society and the institutions.
- Learn about the changing institutions, the processes, the agents and the interventions that bring about change in the Indian society.

Learning Outcomes: This paper is expected to bring familiarity in a student about Indian society. It will present a comprehensive, integrated and empirically –based profile of Indian society. It is hoped that the structure and processes operative in the society, the change agents operating in Indian society presented in this course will also enable students to gain a better understanding of their own situation and region.

Unit-1 : Composition of Indian Society : Caste, Tribe, Religion, Language. Unity in Diversities, Threats to national integration

Unit-2 Hindu Social Organisation: Bases of Hindu Social Organization, Varna, Ashrama and Purushartha. Doctrine of Karma.

Unit-3 : Marriage and Family in India: Hindu marriage as Sacrament, Forms of Hindu Marriage. The Hindu joint family:Patriarchal and Matriarchal systems. Marriage and family among the Muslims. Changes in the institutions of Marriage and Family.

Unit-4 : The Caste system in India: Origin, Features and Functions. Caste and Class, The Dominant Caste,Changes in Caste system, Caste and Politics in India Constitutional and legal provisions for the Scheduled Castes, Scheduled Tribes.

Unit-5 : Social Change in Modern India : Sanskritization, Westernization, Secularization, and Modernization

Essential readings:

1. Bose, N.K. 1967, Culture and Society in India. Bombay : Asia Publishing House
2. Bose, N.K. 1975, Structure of Hindu Society. New Delhi
3. Dube, S.C. 1990, Society in India.(New Delhi: National Book Trust.)
4. Dube, S.C. 1995, Indian Village (London : Routledge)
5. Dube, S.C. 1958: India's changing Villages (London: Routledge and Kegan Paul).
6. Karve, Irawati, 1961 : Hindu Society : An Interpretation(Poona : Deccan-College) :: Lannoy,
7. Mandelbaum, D.G. 1970 : Society in India (Bombay: Popular Prakashan)
8. Srinivas, M.N. 1980 : India: Social Structure (New Delhi: Hindustan - Publishing Corporation)
9. Srinivas, M.N. 1963: Social Change in Modern India (California, Berkeley: University of California Press).
10. Singh, Yogendra, 1973: Modernization of Indian Tradition (Delhi: Thomson Press).

(SOC-3) Sociological Thought

Sociology originated as an intellectual response to the crisis confronting the mid nineteenth century European society. Its development over two centuries has been influenced by a variety of socio-economic and political conditions. It is now established as a multi-paradigmatic academic discipline, with its body of theoretical knowledge enriched and its methodological techniques and procedures systemized. This paper is intended to familiarize the students with the social, political, economic and intellectual contexts in which sociology emerged as a distinctive discipline. It deals with the contributions of the forerunners of the discipline and with the contributions of the founders who gave a systematic shape to the subject.

Objectives: After going through these two papers, the student can

- Gain an understanding of some of the classical contributions in Sociology, and their contemporary relevance.
- Learn about the methodological shift in the discipline over the years.

Learning Outcomes: This paper is expected to clarify and broaden the student's knowledge about the theoretical and methodological contributions of the classical contributors to the subject and the contemporary relevance of these theories.

Unit-1 : Auguste Comte : Law of the Three Stages, Hierarchy of Sciences, Positivism

Unit-2 : Herbert Spencer : Organismic Analogy, Theory of Social Evolution

Unit-3 : Karl Marx : Dialectical Materialism, Class struggle, Alienation, Sociology of Capitalism

Unit-4 : Emile Durkheim : Division of Labour in Society, Rules of Sociological Method, Theory of Suicide.

Unit-5 : Max Weber : Social Action, Protestant ethic and the spirit of capitalism, Ideal type, Bureaucracy, Authority

Essential readings:

1. Aron, Ramond. 1967(1982 reprint) Main currents in sociological thoughts (2 volumes). Harmondsworth, Middlesex: Penguin Books
2. Barnes, H.E. 1959. Introduction to the history to the sociology The University of Chicago press
3. Coser, Lewis A. 1979. Masters of Sociological Thought. New York : Harcourt Brance Jovanovich
4. Fletcher, Ronald. 1994.The Making of Sociology (2 volumes) Jaipur-Rawat
5. Morrison, Ken.1995 Marx, Durkheim, Weber: Formation of Modern Social Thought. London; sage
6. Ritzer, George. 1996. Sociological Theory New Delhi. Tata-McGraw Hill
7. Singh, Yogendra. 1986 Indian Sociology: social conditioning and emerging Trends. New Delhi: Vistaar
8. Zeitlin, Irving.1998 (Indian Edition). Rethiking Sociology: A critique of Contemporary Theory. Jiapur: Rawat.

(SOC-4) Social Change and Development

Change is the law of nature and every society is subject to change. Social change has always been a central concern of Sociological study. Change takes different forms. Change has its pattern which is spelt out by various theories. Change is often propelled by various factors. This paper is designed to provide some ideas to the student about such process, theories and factors.

Objectives: After going through this paper, the student can

- Derive knowledge about the meaning, nature, forms and patterns of change.
- Get an idea about the theories that explain change and their adequacy in explaining so.
- Get an impression about the factors that propel change in the society.

Learning Outcomes: This paper is expected to provide a wholesome idea to the students about the process of social change. They can relate their experience with the theoretical explanations.

Unit-1 : Social Change : Meaning and nature. Social Progress, Evolutuion and Development.

Unit-2 : Theories of Social Change : Evolutionary theory, Cyclical theory, Conflict Theory, Functionalist theory.

Unit-3 : Factors of Social Change: Cultural, Economic, Technological, Ideological, Demographic

Unit-4 : Economic Growth and Social Development : Indicators of Social Development, Human Development Index, Gender Development Index

Unit-5 : Models of Development : Capitalist, Socialist, and Gandhian.

Essential readings:

1. Moore, W.E. 1965 Social Change, Prentice-Hall of India. New Delhi
2. Gandhi M.K., Hind Swaraj
3. Schumacher, E.F., Small is Beautiful
4. Narain, Shreeman, Principles of Gandhian Planning
5. Mishra, B., Capitalism, Socialism and Planning.
6. UNDP, Human Development Report

(SOC-5) Research Methodology

Since the days of August Comte, a debate and a deliberate attempt has been initiated to provide a scientific character to social sciences. In this attempt empirical research has been introduced as an integral part of observing social reality and generalising it objectively without any subjective predisposition. Gradually, research methods have been developed and introduced in social sciences to bring it in par with scientific observations. The essence of this paper lies in introducing the students with these methods of research to ensure objectivity as far as practicable in social research.

Objectives: By going through this paper, the student can

- Get an understanding of the nature of scientific methods, nature of social Phenomena and the way of attaining value neutrality.
- Have a grip over the basic steps involved in social research and the types of social research with their applicability
- Develop an insight into the need and types of research design and the use of sampling method for attaining objectivity and scientific study.

Learning Outcomes: This paper is designed and incorporated to acquaint the students with the scientific ways of studying social phenomena. This provides them with a research insight that will enable them to capture the most relevant data in an objective manner. The market demand of this paper will be very high as the students well versed with this paper will be highly demanded in academics, fundamental research, and policy research undertaken both by Government and Non- Government agencies.

Unit-1 : Meaning and Significance of Social Research, Nature of scientific Method, Applicability of scientific method to the study of social phenomena, Major steps in social research.

Unit-2 : Research Design, Types of Research Design: Exploratory, Diagnostic, Descriptive, and Experimental research Design.

Unit-3 : Hypothesis: Meaning, Characteristics, Types and sources of Hypothesis, Role of Hypothesis in Social Research

Sampling: Meaning, and characteristics, Types: Probability and Non-Probability

Sampling. Role of Sampling in Social Research

Unit-4 : Qualitative social Research : Observation, Case Study, Content Analysis

Unit-5 : Quantitative methods in Social Research: Survey research, Questionnaires,

Recommended Readings:

1. Bajaj and Gupta 1972 Elements of Statistics. New Delhi: R.Chand and Co., New Delhi
2. Beteille, A. and T.N. Madan 1975 Encounter and experience: Personal Accounts of Fieldwork. Vikas Publishing House, New Delhi
3. Bryman, Alan 1988 Quality and Quantity in Social Research Unwin Hyman, London
4. Jayram, N. 1989. Sociology: Methods and Theory. Madras: MacMillan, Madras
5. Kothari, C.R. Research Methodology : Methods and Techniques, Bangalore, Wiley Eastern.
6. Punch, Keith. 1996. Introduction to Social Research, Sage, London
7. Shipman, Martin, 1988 The Limitations of Social Research Sage, London
8. Young, P.V. 1988 Scientific Social Survey and Research Prentice Hall, New Delhi

(SOC-6) Gender and Society

The biological basis to the differences between the sexes does not explain the inequalities faced by the sex groups in the society. In the society variations are marked in the roles, responsibilities, rights of and relations between sex groups depending on the social prescriptions relating to sex affiliations. The differences, inequalities and the division of labour between men and women are often simply treated as consequences of 'natural' differences between male and female humans. But, in reality the social norms, institutions, societal expectations play a significant role in deciding and dictating the behaviour of each sex group. This is the fundamental of the study of Gender and Society.

Objectives: After studying this paper, the student can

- Conceptualize what is "Gender" and what is "Sex" and draw a line of distinction between the two.
- Note the difference in gender roles, responsibilities, rights and relations.
- Trace out the evolution and institutionalization of the institution of "Patriarchy".
- Get to know the theories of Feminism that brought women issues and demands to the forefront.
- Assess the initiatives undertaken for gender development with the paradigm shift from time to time.

Learning Outcomes: This paper is expected to generate ideas and sensitivity about gender in a student which he/she can put into practice in daily life. This will lead to change the prevalent biases and gender practices and create a gender neutral social world where both men and women can enjoy their basic rights and cherish to achieve their dreams.

Unit-1 : Social Construction of Gender : Sex and Gender, Gender stereotyping and socialization, Gender Role and Identity. Gender stratification and Inequality, Gender discrimination and Patriarchy.

Unit-2 : Feminism: Meaning, origin and growth of Feminist Theories. Theories of Feminism : Liberal, Radical, Socialist, and Eco-Feminism.

Unit-3 : Gender and Development: History and Approaches, WID,WAD and GAD. Women Empowerment: Meaning and Dimensions. World Conference of Women, Mexico, Copenhagen, Nairobi and Beijing. Gender- Related Development Index (GDI) and Gender Empowerment Index (GEM).

Unit-4: Status of Women in India : Ancient and Medieval period, women in pre-independence India, Social Reform movements, The Nationalist movement, Women in Independent India.

Unit-5 : Major Challenges and Issues Affecting Women in India: Women and Education, Women and Health, Women and Work. Policy provisions for women.

Recommended Readings:

1. Bhasin, Kamla, 2003 Understanding Gender, Kali for Women
2. Bhasin, Kamala , 1986 Khanv, Said Nighat Some Questions on Feminism and Its Relevance in Sourth Asia, Kali for Women, New Delhi
3. Chaudhuri, Maitrayee 2004 Feminism in India: Issues in Contemporary Indian Feminism Kali for Women, New Delhi
4. Kabeer, Naila 1994 Reversed Realities: Gender Hierarchies in Development Thought: Gender Hierarchies in Development
5. Srivastava Gouri, 2005 Women Education in India Issues and Dimensions, Academic Excellence Publishers & Distributors
6. Agarwal, S.P 2001 Women's Education in India, Concept Publishing Company
7. **Satia, J, Misra, M, Arora, R, Neogi, S**, ed. Innovations in Maternal Health - Case studies from India. New Delhi, India: SAGE Publications Pvt. Ltd.
8. Dube, Leela 1990 Structures and Strategies –Women, Work and Family, SAGE Publications, New Delhi
9. Kalia, Anil 1998 “Women Workers: Invisible and Unprotected”, Social Welfare, Vol.45, No.1, April
10. Cahwala, Monioca 2006 Gender Justice: Women and Law in India, Deep and Deep Publications

(SOC-7) Rural Sociology

Rural Sociology is a specialized branch of Sociology describing the society of villages and rural areas. As the rural areas or the villages mark the beginning of human civilization, this paper is designed to bring out the distinct features of the rural society with their typologies and typicalities. In the present paper an attempt is made to introduce the student with the development of this branch overtime with its focus on the typicality of Indian villages, their structures, changing features and social problems faced by the rural people.

Objectives: After studying this paper, the student can

- Get an impression about the emergence of the sub discipline Rural Sociology and the forces contributing for its origin.

- Learn about the nature of this branch of knowledge, its subject matter and significance.
- Collect information and knowledge about the mooring of the sub discipline in the Indian context.
- Generate an idea about the typicalities of the rural society and the institutions operating therein and their dynamics.
- Derive ideas about rural social problems of the country.

LearningOutcomes: India thrives in her villages. By going through this paper, the student can have a grip on the grass roots of Indian society. This will enable the student to understand the society in a better manner, to note the heterogeneities in culture, institutions and their functions, changes, the contrasts found between the rural urban societies and the problems faced by the people.

Unit-1 : Origin and Scope of Rural Sociology., Nature and Importance of Rural Sociology.

Unit-2 : Rural social Structure: Village Community, Agrarian Economy, Caste System, Mobility and Migration. Rural-Urban Contrast and Continuum

Unit-3: Rural Social problems: Poverty, Unemployment, , Food Security, Landlessness, Indebtedness, Health care and Sanitation

Unit-4 : History and Evolution: Community Development Programme, Land Reforms, Green Revolution. Cooperative Movement, Panchayati Raj Institutions- Constitutional provisions and Structure. Role of Panchayats in Rural Development

Unit-5 Rural Development Programmes: MGNREGA, SGSY, Indira Awas Yojana, Livelihood Mission, Health Mission

Recommended Books:

1. Doshi S.L. & P.C. Jain 2002 Rural Sociology, Jaipur, Rawat
2. Desai A.R. Rural Sociology in India 1997 Bombay Popular Prakasan
3. Dhanagare D.N. 1988 Peasant movements in India, New Delhi, Oxford
4. Gupta D.N. 2001 Rural development System New Delhi Books India International
5. Dube, S.C. 1988 India's changing Village: Human Factor in Community Development Himalayan Publishing House, Bombay
6. Maheshwari, S.R. 1985 Rural Development In India, Sage Publication, New Delhi
7. Vivek, R.& Bhattacharya 1985 The New Strategies of Development in Village India, Metropolitan
8. Jain, Gopal Lal 1985 Rural development Mangaldeep Publication, Jaipur
9. Joshi R P., and S. Narawam 1985 Panchayat Raj in India : Emerging Trends across the States Rawat, Jaipur
10. Singh, Katar 1995 Rural development: Principle policies and Management Sage, New Delhi

(SOC-8) Globalization and Society

Globalisation is the dominant process of social change in the contemporary world. It has resulted in the sinking of time and space and collapse of borders. It is a new coinage for an old process. It has its own dimensions, distinct features and impacts on society. It has given birth to new role players. All these are the focal points of discussion of this paper.

Objectives: Bygoing through this paper, the student can

- Collect information about the meaning and nature of this process, its historical mooring.
- Amass knowledge about its dimensions and impacts, both positive and negative.
- Get introduced to the agencies that manage the process.

Expected Outcomes: This paper is expected to acquaint the student with an ongoing social process bringing tremendous changes in the nations.

Unit-1 : Meaning and characteristics of Globalization. Historical context, Liberalization, Privatization and Globalization.

Unit-2: Dimensions of Contemporary Globalization: Economic, Technological, Political and Cultural.

Unit-3: Consequences of Globalization: Rising Inequality, Environmental impact, Consumerism, Health and Security. Emergence of Anti-Globalization movements.

Unit-4 Globalisation and Indian Society: Understanding the concepts of liberalization, privatization and globalization in the Indian context; Growth of information technology and communication and its impact manifested in everyday life

Unit-5 Impact of globalisation on Religion, Culture, Education, Family, Marriage, Women, Tribes

Essential Readings:

1. Appadurai, Arjun 1996, Modernity at Large, University of Minnesota Press
2. Applebaum, R. and Robinson, W., 2005, Critical Global Studies, Routledge, New York.
3. Bremen, Yan, 1993, Footlose Labour, Cambridge University Press, Cambridge
4. Browning, Halcli, Webster(ed), 1996, Understanding contemporary society: Theories of the present, SAGE Publications, London
5. Cohen Robin and Shirin M.(ed), Global Social Movements, The Athlone Press, London
6. Dubhashi P.R., 2002, Peoples Movement against Global Capitalism : EPW Feb.9

7. Giddens, Anthony, 2000, Runaway World : How globalization is reshaping our lives, Routledge, New York.
8. Jha, Avinash, 2000, Background to Globalization, Centre for Education and Documentation, Mumbai
9. Chander Sekhran Bal krishnana - Impact of Globalization on developing countries and India.
10. C, Rangarajan, 2002 Globalization and its impact

(SOC-9) Marriage, Family and Kinship

This course provides a brief account of the classical approaches to the study of family and kinship. It exposes the students to the distinct aspects of these three interrelated institutions in the Indian context. Finally, it discusses some contemporary issues that pose a challenge to the normative model of these institutions.

Objectives:Bygoing through this paper, the student can

- Understand the three institutions that are the foundations of the society.
- Comprehend the theoretical perspectives on these institutions.
- Get to know the rules governing these institutions.
- Estimate the changes coming over these institutions with the process of social change.

Expected Outcomes:This paper is expected to instill knowledge about the foundational institutions, their governing principles and the continuity and change features of these institutions.

Unit-1: Theoretical Perspectives:Overview of theoretical developments Descent theory ,Alliance theory ,Recent theorizations and their implications

Unit-2: Marriage: Marriage as social Institutions, Functions of Marriage. Rules of Marriage: Endogamy, Exogamy; Monogamy and Polygamy; Levirate and Sororate; Hypogamy and Hypergamy. Dowry and Bride Price.

Unit-3: The Family: Types of Family on the basis of Rules of Authority, Descent and Residence. Functions of Family. Contemporary changes and problems: Divorce and Family Disintegration.

Unit-4:Contemporary Issues: Changing demographic patterns Migration, Diasporas and Impact on Family Implications of new reproductive technologies Domestic violence Challenges to the normative model of family

Unit-5 : The Kinship and Clan System: Meaning and Definition of Kinship and Clan. Types. Clan, Family, Lineage and Totemism and Taboos.

Essential Readings:

- 1.Fox Robin 1967 Kinship and Marriage: An Anthropological Perspective, Pelican.
- 2.Parkin, Robert 1997 Kinship: An Introduction to Basic Concepts, Blackwell, Oxford.
- 3.Parkin, Robert and Linda Stone(ed.) (2004) Kinship and Family : An

Anthropological Reader, Blackwell Publishing, USA.

4. Patel, Tulsi (ed.) (2005) The Family in India : Structure and Practice, Sage Publications, New Delhi.

5. Uberoi, Patricia(ed.) (1993) Family, Kinship and Marriage in India, Oxford University Press, Delhi

(SOC-10) Social Disorganization and Deviance

No society is fully organized in character. Disorganization is apt to occur from time to time. Disorganization is a manifestation of the deviant behavior found among some individuals. This deviance occurs when the individuals feel that the normative order of the society and its institutions are not need fulfilling in character. This present paper makes an attempt to provide an impression about the scenario of disorganization, its forms, causes and consequences with the theories explaining the situation.

Objectives: After going through this paper, the student can

- Understand the meaning, causes, consequences and forms of social disorganization.
- Learn about the theories explaining the disorganization situations.
- Comprehend the concept of crime and the existing theories of punishment.

Learning Outcomes: This paper is designed with an expectation to impress upon a student the concept of deviant behavior leading to social disorganization, forms, theoretical foundations and criminal activities which he encounters in real life situations.

Unit-1 : Social Disorganization: Meaning and Nature. Family Disorganization and Personality Disorganization Causes and Consequences.

Unit- 2: Theories of Deviant Behaviour : Contributions of Durkheim and Merton. Ecological theory, Delinquent Sub-Culture theory, Differential Association theory, Differential Opportunity theory.

Unit- 3 : Crime and Punishment : Concepts of Crime and Delinquency. Causes and consequences. Theories of Punishment: Retributive, Deterrant,Reformative.

Unit-4: Social Problems: Poverty, Unemployment, Alcholism, Indebtedness,Terrorism

Unit-5 Atrocities against women, Domestic violence, Dowry, Divorce

Essential Readings:

1. Mamoria, C.B.,1981 Social Problems and Social Disorganization in India
2. Carrabine;Eamonn,Iganski,Paul,Lee ,Maggy,Plummer Ken,South,Nigel(2004)[Criminology: A Sociological Introduction](#)
3. [Sutherland](#), Edwin Hardin Sutherland(1949) White Collar Crime, Dryden Press
4. Ahuja, Ram(2012) Social problems in India,Rawat
5. Chakraborty, Dipangshu(1999) Atrocities on Indian Women, APH

(SOC-11) Political Sociology

Polity constitutes a vital part of every society. It helps in the system of governance. But the social variables to a great extent determine the course of polity. They decide and detect the system of governance, distribution of power, political institutions like parties and pressure groups, nature of political participation, political socialization. In the same vein, the political institutions, political processes, political culture influence the society and the course of its progress. The present paper highlights the close nexus between society and polity and how dynamism in one brings dynamism in the other.

Objectives: After going through this paper, the student can

- Comprehend the existing forms of states and their relative merits and demerits.
- Differentiate between power, authority and influence which guide and govern the political processes.
- Get to know about the political processes, participation types and determinants and the political institutions.

Learning Outcomes: The very aim of this paper is to generate an insight in the student about the political institutions, political processes, political culture he/she encounters in his/her daily life as a member of the society.

Unit-1 State: Characteristics, Aristotle's classification of types of state: Theological, Monarchical, Aristocratic, Democratic and Totalitarian forms.

Unit-2 Influence, Power and Authority: Meaning and types of influence, characteristics of Power, distribution of power: the Constant sum and the Variable sum approach to power, theories of political elites, authority: Weberian classification of authority, different ways of acquiring legitimacy.

Unit-3 Political culture and political socialization: Meaning and dimensions of political culture, meaning and types of political socialization agencies of political socialization and their role.

Unit-4 Political participation: meaning and types of political participation, political apathy – reasons for political apathy, Determinants of political participation – psychological, social and political.

Unit-5 Political parties and pressure groups: Political parties – features and functions, structures of political parties; meaning of pressure groups and their relationship with political parties, types of pressure groups and their role.

Reference:

1. A.K. Mukhopadhyay 1980 Political Sociology, K.P. Begchi & Company. Calcutta, 1980
2. Ali Ashaf and Sharma B.N. 2001 Political Sociology, University Press, Hyderabad
3. Bhattacharya, D.C. Political Sociology
4. Baral, J.K. Political Sociology
5. T. Bottomore, Political Sociology, Blackie & Sons, Bombay, 1975
6. Lipset S.M. Modern Political Analysis, Printice Hall, New Delhi 1983
7. Dhal, Robert A, Who Governs

(SOC-12)Environment and Society

Environment and society are in constant interaction with each other. It is the environment which sustains life in society and it is the society that is responsible for the preservation and the degradation of the environment. In the recent years environmental challenges have posed a threat to the lives on the planet. Keeping this in view, the present paper tries to create awareness among the students about the major environmental issues and the efforts geared to tackle them.

Objectives: After going through this paper, the student can

- Derive knowledge about the close interaction between society and environment.
- Gain substantial idea about the environmental issues and their repercussions on humanity.
- Accumulate ideas about the ideological currents, issues that drive environment movements.
- Get aware about the global and national efforts to conserve environment.

Learning Outcomes:The very aim of this paper is to disseminate knowledge about the significance of environment for society, to change the practices that can protect and preserve the environment and to make the students participate in the mission to preserve, protect and promote the cause of environment.

UNIT – I Environment and its Concepts: Ecology, Eco-system, Environment and Society – their inter-relations; Eco-Feminism

UNIT – 2 Environmental Issues: Sustainable Development, Industrialization and Development, Urbanization and Development, Environmental Degradation

UNIT – 3 Environmental Movements: Chipko Movement, Narmada Bachao Andolan, Ganga Bachao Abhiyan; The Silent valley movement, Forest Rights.

UNIT – 4 Contemporary Environmental Problems: Problems of Water, Deforestation, Urban Wastes, Slums, Global-Warming and Climate Change.

Unit-5 Environment protection efforts at the global level and the national level in India.

Essential Readings:

1. Albrow, Martin & Elizabeth King (Ed.)1990, Globalisation, Knowledge and Society, Sage: London
2. Baviskar. Amita 1995, In the Valley of the River: Tribal Conflict over Development in the Narmada Valley, Delhi: OUP.
3. Bhatt, Anil 1989 Development and Social Justice: Micro Action by Weaker Section, Sage: New Delhi.
4. Chauhan, I.S 1998, Environmental Degradation, Delhi: Rawat Publications.
5. Desh Bandhu and Garg, R.K.(eds) 1986 Social Forestry and Tribal Development, Dehradun: Natraj Publishers.
6. Dubey, S.M. and Murdia, Ratno(ed)1980 Land Alienation and Restoration in Tribal Communities in India, Bombay: Himalaya Publishing House.
7. Gadgil, Madhav & Ram Chandra. Guha 1996 Ecology and Equity: The use and Abuse of Nature in contemporary India:: New Delhi: OUP.
8. Ghai, Dharam (ed) 1994 Development and Environment: Sustaining People

and Nature. UNRISD: Blackwell Publication.

9. Giddens, Anthony 1996 "Global Problems and Ecological Crisis", 2nd edition New York:W.W.Norton and Co.
10. Guha, Ramechandra 1995 The Unquiet Woods: Ecological Change and Peasant Resistance in the Himalaya, OUP: Delhi.
11. Mehta S.R. (ed) 1997 Poverty, Population and Sustainable Development, New Delhi: Rawat Publications.
12. Plumwood, Val 1992 Gender and Ecology: Feminism and Making of Nature, London: Routledge.

(SOC-13)Urban Sociology

Urbanisation is an important social process that changed the face of human civilization. It was initiated with the process of modernization, transport revolution, coming up of river valley civilizations, establishment of trade links and industrial revolution. Urbanisation has brought both prosperity and problems. It is one of the earnest tasks of Sociology to trace out the evolution of the process, social; problems associated with it and policy planning and measures undertaken to overcome these challenges. This paper Urban Sociology concentrates upon these tasks.

Objectives: After going through this paper, the student can

- Understand the specific traits of urban areas, its historical patterns of growth.
- Develop knowledge about urban social institutions and problems
- Gain insight into urban development plans, programmes and efforts.

Learning Outcomes:The very aim of this paper is to acquaint the students with the process of urbanization, to give an impression about the pattern of evolution of cities, urban institutions, their contrasts with rural institutions, urban problems and the responses developed to arrest them.

Unit-1 Meaning, Nature, Scope and importance of Urban Sociology, Rural Urban Differences: Specific traits of rural world vs. urban world- Socio-cultural differences ,urbanization,Urbanism as a way of life.

Unit-2 Theories of patterns of city growth: Concentric zone theory- Sector model- Multiple nuclei theory.

Unit-3 Social institutions of Indian urban communities: Family, marriage and kinships in urban India – Caste in urban India – Urban politics and urban economy

Unit-4 Urban social problems: Crime and Juvenile delinquency, Slums, Beggary , Prostitution

Unit-5 Urban development in Indian plans, Urban development programmes, Slum development programmes, Urban Basic Services

Essential readings:

1. Lin, Jan and Mele Christipher (edt.)2012The Urban Sociology Reader,

- Routledge
2. Flanagan, W.,1993 *Contemporary Urban Sociology* Cambridge: University of Cambridge
 3. Patel Sujata and Deb, Kushal(edt.) *Urban Studies*
 4. Rao,M.S.A.1992*Urban Sociology in India*
 5. Ramachandran,R 1997 Oxford University Press
 6. Jayapalan, N 2002 *Urban Sociology*,Atlantic Publishers
 7. Wilson, Robert,A Schultz,David, A1978 *Urban Sociology*, prentice Hall

(SOC-14)

Practical: Field Work and Dissertation

(Dissertation: 80 marks and Viva-voce: 20 marks)

- Dissertation may be written on any social institution, problem or may be an evaluative study.
- It should be based on empirical study.
- Size of the dissertation should be around 5000 words.
- Dissertation paper will be examined jointly by one Internal and one External Examiner to be appointed by the University. Marks will be awarded jointly by the Internal and External Examiners on the basis of the written Dissertation and Viva-voce.

(SOC-DSE-1)

Sociology of Movements

Movements reflect the voices raised against the prevailing practices of a society. Every society witnesses social movement in some form or the other. Movements bring social change and transformation. It is a collective effort that is driven by particular issues and brings forth changes. The present paper tries to provide a rudimentary impression to the students about the concept, nature and types of movements with a thrust on the movements witnessed by Indian society.

Objectives:

- To introduce to the students with the concept of social movements and their dynamics.
- To introduce the students to the role of social movements in social transformation .
- To help them understand the various approaches to the study of social movements.

Learning Outcomes:The very aim of this paper is to disseminate knowledge about the concept of social movements and its process and change making role in the society.

Unit:1Social Movements:Nature, Definitions, Characteristics of social movement ,types: Revolutionary, Reform, Revival, Counter movements
Basis of social movements: Leadership, ideology, resource

**Unit-2 Religious movements in India: The SNDP Movements in Kerala
The Brahmo Samaj and The Arya Samaj**

**Unit-3 Peasants Movements in India: The Champaran Satyagraha
(1917), The Kheda Peasant Struggle, The Bardoli Movement in Gujarat.
The Peasant Revolt in Telangana ,The Tebhaga Movement in Bengal.**

**Unit-4 Backward Class Movements in India: Mahar Movement in
Maharashtra, Dalit Movement in Tamil Nadu, The Non Brahmin
Movement in Tamil Nadu**

**Unit-5 Women's Movements in India: In the Pre independence era and
the post independence period**

Essential readings:

1. Foweraker Joe, 1995 Theorising Social Movements, Pluto Press, London,
2. Buechler, S. 1997 'New Social Movement Theories' in Buechler, S. and Cylke, F.K., Jr. (eds.) Social Movements: Perspectives and Issues. Mountain View: Mayfield Publishing Company
3. Rao, M.S.A. ed. 1979 Social Movements in India Vol. I and II, Manohar, New Delhi
4. Dhanagare, D.N. 1983 Peasant Movements in India 1920-1950, OUP, Delhi, 1983
5. Kaur, Manmohan, 1968 "Role of Women in the Freedom Movement 1857-1947", Sterling, New Delhi
6. Basu, Aparna, 1976 "Role of Women in the Freedom Movement", in B.R. Nanda, ed, Indian Women From Purdah to Modernity, Vikas, Delhi.
7. Chattopadhyaya, Kamaladevi, 1983 "Indian Women's Battle for Freedom", Abhinav Publications, New Delhi

(SOC-DSE-2)

Industrial Sociology

Industrialisation as a social process has changed the face of humanity over the years. Industrialisation in its wake has brought several social problems and changes in social institutions, practices. The aim of this paper is to analyse the structure and process of industrial organisations from the sociological perspective. It also deals with the social effects of industrialization on Indian Social Systems and institutions.

Objectives: After going through this paper, the student can

- Understand the nature and scope of industrial sociology as a branch of Sociology.
- The developmental stages of industry.
- The organizational structure of industries and employee and employer relations in the industry.

Learning Outcomes:The very aim of this paper is to impress upon the students of sociology the role they can play in creating effective industrial relations with their knowledge of sociology.

Unit-I Introduction:

Meaning and definition of Industrial sociology. Nature and scope of Industrial Sociology. Significance of Industrial Sociology in India.

Unit-2 Social – industrial Thought:

A. Classical Theories: Adam Smith, Karl Marx, Max Weber, Durkheim and Mayo

B. Sociological Theories: Likert, Herzberg, Maslow, McClelland.

Unit-3 The Development of Industry:

The Manorial system, the Guild system, Domestic system, the Factory system. Industrial evolution in India.

Unit-4 Industrial Organisation:

Formal Organisation: Its nature and features, problems build-in in the formal organization Informal Organisation: Origin and function of informal organization. Informal Organisation of Management.

Unit-5 Industrial and Labour Relations:

Industrial Relations, International Labour Organisation, Labour Legislation, Industrial Relations in India. Industrial Disputes/conflicts.

Workers' participation in Management (WPM): Industrial Democracy: Levels of participation of WPM: Objectives, WPM Models in India.

Reference:

1. Gisbert, Pascal, 1972 Fundamentals of Industrial Sociology, New Delhi, Tata McGraw Hill
2. Davis, Keith, 1984 Human Behaviour at work, New Delhi, McGraw Hill
3. Ramaswamy, E.A. 1978 Industrial Relations in India, Delhi, MacMillan
4. Schneider, Eugene 1971 Industrial Sociology, McGraw Hill- London

(SOC-DSE-3)

Population Studies

Demography is both an index and instrument of development and change. India as a country is plagued by population explosion which retards, the economy and blocks social progress. Irrespective of several positive attempts undertaken by the government, India has failed to control its population problem. This paper is designed to provide an idea to the students about population dynamics and its impact on society.

Objectives: After going through this paper, the student can

- Understand the various facets of population studies and the theories that depict population change.
- Develop specific idea on Indian population structure, policies adopted and programmes launched in the country to check population.
- Assess the role of various agencies in population control.

Learning Outcomes:The very aim of this paper is to acquaint the students with a perennial problem of the Indian society that is population growth and the measures introduced to control it.

Fertility, Mortality and Migration

UNIT – 2 Population Theories: Malthusian, Demographic Transition and Optimum

Population Theory

UNIT – 3 Population Compositions in India: Age Structure, Sex-Ratio, Rural-Urban Composition, Literacy in India

UNIT – 4 Population Planning and Policies: Needs and Objectives; Population Policy of India, National Rural Health Mission

Unit-5 Population Control: Role of technology, women's empowerment, voluntary organisations

Essential Readings:

1. Agarwal, S.N. 1989 Population Studies with Special Reference to India, New Delhi: Lok Surjeet Publication.
2. Bose, Ashish 1991 Demographic Diversity in India, Delhi: B.R.Publishing Corporation.
3. Banarjee, D. 1985 Health and Family Planning Services in India, New Delhi: Lok Parkshan.
4. Chandrasekhar, S. (ed.) 1974 Infant Mortality, Population Growth and Family Planning in India, London: George Alen and Unwin Ltd.
5. Dubey, Surendra Nath 2001 Population of India, Delhi: Authors Press.
6. Kohli, S. 1977 Family Planning in India, New Delhi.
7. Malthus, T.R. 1986 An Essay on the Principle of Population, London: William Pickering.
8. Premi, M.K. 2004 Social Demography, Delhi: Jawahar Publishers and Distributors.
9. Sharma, Rajendra 1997 Demography and Population Problems, New Delhi: Atlantic Publishers.
10. Srivastava, O.S. 1998 Demography and Population Studies, New Delhi: Vikas Publishing House.
11. National Rural Health Mission 2006 Govt. of India, New Delhi.

(SOC-DSE-4)

Sociology of Social Institutions

Social institutions play a significant role in the functioning of a society by regulating the activities of the individuals and fulfilling their needs. Though they are universal to every society, they are not uniform in their characteristics and in terms of the norms they prescribe. They vary from society to society and across cultures. The present paper is designed to introduce to the students the basic social institutions which are fundamental to the lives of the people and significant to the functioning of the society.

Objectives: After going through this paper, the student can

- Understand the basic institutions which are vital to the functioning of the society.
- Learn the variations in the structure and functioning of these institutions across time and societies.
- Get an idea about the emerging features of these institutions.

Learning Outcomes: The very aim of this paper is to impress upon the students the vital role played by the institutions in social life, their typologies and changing features and functions.

Unit-1 Community, Groups, Institutions and Organizations.

Unit-2 Family, Marriage and Kinship: Key concepts; Different forms of family and marriage; Changes in family pattern worldwide; Importance of Kinship.

Unit-3 Religion : Defining religion; Varieties of religion; Theories of religion.

Unit-4 Education : The development of literacy and schooling; Gender and the education system; Education and ethnicity; Theories of schooling; Education and cultural reproduction; Education and inequality

Unit-5 Economy : Importance of work; Organisation of work; Work and technology; Formal Economy and Informal Economy; Market and Society.

Polity: Modern State; Concepts of Power and Authority; Forms of social distribution of power : Marxist, Elitist, Pluralist

Essential readings:

1. Ken Browne : An Introduction to Sociology ,Polity, 3rd ed.
2. Anthony Giddens : Sociology (4th ed) : Human Societies
3. Bilton and others : Introductory Sociology ,Macmillan
4. G. Rocher : A General Introduction to Sociology
5. P. Worsely : New Introducing Sociology
6. Smelser, Neil.J Sociology
7. S.K.Pramanik & R.Ganguly(eds) : Globalization in India ,PHI Learning

(SOC-GE-1)

Introduction to Sociology

This introductory paper intends to acquaint the students with Sociology as a social science and the basic concepts used in the discipline. It also focuses on the social processes and the social institutions that man encounters as a member of the society.

Objectives: After studying these two papers, the student can

- Can get to know the convergence and divergence of Sociology with other social science disciplines in terms of the subject matter, nature and scope of the discipline and its approach.
- Develop knowledge about its historicity.
- Can get acquainted with the basic concepts used in the subject.
- Can generate ideas about the social processes and social institutions man encounters as a member of the society.

Learning Outcomes: This paper is expected to clarify and broaden the student's notion about the subject, the basic concepts used and some universal societal processes. This will provide a wholesome picture about what the subject is all about.

Unit-1: Sociology: Definition and Subject matter, Nature and Scope, Emergence of Sociology, Sociology and its relationship with Anthropology, Political Science, Economics, and History

Unit-2: Basic Concepts: Society, Culture, Community, Institutions, Association, Social Structure, Status and Role, Norms and Values, Folkways and Mores, Associative and Dissociative processes – Cooperation, Assimilation, Accommodation, Competition, and conflict

Unit-3 : Individual and Society : Individual and society, Socialization, Stages and Agencies of Socialization, Development of Self – Contributions of George Herbert Mead, C.H. Cooley's Looking Glass Self The Concept of Group : Types of Groups – Primary and Secondary groups, In-Group and Out-group, Reference Group

Unit-4: Social Stratification: Meaning and definition, Dimensions of Stratification, Theories of Stratification – Functionalist, Marxist, Weberian. Social mobility and its determinants.

Unit-5: Social Control: Meaning and types, Formal and Informal social control, Agencies of Social control

Essential readings:

1. Bottomore. T.B. 1972, Sociology: A guide to problems and literature. Bombay :George Allen and Unwin (India)
2. Harlambos, M.1998. Sociology: Themes and perspectives. New Delhi Oxford University Press
3. Inkeles, Alex, 1987. What is Sociology? New Delhi: Prentice-Hall of India
4. Jaikaram, No. 1988 . What is Sociology .Madras:Macmillan, India :
5. Johnson, Harry M. 1995. Sociology: A Systematic Introduction. New Delhi , Allied Publishers
6. Schaefer, Richard T. and Robert P. Lamm. 1999 Sociology. New Delhi Tata-Mac Graw Hill.

(SOC-GE-2) **Indian Society**

Every society has its own peculiar structure and there are some institutions universal to every society, but with their unique manifestations in each society. There are some change agents and initiatives that enable the society to change with the passage of time. This paper focuses on the structure of the Indian society and the changing aspects with the processes operating, change agents and initiatives.

Objectives: After studying these two papers on Indian society, the student can

- Get an impression about the basic composition of Indian society, its historical moorings, basic philosophical foundations of the society and the institutions.
- Learn about the changing institutions, the processes, the agents and the interventions that bring about change in the Indian society.

Learning Outcomes: This paper is expected to bring familiarity in a student about Indian society. It will present a comprehensive, integrated and empirically –based profile of Indian society. It is hoped that the structure and processes operative in the society, the change agents operating in Indian society presented in this course will also enable students to gain a better understanding of their own situation and region.

Unit-1 : Composition of Indian Society : Caste, Tribe, Religion, Language. Unity in Diversities, Threats to national integration

Unit-2 Hindu Social Organisation: Bases of Hindu Social Organization, Varna, Ashrama and Purushartha. Doctrine of Karma.

Unit-3 : Marriage and Family in India: Hindu marriage as Sacrament, Forms of Hindu Marriage. The Hindu joint family: Patriarchal and Matriarchal systems. Marriage and family among the Muslims. Changes in the institutions of Marriage and Family.

Unit-4 : The Caste system in India: Origin, Features and Functions. Caste and Class, The Dominant Caste, Changes in Caste system, Caste and Politics in India Constitutional and legal provisions for the Scheduled Castes, Scheduled Tribes.

**Unit-5 : Social Change in Modern India :
Sanskritization, Westernization, Secularization,
and Modernization**

Essential readings:

11. Bose, N.K. 1967, Culture and Society in India. Bombay :

Asia Publishing House

12. Bose, N.K. 1975, Structure of Hindu Society. New Delhi
13. Dube, S.C. 1990, Society in India.(New Delhi: National Book Trust.)
14. Dube, S.C. 1995, Indian Village (London : Routledge)
15. Dube, S.C. 1958: India's changing Villages (London: Routledge and Kegan Paul).
16. Karve, Irawati, 1961 : Hindu Society : An Interpretation(Poona : Deccan- College) :: Lannoy,
17. Mandelbaum, D.G. 1970 : Society in India (Bombay: Popular Prakashan)
18. Srinivas, M.N. 1980 : India: Social Structure (New Delhi: Hindustan - Publishing Corporation)
19. Srinivas, M.N. 1963: Social Change in Modern India (California, Berkeley: University of California Press).
20. Singh, Yogendra, 1973: Modernization of Indian Tradition (Delhi: Thomson Press).

(SOC-GE-3)

Sociological Thought

Sociology originated as an intellectual response to the crisis confronting the mid nineteenth century European society. Its development over two centuries has been influenced by a variety of socio-economic and political conditions. It is now established as a multi-paradigmatic academic discipline, with its body of theoretical knowledge enriched and its methodological techniques and procedures systemized. This paper is intended to familiarize the students with the social, political, economic and intellectual contexts in which sociology emerged as a distinctive discipline. It deals with the contributions of the forerunners of the discipline and with the contributions of the founders who gave a systematic shape to the subject.

Objectives: After going through these two papers, the student can

- Gain an understanding of some of the classical contributions in Sociology, and their contemporary relevance.
- Learn about the methodological shift in the discipline over the years.

Learning Outcomes:This paper is expected to clarify and broaden the student's knowledge about the theoretical and methodological contributions of the classical contributors to the subject and the contemporary relevance of these theories.

Unit-1 : Auguste Comte : Law of the Three Stages, Hierarchy of

Sciences, Positivism Unit-2 : Herbert Spencer : Organismic

Analogy, Theory of Social Evolution

Unit-3 : Karl Marx : Dialectical Materialism, Class struggle, Alienation, Sociology of Capitalism

Unit-4 : Emile Durkheim : Division of Labour in Society, Rules of Sociological Method, Theory of Suicide.

Unit-5 : Max Weber : Social Action, Protestant ethic and the spirit of capitalism, Ideal type, Bureaucracy, Authority

Essential readings:

1. Aron, Ramond. 1967(1982 reprint) Main currents in sociological thoughts (2 volumes). Harmondsworth, Middlesex: Penguin Books
2. Barnes, H.E. 1959. Introduction to the history to the sociology The University of Chicago press
3. Coser, Lewis A. 1979. Masters of Sociological Thought. New York : Harcourt Brance Jovanovich
4. Fletcher, Ronald. 1994.The Making of Sociology (2 volumes) Jaipur-Rawat
5. Morrison, Ken.1995 Marx, Durkheim, Weber: Formation of Modern Social Thought. London; sage
6. Ritzer, George. 1996. Sociological Theory New Delhi. Tata-McGraw Hill
7. Singh, Yogendra. 1986 Indian Sociology: social conditioning and emerging Trends. New Delhi: Vistaar
8. Zeitlin, Irving.1998 (Indian Edition). Rethinking Sociology: A critique of Contemporary Theory. Jaipur: Rawat.

(SOC-GE-4)

Social Change and Development

Change is the law of nature and every society is subject to change. Social change has always been a central concern of Sociological study. Change takes different forms. Change has its pattern which is spelt out by various theories. Change is often propelled by various factors. This paper is designed to provide some ideas to the student about such process, theories and factors.

Objectives: After going through this paper, the student can

- Derive knowledge about the meaning, nature, forms and patterns of

change.

- Get an idea about the theories that explain change and their adequacy in explaining so.
- Get an impression about the factors that propel change in the society.

Learning Outcomes: This paper is expected to provide a wholesome idea to the students about the process of social change. They can relate their experience with the theoretical explanations.

Unit-1 : Social Change : Meaning and nature. Social Progress, Evolution and Development.

Unit-2 : Theories of Social Change : Evolutionary theory, Cyclical theory, Conflict Theory, Functionalist theory.

Unit-3 : Factors of Social Change: Cultural, Economic, Technological, Ideological, Demographic

Unit-4 : Economic Growth and Social Development : Indicators of Social Development, Human Development Index, Gender Development Index

Unit-5 : Models of Development : Capitalist, Socialist, and Gandhian.

Essential readings:

1. Moore, W.E. 1965 Social Change, Prentice-Hall of India. New Delhi
2. Gandhi M.K., Hind Swaraj
3. Schumacher, E.F., Small is Beautiful
4. Narain, Shreeman, Principles of Gandhian Planning
5. Mishra, B., Capitalism, Socialism and Planning.
6. UNDP, Human Development Report

 Skill Development
 Employability
 Entrepreneurship
 All the three
 Skill Development and Employability
 Skill Development and Entrepreneurship
 Employability and Entrepreneurship

UTKAL UNIVERSITY

REGULATIONS & SYLLABUS UNDER GRADUATE PROGRAMME IN BACHELOR OF SCIENCE

(HONOURS & PASS)- CBCS PATTERN Effective for Admission Batch: 2017-18

(Applicable to Autonomous Colleges)

REGULATIONS

1. Eligibility

- 1.1 Higher Secondary/+2/ Senior Secondary or any other equivalent examination passed from any Board/Council established by the Govt. of India or any State Govt. or any other equivalent examination recognized by Central Board of Secondary Education/Council of Higher Secondary Education, Govt. of Odisha/Dept of Higher Education/Dept. of Industry or any other Dept of Govt. of Odisha or Utkal University. Those joining B.Sc. Programme must have passed the above examination under the faculty of Science/Technology/Engineering/Pharmacy etc. There shall be no such restriction for joining BA/ B.Com stream.
- 1.2 Students ordinarily may be selected for admission through Entrance Test, Group Discussion and Personal Interview and/or a combination of these with due weighage to career to bedecided by the Autonomous College or Director, Higher Education. DDCE would admit students on first come first serve basis. The Govt. of Odisha may lay down admission process forcolleges under its control.
- 1.3 Admission Policy would be decided by the Academic Council of the respective Autonomous Colleges and for affiliated colleges Government will decide the admission policy.
- 1.4. Directorate of Distance & Continuing Education would decide its own admission policy.

2. Duration

- 2.1 At least three years of six semesters in toto. In case of professional courses the duration may be more as per the direction of regulatory bodies established under Law.
- 2.2 Odd semester is from June to December (i.e., Sem.-I, Sem.-III & Sem.-V semester). The examination shall be held normally in the month of November - December.
- 2.3 Even semester is from January to June (i.e., Sem.-II, Sem.-IV & Sem.-VI semester). The examination shall be held normally in the month of May - June. However the FinalSemester shall be conducted in April and result shall be published by end of May.
- 2.4 A student would be required to complete the course within six academic years from the date of admission.
- 2.5 A student may opt for fast track of completing all the six semesters in two years provided she/he has at least 2(two) years industry/organizational experience after +2. Such permission would be granted at the discretion of the Principal of the Autonomous Colleges and DDCE. This clause shall not be applicable to affiliated, non autonomous colleges.

3. Compulsory Registration in Semester-I

- 3.1 Registration for Semester-I is compulsory. A candidate admitted to +3 Courses but not registered for 1st semester examination, his/her admission will be automatically cancelled.
- 3.2 A candidate may take a blank Semester: A blank Semester has to be clubbed with next Odd or Even Semester as the case may be i.e. Sem.-II, Sem.-IV and Sem.-VI/Sem.-I, Sem.-III and Sem.-V. The Hostel policy for blank semester is to be decided by colleges as per their suitability. Hostel accommodation cannot be claimed as a right for a blank semester. (Blank semester is not to be confused as repetition due to failure).
- 3.3 75% attendance for non DDCE students is a requirement for being eligible to appear at

Examination Up to 15% waiver may be granted by the College Principal at discretion on Health Ground or participation in sports, cultural activities, NCC and NSS activities etc.

3.4 A student may clear backlog papers within 6 years. Improvement if any has to be completed within 4 years.

3.5 A student may register for extra credit i.e. register for additional papers under the same faculty or outside the faculty under an autonomous college or DDCE provided they are in a position to facilitate such teaching.

4. Weightage Distribution (Percentage) for Evaluation

• Theory Subjects

Mid Term Test-I	Mid Term Test-II	End Term Test	Total
10	10	80	100

• Subjects with Practical

Unit Test-I	Unit Test-II	End Term Test	Total
		A-Theory B-Practical	
10	10	A-50 B-30(20+10-Record)	100

• Dissertation/Project Work

Identification of problem	Review of Literature	Methodology	Findings	Analysis	Viva-Voce	Total
10	10	10	25	25	20	100

Note: For the DDCE unit tests, quizzes, presentation, seminar etc. may not be introduced immediately.

5. Grading System

5.1

<u>Grade</u>		<u>Marks secured out of 100</u>	<u>Grade points</u>
Outstanding	^J O ^J	90 – 100	10
Excellent	^J A ⁺ ^J	80 – 89	9
Very Good	^J A ^J	70 – 79	8
Good	^J B ⁺ ^J	60 – 69	7
Above average	<i>B</i>	50 – 59	6
Fair	^J C ^J	40 – 49	5
Pass	^J D ^J	30 – 39	4
Failed	^J F ^J	Below 30	0

NOTE:

- A Candidate has to secure 30% or above to pass in each of the Papers.

- The candidate obtaining Grade-*F* is considered failed and will be required to clear the back paper(s) in the subsequent examinations within the stipulated time.
- The candidate securing Grade-*B* and above in Core/Honours papers in aggregate will be awarded Honours.
- The candidate securing Grade-*B +* and above in aggregate in first appearance will be awarded Honours with Distinction/Distinction(for pass/regular course).
- Any candidate filling the forms for appearing in back papers/improvement shall not be awarded Distinction.

5.2 A transitory letter Grade-I (carrying points 2) shall be introduced for cases where the results are incomplete. This grade shall automatically be converted into appropriate grade(s) as and when the results are complete.

5.3 A student's level of competence shall be categorized by a **GRADE POINT AVERAGE**

to be specified as:

SGPA: Semester Grade Point Average **CGPA: Cumulative Grade Point Average**

(a) **POINT:** Integer equivalent of each letter grade.

(b) **CREDIT:** Integer signifying the relative emphasis of individual course item(s) in a semester as indicated by the Course structure and syllabus.

CREDIT POINT: $(b) \times (a)$ for each course item.

CREDIT INDEX: \sum CREDIT POINT of course items.

$$\text{GRADE POINT AVERAGE: } \frac{\text{CREDIT INDEX}}{\sum \text{CREDIT}} \quad \frac{\text{CREDIT INDEX for a semester}}{\sum \text{CREDIT}}$$

SEMESTER GRADE POINT AVERAGE(SGPA)=

CUMULATIVE GRADE POINT AVERAGE(CGPA)

$$= \frac{\text{CREDIT INDEX of all previous Semester up to the 6th semester}}{\sum \text{CREDIT}}.$$

5.4 In addition to the points marks/ percentage would also be awarded and shall also be reflected in the Mark Sheet.

5.5 The details of grading system shall be printed on the backside of University Mark-sheet.

6. Repeat Examination

6.1 A student has to clear back papers (i.e., in the paper/papers one has failed) by appearing at subsequent semester examinations within six years from the date of admission.

6.2 A student may appear improvement (repeat) in any number of papers in the immediate subsequent examination. The higher marks shall be retained.

6.3 Improvement has to be completed with 4-yrs. from the date of admission.

7. Hard case Rule

7.1 2% of grace mark on the aggregate mark subject to maximum of 5(five) marks in single paper shall be given. This shall be applicable in each semester.

7.2 0.5(point five percent) grace mark can be given for award of B Grade in each semester provided grace mark under 7.1 has not been awarded.

8. Examination Question Pattern(Suggestive)

8.1 The end semester examination will be of three hours irrespective of marks.

8.2 **For subject without having practical** full marks are 100 per paper out of which 20 marks is allotted for Mid-Semester Examination (Internal) and 80 marks for end semester examination. The question papers shall be divided into two parts such as Group-A & Group-B. Group-A will carry 10 short questions of two marks each. The answer should be within two sentences.

There shall be 5 long type questions in Group B with one alternative each have to be attempted and all questions shall be of equal value (12 marks ×5).

For subject with practical full marks are 100 per paper out of which 20 marks is allotted for Mid-Semester Examination, 50 is for End Semester Examination and 30 is for practical.

The question papers shall be divided into two parts such as Group-A & Group-B.

Group-A will carry 10 short questions of one mark each. The answer should be within two sentences.

There shall be 5 long-type questions with one alternative each have to be attempted for subjects having practical. The questions shall be of equal value (8 Marks ×5).

Practical will carry 30 marks out of which 10 will be for records.

8.3 Model answers for long questions should be between 700 – 1000 words.

9. Each Department shall have a designated Teacher in-charge of Examination to be decided by the Principal in addition to the Controller of Examinations of the College (applicable to autonomous colleges).
10. The Internal Evaluation would be the sole responsibility of Teacher offering the course.
11. Suitable modifications may be made by the Autonomous Colleges keeping in view the UGC guideline for Autonomous Colleges, University guidelines from time to time and State Govt. guidelines from time to time.

12. Broad Principles of Credit Transfer

There should be a small group to consider all cases of credit transfer. The group should consist of the following:

Chairman: Chairman P.G Council (for University affiliated colleges)/Director, DDCE for DDCE/Principals of the Autonomous College/Controller of Examinations, Utkal University.

Convener: Dy. Controller of Examinations for University affiliated colleges/Faculty member of DDCE for DDCE/Controller of Examinations of respective Autonomous colleges for Autonomous colleges.

Members: Four teachers to be nominated by the Chairman, P.G. Council/Director, DDCE/Principal of Autonomous Colleges as the case may be.

Waiver for courses covered under other colleges notwithstanding differences in detailed course can be granted. Papers which one has not studied even though they are prescribed for earlier semesters can be covered by the students.

Other Broad Principles: Student transferred after Semester-I examination cannot be given position or medal under autonomous colleges. Students who have failed/remained absent/appeared for improvement shall not be eligible for University Gold medal or Rank. Students who have been granted credit waiver under credit transfer system cannot be awarded Gold medal or position.

DETAILS OF COURSES UNDER BACHELOR OF SCIENCE(HONOURS)

Course	Theory+Practical	Theory + Tutorial
I. Core Course (6 Credits) (14 Papers)	$14 \times 4 = 56$	$14 \times 5 = 70$
Core Course Practical / Tutorial* (14 Papers)	$14 \times 2 = 28$	$14 \times 1 = 14$
II. Elective Course (6 Credits) (8 Papers)		
A.1. Discipline Specific Elective (4 Papers)	$4 \times 4 = 16$	$4 \times 5 = 20$
A.2. Discipline Specific Elective (4 Papers) Practical/ Tutorial*	$4 \times 2 = 8$	$4 \times 1 = 4$
Disciplinary (4 Papers) Tutorials*(4)		
B.1. Generic Elective/Interdis- Papers)	$4 \times 4 = 16$	$4 \times 5 = 20$
B.2. Generic Elective, Practical/	$4 \times 2 = 8$	$4 \times 1 = 4$
• Optional Dissertation or Project Work in place of one Discipline Specific elective paper (6 credits) in Semester-VI.		
III. Ability Enhancement Courses		
1. Ability Enhancement Compulsory Courses(AECC) (2 Papers of 4 credit each)	$2 \times 4 = 8$	$2 \times 4 = 8$
Environmental Science/English/ Hindi/MIL Communication		
2. Skill Enhancement Courses(SEC) (Min.2)(2 Papers of 4 credit each)	$2 \times 4 = 8$	$2 \times 4 = 8$
Total Credit	148	148

- Institute should evolve a system/policy about ECA/General Interest/Hobby/Sports NCC/NSS/related courses on its own.
- Wherever there is a practical there will be no tutorial and vice-versa.
- For Generic Elective, there shall be two subjects other than the Core subject having two papers each.

SCHEME FOR CHOICE BASED CREDIT SYSTEM BACHELOR OF SCIENCE(HONOURS)

Semester	Core Course(14)	Ability Enhancement Compulsory Course (AECC)(2)	Skill Enhancement Course (SEC)(2)	Discipline Specific Elective (DSE)(4)	Generic Elective (GE)(4)
I	C-1 C-2	Environmental Science			GE-1A
II	C-3 C-4	MIL Communication (Oriya/Hindi)			GE-2A
III	C-5 C-6 C-7		SEC-1(English Communication)		GE-1B
IV	C-8 C-9 C-10		SEC-2		GE-2B
V	C-11 C-12		DSE-1 DSE-2		
VI	C-13 C-14		DSE-3 DSE-4		

DETAILS OF COURSES UNDER BACHELOR OF SCIENCE(REGULAR/PASS)

Course	Theory+Practical	Theory + Tutorial
I. Core Course (6 Credits)		
(12 Papers)	$12 \times 4 = 48$	$12 \times 5 = 60$
(4 Courses from each of the 3 Disciplines of choice)		
Core Course Practical / Tutorial*		
(12 Practical/Tutorials*)	$12 \times 2 = 24$	$12 \times 1 = 12$
(4 Courses from each of the 3 Disciplines of choice)		
II. Elective Course (6 Credits)		
(6 Papers)	$6 \times 4 = 24$	$6 \times 5 = 30$
(Two papers from each discipline of choice including paper of interdisciplinary nature)		
Elective Course Practical/Tutorials*		
(6 Practical/Tutorials*)	$6 \times 2 = 12$	$6 \times 1 = 6$
(Two Papers from each Disciplines of choice including paper of interdisciplinary nature)		
<ul style="list-style-type: none"> • Optional Dissertation/Project Work in place of one Discipline elective paper (6 credits) in Semester-VI. 		
III. Ability Enhancement Courses		
1. Ability Enhancement Compulsory Courses(AECC)		
(2 Papers of 4 credit each)	$2 \times 4 = 8$	$2 \times 4 = 8$
Environmental Science/English/ Hindi/MIL Communication		
2. Skill Enhancement Courses(SEC)		
(4 Papers of 4 credit each)	$4 \times 4 = 16$	$4 \times 4 = 16$
<hr/>		
Total Credit	132	132

- Institute should evolve a system/policy about ECA/General Interest/Hobby/Sports NCC/NSS/related courses on its own.
- Wherever there is a practical, there will be no tutorial and vice-versa.

**SCHEME FOR CHOICE BASED CREDIT SYSTEM BACHELOR OF SCIENCE
(REGULAR/ PASS)**

Semester	Core Course(12)	Ability Enhancement Compulsory Course (AECC)(2)	Skill Enhancement Course (SEC)(2)	Discipline Specific Elective (DSE)(6)
I	DSC-1A DSC-2A DSC-3A	Environmental Science		
II	DSC-1B DSC-2B DSC-3B	MIL Communication (Oriya/Hindi)		
III	DSC-1C DSC-2C DSC-3C		SEC-1(English Communication)	
IV	DSC-1D DSC-2D DSC-3D		SEC-2	
V			SEC-3	DSE-1A DSE-2A DSE-3A
VI			SEC-4	DSE-1B DSE-2B DSE-3B

**COLOUR SCHEME OF MAPPING THE SYLLABI FOR ENTREPRENEURSHIP,
EMPLOYABILITY AND SKILL DEVELOPMENT**



Skill Development



Employability



Entrepreneurship



All the three



Skill Development and Employability



Skill Development and Entrepreneurship



Employability and Entrepreneurship

**ABILITY ENHANCEMENT COMPULSORY
COURSES (AECC)
(For all Subjects)**

SEMESTER-I

AECC-I: Environmental Science

Max. Marks:100 (End-Sem.:80 Marks, Mid-Sem.: 20 Marks)

UNIT-I

The Environment: The Atmosphere, Hydrosphere, Lithosphere, Biosphere, Ecology, Ecosystem, Biogeochemical Cycle (Carbon Cycle, Nitrogen Cycle).

UNIT-II

Environment Pollution: Air Pollution, Water Pollution, Soil Pollution, Noise Pollution, Thermal Pollution, Radiation Pollution, Natural Disasters and their Management.

UNIT-III

Population Ecology: Individuals, Species, Pollution, Community, Control Methods of Population, Urbanization and its effects on Society, Communicable Diseases and its Transmission, Non-Communicable Diseases.

UNIT-IV

Environmental Movements in India: Grassroot Environmental movements in India, Role of women, Environmental Movements in Odisha, State Pollution Control Board, Central Pollution Control Board.

UNIT-V

Natural Resources: Conservation of Natural Resources, Management and Conservation of Wildlife, Soil Erosion and Conservation, Environmental Laws: Water Act, 1974, Air Act, 1981, The Wildlife (Protection) Act, 1972, Environment Protection, 1986.

SEMESTER-II

AECC-II: MIL Communication (Odia/Sanskrit/Alt. Eng.)

Max. Marks:100 (End-Sem.:80 Marks, Mid-Sem.: 20 Marks)

(Detailed syllabus for this paper is available in MIL Odia/Sanskrit/Alt. Eng Communication syllabus).

BOTANY(HONOURS)

SEMESTER-I

C-I: MICROBIOLOGY & PHYCOLOGY

(Credits-6: Theory-4, Practical-2)-Max. Marks: 100

THEORY (Each class 1 hr.): Marks-70 PRACTICAL

(Each class 2 hrs.): Marks-30 Lectures: 60 (40

Theory + 20 Practical classes)

Unit-I

Introduction to microbial world, microbial nutrition, growth and metabolism. (2 lectures)

Unit-II

Bacteria: Discovery, general characteristics, types-archaeobacteria, eubacteria, wall-less forms (mycoplasma and spheroplasts), cell structure, nutritional types, reproduction-vegetative, asexual and recombina-

tion (conjugation, transformation and transduction). Economic importance of bacteria with reference to their role in agriculture and industry (fermentation and medicine). (5 lectures)

Unit-III

Algae:- General characteristics; Ecology and distribution; range of thallus organization; Cell structure and components; cell wall, pigment system, reserve food (of only groups represented in the syllabus), flagella; and methods of reproduction, classification; criteria, system of Fritsch, and evolutionary classification of Lee (only upto groups); significant contributions of important phycologists (F.E. Fritsch, G.M. Smith, R.N. Singh, T.V. Desikachary, H.D. Kumar, M.O.P. Iyengar). Role of algae in the environment, agriculture, biotechnology and industry. (6 lectures)

Unit-IV

Cyanophyta:- Ecology and occurrence, range of thallus organization, cell structure, heterocyst, reproduction. economic importance; role in biotechnology. Morphology and life-cycle of Nostoc.(5 lectures)

Chlorophyta:- General characteristics, occurrence, range of thallus organization, cell structure and reproduction. Morphology and life-cycles of Chlamydomonas, Volvox, Oedogonium, Coleochaete. Evolutionary significance of Prochloron. (5 lectures)

Unit-V

Charophyta:- General characteristics; occurrence, morphology, cell structure and life-cycle of Chara; evolutionary significance.(2 lectures)

Xanthophyta:- General characteristics; range of thallus organization; Occurrence, morphology and life-cycle of Vaucheria.(3 lectures)

Phaeophyta:- Characteristics, occurrence, range of thallus organization, cell structure and reproduction. Morphology and life-cycles of Ectocarpus and Fucus.(3 lectures)

Rhodophyta:- General characteristics, occurrence, range of thallus organization, cell structure and reproduction. Morphology and life-cycle of Polysiphonia.(4 lectures)

PRACTICAL

Microbiology:

1. Electron micrographs/Models of viruses T-Phage and TMV, Line drawings/ Photographs of Lytic and Lysogenic Cycle.
2. Types of Bacteria to be observed from temporary/permanent slides/photographs. Electron micrographs of bacteria, binary fission, endospore, conjugation, root Nodule.
3. Gram staining.
4. Endospore staining with malachite green using the (endospores taken from soil bacteria).

Phycology:

Study of vegetative and reproductive structures of Nostoc, Chlamydomonas (electron micrographs), Volvox, Oedogonium, Coleochaete, Chara, Vaucheria, Ectocarpus, Fucus and Polysiphonia, Prochloron through electron micrographs, temporary preparations and permanent slides.

Suggested Readings:

1. Lee, R.E. (2008). Phycology, Cambridge University Press, Cambridge. 4th edition.
2. Prescott, L.M., Harley J.P., Klein D. A. (2005). Microbiology, McGraw Hill, India. 6th edition.
3. Kumar, H.D. (1999). Introductory Phycology. Affiliated East-West Press, Delhi.
4. Sahoo, D. (2000). Farming the ocean: seaweeds cultivation and utilization. Aravali International, New Delhi.
5. Campbell, N.A., Reece J.B., Urry L.A., Cain M.L., Wasserman S.A. Minorsky P.V., Jackson R.B. (2008). Biology, Pearson Benjamin Cummings, USA. 8th edition.
6. Pelczar, M.J. (2001) Microbiology, 5th edition, Tata McGraw-Hill Co, New Delhi.

C-2: BIOMOLECULES & CELL BIOLOGY

(Credits-6: Theory-4, Practical-2)-Max. Marks: 100

THEORY (Each class 1 hr.): Marks-70 PRACTICAL

(Each class 2 hrs.): Marks-30 Lectures: 60 (40
Theory + 20 Practical classes)

Unit-I

Biomolecules: Types and significance of chemical bonds; Structure and properties of water; pH and buffers. (2 lectures)

Carbohydrates: Nomenclature and classification; Role of monosaccharides (glucose, fructose, sugar alcohols mannitol and sorbitol); Disaccharides (sucrose, maltose, lactose), Oligosaccharides and polysaccharides (structural-cellulose, hemicelluloses, pectin, chitin, mucilage; storage, starch, insulin) (3 lectures)

Lipids: Definition and major classes of storage and structural lipids. Storage lipids. Fatty acids

structure and functions. Essential fatty acids. Triacyl glycerols structure, functions and properties. (2 lectures)

Proteins: Structure of amino acids; Peptide bonds; Levels of protein structure-primary, secondary, tertiary and quaternary; Isoelectric point; Protein denaturation and biological roles of proteins. (2 lectures)

Nucleic acids: Structure of nitrogenous bases; Structure and function of nucleotides; Types of nucleic acids; Structure of A, B, Z types of DNA; Types of RNA; Structure of tRNA. (4 lectures) **Unit-II**

Bioenergetics: Laws of thermodynamics, concept of free energy, endergonic and exergonic reactions, coupled reactions, redox reactions. ATP: structure, its role as a energy currency molecule. (3 lectures)

Enzymes: Structure of enzyme: holoenzyme, apoenzyme, cofactors, coenzymes and prosthetic group; Classification of enzymes; Features of active site, substrate specificity, mechanism of action (activation energy, lock and key hypothesis, induced - fit theory), Michaelis Menten equation, enzyme inhibition and factors affecting enzyme activity. (4 lectures)

Unit-III

The cell: Cell as a unit of structure and function; Characteristics of prokaryotic and eukaryotic cells; Origin of eukaryotic cell (Endosymbiotic theory). (2 lectures)

Cell wall and plasma membrane: Chemistry, structure and function of Plant Cell Wall. Overview of membrane function; fluid mosaic model; Chemical composition of membranes; Membrane transport Passive, active and facilitated transport, endocytosis and exocytosis. (3 lectures)

Unit-IV

Cell organelles: Nucleus; Structure-nuclear envelope, nuclear pore complex, nuclear lamina, molecular organization of chromatin; nucleolus. (3 lectures)

Cytoskeleton: Role and structure of microtubules, microfilaments and intermediary filament. (2 lectures)

Chloroplast, mitochondria and peroxisomes: Structural organization; Function; Semiautonomous nature of mitochondria and chloroplast. (2 lectures)

Endoplasmic Reticulum, Golgi Apparatus, Lysosomes (2 lectures)

Unit-V

Cell division: Eukaryotic cell cycle, different stages of mitosis and meiosis. Cell cycle, Regulation of cell cycle. (6 lectures)

PRACTICAL

1. Qualitative tests for carbohydrates, reducing sugars, non-reducing sugars, lipids and proteins.
2. Study of plant cell structure with the help of epidermal peel mount of Onion/Rhoeo/Crinum.
3. Demonstration of the phenomenon of protoplasmic streaming in Hydrilla leaf.
4. Measurement of cell size by the technique of micrometry.
5. Counting the cells per unit volume with the help of haemocytometer. (Yeast/pollen grains).
6. Study of cell and its organelles with the help of electron micrographs.
7. Study the phenomenon of plasmolysis and deplasmolysis.
8. Study different stages of mitosis and meiosis using aceto carmine and aceto orcin method.

Suggested Readings:

1. Campbell, MK (2012) Biochemistry, 7th ed., Published by Cengage Learning.
2. Campbell, PN and Smith AD (2011) Biochemistry Illustrated, 4th ed., Published by Churchill

Livingstone.

3. Tymoczko JL, Berg JM and Stryer L (2012) Biochemistry: A short course, 2nd ed., W.H. Freeman
4. Berg JM, Tymoczko JL and Stryer L (2011) Biochemistry, W.H. Freeman and Company
5. Nelson DL and Cox MM (2008) Lehninger Principles of Biochemistry, 5th Edition., W.H. Freeman and Company.
6. Karp, G. (2010). Cell Biology, John Wiley & Sons, U.S.A. 6th edition.
7. Hardin, J., Becker, G., Skliensmith, L.J. (2012). Beckers World of the Cell, Pearson Education Inc. U.S.A. 8th edition.
8. Cooper, G.M. and Hausman, R.E. 2009 The Cell: A Molecular Approach. 5th edition. ASM Press & Sunderland, Washington, D.C.; Sinauer Associates, MA.
9. Becker, W.M., Kleinsmith, L.J., Hardin. J. and Bertoni, G. P. 2009 The World of the Cell. 7th edition. Pearson Benjamin Cummings Publishing, San Francisco

SEMESTER-II

C-3: MYCOLOGY & PHYTOPATHOLOGY

(Credits-6: Theory-4, Practical-2)-Max. Marks: 100

THEORY (Each class 1 hr.): Marks-70 PRACTICAL

(Each class 2 hrs.): Marks-30 Lectures: 60 (40

Theory + 20 Practical classes)

Unit-I

Introduction to true fungi: Definition, **General characteristics**; Affinities with plants and animals; Thallus organization; Cell wall composition; Nutrition; Classification.

Chytridiomycetes: **General account** (5 lectures)

Zygomycota: **General characteristics**; Ecology; Thallus organisation; Life cycle with reference to Rhizopus. (4 lectures)

Ascomycota: **General characteristics** (asexual and sexual fruiting bodies); Ecology; Life cycle, Heterokaryosis and parasexuality; life cycle and classification with reference to Saccharomyces, Aspergillus, Penicillium, Alternaria and Neurospora, Peziza. (5 lectures)

Unit-II

Basidiomycota: **General characteristics**; Ecology; Life cycle and Classification with reference to black stem rust on wheat Puccinia (Physiological Specialization), loose and covered smut (symptoms only), Agaricus; Bioluminescence, Fairy Rings and Mushroom Cultivation. (5 lectures)

Allied Fungi: **General characteristics**; Status of Slime molds, Classification; Occurrence; Types of plasmodia; Types of fruiting bodies. (3 lectures)

Oomycota: **General characteristic**; Ecology; Life cycle and classification with reference to Phytophthora, Albugo. (4 lectures)

Unit-III

Symbiotic associations: Lichen Occurrence; **General characteristics**; Growth forms and range of thallus organization; Nature of associations of algal and fungal partners; Reproduction. **Mycorrhiza-Ectomycorrhiza, Endomycorrhiza and their significance.** (4 lectures)

Unit-IV

Applied Mycology: **Role of fungi in biotechnology, Application of fungi in food industry (Flavour &**

texture, Fermentation, Baking, Organic acids, Enzymes, Mycoproteins); Secondary metabolites (Pharmaceutical preparations); Agriculture (Biofertilizers); Mycotoxins; Biological control (Mycofungicides, Mycoherbicides, Mycoinsecticides, Myconematicides); Medical mycology. (5 Lectures)

Unit-V

Phytopathology: Terms and concepts; General symptoms; Geographical distribution of diseases; etiology; symptomology; Host-Pathogen relationships; disease cycle and environmental relation; prevention and control of plant diseases, and role of quarantine. Bacterial diseases Citrus canker and angular leaf spot disease of Cotton. Viral diseases Tobacco Mosaic viruses, vein clearing. Fungal diseases Early blight of potato, Black stem rust of wheat, white rust of crucifers. (5 lectures)

PRACTICAL

1. Introduction to the world of fungi (Unicellular, coenocytic/septate mycelium, ascocarps & basidiocarps).
2. Rhizopus: study of asexual stage from temporary mounts and sexual structures through permanent slides.
3. Aspergillus and Penicillium: study of asexual stage from temporary mounts. Study of Sexual stage from permanent slides/photographs.
4. Peziza: sectioning through ascocarp.
5. Alternaria: Specimens/photographs and temporary mounts.
6. Puccinia: Herbarium specimens of Black Stem Rust of Wheat and infected Barberry leaves; sections/ mounts of spores on wheat and permanent slides of both the hosts.
7. Agaricus: Specimens of button stage and full grown mushroom; sectioning of gills of Agaricus, fairy rings and bioluminescent mushrooms to be shown.
8. Albugo: Study of symptoms of plants infected with Albugo; asexual phase study through section/temporary mounts and sexual structures through permanent slides.
9. Lichens: Study of growth forms of lichens (crustose, foliose and fruticose) on different substrates. Study of thallus and reproductive structures (soredia and apothecium) through permanent slides. Mycorrhizae: ectomycorrhiza and endo mycorrhiza (Photographs)
10. Phytopathology: Herbarium specimens of bacterial diseases; Citrus Canker; Viral diseases: TMV, Fungal diseases: Early blight of potato, and White rust of crucifers.

Suggested Readings:

1. Agrios, G.N. 1997 Plant Pathology, 4th edition, Academic Press, U.K.
2. Alexopoulos, C.J., Mims, C.W., Blackwell, M. (1996). Introductory Mycology, John Wiley & Sons (Asia) Singapore. 4th edition.
3. Webster, J. and Weber, R. (2007). Introduction to Fungi, Cambridge University Press, Cambridge. 3rd edition.
4. Sethi, I.K. and Walia, S.K. (2011). Text book of Fungi and Their Allies, Macmillan Publishers India Ltd.
5. Sharma, P.D. (2011). Plant Pathology, Rastogi Publication, Meerut, India.

C-4: ARCHEGONIATE

(Credits-6: Theory-4, Practical-2)-Max. Marks: 100

THEORY (Each class 1 hr.): Marks-70 PRACTICAL

(Each class 2 hrs.): Marks-30 Lectures: 60 (40

Theory + 20 Practical classes)

Unit-I

Introduction: **Unifying features of archegoniates**; Transition to land habit; Alternation of generations. (2 lectures)

Unit-II

Bryophytes: **General characteristics**; Adaptations to land habit; Classification; Range of thallus organization. Classification (up to family). Riccia, Marchantia, Pellia, Porella, Anthoceros, Sphagnum and Funaria; Reproduction and evolutionary trends in Riccia, Marchantia, Anthoceros and Funaria (developmental stages not included). **Ecological and economic importance of bryophytes with special reference to Sphagnum.** (12 lectures)

Unit-III

Pteridophytes: **General characteristics**, classification. Classification (up to family), morphology, anatomy and reproduction of Psilotum, Selaginella, Equisetum and Pteris. (Developmental details not to be included). Apogamy, and apospory, heterospory and seed habit, telome theory, stellar evolution. **Ecological and economic importance.** (10 lectures)

Unit-IV

Gymnosperms: **General characteristics**, classification (up to family), morphology, anatomy and reproduction of Cycas, Pinus, Ginkgo and Gnetum. (Developmental details not to be included). **Ecological and economic importance.** (8 lectures)

Unit-V

Fossils: Geographical time scale, fossils and fossilization process. **Morphology, anatomy and affinities of Rhynia, Calamites, Lepidodendron, Lyginopteris and Cycadeoidea.** (8 lectures)

PRACTICAL

1. Riccia Morphology of thallus.
2. Marchantia- Morphology of thallus, whole mount of rhizoids & Scales, vertical section of thallus through Gemma cup, whole mount of Gemmae (all temporary slides), vertical section of Antheridiophore, Archegoniophore, longitudinal section of Sporophyte (all permanent slides).
3. Anthoceros- Morphology of thallus, dissection of sporophyte (to show stomata, spores, pseudoelaters, columella) (temporary slide), vertical section of thallus (permanent slide).
4. Pellia, Porella- Permanent slides.
5. Sphagnum- Morphology of plant, whole mount of leaf (permanent slide only).
6. Funaria- Morphology, whole mount of leaf, rhizoids, operculum, peristome, annulus, spores (temporary slides); permanent slides showing antheridial and archegonial heads, longitudinal section of capsule and protonema.
7. Psilotum- Study of specimen, transverse section of synangium (permanent slide).
8. Selaginella- Morphology, whole mount of leaf with ligule, transverse section of stem, whole mount of strobilus, whole mount of microsporophyll and megasporophyll (temporary slides), longitudinal section of strobilus (permanent slide).

9. Equisetum- Morphology, transverse section of internode, longitudinal section of strobilus, transverse section of strobilus, whole mount of sporangiophore, whole mount of spores (wet and dry) (temporary slide), transverse section of rhizome (permanent slide).
10. Pteris- Morphology, transverse section of rachis, vertical section of sporophyll, whole mount of sporangium, whole mount of spores (temporary slides), transverse section of rhizome, whole mount of prothallus with sex organs and young sporophyte (permanent slide).
11. Cycas- Morphology (coralloid roots, bulbil, leaf), whole mount of microsporophyll, transverse section of coralloid root, transverse section of rachis, vertical section of leaflet, vertical section of microsporophyll, whole mount of spores (temporary slides), longitudinal section of ovule, transverse section of root (permanent slide).
12. Pinus- Morphology (long and dwarf shoots, whole mount of dwarf shoot, male and female cones), transverse section of Needle, transverse section of stem, longitudinal section of transverse section of male cone, whole mount of microsporophyll, whole mount of Microspores (temporary slides), longitudinal section of female cone, tangential longitudinal section & radial longitudinal sections stem (permanent slide).
13. Gnetum- Morphology (stem, male & female cones), transverse section of stem, vertical section of ovule (permanent slide)
14. Botanical excursion.

Suggested Readings:

1. Vashista, P.C., Sinha, A.K., Kumar, A. (2010). Pteridophyta. S. Chand. Delhi, India.
2. Bhatnagar, S.P. & Moitra, A. (1996). Gymnosperms. New Age International (P) Ltd Publishers, New Delhi, India.
3. Parihar, N.S. (1991). An introduction to Embryophyta: Vol. I. Bryophyta. Central Book Depot. Allahabad.
4. Raven, P.H., Johnson, G.B., Losos, J.B., Singer, S.R. (2005). Biology. Tata McGraw Hill, Delhi.
5. Vander-Poorteri 2009 Introduction to Bryophytes. COP.

SEMESTER-III

C-5: ANATOMY OF ANGIOSPERMS

(Credits-6: Theory-4, Practical-2)-Max. Marks: 100

THEORY (Each class 1 hr.): Marks-70 PRACTICAL

(Each class 2 hrs.): Marks-30 Lectures: 60 (40

Theory + 20 Practical classes)

Unit-I

Introduction and scope of Plant Anatomy: Applications in systematics, forensics and pharmacognosy. (2 Lectures)

Tissues: Classification of tissues; Simple and complex tissues (no phylogeny); cytodifferentiation of tracheary elements and sieve elements; Pits and plasmodesmata; Wall ingrowths and transfer cells, adcrustation and incrustation, Ergastic substances. (5 Lectures)

Unit-II

Stem: Organization of shoot apex (Apical cell theory, Histogen theory, Tunica Corpus theory, continuing meristematic residue, cytohistological zonation); Types of vascular bundles; Structure of dicot

and monocot stem. (5 Lectures)

Leaf: Structure of dicot and monocot leaf, Kranz anatomy. (4 Lectures)

Root: Organization of root apex (Apical cell theory, Histogen theory, Korper-Kappe theory); Quiescent centre; Root cap; Structure of dicot and monocot root; Endodermis, exodermis and origin of lateral root. (4 Lectures)

Unit-III

Vascular Cambium: Structure, function and seasonal activity of cambium; Secondary growth in root and stem. (4 Lectures)

Wood: Axially and radially oriented elements; Types of rays and axial parenchyma; Cyclic aspects and reaction wood; Sapwood and heartwood; Ring and diffuse porous wood; Early and late wood, tyloses; Dendrochronology. (5 Lectures)

Periderm: Development and composition of periderm, rhytidome and lenticels. (3 Lectures)

Unit-IV

Adaptive and Protective Systems Epidermal tissue system, cuticle, epicuticular waxes, trichomes (uni- and multicellular, glandular and nonglandular, two examples of each), stomata (classification); Adcrustation and incrustation; Anatomical adaptations of xerophytes and hydrophytes. (5 Lectures)

Unit-V

Secretory System: Hydathodes, cavities, lithocysts and laticifers. (3 Lectures)

PRACTICAL

1. Study of anatomical details through permanent slides/temporary stain mounts/macerations/museum specimens with the help of suitable examples.
2. Apical meristem of root, shoot and vascular cambium.
3. Distribution and types of parenchyma, collenchyma and sclerenchyma.
4. Xylem: Tracheary elements-tracheids, vessel elements; thickenings; perforation plates; xylem fibres.
5. Wood: ring porous; diffuse porous; tyloses; heart- and sapwood.
6. Phloem: Sieve tubes-sieve plates; companion cells; phloem fibres.
7. Epidermal system: cell types, stomata types; trichomes: non-glandular and glandular.
8. Root: monocot, dicot, secondary growth.
9. Stem: monocot, dicot - primary and secondary growth; periderm; lenticels.
10. Leaf: isobilateral, dorsiventral, C4 leaves (Kranz anatomy).
11. Adaptive Anatomy: xerophytes, hydrophytes.
12. Secretory tissues: cavities, lithocysts and laticifers.

Suggested Readings:

1. Dickison, W.C. (2000). Integrative Plant Anatomy. Harcourt Academic Press, USA.
2. Fahn, A. (1974). Plant Anatomy. Pergmon Press, USA.
3. Mauseth, J.D. (1988). Plant Anatomy. The Benjamin/Cummings Publisher, USA.
4. Esau, K. (1977). Anatomy of Seed Plants. John Wiley & Sons, Inc., Delhi.

C-6: ECONOMIC BOTANY

(Credits-6: Theory-4, Practical-2)-Max. Marks: 100

THEORY (Each class 1 hr.): Marks-70 PRACTICAL

(Each class 2 hrs.): Marks-30 Lectures: 60 (40

Theory + 20 Practical classes)

Unit-I

Origin of Cultivated Plants: Concept of Centres of Origin, their importance with reference to Vavilovs work. Examples of major plant introductions; Crop domestication and loss of genetic diversity; evolution of new crops/varieties, importance of germplasm diversity. (3 Lectures)

Unit-II

Cereals : Wheat and Rice (origin, morphology, processing & uses), brief account of millets. (3 lectures)

Legumes: General account, importance to man and ecosystem. (3 Lectures)

Sugars & Starches: Morphology and processing of sugarcane, products and by-products of sugarcane industry. Potato morphology, propagation & uses. (3 lectures)

Unit-III

Spices:Listing of important spices, their family and part used, economic importance with special reference to fennel, saffron, clove and black pepper (4 Lectures)

Beverages: Tea, Coffee (morphology, processing & uses)(4 lectures) Drug-yielding plants: Therapeutic and habit-forming drugs with special reference to Cinchona, Digitalis, Papaver and Cannabis. (4 Lectures)

Tobacco: Tobacco (Morphology, processing, uses and health hazards) (2Lectures)

Unit-IV

Oils & Fats: General description, classification, extraction, their uses and health implications groundnut, coconut, linseed and Brassica and Coconut (Botanical name, family & uses) (4 lectures) Essential

Oils: General account, extraction methods, comparison with fatty oils & their uses. (4 Lectures)

Unit-V

Natural Rubber: Para-rubber: tapping, processing and uses. (2 Lectures)

Timber plants: General account with special reference to teak and pine. (2 Lectures)

Fibres: Classification based on the origin of fibres, Cotton and Jute (morphology, extraction and uses). (2 Lectures)

PRACTICAL

1. Cereals: Rice (habit sketch, study of paddy and grain, starch grains, micro-chemical tests).
2. Legumes: Soya bean, Groundnut, (habit, fruit, seed structure, micro-chemical tests).
3. Sugars & Starches: Sugarcane (habit sketch; cane juice- micro-chemical tests), Potato(habit sketch, tuber morphology, T.S. tuber to show localization of starch grains, w.m. starch grains, micro-chemical tests).
4. Spices: Black pepper, Fennel and Clove (habit and sections).

5. Beverages: Tea (plant specimen, tea leaves), Coffee (plant specimen, beans).
6. Oils & Fats: Coconut- T.S. nut, Mustard plant specimen, seeds; tests for fats in crushed seeds.
7. Essential oil-yielding plants: Habit sketch of Rosa, Vetiveria, Santalum and Eucalyptus (specimens/photographs).
8. Rubber: specimen, photograph/model of tapping, samples of rubber products.
9. Drug-yielding plants: Specimens of Digitalis, Papaver and Cannabis.
10. Tobacco: specimen and products of Tobacco.
11. Woods: Tectona, Pinus: Specimen, Section of young stem.
12. Fibre-yielding plants: Cotton (specimen, whole mount of seed to show lint and fuzz; whole mount of fibre and test for cellulose), Jute (specimen, transverse section of stem, test for lignin on transverse section of stem and fibre).

Suggested Readings:

1. Kochhar, S.L. (2012). Economic Botany in Tropics, MacMillan & Co. New Delhi, India.
2. Wickens, G.E. (2001). Economic Botany: Principles & Practices. Kluwer Academic Publishers, The Netherlands.
3. Chrispeels, M.J. and Sadava, D.E. (2003). Plants, Genes and Agriculture. Jones & Bartlett Publishers.

C-7: GENETICS

(Credits-6: Theory-4, Practical-2)-Max. Marks: 100
 THEORY (Each class 1 hr.): Marks-70 PRACTICAL
 (Each class 2 hrs.): Marks-30 Lectures: 60 (40
 Theory + 20 Practical classes)

Unit-I

Mendelian genetics and its extension Mendelism: History; Principles of inheritance; Chromosome theory of inheritance; Autosomes and sex chromosomes; Probability and pedigree analysis; Incomplete dominance and codominance; Multiple alleles, Lethal alleles, Epistasis, Pleiotropy, Recessive and Dominant traits, Penetrance and Expressivity, Numericals; Polygenic inheritance. (16 lectures)

Unit-II

Extrachromosomal Inheritance: Chloroplast mutation: Variegation in Four o'clock plant; Mitochondrial mutations in yeast; Maternal effects-shell coiling in snail; Infective heredity- Kappa particles in Paramecium. (6 lectures)

Unit-III

Linkage, crossing over and chromosome mapping: Linkage and crossing over-Cytological basis of crossing over; Recombination frequency, two factor and three factor crosses; Interference and coincidence; Numericals based on gene mapping; Sex Linkage. (12 lectures)

Unit-IV

Variation in chromosome number and structure: Deletion, Duplication, Inversion, Translocation, Position effect, Euploidy and Aneuploidy (8 lectures)

Gene mutations: Types of mutations; Molecular basis of Mutations; Mutagens physical and chemical (Base analogs, deaminating, alkylating and intercalating agents); Detection of mutations: CIB method. Role of Transposons in mutation. DNA repair mechanisms. (6 lectures)

Unit-V

Fine structure of gene: Classical vs molecular concepts of gene; Cis-Trans complementation test for functional allelism; Structure of Phage T4, rII Locus. (6 lectures)

Population and Evolutionary Genetics: Allele frequencies, Genotype frequencies, Hardy-Weinberg Law, role of natural selection, mutation, genetic drift. Genetic variation and Speciation. (6 lectures)

PRACTICAL

1. Meiosis through temporary squash preparation.
2. Mendel's laws through seed ratios. Laboratory exercises in probability and chi-square analysis.
3. Chromosome mapping using test cross data.
4. Pedigree analysis for dominant and recessive autosomal and sex linked traits with floral chart.
5. Incomplete dominance and gene interaction through seed ratios (9:7, 9:6:1, 13:3, 15:1, 12:3:1, 9:3:4).
6. Blood Typing: ABO groups & Rh factor.
7. Study of aneuploidy: Down's, Klinefelter's and Turner's syndromes.
8. Photographs/Permanent Slides showing Translocation Ring, Laggard's and Inversion Bridge.

Suggested Readings:

1. Gardner, E.J., Simmons, M.J., Snustad, D.P. (1991). Principles of Genetics, John Wiley & sons, India. 8th edition.
2. Snustad, D.P. and Simmons, M.J. (2010). Principles of Genetics, John Wiley & Sons Inc., India. 5th edition.
3. Klug, W.S., Cummings, M.R., Spencer, C.A. (2012). Concepts of Genetics. Benjamin Cummings, U.S.A. 10th edition.
4. Griffiths, A.J.F., Wessler, S.R., Carroll, S.B., Doebley, J. (2010). Introduction to Genetic Analysis. W. H. Freeman and Co., U.S.A. 10th edition.

SEMESTER-IV

C-8: MOLECULAR BIOLOGY

(Credits-6: Theory-4, Practical-2)-Max. Marks: 100

THEORY (Each class 1 hr.): Marks-70 PRACTICAL

(Each class 2 hrs.): Marks-30 Lectures: 60 (40

Theory + 20 Practical classes)

Unit-I

Nucleic acids : Carriers of genetic information: Historical perspective; DNA as the carrier of genetic information (Griffiths, Hershey & Chase, Avery, McLeod & McCarty, Fraenkel-Conrats experiment. (4 lectures)

Unit-II

The Structures of DNA and RNA / Genetic Material: DNA Structure: Miescher to Watson and Crick- historic perspective, DNA structure, Salient features of double helix, Types of DNA, Types of genetic material, denaturation and renaturation, cot curves; Organization of DNA Prokaryotes, Viruses, Eukaryotes. RNA Structure- Organelle DNA - mitochondria and chloroplast DNA. The Nucleosome - Chromatin structure- Euchromatin, Heterochromatin- Constitutive and Facultative heterochromatin. (8 lectures)

The replication of DNA: Chemistry of DNA synthesis (Kornbergs discovery); General principles bidirectional, semi-conservative and semi discontinuous replication, RNA priming; Various models of DNA replication, including rolling circle, (theta) mode of replication, replication of linear ds-DNA, replication of the 5' end of linear chromosome; Enzymes involved in DNA replication. (6 lectures)

Unit-III

Central dogma and genetic code: Key experiments establishing-The Central Dogma (Adaptor hypothesis and discovery of mRNA template), Genetic code (deciphering & salient features) (2 lectures)

Mechanism of Transcription: Transcription in prokaryotes; Transcription in eukaryotes (4 lectures)

Processing and modification of RNA: Split genes-concept of introns and exons, removal of introns, spliceosome machinery, splicing pathways, group I & group II intron splicing, alternative splicing eukaryotic mRNA processing(5' cap, 3' polyA tail); Ribozymes, exon shuffling; RNA editing and mRNA transport. (5 lectures)

Unit-IV

Translation (Prokaryotes and eukaryotes): Ribosome structure and assembly, mRNA; Charging of tRNA, aminoacyl tRNA synthetases; Various steps in protein synthesis, proteins involved in initiation, elongation and termination of polypeptides; Fidelity of translation; Inhibitors of protein synthesis; Post-translational modifications of proteins. (6 lectures)

Unit-V

Regulation of transcription in prokaryotes and eukaryotes: Principles of transcriptional regulation; Prokaryotes: Regulation of lactose metabolism and tryptophan synthesis in E.coli. Eukaryotes: transcription factors, heat shock proteins, steroids and peptide hormones; Gene silencing. (5 lectures)

PRACTICAL

1. Preparation of LB medium and raising E.Coli.
2. Isolation of genomic DNA from E.Coli.

3. DNA isolation and RNA estimation by orcinol method.

4. DNA estimation by diphenylamine reagent/UV Spectrophotometry.

5. Study of DNA replication mechanisms through photographs (Rolling circle, Theta replication and semi-discontinuous replication).

6. Study of structures of prokaryotic RNA polymerase and eukaryotic RNA polymerase II through photographs.

7. Photographs establishing nucleic acid as genetic material (Messelson and Stahls, Avery et al, Griffiths, Hershey & Chases and Fraenkel & Conrats experiments)

8. Study of the following through photographs: Assembly of Spliceosome machinery; Splicing mechanism in group I & group II introns; Ribozyme and Alternative splicing.

Suggested Readings:

1. Watson J.D., Baker, T.A., Bell, S.P., Gann, A., Levine, M., Losick, R. (2007). Molecular Biology of the Gene, Pearson Benjamin Cummings, CSHL Press, New York, U.S.A. 6th edition.

2. Snustad, D.P. and Simmons, M.J. (2010). Principles of Genetics. John Wiley and Sons Inc., U.S.A. 5th edition.

3. Klug, W.S., Cummings, M.R., Spencer, C.A. (2009). Concepts of Genetics. Benjamin Cummings. U.S.A. 9th edition.

4. Russell, P.J. (2010). iGenetics- A Molecular Approach. Benjamin Cummings, U.S.A. 3rd edition.

5. Griffiths, A.J.F., Wessler, S.R., Carroll, S.B., Doebley, J. (2010). Introduction to Genetic Analysis. W. H. Freeman and Co., U.S.A. 10th edition.

C-9: PLANT ECOLOGY & PHYTOGEOGRAPHY

(Credits-6: Theory-4, Practical-2)-Max. Marks: 100

THEORY (Each class 1 hr.): Marks-70 PRACTICAL

(Each class 2 hrs.): Marks-30 Lectures: 60 (40

Theory + 20 Practical classes)

Unit-I

Introduction Concept of ecology, Autoecology, Synecology, system ecology, Levels of organization. Inter-relationships between the living world and the environment, the components of environmental, concept of hydrosphere and lithosphere and dynamism, homeostasis. (2 lectures)

Unit-II

Soil: Importance; Origin; Formation; Composition; Physical; Chemical and Biological components; Soil profile; Role of climate in soil development. (5 lectures)

Water: Importance: States of water in the environment; Atmospheric moisture; Precipitation types (rain, fog, snow, hail, dew); Hydrological Cycle; Water in soil; Water table. (2 lectures)

Light, temperature, wind and fire: Variations; adaptations of plants to their variation. (4 lectures)

Unit-III

Biotic interactions: 2 lectures Population ecology: Characteristics and Dynamics .Ecological Speciation 4 lectures Plant communities: Concept of ecological amplitude; Habitat and niche; Characters: analytical and synthetic; Ecotone and edge effect; Dynamics: succession processes, types; climax concepts. (4 lectures)

Unit-IV

Ecological pyramids. (4 lectures)

Functional aspects of ecosystem: Principles and models of energy flow; Production and productivity; Ecological efficiencies; Biogeochemical cycles; Cycling of Carbon, Nitrogen and Phosphorus.(5 lectures)

Unit-V

Phytogeography: Principles; Continental drift; Theory of tolerance; Endemism; Brief description of major terrestrial biomes (one each from tropical, temperate & tundra); Phytogeographical division of India; Local Vegetation. (8 lectures)

PRACTICAL

1. Study of instruments used to measure microclimatic variables: Soil thermometer, maximum and minimum thermometer, anemometer, psychrometer/hygrometer, rain gauge and luxmeter.
2. Determination of pH of various soil and water samples (pH meter, universal indicator/Lovibond comparator and pH paper)
3. Analysis for carbonates, chlorides, nitrates, sulphates, organic matter and base deficiency from two soil samples by rapid field tests.
4. Determination of organic matter of different soil samples by Walkley & Black rapid titration method.
5. Comparison of bulk density, porosity and rate of infiltration of water in soils of three habitats.
6. Determination of dissolved oxygen of water samples from polluted and unpolluted sources.
7. (a) Study of morphological adaptations of hydrophytes and xerophytes (four each). (b) Study of biotic interactions of the following: Stem parasite (Cuscuta), Root parasite (Orobanchae) Epiphytes, Predation (Insectivorous plants).
8. Determination of minimal quadrat size for the study of herbaceous vegetation in the college campus, by species area curve method (species to be listed).
9. Quantitative analysis of herbaceous vegetation in the college campus for frequency and comparison with Raunkiaers frequency distribution law.
10. Quantitative analysis of herbaceous vegetation for density and abundance in the college campus.

11. Field visit to familiarise students with ecology of different sites.

Suggested Readings:

1. Odum, E.P. (2005). Fundamentals of ecology. Cengage Learning India Pvt. Ltd., New Delhi. 5th edition.
2. Singh, J.S., Singh, S.P., Gupta, S. (2006). Ecology Environment and Resource Conservation. Anamaya Publications, New Delhi, India.
3. Sharma, P.D. (2010). Ecology and Environment. Rastogi Publications, Meerut, India. 8th edition.
4. Wilkinson, D.M. (2007). Fundamental Processes in Ecology: An Earth Systems Approach. Oxford University Press. U.S.A.
5. Kormondy, E.J. (1996). Concepts of ecology. PHI Learning Pvt. Ltd., Delhi, India. 4th edition.

C-10: PLANT SYSTEMATICS

(Credits-6: Theory-4, Practical-2)-Max. Marks: 100
THEORY (Each class 1 hr.): Marks-70 PRACTICAL
(Each class 2 hrs.): Marks-30 Lectures: 60 (40
Theory + 20 Practical classes)

Unit-I

Plant identification, Classification, Nomenclature; Biosystematics. (2 lectures)

Identification: Field inventory; Functions of Herbarium; Important herbaria and botanical gardens of the world and India; Virtual herbarium; E-flora; Documentation: Flora, Monographs, Journals; Keys: Single access and Multi-access. (5 lectures)

Unit-II

Taxonomic hierarchy: Concept of taxa (family, genus, species); Categories and taxonomic hierarchy; Species concept (taxonomic, biological, evolutionary). (5 lectures)

Botanical nomenclature: Principles and rules (ICN); Ranks and names; Typification, author citation, valid publication, rejection of names, principle of priority and its limitations; Names of hybrids. (5 lectures)

Unit-III

Systematics-an interdisciplinary science: Evidence from palynology, cytology, phytochemistry and molecular data. (6 lectures)

Systems of classification: Major contributions of Theophrastus, Bauhin, Tournefort, Linnaeus, Adanson, de Candolle, Bessey, Hutchinson, Takhtajan and Cronquist; Classification systems of Bentham and Hooker (upto series) and Engler and Prantl (upto series); Brief reference of Angiosperm Phylogeny Group (APG III) classification. (6 lectures)

Unit-IV

Biometrics, numerical taxonomy and cladistics: Characters; Variations; OTUs, character weighting and coding; cluster analysis; Phenograms, cladograms (definitions and differences). (4 lectures)

Unit-V

Phylogeny of Angiosperms: Terms and concepts (primitive and advanced, homology and analogy, parallelism and convergence, monophyly, Paraphyly, polyphyly and clades). origin & evolution of angiosperms; coevolution of angiosperms and animals; methods of illustrating evolutionary relationship (phylogenetic tree, cladogram). (7 lectures)

PRACTICAL

1. **Study of vegetative and floral characters of the following families** (Description, V.S. flower, section of ovary, floral diagram/s, floral formula/e and systematic position according to Bentham & Hookers system of classification):
Ranunculaceae - Ranunculus, Delphinium
Brassicaceae - Brassica, Alyssum / Iberis
Myrtaceae - Eucalyptus, Callistemon
Umbelliferae - Coriandrum /Anethum / Foeniculum
Asteraceae - Sonchus/Launaea, Vernonia/Ageratum, Eclipta/Tridax
Solanaceae - Solanum nigrum/Withania
Lamiaceae - Salvia/Ocimum
Euphorbiaceae - Euphorbia hirta/E.milii, Jatropha
Liliaceae - Asphodelus/Lilium/Allium
Poaceae - Triticum/Hordeum/Avena
2. **Field visit** (local) Subject to grant of funds from the university.
3. Mounting of a properly dried and pressed specimen of any wild plant with herbarium label (to be submitted in the record book)

Suggested Readings:

1. Singh, G. (2012). Plant Systematics: Theory and Practice. Oxford & IBH Pvt. Ltd., New Delhi. 3rd edition.
2. Jeffrey, C. (1982). An Introduction to Plant Taxonomy. Cambridge University Press, Cambridge.
3. Judd, W.S., Campbell, C.S., Kellogg, E.A., Stevens, P.F. (2002). Plant Systematics-A Phylogenetic Approach. Sinauer Associates Inc., U.S.A. 2nd edition.
4. Maheshwari, J.K. (1963). Flora of Delhi. CSIR, New Delhi.
5. Radford, A.E. (1986). Fundamentals of Plant Systematics. Harper and Row, New York.

SEMESTER-V

C-11: REPRODUCTIVE BIOLOGY OF ANGIOSPERMS

(Credits-6: Theory-4, Practical-2)-Max. Marks: 100

THEORY (Each class 1 hr.): Marks-70 PRACTICAL

(Each class 2 hrs.): Marks-30 Lectures: 60 (40

Theory + 20 Practical classes)

Unit-I

Introduction: History (contributions of G.B. Amici, W. Hofmeister, E. Strasburger, S.G. Nawaschin, P. Maheshwari, B.M. Johri, W.A. Jensen, J. Heslop-Harrison) and scope. (2 lectures)

Unit-II

Anther: Anther wall: Structure and functions, microsporogenesis, callose deposition and its significance. (2 lectures)

Pollen biology: Microgametogenesis; Pollen wall structure, MGU (male germ unit) structure, NPC system; Palynology and scope (a brief account); Pollen wall proteins; Pollen viability, storage and germination; Abnormal features: Pseudomonads, polyads, massulae, pollinia. (5 lectures)

Unit-III

Ovule: Structure; Types; Special structures: endothelium, obturator, aril, caruncle and hypostase; Female gametophyte megasporogenesis (monosporic, bisporic and tetrasporic) and megagametogenesis (details of Polygonum type); Organization and ultrastructure of mature embryo sac. (5 lectures)

Endosperm: Types, development, structure and functions.(3 lectures)

Embryo: Six types of embryogeny; General pattern of development of dicot and monocot embryo; Suspensor: structure and functions; Embryoendosperm relationship; Nutrition of embryo; Unusual features; Embryo development in Paeonia. (6 lectures)

Unit-IV

Pollination and fertilization: Pollination types and significance; adaptations; structure of stigma and style; path of pollen tube in pistil; double fertilization. (4 lectures)

Self incompatibility: Basic concepts (interspecific, intraspecific, homomorphic, heteromorphic, GSI and SSI); Methods to overcome selfincompatibility: mixed pollination, bud pollination, stub pollination; Intraovarian and in vitro pollination; Modification of stigma surface, parasexual hybridization; Cybrids, in vitro fertilization. (5 lectures)

Unit-V

Seed: Structure, importance and dispersal mechanisms (3 lectures)

Polyembryony and apomixes: Introduction; Classification; Causes and applications. (4 lectures)

Germline transformation: Pollen grain and ovules through pollen tube pathway method/ Agrobacterium/ electrofusion/floral dip/biolistic. (4 lectures)

PRACTICAL

1. Anther: Wall and its ontogeny; Tapetum (amoeboid and glandular); MMC, spore tetrads, uninucleate, bicelled and dehisced anther stages through slides/micrographs, male germ unit (MGU) through photographs and schematic representation.
2. Pollen grains: Fresh and acetolyzed showing ornamentation and aperture, pseudomonads, polyads, pollinia (slides/photographs, fresh material), ultrastructure of pollen wall(micrograph); Pollen viability: Tetrazolium test.germination: Calculation of percentage germination in different media using hanging drop method.
3. Ovule: Types-anatropous, orthotropous, amphitropous/campylotropous, circinotropous, unitegmic,

bitegmic; Tenuinucellate and crassinucellate; Special structures: Endothelium, obturator, hypostase, caruncle and aril (permanent slides/specimens/photographs).

4. Female gametophyte through permanent slides/ photographs: Types, ultrastructure of mature egg apparatus.
5. Intra-ovarian pollination; Test tube pollination through photographs.
6. Endosperm: Dissections of developing seeds for endosperm with free-nuclear haustoria.
7. Embryogenesis: Study of development of dicot embryo through permanent slides; dissection of developing seeds for embryos at various developmental stages; Study of suspensor through electron micrographs.

Suggested Readings:

1. Bhojwani, S.S. and Bhatnagar, S.P. (2011). The Embryology of Angiosperms, Vikas Publishing House. Delhi. 5th edition.
2. Shivanna, K.R. (2003). Pollen Biology and Biotechnology. Oxford and IBH Publishing Co. Pvt. Ltd. Delhi.
3. Raghavan, V. (2000). Developmental Biology of Flowering plants, Springer, Netherlands.
4. Johri, B.M. I (1984). Embryology of Angiosperms, Springer-Verlag, Netherlands.

C-12: PLANT PHYSIOLOGY

(Credits-6: Theory-4, Practical-2)-Max. Marks: 100
THEORY (Each class 1 hr.): Marks-70 PRACTICAL
(Each class 2 hrs.): Marks-30 Lectures: 60 (40
Theory + 20 Practical classes)

Unit-I

Plant water relationship: Water Potential and its components, water absorption by roots, aquaporins, pathway of water movement, symplast, apoplast, transmembrane pathways, root pressure, guttation. Ascent of sap cohesion-tension theory. Transpiration and factors affecting transpiration, antitranspirants, mechanism of stomatal movement. (6 lectures)

Translocation in the phloem: Experimental evidence in support of phloem as the site of sugar translocation. Pressure Flow Model; Phloem loading and unloading; Source-sink relationship. (5 lectures)

Unit-II

Mineral nutrition: Essential and beneficial elements, macro and micronutrients, methods of study and use of nutrient solutions, criteria for essentiality, mineral deficiency symptoms, roles of essential elements, chelating agents. (5 lectures)

Unit-III

Nutrient Uptake: Soil as a nutrient reservoir, transport of ions across cell membrane, passive absorption, electrochemical gradient, facilitated diffusion, active absorption, role of ATP, carrier systems, proton ATPase pump and ion flux, uniport, co-transport, symport, antiport. (5 lectures)

Unit-IV

Plant growth regulators: Discovery, chemical nature (basic structure), bioassay and physiological roles of Auxin, Gibberellins, Cytokinin, Abscisic acid, Ethylene, Brassinosteroids and Jasmonic acid. (10 lectures)

Unit-V

Physiology of flowering: Photoperiodism, flowering stimulus, florigen concept, vernalization, seed dormancy. (4 lectures)

Phytochrome: Discovery, chemical nature, role of phytochrome in photomorphogenesis, low energy responses (LER) and high irradiance responses (HIR), mode of action. (5 lectures)

PRACTICAL

1. Determination of osmotic potential of plant cell sap by plasmolytic method.
2. Determination of water potential of given tissue (potato tuber) by weight method.
3. Study of the effect of wind velocity and light on the rate of transpiration in excised twig/leaf.
4. Calculation of stomatal index and stomatal frequency from the two surfaces of leaves of a mesophyte and xerophyte.
5. To calculate the area of an open stoma and percentage of leaf area open through stomata in a mesophyte and xerophyte (both surfaces).
6. To study the phenomenon of seed germination (effect of light).
7. To study the induction of amylase activity in germinating barley grains.

Demonstration experiments:

(a) To demonstrate suction due to transpiration. (b) Fruit ripening/Rooting from cuttings (Demonstration). (c) Bolting experiment/Avena coleptile bioassay (demonstration).

Suggested Readings:

1. Hopkins, W.G. and Huner, A. (2008). Introduction to Plant Physiology. John Wiley and Sons. U.S.A. 4th edition.
2. Taiz, L., Zeiger, E., Mller, I.M. and Murphy, A (2015). Plant Physiology and Development. Sinauer Associates Inc. USA. 6th edition.
3. Bajracharya D. (1999). Experiments in Plant Physiology-A Laboratory Manual. Narosa Publishing House, New Delhi.

SEMESTER-VI

C-13: PLANT METABOLISM

(Credits-6: Theory-4, Practical-2)-Max. Marks: 100
THEORY (Each class 1 hr.): Marks-70 PRACTICAL
(Each class 2 hrs.): Marks-30 Lectures: 60 (40
Theory + 20 Practical classes)

Unit-I

Concept of metabolism: Introduction, anabolic and catabolic pathways, regulation of metabolism, role of regulatory enzymes (allosteric, covalent modulation and Isozymes). (5 lectures) Carbohydrate metabolism: Synthesis and catabolism of sucrose and starch. (1 lectures)

Unit-II

Carbon assimilation: Historical background, photosynthetic pigments, role of photosynthetic pigments (chlorophylls and accessory pigments), antenna molecules and reaction centres, photochemical reactions, photosynthetic electron transport, PSI, PSII, Q cycle, CO_2 reduction, photorespiration, C4 pathways; Crassulacean acid metabolism; Factors affecting CO_2 reduction. (10 lectures)

Unit-III

Carbon Oxidation: Glycolysis, fate of pyruvate, regulation of glycolysis, oxidative pentose phosphate pathway, oxidative decarboxylation of pyruvate, regulation of PDH, NADH shuttle; TCA cycle, amphibolic role, anaplerotic reactions, regulation of the cycle, mitochondrial electron transport, oxidative phosphorylation, cyanide resistant respiration, factors affecting respiration. (6 lectures)

ATP-Synthesis: Mechanism of ATP synthesis, substrate level phosphorylation, chemiosmotic mechanism (oxidative and photophosphorylation), ATP synthase, Boyers conformational model, Racker's experiment, Jagendorf's experiment; role of uncouplers. (4 lectures)

Unit-IV

Lipid metabolism: Synthesis and breakdown of triglycerides, β -oxidation, glyoxylate cycle, gluconeogenesis and its role in mobilisation of lipids during seed germination, α oxidation. (5 lectures)

Unit-V

Nitrogen metabolism: Nitrate assimilation, biological nitrogen fixation (examples of legumes and non-legumes); Physiology and biochemistry of nitrogen fixation; Ammonia assimilation and transamination. (5 lectures)

Mechanisms of signal transduction: Calcium, phospholipids, cGMP, NO. (4 lectures)

PRACTICAL

1. Chemical separation of photosynthetic pigments.
2. Experimental demonstration of Hill's reaction.
3. To study the effect of light intensity on the rate of photosynthesis.
4. Effect of carbon dioxide on the rate of photosynthesis.
5. To compare the rate of respiration in different parts of a plant.
6. To demonstrate activity of Nitrate Reductase in germinating leaves of different plant sources.
7. To study the activity of lipases in germinating oilseeds and demonstrate mobilization of lipids during germination.
8. Demonstration of fluorescence by isolated chlorophyll pigments.
9. Demonstration of absorption spectrum of photosynthetic pigments.

Suggested Readings:

1. Hopkins, W.G. and Huner, A. (2008). Introduction to Plant Physiology. John Wiley and Sons. U.S.A. 4th edition.
2. Taiz, L., Zeiger, E., Miller, I.M. and Murphy, A (2015). Plant Physiology and Development. Sinauer Associates Inc. USA. 6th edition.
3. Harborne, J.B. (1973). Phytochemical Methods. John Wiley & Sons. New York.

C-14: PLANT BIO-TECHNOLOGY

(Credits-6: Theory-4, Practical-2)-Max. Marks: 100
THEORY (Each class 1 hr.): Marks-70 PRACTICAL
(Each class 2 hrs.): Marks-30 Lectures: 60 (40
Theory + 20 Practical classes)

Unit-I

Plant Tissue Culture: Historical perspective; Aseptic tissue culture techniques, Composition of media; Nutrient and hormone requirements (role of vitamins and hormones). (3 lectures)

Unit-II

Totipotency; Organogenesis; Embryogenesis (somatic and zygotic); Protoplast isolation, culture and fusion; Tissue culture applications (micropropagation, androgenesis, virus elimination, secondary metabolite production, haploids, triploids and hybrids; Cryopreservation; Germplasm Conservation). (7 lectures)

Unit-III

Recombinant DNA technology-I: Restriction Endonucleases (History, Types I-IV, biological role and application); Restriction Mapping (Linear and Circular); Cloning Vectors: Prokaryotic (pUC 18 and pUC19, pBR322, Ti plasmid, BAC); Lambda phage, M13 phagemid, Cosmid, Shuttle vector; Eukaryotic Vectors (YAC and briefly PAC, MAC, HAC). Gene Cloning (Recombinant DNA, Bacterial Transformation and selection of recombinant clones, PCR-mediated gene cloning). (10 lectures) **Unit-IV**

Recombinant DNA technology-II: Gene Construct; construction of genomic and cDNA libraries, screening DNA libraries to obtain gene of interest by genetic selection; complementation, colony hybridization; Probes-oligonucleotide, heterologous, PCR; Methods of gene transfer-Agrobacterium-mediated, Direct gene transfer by Electroporation, Microinjection, Microprojectile bombardment; Selection of transgenics selectable marker and reporter genes (Luciferase, GUS, GFP). (10 lectures)

Unit-V

Applications of Biotechnology: Pest resistant (Bt-cotton); herbicide resistant plants (RoundUp Ready soybean); Transgenic crops with improved quality traits (Flavr Savr tomato, Golden rice); Improved horticultural varieties (Moondust carnations); Role of transgenics in bioremediation (Su-perbug); edible vaccines; Industrial enzymes (Aspergillase, Protease, Lipase); Genetically Engineered Products Human Growth Hormone; Humulin; Biosafety concerns. (10 lectures)

PRACTICAL

1. (a) Preparation of MS medium.
(b) Demonstration of in vitro sterilization and inoculation methods using leaf and nodal explants of tobacco, Datura, Brassica etc.
2. Study of anther, embryo and endosperm culture, micropropagation, somatic embryogenesis & artificial seeds through photographs.
3. Isolation of protoplasts.
4. Construction of restriction map of circular and linear DNA from the data provided.

5. Study of methods of gene transfer through photographs: Agrobacterium-mediated, direct gene transfer by electroporation, microinjection, microprojectile bombardment.
6. Study of steps of genetic engineering for production of Bt cotton, Golden rice, Flavr Savr tomato through photographs.
7. Isolation of plasmid DNA.
8. Restriction digestion and gel electrophoresis of plasmid DNA.

Suggested Readings:

1. Bhojwani, S.S. and Razdan, M.K., (1996). Plant Tissue Culture: Theory and Practice. Elsevier Science Amsterdam. The Netherlands.
2. Glick, B.R., Pasternak, J.J. (2003). Molecular Biotechnology- Principles and Applications of recombinant DNA. ASM Press, Washington.
3. Bhojwani, S.S. and Bhatnagar, S.P. (2011). The Embryology of Angiosperms. Vikas Publication House Pvt. Ltd., New Delhi. 5th edition.
4. Snustad, D.P. and Simmons, M.J. (2010). Principles of Genetics. John Wiley and Sons, U.K. 5th edition.
5. Stewart, C.N. Jr. (2008). Plant Biotechnology & Genetics: Principles, Techniques and Applications. John Wiley & Sons Inc. U.S.A.
6. Chawla, H.S. (2010). Introduction to Plant Biotechnology. Oxford & IBH Publishing Co. Pvt. Ltd., New Delhi.
7. Singh, B. D. (2010) Biotechnology: Expanding Horizon. Kalyani Publishers. New Delhi.

DISCIPLINE SPECIFIC ELECTIVE COURSES

DSE-1A: ANALYTICAL TECHNIQUES IN PLANT SCIENCES

(Credits-6: Theory-4, Practical-2)-Max. Marks: 100

THEORY (Each class 1 hr.): Marks-70 PRACTICAL

(Each class 2 hrs.): Marks-30 Lectures: 60 (40

Theory + 20 Practical classes)

UNIT-I: Imaging and related techniques: Principles of microscopy; Light microscopy; Fluorescence microscopy; Confocal microscopy; Use of fluorochromes: (a) Flow cytometry (FACS); (b) Applications of fluorescence microscopy: Chromosome banding, FISH, chromosome painting; Transmission and Scanning electron microscopy sample preparation for electron microscopy, cryofixation, negative staining, shadow casting, freeze fracture, freeze etching. (10 lectures)

UNIT-II: Cell fractionation: Centrifugation: Differential and density gradient centrifugation, sucrose density gradient, CsCl₂ gradient, analytical centrifugation, ultracentrifugation, marker enzymes. (5 lectures)

UNIT-III: Radioisotopes: Use in biological research, auto-radiography, pulse chase experiment. (3 lectures)

Spectrophotometry: Principle and its application in biological research. 3 lectures Chromatography: Principle; Paper chromatography; Column chromatography, TLC, GLC, HPLC, Ion-exchange chromatography; Molecular sieve chromatography; Affinity chromatography. (6 lectures)

UNIT-IV: Characterization of proteins and nucleic acids: Mass spectrometry; X-ray diffraction; X-ray crystallography; Characterization of proteins and nucleic acids; Electrophoresis: AGE, PAGE, SDS-PAGE (5 lectures)

UNIT-V: Biostatistics: Statistics, data, population, samples, parameters; Representation of Data: Tabular, Graphical; Measures of central tendency: Arithmetic mean, mode, median; Measures of dispersion: Range, mean deviation, variation, standard deviation; Chi-square test for goodness of fit. (8 lectures)

PRACTICAL

1. Study of Blotting techniques: Southern, Northern and Western, DNA fingerprinting, DNA sequencing, PCR through photographs.
2. Demonstration of ELISA.
3. To separate nitrogenous bases by paper chromatography.
4. To separate sugars by thin layer chromatography.
5. Isolation of chloroplasts by differential centrifugation.
6. To separate chloroplast pigments by column chromatography.
7. To estimate protein concentration through Lowry's methods.

8. To separate proteins using PAGE.
9. To separation DNA (marker) using AGE.
10. Study of different microscopic techniques using photographs/micrographs (freeze fracture, freeze etching, negative staining, positive staining, fluorescence and FISH).
11. Preparation of permanent slides (double staining).
12. Estimation of plant pigments.

Suggested Readings:

1. Plummer, D.T. (1996). An Introduction to Practical Biochemistry. Tata McGraw-Hill Publishing Co. Ltd. New Delhi. 3rd edition.
2. Ruzin, S.E. (1999). Plant Microtechnique and Microscopy, Oxford University Press, New York. U.S.A.
3. Ausubel, F., Brent, R., Kingston, R. E., Moore, D.D., Seidman, J.G., Smith, J.A., Struhl, K. (1995). Short Protocols in Molecular Biology. John Wiley & Sons. 3rd edition.
4. Zar, J.H. (2012). Biostatistical Analysis. Pearson Publication. U.S.A. 4th ed

DSE-1B: BIO-INFORMATICS

(Credits-6: Theory-4, Practical-2)-Max. Marks: 100

THEORY (Each class 1 hr.): Marks-70 PRACTICAL

(Each class 2 hrs.): Marks-30 Lectures: 60 (40

Theory + 20 Practical classes)

UNIT-I: Introduction to Bioinformatics: Introduction, Branches of Bioinformatics, Aim, Scope and Research areas of Bioinformatics. (3 Lectures)

Databases in Bioinformatics: Introduction, Biological Databases, Classification format of Biological Databases, Biological Database Retrieval System. (4 Lectures)

UNIT-II: Biological Sequence Databases: National Center for Biotechnology Information (NCBI): Tools and Databases of NCBI, Database Retrieval Tool, Sequence Submission to NCBI, Basic local alignment search tool (BLAST), Nucleotide Database, Protein Database, Gene Expression Database. EMBL Nucleotide Sequence Database (EMBL-Bank): Introduction, Sequence Retrieval, Sequence Submission to EMBL, Sequence analysis tools. DNA Data Bank of Japan (DDBJ): Introduction, Resources at DDBJ, Data Submission at DDBJ. Protein Information Resource (PIR): About PIR, Resources of PIR, Databases of PIR, Data Retrieval in PIR. Swiss-Prot: Introduction and Salient Features. (15 Lectures)

UNIT-III: Sequence Alignments: Introduction, Concept of Alignment, Multiple Sequence Alignment (MSA), MSA by CLUSTALW, Scoring Matrices, Percent Accepted Mutation (PAM), Blocks of Amino Acid Substitution Matrix (BLOSUM). (8 Lectures)

UNIT-IV: Molecular Phylogeny: Methods of Phylogeny, Software for Phylogenetic Analyses, Consistency of Molecular Phylogenetic Prediction. (5 Lectures)

UNIT-V: Applications of Bioinformatics: Structural Bioinformatics in Drug Discovery, Quantitative structure-activity relationship (QSAR) techniques in Drug Design, Microbial genome applications, Crop improvement. (5 Lectures)

PRACTICAL

1. Nucleic acid and protein databases.
2. Sequence retrieval from databases.

3. Sequence alignment.
4. Sequence homology and Gene annotation.
5. Construction of phylogenetic tree.

Suggested Readings:

1. Ghosh Z. and Bibekanand M. (2008) Bioinformatics: Principles and Applications. Oxford University Press.
2. Pevsner J. (2009) Bioinformatics and Functional Genomics. II Edition. Wiley-Blackwell.
3. Campbell A. M., Heyer L. J. (2006) Discovering Genomics, Proteomics and Bioinformatics-II Edition. Benjamin Cummings.

DSE-2A: PLANT BREEDING

(Credits-6: Theory-4, Practical-2)-Max. Marks: 100
 THEORY (Each class 1 hr.): Marks-70 PRACTICAL
 (Each class 2 hrs.): Marks-30 Lectures: 60 (40
 Theory + 20 Practical classes)

UNIT-I: Plant Breeding: Introduction and objectives. Breeding systems: modes of reproduction in crop plants. Important achievements and undesirable consequences of plant breeding. (6 lectures)

UNIT-II; Methods of crop improvement: Introduction: Centres of origin and domestication of crop plants, plant genetic resources; Acclimatization; Selection methods: For self pollinated, cross pollinated and vegetatively propagated plants; Hybridization: For self, cross and vegetatively propagated plants Procedure, advantages and limitations. (15 lectures)

UNIT-III: Quantitative inheritance: Concept, mechanism, examples of inheritance of Kernel colour in wheat, Skin colour in human beings. Monogenic vs polygenic Inheritance. (6 lectures)

UNIT-IV: Inbreeding depression and heterosis: History, genetic basis of inbreeding depression and heterosis; Applications. (6 lectures)

UNIT-V: Crop improvement and breeding: Role of mutations; Polyploidy; Distant hybridization and role of biotechnology in crop improvement. (7 lectures)

PRACTICAL

Practical related to theory.

Suggested Readings:

1. Singh, B.D. (2005). Plant Breeding: Principles and Methods. Kalyani Publishers. 7th edition.
2. Chaudhari, H.K. (1984). Elementary Principles of Plant Breeding. Oxford IBH. 2nd edition.
3. Acquaah, G. (2007). Principles of Plant Genetics & Breeding. Blackwell Publishers.

DSE-2B: NATURAL RESOURCE MANAGEMENT

(Credits-6: Theory-4, Practical-2)-Max. Marks: 100
 THEORY (Each class 1 hr.): Marks-70 PRACTICAL
 (Each class 2 hrs.): Marks-30 Lectures: 60 (40
 Theory + 20 Practical classes)

UNIT-I: Natural resources: Definition and types. 2 lectures Sustainable utilization: Concept, approaches (economic, ecological and socio-cultural). (5 lectures)

UNIT-II: Land: Utilization (agricultural, pastoral, horticultural, silvicultural); Soil degradation and management. (5 lectures)

Water: Fresh water (rivers, lakes, groundwater, aquifers, watershed); Marine; Estuarine; Wetlands; Threats and management strategies. (4 lectures)

UNIT-III: Biological Resources: Biodiversity-definition and types; Significance; Threats; Management strategies; Bioprospecting; IPR; CBD; National Biodiversity Action Plan). (8 lectures) Forests: Definition, Cover and its significance (with special reference to India); Major and minor forest products; Depletion; Management. (4 lectures)

UNIT-IV: Energy: Renewable and non-renewable sources of energy 4 lectures Contemporary practices in resource management: EIA, GIS, Participatory Resource Appraisal, Ecological Footprint with emphasis on carbon footprint. (6 lectures)

UNIT-V: Resource Accounting; Waste management. National and international efforts in resource management and conservation (4 lectures)

PRACTICAL

1. Estimation of solid waste generated by a domestic system (biodegradable and nonbiodegradable) and its impact on land degradation.
2. Collection of data on forest cover of specific area.
3. Measurement of dominance of woody species by DBH (diameter at breast height) method.
4. Calculation and analysis of ecological footprint.
5. Ecological modeling.

Suggested Readings:

1. Vasudevan, N. (2006). Essentials of Environmental Science. Narosa Publishing House, New Delhi.
2. Singh, J. S., Singh, S.P. and Gupta, S. (2006). Ecology, Environment and Resource Conservation. Anamaya Publications, New Delhi.
3. Rogers, P.P., Jalal, K.F. and Boyd, J.A. (2008). An Introduction to Sustainable Development. Prentice Hall of India Private Limited, New Delhi.

DSE-2C: BIO-STATISTICS

(Credits-6: Theory-4, Practical-2)-Max. Marks: 100

THEORY (Each class 1 hr.): Marks-70 PRACTICAL

(Each class 2 hrs.): Marks-30 Lectures: 60 (40

Theory + 20 Practical classes)

UNIT-I: Biostatistics - definition - statistical methods - basic principles. Variables - measurements, functions, limitations and uses of statistics. (8 lectures)

Unit-II: Collection of data primary and secondary - types and methods of data collection procedures - merits and demerits. Classification - tabulation and presentation of data sampling methods. (8 lectures)

Unit-III: Measures of central tendency - mean, median, mode, geometric mean - merits & demerits. Measures of dispersion - range, standard deviation, mean deviation, quartile deviation - merits and demerits; Co-efficient of variations. (10 lectures)

Unit-IV: Correlation - types and methods of correlation, regression, simple regression equation, fitting prediction, similarities and dissimilarities of correlation and regression. (8 lectures)

Unit-V: Statistical inference - hypothesis - simple hypothesis - student 't' test - chi square test. (6 lectures)

PRACTICAL

1. Calculation of mean, standard deviation and standard error
2. Calculation of correlation coefficient values and finding out the probability
3. Calculation of F value and finding out the probability value for the Fvalue.

Suggested Readings:

1. Biostatistic, Danniell, W.W., 1987. New York, John Wiley Sons.
2. An introduction to Biostatistics, 3rd edition, Sundarrao, P.S.S and Richards, J. Christian Medical College, Vellore
3. Statistical Analysis of epidemiological data, Selvin, S., 1991. New York University Press.
4. Statistics for Biology, Boston, Bishop, O.N. Houghton, Mifflin.
5. The Principles of scientific research, Freedman, P. New York, Pergamon Press.
6. Statistics for Biologists, Campbell, R.C., 1998. Cambridge University Press.

DSE-3A: STRESS BIOLOGY

(Credits-6: Theory-4, Practical-2)-Max. Marks: 100
THEORY (Each class 1 hr.): Marks-70 PRACTICAL
(Each class 2 hrs.): Marks-30 Lectures: 60 (40
Theory + 20 Practical classes)

UNIT-I: Defining plant stress: Acclimation and adaptation. (2 lectures)

UNIT-II: Environmental factors: Water stress; Salinity stress, High light stress; Temperature stress; Hypersensitive reaction; Pathogenesis related (PR) proteins; Systemic acquired resistance; Mediation of insect and disease resistance by jasmonates. (12 lectures)

UNIT-III: Stress sensing mechanisms in plants: Role of nitric oxide. Calcium modulation, Phospholipid signaling (12 lectures)

UNIT-IV: Developmental and physiological mechanisms that protect plants against environmental stress: Adaptation in plants; Changes in root: shoot ratio; Aerenchyna development; Osmotic adjustment; Compatible solute production. (10 lectures)

UNIT-V: Reactive oxygen species Production and scavenging mechanisms. (4 lectures)

PRACTICAL

1. Quantitative estimation of peroxidase activity in the seedlings in the absence and presence of salt stress.
2. Superoxide activity in seedlings in the absence and presence of salt stress.
3. Assay of Ascorbate
4. Assay of peroxidase.

5. Assay of superoxide dismutase activity.
6. Quantitative estimation and analysis of catalase.

Suggested Readings:

1. Hopkins, W.G. and Huner, A. (2008). Introduction to Plant Physiology. John Wiley and Sons. U.S.A. 4th edition.
2. Taiz, L., Zeiger, E., Miller, I.M. and Murphy, A (2015). Plant Physiology and Development. Sinauer Associates Inc. USA. 6th edition.

DSE-3B: HORTICULTURAL PRACTICES & POST-HARVEST TECHNOLOGY

(Credits-6: Theory-4, Practical-2)-Max. Marks: 100

THEORY (Each class 1 hr.): Marks-70 PRACTICAL

(Each class 2 hrs.): Marks-30 Lectures: 60 (40

Theory + 20 Practical classes)

UNIT-I: Introduction: Scope and importance, Branches of horticulture; Role in rural economy and employment generation; Importance in food and nutritional security; Urban horticulture and ecotourism. (2 lectures)

Ornamental plants: Types, classification (annuals, perennials, climbers and trees); Identification and salient features of some ornamental plants [rose, marigold, gladiolus, carnations, orchids, poppies, gerberas, tuberose, sages, cacti and succulents (opuntia, agave and spurges)] Ornamental flowering trees (Indian laburnum, gulmohar, Jacaranda, Lagerstroemia, fishtail and areca palms, semul, Coral tree). (3 lectures)

UNIT-II: Fruit and vegetable crops: Production, origin and distribution; Description of plants and their economic products; Management and marketing of vegetable and fruit crops; Identification of some fruits and vegetable varieties (citrus, banana, mango, chillies and cucurbits). (4 lectures) Horticultural techniques: Application of manure, fertilizers, nutrients and PGRs; Weed control; Biofertilizers, biopesticides; Irrigation methods (drip irrigation, surface irrigation, furrow and border irrigation); Hydroponics; Propagation Methods: asexual (grafting, cutting, layering, budding), sexual (seed propagation), Scope and limitations. (6 lectures)

UNIT-III: Landscaping and garden design : Planning and layout (parks and avenues); gardening traditions - Ancient Indian, European, Mughal and Japanese Gardens; Urban forestry; policies and practices. (4 lectures)

Floriculture: Cut flowers, bonsai, commerce (market demand and supply); Importance of flower shows and exhibitions. (4 lectures)

UNIT-IV: Post-harvest technology: Importance of post harvest technology in horticultural crops; Evaluation of quality traits; Harvesting and handling of fruits, vegetables and cut flowers; Principles, methods of preservation and processing; Methods of minimizing losses during storage and transportation; Food irradiation - advantages and disadvantages; food safety. (6 lectures)

Disease control and management : Field and post-harvest diseases; Identification of deficiency symptoms; remedial measures and nutritional management practices; Crop sanitation; IPM strategies (genetic, biological and chemical methods for pest control); Quarantine practices; Identification of common diseases and pests of ornamentals, fruits and vegetable crops. (5 lectures)

UNIT-V: Horticultural crops - conservation and management: Documentation and conservation of germplasm; Role of micropropagation and tissue culture techniques; Varieties and cultivars of various horticultural crops; IPR issues; National, international and professional societies and sources of information on horticulture. (6 lectures)

Field Trip: Field visits to gardens, standing crop sites, nurseries, vegetable gardens and horticultural fields at IARI or other suitable locations.

PRACTICAL

Practical related to theory.

Suggested Readings:

1. Singh, D. & Manivannan, S. (2009). Genetic Resources of Horticultural Crops. Ridhi International, Delhi, India.
2. Swaminathan, M.S. and Kochhar, S.L. (2007). Groves of Beauty and Plenty: An Atlas of Major Flowering Trees in India. Macmillan Publishers, India.
3. NIIR Board (2005). Cultivation of Fruits, Vegetables and Floriculture. National Institute of Industrial Research Board, Delhi.
4. Kader, A.A. (2002). Post-Harvest Technology of Horticultural Crops. UCANR Publications, USA.
5. Capon, B. (2010). Botany for Gardeners. 3rd Edition. Timber Press, Portland, Oregon.

DSE-3C: RESEARCH METHODOLOGY

(Credits-6: Theory-4, Practical-2)-Max. Marks: 100

THEORY (Each class 1 hr.): Marks-70 PRACTICAL

(Each class 2 hrs.): Marks-30 Lectures: 60 (40

Theory + 20 Practical classes)

UNIT-I: Basic concepts of research :Research-definition and types of research (Descriptive vs analytical; applied vs fundamental; quantitative vs qualitative; conceptual vs empirical).Research methods vs methodology.Literature-review and its consolidation; Library research; field research; laboratory research. (6 lectures) General laboratory practices: Common calculations in botany laboratories. Understanding the details on the label of reagent bottles. Molarity and normality of common acids and bases.Preparation of solutions. Dilutions. Percentage solutions. Molar, molal and normal solutions.Technique of handling micropipettes; Knowledge about common toxic chemicals and safety measures in their handling. (8 lectures)

UNIT-II: Data collection and documentation of observations: Maintaining a laboratory record; Tabulation and generation of graphs. Imaging of tissuespecimens and application of scale bars. The art of field photography. (4 lectures)

Overview of Biological Problems : History; Key biology research areas, Model organisms in biology (A Brief overview): Genetics, Physiology, Biochemistry, Molecular Biology, Cell Biology,Genomics, Proteomics- Transcriptional regulatory network. (4 lectures)

UNIT-III: Methods to study plant cell/tissue structure: Whole mounts, peel mounts, squash preparations, clearing, maceration and sectioning; Tissue preparation: living vs fixed, physical vs chemical fixation, coagulating fixatives, noncoagulant fixatives; tissue dehydration using graded solvent series; Paraffin and plastic infiltration; Preparation of thin and ultrathin sections. (4 lectures)

UNIT-IV: Plant microtechniques : Staining procedures, classification and chemistry of stains. Staining equipment. Reactive dyes and fluorochromes (including genetically engineered protein labeling with GFP and other tags). Cytogenetic techniques with squashed plant materials. (8 lectures)

UNIT-V: The art of scientific writing and its presentation : Numbers, units, abbreviations and nomenclature used in scientific writing. Writing references. Power point presentation. Poster pre-

sentation. Scientific writing and ethics, Introduction to copyright-academic misconduct/plagiarism. (6 lectures)

PRACTICAL

1. Experiments based on chemical calculations.
2. Plant microtechnique experiments.
3. The art of imaging of samples through microphotography and field photography.
4. Poster presentation on defined topics.
5. Technical writing on topics assigned.

Suggested Readings:

1. Dawson, C. (2002). Practical research methods. UBS Publishers, New Delhi.
2. Stapleton, P., Yondeowei, A., Mukanyange, J., Houten, H. (1995). Scientific writing for agricultural research scientists a training reference manual. West Africa Rice Development Association, Hong Kong.
3. Ruzin, S.E. (1999). Plant microtechnique and microscopy. Oxford University Press, New York, U.S.

DSE-3D: INDUSTRIAL & ENVIRONMENTAL MICROBIOLOGY

(Credits-6: Theory-4, Practical-2)-Max. Marks: 100

THEORY (Each class 1 hr.): Marks-70 PRACTICAL

(Each class 2 hrs.): Marks-30 Lectures: 60 (40

Theory + 20 Practical classes)

UNIT-I: Scope of microbes in industry and environment: (2 lectures)

Bioreactors/Fermenters and fermentation processes: Solid-state and liquid-state (stationary and submerged) fermentations; Batch and continuous fermentations. Components of a typical bioreactor, Types of bioreactors laboratory, pilot scale and production fermenters; Constantly stirred tank fermenter, tower fermenter, fixed bed and fluidized bed bioreactors and airlift fermenter. A visit to any educational institute/ industry to see an industrial fermenter, and other downstream processing operations. (8 lectures)

UNIT-II: Microbial production of industrial products: Microorganisms involved, media, fermentation conditions, downstream processing and uses; Filtration, centrifugation, cell disruption, solvent extraction, precipitation and ultrafiltration, lyophilization, spray drying; Hands on microbial fermentations for the production and estimation (qualitative and quantitative) of Enzyme: amylase or lipase activity, Organic acid (citric acid or glutamic acid), alcohol (Ethanol) and antibiotic (Penicillin) (8 lectures)

Microbial enzymes of industrial interest and enzyme immobilization: Microorganisms for industrial applications and hands on screening microorganisms for casein hydrolysis; starch hydrolysis; cellulose hydrolysis. Methods of immobilization, advantages and applications of immobilization, large scale applications of immobilized enzymes (glucose isomerase and penicillin acylase). (6 lectures)

UNIT-III: Microbes and quality of environment: Distribution of microbes in air; Isolation of microorganisms from soil, air and water. (4 lectures)

UNIT-IV: Microbial flora of water: Water pollution, role of microbes in sewage and domestic waste

water treatment systems. Determination of BOD, COD, TDS and TOC of water samples; Microorganisms as indicators of water quality, check coliform and fecal coliform in water samples. (6 lectures)

UNIT-V: Microbes in agriculture and remediation of contaminated soils: Biological fixation; Mycorrhizae; Bioremediation of contaminated soils. Isolation of root nodulating bacteria, arbuscular mycorrhizal colonization in plant roots. (6 lectures)

PRACTICAL

1. Principles and functioning of instruments in microbiology laboratory
2. Hands on sterilization techniques and preparation of culture media.

Suggested Readings:

1. Pelzar, M.J. Jr., Chen E.C. S., Krieg, N.R. (2010). Microbiology: An application based approach. Tata McGraw Hill Education Pvt. Ltd., Delhi.
2. Tortora, G.J., Funke, B.R., Case. C.L. (2007). Microbiology. Pearson Benjamin Cummings, San Francisco, U.S.A. 9th edition.

GENERIC ELECTIVE COURSES

GE-1A: BIODIVERSITY

(Credits-6: Theory-4, Practical-2)-Max. Marks: 100
THEORY (Each class 1 hr.): Marks-70 PRACTICAL
(Each class 2 hrs.): Marks-30 Lectures: 60 (40
Theory + 20 Practical classes)

UNIT-I: Microbes : Viruses Discovery, general structure, replication (general account), DNA virus (T-phage); Lytic and lysogenic cycle, RNA virus (TMV); **Economic importance**; Bacteria Discovery, General characteristics and cell structure; Reproduction vegetative, asexual and recombination (conjugation, transformation and transduction); **Economic importance**. (8 lectures)

UNIT-II: Algae: General characteristics; Ecology and distribution; Range of thallus organization and reproduction; Classification of algae; Morphology and lifecycles of the following: *Nostoc*, *Chlamydomonas*, *Oedogonium*, *Vaucheria*, *Fucus*, *Polysiphonia*. **Economic importance of algae**. (10 lectures)

Fungi : Introduction- General characteristics, **ecology and significance**, range of thallus organization, cell wall composition, nutrition, reproduction and classification; True Fungi- General characteristics, **ecology and significance**, life cycle of *Rhizopus* (Zygomycota) *Penicillium*, *Alternaria* (Ascomycota), *Puccinia*, *Agaricus* (Basidiomycota); Symbiotic Associations-**Lichens**: (6 lectures)

UNIT-III: Introduction to Archegoniate : Unifying features of archegoniates, Transition to land habit, Alternation of generations. (2 lectures)

Bryophytes : General characteristics, adaptations to land habit, Classification, Range of thallus organization. Classification (up to family), morphology, anatomy and reproduction of *Marchantia* and *Funaria*. (Developmental details not to be included). **Ecology and economic importance of bryophytes with special mention of Sphagnum**. (6 lectures)

UNIT-IV: Pteridophytes : General characteristics, classification, Early land plants (*Cooksonia* and

Rhynia). Classification (up to family), morphology, anatomy and reproduction of Selaginella, Equisetum and Pteris. (Developmental details not to be included). Heterospory and seed habit, stellar evolution. **Ecological and economical importance of Pteridophytes**. (5 lectures)

UNIT-V: Gymnosperms: General characteristics, classification. Classification (up to family), morphology, anatomy and reproduction of Cycas and Pinus. (Developmental details not to be included). **Ecological and economical importance**. (6 lectures)

PRACTICAL

1. EMs/Models of viruses T-Phage and TMV, Line drawing/Photograph of Lytic and Lysogenic Cycle.
2. Types of Bacteria from temporary/permanent slides/photographs; EM bacterium; Binary Fission; Conjugation; Structure of root nodule.
3. Gram staining.
4. Study of vegetative and reproductive structures of Nostoc, Chlamydomonas (electron micrographs), Oedogonium, Vaucheria, Fucus* and Polysiphonia through temporary preparations and permanent slides. (*: Fucus - Specimen and permanent slides)
5. Rhizopus and Penicillium: Asexual stage from temporary mounts and sexual structures through permanent slides.
6. Alternaria: Specimens/photographs and tease mounts.
7. Puccinia: Herbarium specimens of Black Stem Rust of Wheat and infected Barberry leaves; section/tease mounts of spores on Wheat and permanent slides of both the hosts.
8. Agaricus: Specimens of button stage and full grown mushroom; Sectioning of gills of Agaricus.
9. Lichens: Study of growth forms of lichens (crustose, foliose and fruticose)
10. Mycorrhiza: ecto mycorrhiza and endo mycorrhiza (Photographs)
11. Marchantia- morphology of thallus, w.m. rhizoids and scales, v.s. thallus through gemma cup, w.m. gemmae (all temporary slides), v.s. antheridiophore, archegoniophore, l.s. sporophyte (all permanent slides).
12. Funaria- morphology, w.m. leaf, rhizoids, operculum, peristome, annulus, spores (temporary slides); permanent slides showing antheridial and archegonial heads, l.s. capsule and protonema.
13. Selaginella- morphology, w.m. leaf with ligule, t.s. stem, w.m. strobilus, w.m. microsporophyll and megasporophyll (temporary slides), l.s. strobilus (permanent slide).
14. Equisetum- morphology, t.s. internode, l.s. strobilus, t.s. strobilus, w.m. sporangiophore, w.m. spores (wet and dry) (temporary slides); t.s. rhizome (permanent slide).
15. Pteris- morphology, t.s. rachis, v.s. sporophyll, w.m. sporangium, w.m. spores (temporary slides), t.s. rhizome, w.m. prothallus with sex organs and young sporophyte (permanent slide).
16. Cycas- morphology (coralloid roots, bulbil, leaf), t.s. coralloid root, t.s. rachis, v.s. leaflet, v.s. microsporophyll, w.m. spores (temporary slides), l.s. ovule, t.s. root (permanent slide).
17. Pinus- morphology (long and dwarf shoots, w.m. dwarf shoot, male and female), w.m. dwarf

shoot, t.s. needle, t.s. stem, , l.s./t.s. male cone, w.m. microsporophyll, w.m. microspores (temporary slides), l.s. female cone, t.l.s. & r.l.s. stem (permanent slide).

Suggested Readings:

1. Kumar, H.D. (1999). Introductory Phycology. Affiliated East-West. Press Pvt. Ltd. Delhi. 2nd edition.
2. Tortora, G.J., Funke, B.R., Case, C.L. (2010). Microbiology: An Introduction, Pearson Benjamin Cummings, U.S.A. 10th edition.
3. . Sethi, I.K. and Walia, S.K. (2011). Text book of Fungi & Their Allies, MacMillan Publishers Pvt. Ltd., Delhi.
4. Alexopoulos, C.J., Mims, C.W., Blackwell, M. (1996). Introductory Mycology, John Wiley and Sons (Asia), Singapore. 4th edition.
5. Raven, P.H., Johnson, G.B., Losos, J.B., Singer, S.R., (2005). Biology. Tata McGraw Hill, Delhi, India.
6. Vashishta, P.C., Sinha, A.K., Kumar, A., (2010). Pteridophyta, S. Chand. Delhi, India.
7. Bhatnagar, S.P. and Moitra, A. (1996). Gymnosperms. New Age International (P) Ltd Publishers, New Delhi, India.
8. Parihar, N.S. (1991). An introduction to Embryophyta. Vol. I. Bryophyta. Central Book Depot, Allahabad.

GE-1B: PLANT ECOLOGY & TAXONOMY

(Credits-6: Theory-4, Practical-2)-Max. Marks: 100

THEORY (Each class 1 hr.): Marks-70 PRACTICAL

(Each class 2 hrs.): Marks-30 Lectures: 60 (40

Theory + 20 Practical classes)

UNIT-I: Introduction: (2 lectures)

Ecological factors : Soil: Origin, formation, composition, soil profile. Water: States of water in the environment, precipitation types. Light and temperature: Variation Optimal and limiting factors; Shelford law of tolerance. Adaptation of hydrophytes and xerophytes (6 lectures)

Plant communities : Characters; Ecotone and edge effect; Succession; Processes and types (3 lectures)

UNIT-II: Ecosystem : Structure; Biotic and abiotic components, energy flow trophic organisation; Food chains and food webs, Ecological pyramids production and productivity; Biogeochemical cycling; Cycling of carbon, nitrogen and Phosphorous (6 lectures)

Phytogeography : Principle biogeographical zones; Endemism (2 lectures)

UNIT-III: Introduction to plant taxonomy: Identification, Classification, Nomenclature. (2 lectures)

Identification : Functions of Herbarium, important herbaria and botanical gardens of the world and India; Documentation: Flora, Keys: single access and multi-access (3 lectures)

UNIT-IV: Taxonomic evidences from palynology, cytology, phytochemistry and molecular Data: (4 lectures)

Taxonomic hierarchy: Ranks, categories and taxonomic groups 2 lectures Biometrics, numerical taxonomy and cladistics: Characters; variations; OTUs, character weighting and coding; cluster analysis; phenograms, cladograms (definitions and differences). (5 lectures)

UNIT-V: Botanical nomenclature: Principles and rules (ICN); ranks and names; binominal system, typification, author citation, valid publication, rejection of names, principle of priority and its limitations. (4 lectures)

Classification: Types of classification-artificial, natural and phylogenetic. Bentham and Hooker (upto series), Engler and Prantl (upto series). (5 lectures)

PRACTICAL

1. Study of instruments used to measure microclimatic variables: Soil thermometer, maximum and minimum thermometer, anemometer, psychrometer/hygrometer, rain gauge and luxmeter.
2. Determination of pH, and analysis of two soil samples for carbonates, chlorides, nitrates, sulphates, organic matter and base deficiency by rapid field test.
3. Comparison of bulk density, porosity and rate of infiltration of water in soil of three habitats.
4. (a) Study of morphological adaptations of hydrophytes and xerophytes (four each). (b) Study of biotic interactions of the following: Stem parasite (*Cuscuta*), Root parasite (*Orobancha*), Epiphytes, Predation (Insectivorous plants).
5. Determination of minimal quadrat size for the study of herbaceous vegetation in the college campus by species area curve method. (species to be listed)
6. Quantitative analysis of herbaceous vegetation in the college campus for frequency and comparison with Raunkiaers frequency distribution law
7. Study of vegetative and floral characters of the following families (Description, V.S. flower, section of ovary, floral diagram/s, floral formula/e and systematic position according to Bentham & Hookers system of classification): Brassicaceae - Brassica, Alyssum / Iberis; Asteraceae - Sonchus/Launaea, Vernonia/Ageratum, Eclipta/Tridax; Solanaceae - Solanum nigrum, Withania; Lamiaceae - Salvia, Ocimum; Liliaceae - Asphodelus / Liliium / Allium.
8. Mounting of a properly dried and pressed specimen of any wild plant with herbarium label (to be submitted in the record book).

Suggested Readings:

1. Kormondy, E.J. (1996). Concepts of Ecology. Prentice Hall, U.S.A. 4th edition.
2. Sharma, P.D. (2010) Ecology and Environment. Rastogi Publications, Meerut, India. 8th edition.
3. Simpson, M.G. (2006). Plant Systematics. Elsevier Academic Press, San Diego, CA, U.S.A.

4. Singh, G. (2012). Plant Systematics: Theory and Practice. Oxford & IBH Pvt. Ltd., New Delhi. 3rd edition.

GE-2: ECONOMIC PLANT ANATOMY & EMBRYOLOGY

(Credits-6: Theory-4, Practical-2)-Max. Marks: 100

THEORY (Each class 1 hr.): Marks-70 PRACTICAL

(Each class 2 hrs.): Marks-30 Lectures: 60 (40

Theory + 20 Practical classes)

UNIT-I: Introduction: (2 lectures)

Meristematic and permanent tissues: Root and shoot apical meristems; Simple and complex tissues (5 lectures)

Organs: Structure of dicot and monocot root stem and leaf. (3 lectures)

UNIT-II: Secondary Growth: Vascular cambium structure and function, seasonal activity. Secondary growth in root and stem, Wood (heartwood and sapwood) (6 lectures)

Adaptive and protective systems: Epidermis, cuticle, stomata; General account of adaptations in xerophytes and hydrophytes. (5 lectures)

UNIT-III: Structural organization of flower: Structure of anther and pollen; Structure and types of ovules; Types of embryo sacs, organization and ultrastructure of mature embryo sac. (5 lectures)

Pollination and fertilization: Pollination mechanisms and adaptations; Double fertilization; Seed-structure appendages and dispersal mechanisms. (6 lectures)

UNIT-IV: Embryo and endosperm: Endosperm types, structure and functions; Dicot and monocot embryo; Embryo endosperm relationship (5 lectures)

UNIT-V: Apomixis and polyembryony: Definition, types and Practical applications. (5 lectures)

PRACTICAL

1. Study of meristems through permanent slides and photographs.
2. Tissues (parenchyma, collenchyma and sclerenchyma); Macerated xylary elements, Phloem (Permanent slides, photographs)
3. Stem: Monocot: Zea mays; Dicot: Helianthus; Secondary: Helianthus (only Permanent slides).
4. Root: Monocot: Zea mays; Dicot: Helianthus; Secondary: Helianthus (only Permanent slides).
5. Leaf: Dicot and Monocot leaf (only Permanent slides).
6. Adaptive anatomy: Xerophyte (Nerium leaf); Hydrophyte (Hydrilla stem).
7. Structure of anther (young and mature), tapetum (amoeboid and secretory) (Permanent slides).
8. Types of ovules: anatropous, orthotropous, circinotropous, amphitropous/ campylotropous.
9. Female gametophyte: Polygonum (monosporic) type of Embryo sac Development (Permanent slides/photographs).
10. Ultrastructure of mature egg apparatus cells through electron micrographs.
11. Pollination types and seed dispersal mechanisms (including appendages, aril, caruncle) (Photographs and specimens).
12. Dissection of embryo/endosperm from developing seeds.

13. Calculation of percentage of germinated pollen in a given medium.

Suggested Readings:

1. Bhojwani, S.S. & Bhatnagar, S.P. (2011). Embryology of Angiosperms. Vikas Publication House Pvt. Ltd. New Delhi. 5th edition.
2. Mauseth, J.D. (1988). Plant Anatomy. The Benjamin/Cummings Publisher, USA.

GE-4A: PLANT PHYSIOLOGY & METABOLISM

(Credits-6: Theory-4, Practical-2)-Max. Marks: 100

THEORY (Each class 1 hr.): Marks-70 PRACTICAL

(Each class 2 hrs.): Marks-30 Lectures: 60 (40

Theory + 20 Practical classes)

UNIT-I: Plant-water relations: Importance of water, water potential and its components; Transpiration and its significance; Factors affecting transpiration; Root pressure and guttation. (4 lectures)
Mineral nutrition: Essential elements, macro and micronutrients; Criteria of essentiality of elements; Role of essential elements; Transport of ions across cell membrane, active and passive transport, carriers, channels and pumps. (4 lectures)

Translocation in phloem.: Composition of phloem sap, girdling experiment; Pressure flow model; Phloem loading and unloading (4 lectures)

UNIT-II: Photosynthesis: Photosynthetic Pigments (Chl a, b, xanthophylls, carotene); Photo- system I and II, reaction center, antenna molecules; Electron transport and mechanism of ATP synthesis; C₃, C₄ and CAM pathways of carbon fixation; Photorespiration. (8 lectures)

UNIT-III: Respiration : Glycolysis, anaerobic respiration, TCA cycle; Oxidative phosphorylation, Glyoxylate, Oxidative Pentose Phosphate Pathway. (4 lectures)

UNIT-IV: Enzymes: Structure and properties; Mechanism of enzyme catalysis and enzyme inhibition. (3 lectures)

Nitrogen metabolism : Biological nitrogen fixation; Nitrate and ammonia assimilation. (3 lectures)

UNIT-V: Plant growth regulators : Discovery and physiological roles of auxins, gibberellins, cytokinins, ABA, ethylene. (5 lectures)

Plant response to light and temperature: Photoperiodism (SDP, LDP, Day neutral plants); **Phytochrome** (discovery and structure), red and far red light responses on photomorphogenesis; Vernalization. (5 lectures)

PRACTICAL

1. Determination of osmotic potential of plant cell sap by plasmolytic method.
2. To study the effect of two environmental factors (light and wind) on transpiration by excised twig.
3. Calculation of stomatal index and stomatal frequency of a mesophyte and a xerophyte.
4. Demonstration of Hill reaction.
5. Demonstrate the activity of catalase and study the effect of pH and enzyme concentration.
6. To study the effect of light intensity and bicarbonate concentration on O₂ evolution in photosynthesis.

7. Comparison of the rate of respiration in any two parts of a plant.
8. Separation of amino acids by paper chromatography.

Demonstration experiments (any four): (a) Bolting.

- (b) Effect of auxins on rooting.
- (c) Suction due to transpiration.
- (d) R.Q. (e) Respiration in roots.

Suggested Readings:

1. Taiz, L., Zeiger, E., Mller, I.M. and Murphy, A (2015). Plant Physiology and Development. Sinauer Associates Inc. USA. 6th edition.
2. Hopkins, W.G., Huner, N.P., (2009). Introduction to Plant Physiology. John Wiley & Sons, U.S.A. 4th Edition.
3. Bajracharya, D., (1999). Experiments in Plant Physiology- A Laboratory Manual. Narosa Publishing House, New Delhi.

GE-4B: BOTANY & PLANT BIO-TECHNOLOGY

(Credits-6: Theory-4, Practical-2)-Max. Marks: 100

THEORY (Each class 1 hr.): Marks-70 PRACTICAL

(Each class 2 hrs.): Marks-30 Lectures: 60 (40 Theory + 20 Practical classes)

UNIT-I: Origin of Cultivated Plants: Concept of centres of origin, their importance with reference to Vavilovs work. (3lectures)

UNIT-II: Cereals: Wheat -Origin, morphology, uses 3 lectures Legumes: General account with special reference to Gram and soybean (4 lectures)

UNIT-III: Spices: General account with special reference to clove and black pepper (Botanical name, family, part used, morphology and uses) (4 lectures)

Beverages: Tea (morphology, processing, uses) (3 lectures)

UNIT-IV: Oils and Fats: General description with special reference to groundnut 3 lectures Fibre Yielding Plants: General description with special reference to Cotton (Botanical name, family, part used, morphology and uses) (3 lectures)

UNIT-V: Introduction to biotechnology (2 lectures)

Plant tissue culture: Micropropagation; haploid production through androgenesis and gynogenesis; brief account of embryo and endosperm culture with their applications, Gene cloning by recombinant DNA technology, transgenic plants. (6 lectures)

Molecular Techniques: Blotting techniques: Northern, Southern and Western Blotting, DNA Fingerprinting; Molecular DNA markers i.e. RAPD, RFLP, SNPs; DNA sequencing, PCR and Reverse Transcriptase-PCR. Hybridoma and monoclonal antibodies, ELISA and Immunodetection. Molecular diagnosis of human disease, Human gene Therapy. (9lectures)

PRACTICAL

1. Study of economically important plants: Wheat, Gram, Soybean, Black pepper, Clove Tea, Cotton, Groundnut through specimens, sections and microchemical tests

2. Familiarization with basic equipments in tissue culture.
3. Study through photographs: Anther culture, somatic embryogenesis, endosperm and embryo culture; micropropagation.
4. Study of molecular techniques: PCR, Blotting techniques, AGE and PAGE.

Suggested Readings:

1. Kochhar, S.L. (2011). Economic Botany in the Tropics, MacMillan Publishers India Ltd., New Delhi. 4th edition.
2. Bhojwani, S.S. and Razdan, M.K., (1996). Plant Tissue Culture: Theory and Practice. Elsevier Science Amsterdam. The Netherlands.
3. Glick, B.R., Pasternak, J.J. (2003). Molecular Biotechnology- Principles and Applications of recombinant DNA. ASM Press, Washington.

GE-V: ENVIRONMENTAL BIO-TECHNOLOGY

(Credits-6: Theory-4, Practical-2)-Max. Marks: 100

THEORY (Each class 1 hr.): Marks-70 PRACTICAL

(Each class 2 hrs.): Marks-30 Lectures: 60 (40
Theory + 20 Practical classes)

UNIT-I: Environment - basic concepts and issues, global environmental problems ozone depletion, UV-B, greenhouse effect and acid rain due to anthropogenic activities, their impact and biotechnological approaches for management. (4 lectures)

An overview of atmosphere, hydrosphere, lithosphere and anthrosphere - environmental problems. Environmental pollution - types of pollution, sources of pollution, measurement of pollution, Bio-concentration, bio/geomagnification. (4 lectures)

UNIT-II: Microbiology of waste water treatment, aerobic process - activated sludge, oxidation ponds, trickling filter, towers, rotating discs, rotating drums, oxidation ditch. Anaerobic process - anaerobic digestion, anaerobic filters, up-flow anaerobic sludge blanket reactors. Treatment schemes for waste waters of dairy, distillery, tannery, sugar and antibiotic industries. (6 lectures)

UNIT-III: Xenobiotic compounds - organic (chlorinated hydrocarbons, substituted simple aromatic compounds, poly-aromatic hydrocarbons, pesticides, surfactants) and inorganic (metals, radionuclides, phosphates, nitrates). Bio-remediation of xenobiotics in environment - ecological consideration, decay behavior and degradative plasmids, molecular techniques in bio-remediation. (6 lectures)

Role of immobilized cells/enzymes in treatment of toxic compounds. Bio-pesticides, bio-reactors, bio-leaching, bio-mining, bio-sensors, bio-techniques for air pollution abatement and odour control. (4 lectures)

UNIT-IV: Sustainable Development: Economics and Environment: Economic growth, Gross National Productivity and the quality of life, Tragedy of Commons, Economics of Pollution control, Cost-benefit and cost effectiveness analysis, WTO and Environment, Corporate Social Responsibility, Environmental awareness and Education; Environmental Ethics. (6 lectures)

UNIT-V: International Legislations, Policies for Environmental Protection: Stockholm Conference (1972) and its declaration, WCED (1983) and Brundtland Report (1987), Rio Earth Summit-UNCED (1992) and its declaration, Montreal Protocol - 1987, Basel Convention (1989), Kyoto Protocol- 1997, Ramsar Convention 1971. (3 lectures)

National Legislations, Policies for Pollution Management: Salient features of Wild life protection act

1972, Water Pollution (Prevention and Control) Act- 1974, Forest conservation act 1980, Air Pollution (Prevention and Control) Act-1981, National Environmental Policy-2006, Central and State Pollution Control Boards: Constitution and power. (3 lectures)

Public Participation for Environmental Protection: Environmental movement and peoples participation with special references to Gandhamardan, Chilika and Narmada Bachao Andolan, Chipko and Silent valley Movement; Women and Environmental Protection, Role of NGO in bringing environmental awareness and education in the society. (4lectures)

PRACTICAL

1. Water/Soil analysis-DO, salinity, pH, chloride, total hardness, alkalinity, acidity, nitrate, calcium, Magnesium and phosphorus.
2. Gravimetric analysis-Total solid, dissolved solid, suspended solid in an effluent
3. Microbial assessment of air (open plate and air sample) and water.

Suggested Readings:

1. Waste water engineering-treatment, disposal and reuse, Metcalf and Eddy Inc., Tata McGraw Hill, New Delhi.
2. Environmental Chemistry, AK. De, Wiley Eastern Ltd, New Delhi.
3. Introduction to Bio-deterioration, D.Allsopp and K.J. Seal, ELBS / Edward Arnold.
4. Bioremediation, Baaker, KH and Herson D.S., 1994. Mc.GrawHill Inc, NewYork.
5. Industrial and Environmental Biotechnology - Nuzhat Ahmed, Fouad M. Qureshi and Obaid Y. Khan, 2006. Horizon Press.
6. Environmental Molecular Biology, Paul. A, Rochelle, 2001.Horizon Press.
7. Environmental Protection and Laws by Jadhav and Bhosale, V.M.Himalaya publ. House 13. Biodiversity Assessment and Conservation by PC Trivedi, Agrobios publ.

SKILL ENHANCEMENT COURSES (SEC)

SEC-I: BIO-FERTILIZERS

(Credits-2: Lectures: 30)

THEORY (Each class 1 hr.)-Marks: 50.

Unit-I: General account about the microbes used as biofertilizer Rhizobium isolation, identification, mass multiplication, carrier based inoculants, Actinorrhizal symbiosis. (4 lectures)

Unit-II: Azospirillum: isolation and mass multiplication carrier based inoculant, associative effect of different microorganisms. Azotobacter: classification, characteristics crop response to Azotobacter inoculum, maintenance and mass multiplication. (8 lectures)

Unit-III: Cyanobacteria (blue green algae), Azolla and Anabaena azollae association, nitrogen fixation, factors affecting growth, blue green algae and Azolla in rice cultivation. (4 lectures)

Unit-IV: Mycorrhizal association, types of mycorrhizal association, taxonomy, occurrence and distribution, phosphorus nutrition, growth and yield colonization of VAM isolation and inoculum production of VAM, and its influence on growth and yield of crop plants. (8 lectures)

Unit-V: Organic farming Green manuring and organic fertilizers, Recycling of biodegradable municipal, agricultural and Industrial wastes bio-compost making methods, types and method of vermicomposting field Application. (6 lectures)

Suggested Readings:

1. Dubey, R.C., 2005 A Text book of Biotechnology S.Chand & Co, New Delhi.
2. Kumaresan, V. 2005, Biotechnology, Saras Publications, New Delhi.
3. John Jothi Prakash, E. 2004. Outlines of Plant Biotechnology. Emkay, Publication, New Delhi.
4. Sathe, T.V. 2004 Vermiculture and Organic Farming. Daya publishers.
5. Subha Rao, N.S. 2000, Soil Microbiology, Oxford & IBH Publishers, New Delhi.
6. Vayas,S.C, Vayas, S. and Modi, H.A. 1998 Bio-fertilizers and organic, Farming Akta Prakashan, Nadiad

SEC-II: HERBAL TECHNOLOGY

(Credits-2: Lectures: 30)

THEORY (Each class 1 hr.)-Marks: 50.

Unit-I: Herbal medicines: history and scope - definition of medical terms - role of medicinal plants in Siddha systems of medicine; cultivation - harvesting - processing - storage - marketing and utilization of medicinal plants. (6 lectures)

Unit-II: Pharmacognosy - systematic position m edicinal uses of the following herbs in curing various ailments; Tulsi, Ginger, Fenugreek, Indian Goose berry and Ashoka. (6 lectures)

Unit-III:Phytochemistry - active principles and methods of their testing - identification and utilization of the medicinal herbs; Catharanthus roseus (cardiotonic), Withania somnifera (drugs acting on nervous system), Clerodendron phlomoides (anti-rheumatic) and Centella asiatica (memory booster). (6 lectures)

Unit-IV: Analytical pharmacognosy: Drug adulteration - types, methods of drug evaluation - Biological testing of herbal drugs - Phytochemical screening tests for secondary metabolites (alkaloids, flavonoids, steroids, triterpenoids, phenolic compounds) (8 lectures)

Unit-V: Medicinal plant banks micro propagation of important species (Withania somnifera, neem and tulsi- Herbal foods-future of pharmacognosy) (4 lectures)

Suggested Readings:

1. Glossary of Indian medicinal plants, R.N.Chopra, S.L.Nayar and I.C.Chopra, 1956. C.S.I.R, New Delhi.
2. The indigenous drugs of India, Kanny, Lall, Dey and Raj Bahadur, 1984. International Book Distributors.
3. Herbal plants and Drugs Agnes Arber, 1999. Mangal Deep Publications.
4. Ayurvedic drugs and their plant source. V.V. Sivarajan and Balachandran Indra 1994. Oxford IBH publishing Co.
5. Ayurveda and Aromatherapy. Miller, Light and Miller, Bryan, 1998. Banarsidass, Delhi.
6. Principles of Ayurveda, Anne Green, 2000. Thomsons, London.

7. Pharmacognosy, Dr.C.K.Kokate et al. 1999. Nirali Prakashan.

SEC-III: NURSERY & GARDENING

(Credits-2: Lectures: 30)

THEORY (Each class 1 hr.)-Marks: 50.

Unit-I: Nursery: definition, objectives and scope and building up of infrastructure for nursery, planning and seasonal activities - Planting - direct seeding and transplants. (4 lectures)

Unit-II: Seed: Structure and types - Seed dormancy; causes and methods of breaking dormancy - Seed storage: Seed banks, factors affecting seed viability, genetic erosion Seed production technology - seed testing and certification. (6 lectures)

Unit-III: Vegetative propagation: air-layering, cutting, selection of cutting, collecting season, treatment of cutting, rooting medium and planting of cuttings - Hardening of plants green house - mist chamber, shed root, shade house and glass house. (6 lectures)

Unit-IV: Gardening: definition, objectives and scope - different types of gardening landscape and home gardening - parks and its components - plant materials and design computer applications in landscaping - Gardening operations: soil laying, manuring, watering, management of pests and diseases and harvesting. (8 lectures)

Unit-V: Sowing/raising of seeds and seedlings - Transplanting of seedlings - Study of cultivation of different vegetables: cabbage, brinjal, lady's finger, onion, garlic, tomatoes, and carrots - Storage and marketing procedures. (6 lectures)

Suggested Readings:

1. Bose T.K. & Mukherjee, D., 1972, Gardening in India, Oxford & IBH Publishing Co., New Delhi.
2. Sandhu, M.K., 1989, Plant Propagation, Wile Eastern Ltd., Bangalore, Madras.
3. Kumar, N., 1997, Introduction to Horticulture, Rajalakshmi Publications, Nagercoil.
4. Edmond Musser & Andres, Fundamentals of Horticulture, McGraw Hill Book Co., New Delhi.
5. Agrawal, P.K. 1993, Hand Book of Seed Technology, Dept. of Agriculture and Cooperation, National Seed Corporation Ltd., New Delhi.
6. Janick Jules. 1979. Horticultural Science. (3rd Ed.), W.H. Freeman and Co., San Francisco, USA.

SEC-IV: FLORICULTURE

(Credits-2: Lectures: 30)

THEORY (Each class 1 hr.)-Marks: 50.

Unit-I: Introduction: History of gardening; Importance and scope of floriculture and landscape gardening. (2 lectures)

Unit-II: Nursery Management and Routine Garden Operations: Sexual and vegetative methods of propagation; Soil sterilization; Seed sowing; Pricking; Planting and transplanting; Shading; Stopping or pinching; Defoliation; Wintering; Mulching; Topiary; Role of plant growth regulators. (8 lectures)

Unit-III: Ornamental Plants: Flowering annuals; Herbaceous perennials; Divine vines; Shade and ornamental trees; Ornamental bulbous and foliage plants; Cacti and succulents; Palms and Cycads; Ferns and Selaginellas; Cultivation of plants in pots; Indoor gardening; Bonsai. (4 lectures)

Unit-IV: Principles of Garden Designs: English, Italian, French, Persian, Mughal and Japanese gardens; Features of a garden (Garden wall, Fencing, Steps, Hedge, Edging, Lawn, Flower beds,

Shrubbery, Borders, Water garden. Some Famous gardens of India (4 lectures)
Landscaping Places of Public Importance: Landscaping highways and Educational institutions. (4 lectures)

Unit-V: Commercial Floriculture: Factors affecting flower production; Production and packaging of cut flowers; Flower arrangements; Methods to prolong vase life; Cultivation of Important cut flowers (Carnation, Aster, Chrysanthemum, Dahlia, Gerbera, Gladiolous, Marigold, Rose, Liliium, Orchids). (6 lectures)

Diseases and Pests of Ornamental Plants. (2 lectures)

Suggested Readings:

Randhawa, G.S. and Mukhopadhyay, A. 1986. Floriculture in India. Allied Publishers.

SEC-V: MEDICAL BOTANY

(Credits-2: Lectures: 30)

THEORY (Each class 1 hr.)-Marks: 50.

Unit-I: History, Scope and Importance of Medicinal Plants. Indigenous Medicinal Sciences; Definition and Scope-Ayurveda: History, origin, panchamahabhutas, saptadhatu and tridosha concepts, Rasayana, plants used in ayurvedic treatments. (5 lectures)

Unit-II: Siddha: Origin of Siddha medicinal systems, Basis of Siddha system, plants used in Siddha medicine. Unani: History, concept: Umoor-e- tabiya, tumors treatments/ therapy, polyherbal formulations. (5 lectures)

Unit-III: Conservation of endangered and endemic medicinal plants. Definition: endemic and endangered medicinal plants, Red list criteria; In situ conservation: Biosphere reserves, sacred groves, National Parks; Ex situ conservation: Botanic Gardens, Ethno medicinal plant Gardens. (6 lectures)

Unit-IV: Propagation of Medicinal Plants: Objectives of the nursery, its classification, important components of a nursery, sowing, pricking, use of green house for nursery production, propagation through cuttings, layering, grafting and budding. (6 lectures)

Unit-V: Ethnobotany and Folk medicines. Definition; Ethnobotany in India: Methods to study ethnobotany; Applications of Ethnobotany: National interacts, Palaeo-ethnobotany. Folk medicines of ethnobotany, ethno medicine, ethno ecology, ethnic communities of India. Application of natural products to certain diseases- Jaundice, cardiac, infertility, diabetics, Blood pressure and skin diseases. (8 lectures)

Suggested Readings:

1. Trivedi P C, 2006. Medicinal Plants: Ethno botanical Approach, Agro-bios, India.
2. Purohit and Vyas, 2008. Medicinal Plant Cultivation: A Scientific Approach, 2nd Edn. Agro- bios, India.

SEC-VI: PLANT DIVERSITY & HUMAN WELFARE

(Credits-2: Lectures: 30)

THEORY (Each class 1 hr.)-Marks: 50.

Unit-I: Plant diversity and its scope- Genetic diversity, Species diversity, Plant diversity at the ecosystem level, Agro-bio-diversity and cultivated plant taxa, wild taxa. Values and uses of Biodiversity: Ethical and aesthetic values, Precautionary principle, Methodologies for valuation, Uses of plants, Uses of microbes. (6 lectures)

Unit-II: Loss of Bio-diversity: Loss of genetic diversity, Loss of species diversity, Loss of ecosystem diversity, Loss of agro-bio-diversity, Projected scenario for biodiversity loss, (6 lectures)

Unit-III: Management of Plant Bio-diversity: Organizations associated with bio-diversity management- Methodology for execution-IUCN, UNEP, UNESCO, WWF, NBPGR; Bio-diversity legislation and conservations, Bio-diversity information management and communication. (6 lectures)

Unit-IV: Conservation of Bio-diversity: Conservation of genetic diversity, species diversity and ecosystem diversity, In situ and ex situ conservation, Social approaches to conservation, Bio-diversity awareness programmes, Sustainable development. (6 lectures)

Unit-V: Role of plants in relation to Human Welfare: (a) Importance of forestry their utilization and commercial aspects (b) Avenue trees. (c) Ornamental plants of India. (d) Alcoholic beverages through ages. Fruits and nuts: Important fruit crops their commercial importance. Wood and its uses. (6 lectures)

Suggested Readings:

Krishnamurthy, K.V. (2004). An Advanced Text Book of Biodiversity - Principles and Practices. Oxford and IBH Publications Co. Pvt. Ltd. New Delhi

SEC-VII: ETHNOBOTANY

(Credits-2: Lectures: 30)

THEORY (Each class 1 hr.)-Marks: 50.

Unit-I: Introduction, concept, scope and objectives; Ethnobotany as an interdisciplinary science. The relevance of ethnobotany in the present context; Major and minor ethnic groups or Tribals of India, and their life styles. Plants used by the tribals: (a) Food plants. (b) intoxicants and beverages
c) Resins and oils and miscellaneous uses. (6 lectures)

Unit-II: Methodology of Ethnobotanical studies: (a) Field work. (b) Herbarium. (c) Ancient Literature. (d) Archaeological findings. (e) Temples and sacred places. (6 lectures)

Unit-III: Role of ethnobotany in modern Medicine Medico-ethnobotanical sources in India; Significance of the following plants in ethno botanical practices (along with their habitat and morphology) (a) Azadiractha indica. (b) Ocimum sanctum. (c) Vitex negundo. (d) Gloriosa superba e) Tribulus terrestris. (f) Pongamia pinnata. (g) Cassia auriculata. (h) Indigofera tinctoria. Role of ethnobotany in modern medicine with special example Rauvolfia sepentina, Trichopus zeylanicus, Artemisia, Withania. (8 lectures)

Unit-IV: Role of ethnic groups in conservation of plant genetic resources. Endangered taxa and forest management (participatory forest management). (4 lectures)

Unit-V: Ethnobotany and legal aspects Ethnobotany as a tool to protect interests of ethnic groups. Sharing of wealth concept with few examples from India. Biopiracy, Intellectual Property Rights and Traditional Knowledge. (6 lectures)

Suggested Readings:

1. S.K. Jain, Manual of Ethnobotany, Scientific Publishers, Jodhpur, 1995.
2. S.K. Jain (ed.) Glimpses of Indian. Ethnobotny, Oxford and I B H, New Delhi 1981
3. Lone et al., Palaeoethnobotany

4. S.K. Jain (ed.) 1989. Methods and approaches in ethnobotany. Society of ethnobotanists, Lucknow, India.
5. S.K. Jain, 1990. Contributions of Indian ethnobotny. Scientific publishers, Jodhpur.
6. Colton C.M. 1997. Ethnobotany Principles and applications. John Wiley and sons Chichester
7. Rama Ro, N and A.N. Henry (1996). The Ethnobotany of Eastern Ghats in Andhra Pradesh, India. Botanical Survey of India. Howrah.
8. Rajiv K. Sinha Ethnobotany The Renaissance of Traditional Herbal Medicine INA SHREE Publishers, Jaipur-1996
9. Faulks, P.J. 1958. An introduction to Ethnobotany, Moredale pub. Ltd.

SEC-VIII: MUSHROOM CULTURE TECHNOLOGY

(Credits-2: Lectures: 30)

THEORY (Each class 1 hr.)-Marks: 50.

Unit-I: Introduction, history. Nutritional and medicinal value of edible mushrooms; Poisonous mushrooms. Types of edible mushrooms available in India - *Volvariella volvacea*, *Pleurotus citrinopileatus*, *Agaricus bisporus*. (5 lectures)

Unit-II: Cultivation Technology : Infrastructure: substrates (locally available) Polythene bag, vessels, Inoculation hook, inoculation loop, low cost stove, sieves, culture rack, mushroom unit (Thatched house) water sprayer, tray, small polythene bag. (6 Lectures)

Unit-III: Pure culture: Medium, sterilization, preparation of spawn, multiplication. Mushroom bed preparation - paddy straw, sugarcane trash, maize straw, banana leaves. Factors affecting the mushroom bed preparation - Low cost technology, Composting technology in mushroom production. (6 lectures)

Unit-IV: Storage and nutrition : Short-term storage (Refrigeration - upto 24 hours) Long term Storage (canning, pickles, papads), drying, storage in salt solutions. Nutrition - Proteins - amino acids, mineral elements nutrition - Carbohydrates, Crude fibre content - Vitamins. (8 lectures)

Unit-V: Food Preparation: Types of foods prepared from mushroom. Research Centres - National level and Regional level. Cost benefit ratio - Marketing in India and abroad, Export Value. (5 lectures)

Suggested Readings:

1. Marimuthu, T. Krishnamoorthy, A.S. Sivaprakasam, K. and Jayarajan. R (1991) Oyster Mushrooms, Department of Plant Pathology, Tamil Nadu Agricultural University, Coimbatore.
2. Swaminathan, M. (1990) Food and Nutrition. Bappco, The Bangalore Printing and Publishing Co. Ltd., No. 88, Mysore Road, Bangalore - 560018.
3. Tewari, Pankaj Kapoor, S.C., (1988). Mushroom cultivation, Mittal Publications, Delhi.

4. Nita Bahl (1984-1988) Hand book of Mushrooms, II Edition, Vol. I & Vol. II.

SEC-IX: INTELLECTUAL PROPERTY RIGHTS

(Credits-2: Lectures: 30)

THEORY (Each class 1 hr.)-Marks: 50.

Unit-I: Introduction to intellectual property right (IPR) : Concept and kinds. Economic importance. IPR in India and world: Genesis and scope, some important examples. IPR and WTO (TRIPS, WIPO). (2 lectures)

Patents: Objectives, Rights, Patent Act 1970 and its amendments. Procedure of obtaining patents, Working of patents. Infringement. (3 Lectures)

Copyrights: Introduction, Works protected under copyright law, Rights, Transfer of Copyright, Infringement. (3 Lectures)

Unit-II: Trademarks: Objectives, Types, Rights, Protection of goodwill, Infringement, Passing off, Defences, Domain name. (3 Lectures)

Geographical Indications : Objectives, Justification, International Position, Multilateral Treaties, National Level, Indian Position. (3 Lectures)

Unit-III: Protection of Traditional Knowledge : Objective, Concept of Traditional Knowledge, Holders, Issues concerning, Bio-Prospecting and Bio-Piracy, Alternative ways, Protectability, need for a Sui-Generis regime, Traditional Knowledge on the International Arena, at WTO, at National level, Traditional Knowledge Digital Library. (4 Lectures)

Unit-IV: Protection of Plant Varieties : Plant Varieties Protection-Objectives, Justification, International Position, Plant varieties protection in India. Rights of farmers, Breeders and Researchers. National gene bank, Benefit sharing. Protection of Plant Varieties and Farmers Rights Act, 2001. (2 Lectures)

Unit-V: Industrial Designs: Objectives, Rights, Assignments, Infringements, Defences of Design Infringement (2 Lectures)

CHEMISTRY(HONOURS)

SEMESTER-I

C-1: INORGANIC CHEMISTRY-I

(Credits-6: Theory-4, Practical-2)-Max. Marks: 100
THEORY (Each class 1 hr.): Marks-70 PRACTICAL
(Each class 2 hrs.): Marks-30 Lectures: 60 (40 Theory
+ 20 Practical classes)

Unit-I: Atomic structure

Bohrs theory, its limitations and atomic spectrum of hydrogen atom. Wave mechanics: de Broglie equation, Heisenbergs Uncertainty Principle and its significance, Schrdingers wave equation, significance of ψ and ψ^2 . Quantum numbers and their significance. Normalized and orthogonal wave functions. Sign of wave functions. Radial and angular wave functions for hydrogen atom. Radial and angular distribution curves. Shapes of s, p, d and f orbitals. Paulis Exclusion Principle, Hunds rule of maximum multiplicity, Aufbaus principle and its limitations. (14 Lectures)

Unit-II: Periodicity of elements

Periodicity of elements Periodicity of Elements: s, p, d, f block elements, the long form of periodic table. Detailed discussion of the following properties of the elements, with reference to s & p-block. (a) Effective nuclear charge, shielding or screening effect, Slater rules, variation of effective nuclear charge in periodic table. (b) Atomic radii (van der Waals) (c) Ionic and crystal radii. (d) Covalent radii (octahedral and tetrahedral) (e) Ionization enthalpy, Successive ionization enthalpies and factors affecting ionization energy. Applications of ionization enthalpy. (f) Electron gain enthalpy, trends of electron gain enthalpy. (g) Electronegativity, Paulings/ Mullikens electronegativity scales. Variation of electronegativity with bond order, partial charge, hybridization, group electronegativity. Sandersons electron density ratio. (16 Lectures)

Unit-III: Chemical bonding-I

Ionic bond: General characteristics, types of ions, size effects, radius ratio rule and its limitations. Packing of ions in crystals. Born-Land equation with derivation. Madelung constant, Born-Haber cycle and its application, Solvation energy. (ii) Covalent bond: Lewis structure, Valence Bond theory (Heitler-London approach). Energetics of hybridization, equivalent and non-equivalent hybrid orbitals, Resonance and resonance energy, Molecular orbital theory. Molecular orbital diagrams of diatomic and simple polyatomic molecules N_2 , O_2 , C_2 , B_2 , F_2 , CO , NO , and their ions; Valence shell electron pair repulsion theory (VSEPR), shapes of simple molecules and ions containing lone pairs and bond pairs of electrons, multiple bonding (σ and π bond approach) and bond lengths. Covalent character in ionic compounds, polarizing power and polarizability. Fajans rules and consequences of polarization. Ionic character in covalent compounds: Bond moment and dipole moment. Percentage ionic character from dipole moment and electronegativity difference. (16 Lectures)

Unit-IV: Chemical Bonding-II

(i) Metallic Bond: Qualitative idea of valence bond and band theories. Semiconductors and insulators. (ii) Weak Chemical Forces: van der Waals forces, ion-dipole forces, dipole-dipole interactions,

induced dipole interactions, Instantaneous dipole-induced dipole interactions. Repulsive forces, Hydrogen bonding (theories of hydrogen bonding, valence bond treatment) Effects of chemical force, melting and boiling points, solubility energetics of dissolution process. (10 Lectures)

Oxidation-reduction Redox equations, standard electrode potential and its application to inorganic reactions. Principles involved in some volumetric analyses (iron, copper and manganese). (4 Lectures)

Reference Books:

- Lee, J.D. Concise Inorganic Chemistry, ELBS, 1991.
- Douglas, B.E. and Mc Daniel, D.H., Concepts & Models of Inorganic Chemistry, Oxford, 1970.
- Atkins, P.W. & Paula, J. Physical Chemistry, Oxford Press, 2006.
- Day, M.C. and Selbin, J. Theoretical Inorganic Chemistry, ACS Publications 1962.

PRACTICAL: C-1 LAB.

(A) Titrimetric Analysis:

(i) Calibration and use of apparatus. (ii) Preparation of solutions of different Molarity/Normality of titrants.

(B) Acid-Base Titrations:

(i) Estimation of carbonate and hydroxide present together in mixture. (ii) Estimation of carbonate and bicarbonate present together in a mixture. (iii) Estimation of free alkali present in different soaps/detergents.

(C) Oxidation-Reduction Titrimetry:

(i) Estimation of Fe(II) and oxalic acid using standardized KMnO_4 solution. (ii) Estimation of oxalic acid and sodium oxalate in a given mixture. (iii) Estimation of Fe(II) with $\text{K}_2\text{Cr}_2\text{O}_7$ using internal (diphenylamine, anthranilic acid) and external indicator.

Reference text:

Vogel, A.I. A Textbook of Quantitative Inorganic Analysis, ELBS.

C-2: PHYSICAL CHEMISTRY

(Credits-6: Theory-4, Practical-2)-Max. Marks: 100
THEORY (Each class 1 hr.): Marks-70 PRACTICAL
(Each class 2 hrs.): Marks-30 Lectures: 60 (40 Theory
+ 20 Practical classes)

Unit-I: Gaseous state

Kinetic molecular model of a gas: postulates and derivation of the kinetic gas equation; collision frequency; collision diameter; mean free path and viscosity of gases, including their temperature and pressure dependence, relation between mean free path and coefficient of viscosity, calculation of σ from η ; variation of viscosity with temperature and pressure. Maxwell distribution and its use in evaluating molecular velocities (average, root mean square and most probable) and average kinetic energy, law of equipartition of energy, degrees of freedom and molecular basis of heat capacities. Behaviour of real gases: Deviations from ideal gas behaviour, compressibility factor, Z, and its variation with pressure for different gases. Causes of deviation from ideal behaviour. van der Waals

equation of state, its derivation and application in explaining real gas behaviour. Isotherms of real gases and their comparison with van der Waals isotherms, continuity of states, critical state, relation between critical constants and van der Waals constants, law of corresponding states. (18 Lectures)

Unit-II: Liquid state

(i) Qualitative treatment of the structure of the liquid state; physical properties of liquids; vapour pressure, surface tension and coefficient of viscosity, and their determination. Effect of addition of various solutes on surface tension and viscosity. Explanation of cleansing action of detergents. Temperature variation of viscosity of liquids and comparison with that of gases. Qualitative discussion of structure of water. (6 Lectures)

Ionic equilibria- I

(ii) Strong, moderate and weak electrolytes, degree of ionization, factors affecting degree of ionization, ionization constant and ionic product of water. Ionization of weak acids and bases, pH scale, common ion effect; dissociation constants of mono- and diprotic acids. (6 Lectures)

Unit- III: Solid state

Nature of the solid state, law of constancy of interfacial angles, law of rational indices, Miller indices, elementary ideas of symmetry, symmetry elements and symmetry operations, seven crystal systems and fourteen Bravais lattices; X-ray diffraction, Bragg's law, a simple account of rotating crystal method and powder pattern method. Analysis of powder diffraction patterns of NaCl, CsCl and KCl. Defects in crystals. Glasses and liquid crystals. (16 Lectures)

Unit-IV: Ionic equilibria - II

Salt hydrolysis-calculation of hydrolysis constant, degree of hydrolysis and pH for different salts. Buffer solutions; derivation of Henderson equation and its applications; buffer capacity, buffer range, buffer action and applications of buffers in analytical chemistry and biochemical processes in the human body. Solubility and solubility product of sparingly soluble salts applications of solubility product principle. Qualitative treatment of acid base titration curves (calculation of pH at various stages). Theory of acidbase indicators; selection of indicators and their limitations. Multistage equilibria in polyelectrolyte systems; hydrolysis and hydrolysis constants. (14 Lectures)

Reference Books:

- Atkins, P. W. & Paula, J. de Atkins Physical Chemistry Ed., Oxford University Press (2006).
- Ball, D. W. Physical Chemistry Thomson Press, India (2007).
- Castellan, G. W. Physical Chemistry 4th Ed. Narosa (2004).
- Mortimer, R. G. Physical Chemistry 3rd Ed. Elsevier: NOIDA, UP (2009).
- Principles of Physical Chemistry, Puri, Sharma, Pathania, Vishal Pub. Co.

PRACTICAL: C-2 LAB.

Surface tension measurements.

- (a) Determine the surface tension by (i) drop number (ii) drop weight method.
- (b) Study the variation of surface tension of detergent solutions with concentration.

Viscosity measurement using Ostwalds viscometer.

- (a) Determination of viscosity of aqueous solutions of (i) polymer, (ii) ethanol, and (iii) sugar at room temperature.

(b) Study the variation of viscosity of sucrose solution with the concentration of solute.

pH metry.

(a) Study the effect on pH of addition of HCl/NaOH to solutions of acetic acid, sodium acetate and their mixtures.

(b) Preparation of buffer solutions of different pH (i) Sodium acetate-acetic acid, (ii) Ammonium chloride-ammonium hydroxide.

(c) pH metric titration of (i) strong acid vs. strong base, (ii) weak acid vs. strong base.

(d) Determination of dissociation constant of a weak acid.

Reference Books:

- Khosla, B. D.; Garg, V. C. & Gulati, A. Senior Practical Physical Chemistry, R. Chand & Co., New Delhi (2011).
- Garland, C. W., Nibler, J. W. & Shoemaker, D. P. Experiments in Physical Chemistry 8th Ed.; McGraw-Hill, New York (2003).
- Halpern, A. M. & McBane, G. C. Experimental Physical Chemistry 3rd Ed.; W.H. Freeman & Co., New York (2003).

SEMESTER-II

C-3: ORGANIC CHEMISTRY I

(Credits-6: Theory-4, Practical-2)-Max. Marks: 100

THEORY (Each class 1 hr.): Marks-70 PRACTICAL

(Each class 2 hrs.): Marks-30 Lectures: 60 (40 Theory

+ 20 Practical classes)

Unit-I: BASICS OF ORGANIC CHEMISTRY

Electronic Displacements: Inductive, electromeric, resonance and mesomeric effects, hyperconjugation and their applications; Dipole moment; Organic acids and bases; their relative strength. Homolytic and Heterolytic fission with suitable examples. Curly arrow rules; Electrophiles and Nucleophiles; Nucleophilicity and basicity; Types, shape and their relative stability of carbocations, carbanions, free radicals and carbenes. Introduction to types of organic reactions and their mechanism: Addition, Elimination and Substitution reactions.

CARBON-CARBON SIGMA BONDS

Chemistry of alkanes: Formation of alkanes, Wurtz Reaction, Wurtz-Fittig Reactions, Free radical substitutions: Halogenation -relative reactivity and selectivity. (12 Lectures)

Unit-II: STEREOCHEMISTRY

Fischer Projection, Newmann and Sawhorse Projection formulae; Geometrical isomerism: cis-trans and, syn-anti isomerism E/Z notations with C.I.P rules. Optical Isomerism: Optical Activity, Specific Rotation, Chirality/Asymmetry, Enantiomers, Molecules with one and two chiral-centres, Diastereoisomers, meso structures, Racemic mixture and resolution. Relative and absolute configuration: D/L and R/S designations. (18 Lectures)

Unit-III: CHEMISTRY OF ALIPHATIC HYDROCARBONS

A. Carbon-Carbon pi bonds:

Formation of alkenes and alkynes by elimination reactions, Mechanism of E1, E2, E1cb reactions. Saytzeff and Hofmann eliminations. Reactions of alkenes: Electrophilic additions their mechanisms (Markownikoff/ Anti Markownikoff addition), mechanism of oxymercuration-demercuration, hydroborationoxidation, ozonolysis, reduction (catalytic and chemical), syn and anti-hydroxylation(oxidation). 1,2- and 1,4-addition reactions in conjugated dienes and, Diels-Alder reaction; Allylic and benzylic bromination and mechanism, e.g. propene, 1-butene, toluene, ethyl benzene. Reactions of alkynes: Acidity, Electrophilic and Nucleophilic additions. Hydration to form carbonyl compounds, Alkylation of terminal alkynes. **B. Cycloalkanes and Conformational Analysis**

Types of cycloalkanes and their relative stability, Baeyer strain theory, Conformation analysis of alkanes (ethane and n-butane): Relative stability with energy diagrams. Energy diagrams of cyclohexane: Chair, Boat and Twist boat forms. (18 Lectures)

Unit-IV: AROMATIC HYDROCARBONS

Aromaticity: Hckels rule, aromatic character of arenes, cyclic carbocations/carbanions and heterocyclic compounds with suitable examples. Electrophilic aromatic substitution: halogenation, nitration, sulphonation and Friedel-Crafts alkylation/acylation with their mechanism. Directing effects of the groups. (12 Lectures)

Reference Books:

- Morrison, R. N. & Boyd, R. N. Organic Chemistry, Dorling Kindersley (India) Pvt. Ltd. (Pearson Education).
- Finar, I. L. Organic Chemistry (Volume 1), Dorling Kindersley (India) Pvt. Ltd. (Pearson Education).
- Finar, I. L. Organic Chemistry (Volume 2): Stereochemistry and the Chemistry of Natural Products, Dorling Kindersley (India) Pvt. Ltd. (Pearson Education).
- Eliel, E. L. & Wilen, S. H. Stereochemistry of Organic Compounds; Wiley: London, 1994.
- Kalsi, P. S. Stereochemistry Conformation and Mechanism; New Age International, 2005.

PRACTICAL: C-3 LAB.

1. Checking the calibration of the thermometer.
2. Purification of organic compounds by crystallization using the following solvents:
 - Water
 - Alcohol
 - Alcohol-Water
3. Determination of the melting points of above compounds and unknown organic compounds (Kjeldahl method and electrically heated melting point apparatus).
4. Effect of impurities on the melting point mixed melting point of two unknown organic compounds.
5. Determination of boiling point of liquid compounds. (boiling point lower than and more than 100C by distillation and capillary method)

6. Chromatography

- Separation of a mixture of two amino acids by ascending and horizontal paper chromatography.
- Separation of a mixture of two sugars by ascending paper chromatography.
- Separation of a mixture of o-and p-nitrophenol or o-and p-aminophenol by thin layer chromatography (TLC).

Reference Books:

- Mann, F.G. & Saunders, B.C. Practical Organic Chemistry, Pearson Education (2009).
- Furniss, B.S., Hannaford, A.J.; Smith, P.W.G.; Tatchell, A.R. Practical Organic Chemistry, 5th Ed., Pearson (2012).

C-4: PHYSICAL CHEMISTRY-II

(Credits-6: Theory-4, Practical-2)-Max. Marks: 100
THEORY (Each class 1 hr.): Marks-70 PRACTICAL
(Each class 2 hrs.): Marks-30 Lectures: 60 (40 Theory
+ 20 Practical classes)

Unit-I: Chemical thermodynamics

Intensive and extensive variables; state and path functions; isolated, closed and open systems; zeroth law of thermodynamics. First law: Concept of heat, q , work, w , internal energy, U , and statement of first law; enthalpy, H , relation between heat capacities, calculations of q , w , U and H for reversible, irreversible and free expansion of gases (ideal and van der Waals) under isothermal and adiabatic conditions. Thermochemistry: Heats of reactions: standard states; enthalpy of formation of molecules and ions and enthalpy of combustion and its applications; calculation of bond energy, bond dissociation energy and resonance energy from thermochemical data, effect of temperature (Kirchhoffs equations) and pressure on enthalpy of reactions. (14 Lectures)

Unit-II: Second Law: Concept of entropy; thermodynamic scale of temperature, statement of the second law of thermodynamics; molecular and statistical interpretation of entropy. Calculation of entropy change for reversible and irreversible processes. Third Law: Statement of third law, concept of residual entropy, calculation of absolute entropy of molecules. Free Energy Functions: Gibbs and Helmholtz energy; variation of S , G , A with T , V , P ; Free energy change and spontaneity. Relation between Joule-Thomson coefficient and other thermodynamic parameters; inversion temperature; Gibbs-Helmholtz equation; Maxwell 17 relations; thermodynamic equation of state. (14 Lectures)

Unit-III: Systems of variable composition

Partial molar quantities, dependence of thermodynamic parameters on composition; Gibbs Duhem equation, chemical potential of ideal mixtures, change in thermodynamic functions in mixing of ideal gases. Chemical equilibrium, Criteria of thermodynamic equilibrium, degree of advancement of reaction, chemical equilibria in ideal gases, concept of fugacity. Thermodynamic derivation of relation between Gibbs free energy of reaction and reaction quotient (van Hoff's reaction). Equilibrium constants and their quantitative dependence on temperature, pressure and concentration. Free energy of mixing and spontaneity; thermodynamic derivation of relations between the various equilibrium

constants K_p , K_c and K_x . Le Chatelier principle (quantitative treatment) and its applications. (18 Lectures)

Unit-IV: Solutions and Colligative Properties

Dilute solutions; lowering of vapour pressure, Raoult's and Henry's Laws and their applications. Thermodynamic derivation using chemical potential to derive relations between the four colligative properties [(i) relative lowering of vapour pressure, (ii) elevation of boiling point, (iii) Depression of freezing point, (iv) osmotic pressure] and amount of solute. Applications in calculating molar masses of normal, dissociated and associated solutes in solution. (14 Lectures)

Reference Books:

- Peter, A. & Paula, J. de. Physical Chemistry 9th Ed., Oxford University Press (2011).
- Castellan, G. W. Physical Chemistry 4th Ed., Narosa (2004).
- Engel, T. & Reid, P. Physical Chemistry 3rd Ed., Prentice-Hall (2012).
- McQuarrie, D. A. & Simon, J. D. Molecular Thermodynamics Viva Books Pvt. Ltd.: New Delhi (2004).
- Assael, M. J.; Goodwin, A. R. H.; Stamatoudis, M.; Wakeham, W. A. & Will, S. Commonly Asked Questions in Thermodynamics. CRC Press: NY (2011).
- Levine, I. N. Physical Chemistry 6th Ed., Tata Mc Graw Hill (2010).
- Metz, C.R. 2000 solved problems in chemistry, Schaum Series (2006).

PRACTICAL: C-4 LAB.

THERMOCHEMISTRY

- (a) Determination of heat capacity of a calorimeter for different volumes using change of enthalpy data of a known system (method of back calculation of heat capacity of calorimeter from known enthalpy of solution or enthalpy of neutralization).
- (b) Determination of heat capacity of the calorimeter and enthalpy of neutralization of hydrochloric acid with sodium hydroxide.
- (c) Calculation of the enthalpy of ionization of ethanoic acid.
- (d) Determination of heat capacity of the calorimeter and integral enthalpy (endothermic and exothermic) solution of salts.
- (e) Determination of basicity/proticity of a polyprotic acid by the thermochemical method in terms of the changes of temperatures observed in the graph of temperature versus time for different additions of a base. Also calculate the enthalpy of neutralization of the first step.
- (f) Determination of enthalpy of hydration of copper sulphate.
- (g) Study of the solubility of benzoic acid in water and determination of H .

Reference Books;

- Khosla, B. D.; Garg, V. C. & Gulati, A., Senior Practical Physical Chemistry, R. Chand & Co.: New Delhi (2011).
- Athawale, V. D. & Mathur, P. Experimental Physical Chemistry New Age International: New Delhi (2001).

SEMESTER-III

C-5: INORGANIC CHEMISTRY-II

(Credits-6: Theory-4, Practical-2)-Max. Marks: 100
THEORY (Each class 1 hr.): Marks-70 PRACTICAL
(Each class 2 hrs.): Marks-30 Lectures: 60 (40 Theory
+ 20 Practical classes)

UNIT-I: General Principles of Metallurgy

Chief modes of occurrence of metals based on standard electrode potentials. Ellingham diagrams for reduction of metal oxides using carbon and carbon monoxide as reducing agent. Electrolytic Reduction, Hydrometallurgy. Methods of purification of metals: Electrolytic process, Parting process, van Arkel-de Boer process and Mond's process, Zone refining. (8 Lectures)

Acids and Bases

Bronsted-Lowry concept of acid-base reactions, solvated proton, relative strength of acids, types of acid-base reactions, Lewis acid-base concept, Classification of Lewis acids, Hard and Soft Acids and Bases (HSAB) Application of HSAB principle. (8 Lectures)

UNIT-II: Chemistry of s and p Block Elements-I

Inert pair effect, Relative stability of different oxidation states, diagonal relationship and anomalous behaviour of first member of each group. Allotropy and catenation. Complex formation tendency of s and p block elements. Hydrides and their classification ionic, covalent and interstitial. Basic beryllium acetate and nitrate. (14 Lectures)

UNIT-III: Chemistry of s and p Block Elements-II

Study of the following compounds with emphasis on structure, bonding, preparation, properties and uses. Boric acid and borates, boron nitrides, borohydrides (diborane) carboranes and graphitic compounds, silanes. Oxides and oxoacids of nitrogen, Phosphorus and chlorine. Peroxo acids of sulphur, interhalogen compounds, polyhalide ions, pseudohalogens and basic properties of halogens. (14 Lectures)

UNIT-IV: Noble Gases

Occurrence and uses, rationalization of inertness of noble gases, Clathrates; preparation and properties of XeF_2 , XeF_4 and XeF_6 ; Nature of bonding in noble gas compounds (Valence bond treatment and MO treatment for XeF_2). Molecular shapes of noble gas compounds (VSEPR theory). (8 Lectures)

Inorganic Polymers:

Types of inorganic polymers, comparison with organic polymers, synthesis, structural aspects and applications of silicones and siloxanes. Borazines, silicates and phosphazenes, and polysulphates. (8 Lectures)

Reference Books:

- Lee, J.D. Concise Inorganic Chemistry, ELBS, 1991.
- Douglas, B.E; Mc Daniel, D.H. & Alexander, J.J. Concepts & Models of Inorganic Chemistry 3rd Ed., John Wiley Sons, N.Y. 1994.
- Greenwood, N.N. & Earnshaw. Chemistry of the Elements, Butterworth-Heinemann. 1997.

- Cotton, F.A. & Wilkinson, G. Advanced Inorganic Chemistry, Wiley, VCH, 1999.
- Miessler, G. L. & Donald, A. Tarr. Inorganic Chemistry 4th Ed., Pearson, 2010.
- Shriver & Atkins, Inorganic Chemistry 5th Ed.

PRACTICAL: C-5 LAB.

(A) Iodo / Iodimetric Titrations

- Estimation of Cu(II) and $K_2Cr_2O_7$ using sodium thiosulphate solution (Iodimetrically).
- Estimation of available chlorine in bleaching powder iodometrically.

(B) Inorganic preparations

- Cuprous chloride, Cu_2Cl_2 .
- Preparation of manganese(III) phosphate, $MnPO_4.H_2O$.
- Preparation of aluminium potassium sulphate $K_2SO_4.Al_2(SO_4)_3.24H_2O$ (Potashalum).

Reference Books:

- Vogel, A.I. A Textbook of Quantitative Inorganic Analysis, ELBS. 1978

C-6: ORGANIC CHEMISTRY-II

(Credits-6: Theory-4, Practical-2)-Max. Marks: 100
 THEORY (Each class 1 hr.): Marks-70 PRACTICAL
 (Each class 2 hrs.): Marks-30 Lectures: 60 (40 Theory
 + 20 Practical classes)

UNIT-I: Chemistry of Halogenated Hydrocarbons

Alkyl halides: Methods of preparation, nucleophilic substitution reactions SN_1 , SN_2 and SN_i mechanisms with stereochemical aspects and effect of solvent etc.; nucleophilic substitution vs. elimination. Aryl halides: Preparation, including preparation from diazonium salts, nucleophilic aromatic substitution; SN_{Ar} , Benzyne mechanism. Relative reactivity of alkyl, allyl/benzyl, vinyl and aryl halides towards nucleophilic substitution reactions. Organometallic compounds of Mg and Li Use in synthesis of organic compounds. (16 Lectures)

UNIT-II: Alcohols, Phenols, Ethers and Epoxides

Alcohols: preparation, properties and relative reactivity of 1, 2, 3 alcohols, Bouvaelt-Blanc Reduction; Preparation and properties of glycols: Oxidation by periodic acid and lead tetraacetate, Pinacol-Pinacolone rearrangement; Phenols: Preparation and properties; Acidity and factors affecting it, Ring substitution reactions, ReimerTiemann and KolbesSchmidt Reactions, Fries and Claisen rearrangements with mechanism; Ethers and Epoxides: Preparation and reactions with acids. Reactions of epoxides with alcohols, ammonia derivatives and $LiAlH_4$ (16 Lectures)

UNIT-III: Carbonyl Compounds

Structure, reactivity and preparation: Nucleophilic additions, Nucleophilic addition-elimination reactions with ammonia derivatives with mechanism; Mechanisms of Aldol and Benzoin condensation, Knoevenagel condensation, Perkin, Cannizzaro and Wittig reaction, Beckmann rearrangements, haloform reaction and Baeyer Villiger oxidation, - substitution reactions, oxidations and reductions (Clemmensen, Wolff-Kishner, $LiAlH_4$, $NaBH_4$, MPV.; Addition reactions of unsaturated carbonyl compounds: Michael addition. Active methylene compounds: Keto-enol tautomerism. Preparation and synthetic applications of diethyl malonate and ethyl acetoacetate. (14 Lectures)

UNIT-IV: Carboxylic Acids and their Derivatives

Preparation, physical properties and reactions of monocarboxylic acids: Typical reactions of dicar-

boxylic acids, hydroxy acids and unsaturated acids: succinic, lactic, malic, tartaric, citric, maleic and fumaric acids; Preparation and reactions of acid chlorides, anhydrides, esters and amides; Comparative study of nucleophilic substitution at acyl group -Mechanism of acidic and alkaline hydrolysis of esters, Claisen condensation, Dieckmann and Reformatsky reactions, Hofmann-bromamide degradation and Curtius rearrangement. (10 Lectures)

Sulphur containing compounds

Preparation and reactions of thiols, thioethers. (4 Lectures)

Reference Books:

- Morrison, R. T. & Boyd, R. N. Organic Chemistry, Dorling Kindersley (India) Pvt. Ltd. (Pearson Education).
- Graham Solomons, T.W. Organic Chemistry, John Wiley & Sons, Inc.

PRACTICAL: C-6 LAB.

1. Functional group tests for alcohols, phenols, carbonyl and carboxylic acid group.
2. Organic preparations:
 - (i) Acetylation of one of the following compounds: amines (aniline, o-, m-, p-toluidines and o-, m-, p-anisidine) and phenols (-naphthol, vanillin, salicylic acid) by any one method:
 - (a) Using conventional method.
 - (b) Using green approach.
 - (ii) Benzoylation of one of the following amines (aniline, o-, m-, p-toluidines and o-, m-, p-anisidine) and one of the following phenols (-naphthol, resorcinol, p-cresol) by Schotten-Baumann reaction.
 - (iii) Bromination of any one of the following:
 - (a) Acetanilide by conventional methods.
 - (b) Acetanilide using green approach (Bromate-bromide method).
 - (iv) Nitration of any one of the following:
 - (a) Acetanilide/nitrobenzene by conventional method.
 - (b) Salicylic acid by green approach (using ceric ammonium nitrate).

The above derivatives should be prepared using 0.5-1gm. of the organic compound. The solid samples must be collected and may be used for recrystallization, melting point and TLC. **Reference**

Books:

- Mann, F.G. & Saunders, B.C. Practical Organic Chemistry, Pearson Education (2009).
- Furniss, B.S.; Hannaford, A.J.; Smith, P.W.G.; Tatchell, A.R. Practical Organic Chemistry, 5th Ed., Pearson (2012).
- Ahluwalia, V.K. & Aggarwal, R. Comprehensive Practical Organic Chemistry: Preparation and Quantitative Analysis, University Press (2000).
- Ahluwalia, V.K. & Dhingra, S. Comprehensive Practical Organic Chemistry: Qualitative Analysis, University Press (2000).

C-7: PHYSICAL CHEMISTRY-III

(Credits-6: Theory-4, Practical-2)-Max. Marks: 100
THEORY (Each class 1 hr.): Marks-70 PRACTICAL
(Each class 2 hrs.): Marks-30 Lectures: 60 (40 Theory
+ 20 Practical classes))

UNIT-I: Phase Equilibria-I

Concept of phases, components and degrees of freedom, derivation of Gibbs Phase Rule for non-reactive and reactive systems; Clausius-Clapeyron equation and its applications to solid-liquid, liquid-vapour and solid-vapour equilibria, phase diagram for one component systems, with applications

(H_2O and sulphur system). Phase diagrams for systems of solid-liquid equilibria involving eutectic, congruent and incongruent melting points, solid solutions (Pb-Ag system, desilverisation of lead) (14 Lectures)

UNIT-II: Phase Equilibria-II

Three component systems, water-chloroform-acetic acid system, triangular plots. Binary solutions: Gibbs-Duhem-Margules equation, its derivation and applications to fractional distillation of binary miscible liquids (ideal and non-ideal), azeotropes, partial miscibility of liquids, CST, miscible pairs, steam distillation. Nernst distribution law: its derivation and applications. (14 Lectures)

UNIT-III: Chemical Kinetics

Order and molecularity of a reaction, rate laws in terms of the advancement of a reaction, differential and integrated form of rate expressions up to second order reactions, experimental methods of the determination of orders, kinetics of complex reactions (integrated rate expressions up to first order only): (i) Opposing reactions (ii) parallel reactions and (iii) consecutive reactions and their differential rate equations (steady-state approximation in reaction mechanisms) (iv) chain reactions. Temperature dependence of reaction rates; Arrhenius equation; activation energy. Collision theory of reaction rates, qualitative treatment of the theory of absolute reaction rates. (18 Lectures)

UNIT-IV: Catalysis

Types of catalyst, specificity and selectivity, mechanisms of catalyzed reactions at solid surfaces; effect of particle size and efficiency of nanoparticles as catalysts. Enzyme catalysis, Michaelis-Menten mechanism, acid-base catalysis. (8 Lectures)

Surface chemistry

Physical adsorption, chemisorption, adsorption isotherms (Langmuir, Freundlich and Gibbs isotherms), nature of adsorbed state. (6 Lectures)

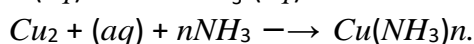
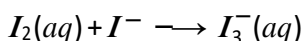
Reference Books:

- Peter Atkins & Julio De Paula, Physical Chemistry 9th Ed., Oxford University Press(2010).
- Castellan, G. W. Physical Chemistry, 4th Ed., Narosa (2004).
- McQuarrie, D. A. & Simon, J. D., Molecular Thermodynamics, Viva Books Pvt. Ltd.: New Delhi (2004).
- Engel, T. & Reid, P. Physical Chemistry 3rd Ed., Prentice-Hall (2012).
- Assael, M. J.; Goodwin, A. R. H.; Stamatoudis, M.; Wakeham, W. A. & Will, S.
- Commonly Asked Questions in Thermodynamics. CRC Press: NY (2011).
- Zundhal, S.S. Chemistry concepts and applications Cengage India(2011).
- Ball, D. W. Physical Chemistry Cengage India (2012).
- Mortimer, R. G. Physical Chemistry 3rd Ed., Elsevier: NOIDA, UP (2009).
- Levine, I. N. Physical Chemistry 6th Ed., Tata McGraw-Hill(2011).
- Metz, C. R. Physical Chemistry 2nd Ed., Tata McGraw-Hill(2009).

PRACTICAL: C-7 LAB.

I. Distribution of acetic/ benzoic acid between water and cyclohexane.

II. Study the equilibrium of at least one of the following reactions by the distribution method:



III. Study the kinetics of the following reactions.

(1) Integrated rate method:

- a. Acid hydrolysis of methyl acetate with hydrochloric acid.
- b. Saponification of ethyl acetate.

(2) Compare the strengths of HCl and H₂SO₄ by studying kinetics of hydrolysis of methylacetate.

Adsorption

Verify the Freundlich and Langmuir isotherms for adsorption of acetic acid on activated charcoal.

Reference Books:

- Khosla, B. D.; Garg, V. C. & Gulati, A. Senior Practical Physical Chemistry, R. Chand & Co.: New Delhi (2011).
 - Garland, C. W.; Nibler, J. W. & Shoemaker, D. P. Experiments in Physical Chemistry 8th Ed.; McGraw-Hill: New York (2003).
 - Halpern, A. M. & McBane, G. C. Experimental Physical Chemistry 3rd Ed.; W.H. Freeman & Co.: New York (2003).
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SEMESTER- IV

C-8: INORGANIC CHEMISTRY-III

(Credits-6: Theory-4, Practical-2)-Max. Marks: 100
THEORY (Each class 1 hr.): Marks-70 PRACTICAL
(Each class 2 hrs.): Marks-30 Lectures: 60 (40 Theory
+ 20 Practical classes)

UNIT-I: Coordination Chemistry

Werners theory, valence bond theory (inner and outer orbital complexes), electroneutrality principle and back bonding. Crystal field theory, measurement of CFSE weak and strong fields, pairing energies, factors affecting the magnitude of $10 Dq$ in octahedral vs. tetrahedral coordination, tetragonal distortions from octahedral geometry, Jahn-Teller theorem, square planar geometry. Qualitative aspect of ligand field and MO Theory. IUPAC nomenclature of coordination compounds, isomerism in coordination compounds. Stereochemistry of complexes with 4 and 6 coordination numbers. Chelate effect, Labile and inert complexes. (20 Lectures)

UNIT-II: Transition Elements-I

General group trends with special reference to electronic configuration, colour, variable valency, magnetic and catalytic properties, ability to form complexes. Stability of various oxidation states and e.m.f. (Latimer & Bsworth diagrams). Difference between the first, second and third transition series. (12 Lectures)

UNIT-III: Transition Elements-II

Chemistry of Ti, V, Cr Mn, Fe and Co in various oxidation states (excluding their metallurgy). (12 Lectures)

UNIT-IV: Lanthanoids and Actinoids

Electronic configuration, oxidation states, colour, spectral and magnetic properties, lanthanide contraction, separation of lanthanides (ion-exchange method only). General features of actinoids, separation of Np, Pm, Am from U. (6 Lectures)

Bioinorganic Chemistry

Metal ions present in biological systems, classification of elements according to their action in biological system. Na/K-pump, carbonic anhydrase and carboxypeptidase. Excess and deficiency of some trace metals. Toxicity of metal ions (Hg, Pb, Cd and As), reasons for toxicity, Use of chelating agents in medicine. Iron and its application in bio-systems, Haemoglobin; Storage and transfer of iron. (10 Lectures)

Reference Books:

- Purcell, K.F & Kotz, J.C. Inorganic Chemistry W.B. Saunders Co, 1977.
- Huheey, J.E., Inorganic Chemistry, Prentice Hall, 1993.
- Lippard, S.J. & Berg, J.M. Principles of Bioinorganic Chemistry Panima Publishing Company 1994.
- Cotton, F.A. & Wilkinson, G, Advanced Inorganic Chemistry. Wiley-VCH, 1999.
- Basolo, F, and Pearson, R.C., Mechanisms of Inorganic Chemistry, John Wiley & Sons, NY, 1967.
- Greenwood, N.N. & Earnshaw A., Chemistry of the Elements, Butterworth-Heinemann, 1997.

PRACTICAL: C-8 LAB.

Gravimetric Analysis:

- i. Estimation of nickel(II) using Dimethylglyoxime (DMG).
- ii. Estimation of copper as CuSCN.
- iii. Estimation of iron as Fe_2O_3 by precipitating iron as $Fe(OH)_3$.
- iv. Estimation of Al(III) by precipitating with oxine and weighing as Al(oxine)₃ (aluminium oxinate).

Chromatography of metal ions

Principles involved in chromatographic separations. Paper chromatographic separation of following metal ions:

- i. Ni(II) and Co(II)
- ii. Fe(III) and Al(III)

Reference Book:

- Vogel, A.I. A text book of Quantitative Analysis, ELBS 1986.

C-9: ORGANIC CHEMISTRY-III

(Credits-6: Theory-4, Practical-2)-Max. Marks: 100

THEORY (Each class 1 hr.): Marks-70 PRACTICAL

(Each class 2 hrs.): Marks-30 Lectures: 60 (40 Theory

+ 20 Practical classes)

UNIT-I: Nitrogen Containing Functional Groups

Preparation and important reactions of nitro and compounds, nitriles. Amines: Effect of substituent and solvent on basicity; Preparation and properties: Gabriel phthalimide synthesis, Carbylamine reaction, Mannich reaction, Hoffmanns exhaustive methylation, Hofmann-elimination reaction; Distinction between 1, 2 and 3 amines with Hinsberg reagent and nitrous acid. (14 Lectures)

UNIT-II: Diazonium Salts

Preparation and their synthetic applications.

Polynuclear Hydrocarbons

Reactions of naphthalene and anthracene Structure, Preparation and structure elucidation and important derivatives of naphthalene and anthracene. Polynuclear hydrocarbons. (12 Lectures)

UNIT-III: Heterocyclic Compounds

Classification and nomenclature, Structure, aromaticity in 5-numbered and 6-membered rings containing one heteroatom; Synthesis, reactions and mechanism of substitution reactions of: Furan,

Pyrrrole (Paal-Knorr synthesis, Knorr pyrrole synthesis, Hantzsch synthesis), Thiophene, Pyridine (Hantzsch synthesis), Pyrimidine. Fischer indole synthesis and Madelung synthesis, structure of quinoline and isoquinoline. Derivatives of furan: Furfural and furoic acid (preparation only). (18 Lectures)

UNIT-IV: Alkaloids

Natural occurrence, General structural features, Isolation and their physiological action Hoffmanns exhaustive methylation, Emdes modification, Structure elucidation and synthesis of Hygrine and Nicotine. Medicinal importance of Nicotine, Hygrine, Quinine, Morphine, Cocaine, and Reserpine. (8 Lectures) Terpenes Occurrence, classification, isoprene rule; Elucidation of structure and synthesis of Citral, Neral and -terpineol. (8 Lectures)

Reference Books:

- Morrison, R. T. & Boyd, R. N. Organic Chemistry, Dorling Kindersley (India) Pvt. Ltd. (Pearson Education).
- Finar, I. L. Organic Chemistry (Volume 1), Dorling Kindersley (India) Pvt. Ltd. (Pearson Education).
- Finar, I. L. Organic Chemistry (Volume 2: Stereochemistry and the Chemistry of Natural Products), Dorling Kindersley (India) Pvt. Ltd. (Pearson Education).
- Acheson, R.M. Introduction to the Chemistry of Heterocyclic compounds, John Welly & Sons (1976).
- Graham Solomons, T.W. Organic Chemistry, John Wiley & Sons, Inc.
- Kalsi, P. S. Textbook of Organic Chemistry 1st Ed., New Age International (P) Ltd. Pub.
- Clayden, J.; Greeves, N.; Warren, S.; Wothers, P.; Organic Chemistry, Oxford University Press.
- Singh, J.; Ali, S.M. & Singh, J. Natural Product Chemistry, Prajati Parakashan (2010).

PRACTICAL: C-9 LAB.

1. Detection of extra elements (N, X, S).
2. Functional group test for nitro, amine and amide groups.
3. Qualitative analysis of unknown organic compounds containing simple functional groups (alcohols, carboxylic acids, phenols and carbonyl compounds).

Reference Books:

- Mann, F.G. & Saunders, B.C. Practical Organic Chemistry, Pearson Education (2009).
- Furniss, B.S.; Hannaford, A.J.; Smith, P.W.G.; Tatchell, A.R. Practical Organic Chemistry, 5th Ed., Pearson (2012).
- Ahluwalia, V.K. & Aggarwal, R. Comprehensive Practical Organic Chemistry: Preparation and Quantitative Analysis, University Press (2000).
- Ahluwalia, V.K. & Dhingra, S. Comprehensive Practical Organic Chemistry: Qualitative Analysis, University Press (2000).

C-10: PHYSICAL CHEMISTRY-IV

(Credits-6: Theory-4, Practical-2)-Max. Marks: 100

THEORY (Each class 1 hr.): Marks-70 PRACTICAL

(Each class 2 hrs.): Marks-30 Lectures: 60 (40

Theory + 20 Practical classes)

UNIT-I: Conductance-I

Arrhenius theory of electrolytic dissociation. Conductivity, equivalent and molar conductivity and their variation with dilution for weak and strong electrolytes. Molar conductivity at infinite dilution. Kohlrausch law of independent migration of ions. Debye-Hckel-Onsager equation, Wien effect, Debye-Falkenhagen effect, Waldens rules. (12 Lectures)

UNIT-II: Conductance-II

Ionic velocities, mobilities and their determinations, transference numbers and their relation to ionic mobilities, determination of transference numbers using Hittorf and Moving Boundary methods. Applications of conductance measurement: (i) degree of dissociation of weak electrolytes, (ii) ionic product of water (iii) solubility and solubility product of sparingly soluble salts, (iv) conductometric titrations, and (v) hydrolysis constants of salts. (16 Lectures)

UNIT-III: Electrochemistry-I

Quantitative aspects of Faradays laws of electrolysis, rules of oxidation/reduction of ions based on half-cell potentials, applications of electrolysis in metallurgy and industry. Chemical cells, reversible and irreversible cells with examples. Electromotive force of a cell and its measurement, Nernst equation; Standard electrode (reduction) potential and its application to different kinds of half-cells. Application of EMF measurements in determining free energy, enthalpy and entropy of a cell reaction, (ii) equilibrium constants, and (iii) pH values, using hydrogen, quinone-hydroquinone, glass electrodes. (18 Lectures)

UNIT-IV: Electrochemistry-II

Concentration cells with and without transference, liquid junction potential; determination of activity coefficients and transference numbers. Qualitative discussion of potentiometric titrations (acid-base, redox, precipitation). Electrical properties of atoms and molecules Basic ideas of electrostatics, Electrostatics of dielectric media. Clausius-Mosotti equation and Lorenz-Laurentz equation (no derivation), Dipole moment and molecular polarizabilities and their measurements. (14 Lectures)

Reference Books:

- Atkins, P.W & Paula, J.D. Physical Chemistry, 9th Ed., Oxford University Press (2011).
- Castellan, G. W. Physical Chemistry 4th Ed., Narosa (2004).
- Mortimer, R. G. Physical Chemistry 3rd Ed., Elsevier: NOIDA, UP (2009).
- Barrow, G. M., Physical Chemistry 5th Ed., Tata McGraw Hill: New Delhi (2006).
- Engel, T. & Reid, P. Physical Chemistry 3rd Ed., Prentice-Hall (2012).
- Rogers, D. W. Concise Physical Chemistry Wiley (2010).
- Silbey, R. J.; Alberty, R. A. & Bawendi, M. G. Physical Chemistry 4th Ed., John Wiley & Sons, Inc. (2005).

PRACTICAL: C-10 LAB.

Conductometry

- I. Determination of cell constant.
- II. Determination of equivalent conductance, degree of dissociation and dissociation constant of a weak acid.
- III. Perform the following conductometric titrations:
 - i. Strong acid vs. strong base
 - ii. Weak acid vs. strong base
 - iii. Strong acid vs. weak base

Potentiometry

- I. Perform the following potentiometric titrations:
 - i. Strong acid vs. strong base
 - ii. Weak acid vs. strong base
 - iii. Dibasic acid vs. strong base

Reference Books:

- Khosla, B. D.; Garg, V. C. & Gulati, A. Senior Practical Physical Chemistry, R. Chand & Co.: New Delhi (2011).
- Garland, C. W.; Nibler, J. W. & Shoemaker, D. P. Experiments in Physical Chemistry 8th Ed.; McGraw-Hill: New York (2003).
- Halpern, A. M. & McBane, G. C. Experimental Physical Chemistry 3rd Ed.; W.H. Freeman & Co.: New York (2003).

SEMESTER- V

C-11: ORGANIC CHEMISTRY-IV

(Credits-6: Theory-4, Practical-2)-Max. Marks: 100
THEORY (Each class 1 hr.): Marks-70 PRACTICAL
(Each class 2 hrs.): Marks-30 Lectures: 60 (40 Theory
+ 20 Practical classes)

UNIT-I: Nucleic Acids

Components of nucleic acids, Nucleosides and nucleotides; Structure, synthesis and reactions of: Adenine, Guanine, Cytosine, Uracil and Thymine; Structure of polynucleotides. (9 Lectures) **Enzymes** Introduction, classification and characteristics of enzymes. Salient features of active site of enzymes. Mechanism of enzyme action (taking trypsin as example), factors affecting enzyme action, coenzymes and cofactors and their role in biological reactions, specificity of enzyme action (including stereospecificity), enzyme inhibitors and their importance, phenomenon of inhibition (competitive, uncompetitive and non-competitive inhibition including allosteric inhibition). (8 Lectures)

UNIT-II: Amino Acids, Peptides and Proteins

Amino acids, peptides and their classification. -Amino acids - Synthesis, ionic properties and reactions. Zwitterions, pKa values, isoelectric point and electrophoresis. Study of peptides: determination of their primary structures-end group analysis, methods of peptide synthesis. Synthesis

of peptides using N-protecting, C-protecting and C-activating groups -Solid-phase synthesis (16 Lectures)

UNIT-III: Lipids

Introduction to oils and fats; common fatty acids present in oils and fats, Hydrogenation of fats and oils, Saponification value, acid value, iodine number. Reversion and rancidity. (8 Lectures) **Concept of Energy in Biosystems**

Cells obtain energy by the oxidation of foodstuff (organic molecules). Introduction to metabolism (catabolism and anabolism). Overview of catabolic pathways of fat and protein. Interrelationship in the metabolic pathways of protein, fat and carbohydrate. Caloric value of food, standard caloric content of food types. (7 Lectures)

UNIT-IV: Pharmaceutical Compounds: Structure and Importance

Classification, structure and therapeutic uses of antipyretics: Paracetamol (with synthesis), Analgesics: Ibuprofen (with synthesis), Antimalarials: Chloroquine (with synthesis). An elementary treatment of Antibiotics and detailed study of chloramphenicol, Medicinal values of curcumin (haldi), azadirachtin (neem), vitamin C and antacid (ranitidine). (12 Lectures)

Reference Books:

- Berg, J.M., Tymoczko, J.L. and Stryer, L. (2006) Biochemistry. VIth Edition. W.H. Freeman and Co.
- Nelson, D.L., Cox, M.M. and Lehninger, A.L. (2009) Principles of Biochemistry. IV Edition. W.H. Freeman and Co.
- Murray, R.K., Granner, D.K., Mayes, P.A. and Rodwell, V.W. (2009) Harpers Illustrated Biochemistry. XXVIII edition. Lange Medical Books/McGraw-Hill.

PRACTICAL: C-11 LAB.

1. Preparations of the following compounds:
 - i. Aspirine, ii. Phenacetin, iii. Milk of magnesia, iv. Aluminium hydroxide gel, v. Divol.
2. Saponification value of an oil or a fat.
3. Determination of Iodine number of an oil/ fat.

Reference Books:

- Manual of Biochemistry Workshop, 2012, Department of Chemistry, University of Delhi.
- Arthur, I. Vogel, Quantitative Organic Analysis, Pearson.

C-12: PHYSICAL CHEMISTRY-V

(Credits-6: Theory-4, Practical-2)-Max. Marks: 100
THEORY (Each class 1 hr.): Marks-70 PRACTICAL
(Each class 2 hrs.): Marks-30 Lectures: 60 (40 Theory
+ 20 Practical classes)

UNIT-I: Quantum Chemistry

Postulates of quantum mechanics, quantum mechanical operators, Schrödinger equation and its application to free particle and particle-in-a-box (rigorous treatment), quantization of energy levels,

zero-point energy and Heisenberg Uncertainty principle; wave functions, probability distribution functions, nodal properties. Extension to three dimensional boxes, separation of variables, degeneracy. Qualitative treatment of simple harmonic oscillator model of vibrational motion: Setting up of Schrödinger equation and discussion of solution and wave functions. Vibrational energy of diatomic molecules and zero-point energy. Angular momentum: Commutation rules, quantization of square of total angular momentum and z-component. Rigid rotator model of rotation of diatomic molecule. Schrödinger equation, transformation to spherical polar coordinates. Separation of variables (Preliminary treatment). Qualitative treatment of hydrogen atom and hydrogen-like ions: setting up of Schrödinger equation in spherical polar coordinates, radial part, quantization of energy (only final energy expression). Average and most probable distances of electron from nucleus. (18 Lectures)

UNIT-II: Chemical Bonding

Chemical bonding: Covalent bonding, valence bond and molecular orbital approaches, LCAO-MO treatment of H^+ . Bonding and antibonding orbitals. Qualitative extension to H_2 . Comparison of LCAO-MO and VB treatments of H_2 (only wavefunctions, detailed solution not required) and their limitations. Qualitative description of LCAO-MO treatment of homonuclear and heteronuclear diatomic molecules (HF, LiH). Localised and non-localised molecular orbitals treatment of triatomic (BeH_2 , H_2O) molecules. Qualitative MO theory and its application to AH_2 type molecules. (12 Lectures)

UNIT-III: Molecular Spectroscopy-I

Interaction of electromagnetic radiation with molecules and various types of spectra; Born-Oppenheimer approximation. Rotation spectroscopy: Selection rules, intensities of spectral lines, determination of bond lengths of diatomic and linear triatomic molecules, isotopic substitution.

Vibrational spectroscopy: Classical equation of vibration, computation of force constant, amplitude of diatomic molecular vibrations, anharmonicity, Morse potential, dissociation energies, fundamental frequencies, overtones, hot bands, degrees of freedom for polyatomic molecules, modes of vibration. Vibration-rotation spectroscopy: diatomic vibrating rotator, P, Q, R branches.

Raman spectroscopy: Qualitative treatment of Rotational Raman effect; Effect of nuclear spin, Vibrational Raman spectra, Stokes and anti-Stokes lines; their intensity difference, rule of mutual exclusion. (16 Lectures)

UNIT-IV: Molecular Spectroscopy-II

Electronic spectroscopy: Franck-Condon principle, electronic transitions, singlet and triplet states, fluorescence and phosphorescence, dissociation and predissociation. (6 Lectures) **Photochemistry**

Characteristics of electromagnetic radiation, Lambert-Beers law and its limitations, physical significance of absorption coefficients. Laws of photochemistry, quantum yield, actinometry, examples of low and high quantum yields, photochemical equilibrium and the differential rate of photochemical reactions, photosensitised reactions, quenching. Role of photochemical reactions in biochemical processes, photostationary states, chemiluminescence. (8 Lectures)

Reference Books:

- Banwell, C. N. & McCash, E. M. Fundamentals of Molecular Spectroscopy 4th Ed. Tata McGraw-

Hill: New Delhi (2006).

- Chandra, A. K. Introductory Quantum Chemistry Tata McGraw-Hill (2001).
- House, J. E. Fundamentals of Quantum Chemistry 2nd Ed. Elsevier: USA (2004).
- Lowe, J. P. & Peterson, K. Quantum Chemistry, Academic Press (2005).
- Kakkar, R. Atomic & Molecular Spectroscopy, Cambridge University Press (2015).

PRACTICAL: C-12 LAB.

Colourimetry

1. Determine the concentration of HCl against 0.1 N NaOH spectrophotometrically.
2. To find the strength of given ferric ammonium sulfate solution of (0.05 M) by using EDTA spectrophotometrically.
3. To find out the strength of CuSO₄ solution by titrating with EDTA spectrophotometrically.
4. To determine the concentration of Cu(II) and Fe(III) solution photometrically by titrating with EDTA.

Reference Books:

- Khosla, B. D.; Garg, V. C. & Gulati, A., Senior Practical Physical Chemistry, R. Chand & Co.: New Delhi (2011).
- Garland, C. W.; Nibler, J. W. & Shoemaker, D. P. Experiments in Physical Chemistry 8th Ed.; McGraw-Hill: New York (2003).
- Halpern, A. M. & McBane, G. C. Experimental Physical Chemistry 3rd Ed.; W.H. Freeman & Co.: New York (2003).
- Experimental Physical Chemistry by J. N. Gurtu, R. Kapoor.

SEMESTER- VI

C-13: INORGANIC CHEMISTRY-IV

(Credits-6: Theory-4, Practical-2)-Max. Marks: 100
THEORY (Each class 1 hr.): Marks-70 PRACTICAL
(Each class 2 hrs.): Marks-30 Lectures: 60 (40 Theory
+ 20 Practical classes)

UNIT-I: Organometallic Compounds-I

Definition and classification of organometallic compounds on the basis of bond type. Concept of hapticity of organic ligands. Metal carbonyls: 18 electron rule, electron count of mononuclear, polynuclear and substituted metal carbonyls of 3d series. General methods of preparation (direct combination, reductive carbonylation, thermal and photochemical decomposition) of mono and binuclear carbonyls of 3d series. Structures of mononuclear and binuclear carbonyls of Cr, Mn, Fe, Co and Ni using VBT. -acceptor behaviour of CO (MO diagram of CO to be discussed), synergic effect and use of IR data to explain extent of back bonding. Zeises salt: Preparation and structure, evidences of synergic effect and comparison of synergic effect with that in carbonyls. (14 Lectures)

UNIT-II: Organometallic Compounds-II

Metal Alkyls: Important structural features of methyl lithium (tetramer) and trialkyl aluminium

(dimer), concept of multicentre bonding in these compounds. Role of triethylaluminium in polymerisation of ethene (Ziegler Natta Catalyst). Species present in ether solution of Grignard reagent and their structures. Ferrocene: Preparation and reactions (acetylation, alkylation, metallation, Mannich Condensation), structure and aromaticity, comparison of aromaticity and reactivity with that of benzene. (14 Lectures)

UNIT-III: Theoretical Principles in Qualitative Analysis (H_2S Scheme)

Basic principles involved in analysis of cations and anions and solubility products, common ion effect. Principles involved in separation of cations into groups and choice of group reagents. Interfering anions (fluoride, borate, oxalate and phosphate) and need to remove them after Group II. (10 Lectures)

Catalysis by Organometallic Compounds

Study of the following industrial processes and their mechanism:

1. Alkene hydrogenation (Wilkinson's Catalyst).
2. Hydroformylation (Co salts).
3. Wacker Process.
4. Synthetic gasoline (Fischer Tropsch reaction). (8 Lectures)

UNIT-IV: Reaction Kinetics and Mechanism

Introduction to inorganic reaction mechanisms. Substitution reactions in square planar complexes, Trans-effect and its applications, theories of trans effect, Mechanism of nucleophilic substitution in square planar complexes. Thermodynamic and kinetic stability, Kinetics of octahedral substitution (classification of metal ions based on water exchange rate), General mechanism of substitution in octahedral complexes (D, I, Id, Ia). (14 Lectures)

Reference Books:

- Vogel, A.I. Qualitative Inorganic Analysis, Longman, 1972.
- Svehla, G. Vogel's Qualitative Inorganic Analysis, 7th Edition, Prentice Hall, 1996-03-07.
- Huheey, J. E.; Keiter, E.A. & Keiter, R.L. Inorganic Chemistry, Principles of Structure and Reactivity 4th Ed., Harper Collins 1993, Pearson, 2006.
- Sharpe, A.G. Inorganic Chemistry, 4th Indian Reprint (Pearson Education) 2005.
- Douglas, B. E.; McDaniel, D.H. & Alexander, J.J. Concepts and Models in Inorganic Chemistry, 3rd Ed., John Wiley and Sons, NY, 1994.
- Greenwood, N.N. & Earnshaw, A. Chemistry of the Elements, Elsevier 2nd Ed, 1997 (Ziegler Natta Catalyst and Equilibria in Grignard Solution).
- Lee, J.D. Concise Inorganic Chemistry 5th Ed., John Wiley and sons 2008.
- Powell, P. Principles of Organometallic Chemistry, Chapman and Hall, 1988.
- Shriver, D.D. & P. Atkins, Inorganic Chemistry 2nd Ed., Oxford University Press, 1994.
- Basolo, F. & Person, R. Mechanisms of Inorganic Reactions: Study of Metal Complexes in Solution 2nd Ed., John Wiley & Sons Inc; NY.
- Purcell, K.F. & Kotz, J.C., Inorganic Chemistry, W.B. Saunders Co. 1977.
- Miessler, G. L. & Donald, A. Tarr, Inorganic Chemistry 4th Ed., Pearson, 2010.
- Collman, James P. et al. Principles and Applications of Organotransition Metal Chemistry. Mill Valley, CA: University Science Books, 1987.

- Crabtree, Robert H. The Organometallic Chemistry of the Transition Metals, New York, NY: John Wiley, 2000.
- Spessard, Gary O., & Gary L. Miessler. Organometallic Chemistry. Upper Saddle River, NJ: Prentice-Hall, 1996.
- Mehrotra R.C. and Singh, A. Organometallic Chemistry, New Age International Publishers, 2nd Edn, 2000.

PRACTICAL: C-13 LAB.

Qualitative semimicro analysis of mixtures containing 3 anions and 3 cations. Emphasis should be given to the understanding of the chemistry of different reactions. The following radicals are suggested:

CO_3^{2-} , NO_2^- , S^- , SO_3^- , $S_2O_3^{2-}$, CH_3COO^- , F^- , Cl^- , Br^- , I^- , NO_3^- , BO_3^- , $C_2O_4^{2-}$, PO_4^{3-} , NH_4^+ , K^+ , Pb^{2+} , Cu^{2+} , Cd^{2+} , Bi^{3+} , Sn^{2+} , Sb^{3+} , Fe^{3+} , Al^{3+} , Cr^{3+} , Zn^{2+} , Mn^{2+} , Co^{2+} , Ni^{2+} , Ba^{2+} , Sr^{2+} , Ca^{2+} , Mg^{2+} .

Mixtures should preferably contain one interfering anion, or insoluble component ($BaSO_4$, $SrSO_4$, $PbSO_4$, CaF_2 or Al_2O_3) or combination of anions e.g. CO_3^{2-} and SO_3^{2-} , NO_2^- and NO_3^- , Cl^- and Br^- , Cl^- and I^- , Br^- and I^- , NO_3^- and Br^- , NO_3^- and I^- .

Spot tests should be done whenever possible.

Reference Books:

- Vogels Qualitative Inorganic Analysis, Revised by G.Svehla.
- Marr & Rockett Inorganic Preparations.

C-14: ORGANIC CHEMISTRY-IV

(Credits-6: Theory-4, Practical-2)-Max. Marks: 100

THEORY (Each class 1 hr.): Marks-70 PRACTICAL

(Each class 2 hrs.): Marks-30

Lectures: 60 (40 Theory + 20 Practical classes)

UNIT-I: Organic Spectroscopy-I

UV Spectroscopy: Types of electronic transitions, max, Chromophores and Auxochromes, Bathochromic and Hypsochromic shifts, Intensity of absorption; Application of Woodward rules for calculation of max for the following systems: the unsaturated aldehydes: ketones, carboxylic acids and esters; Conjugated dienes: alicyclic, homoannular and heteroannular; Extended conjugated systems (aldehydes, ketones and dienes); distinction between cis and trans isomers.

IR Spectroscopy: Fundamental and non-fundamental molecular vibrations; IR absorption positions of O, N and S containing functional groups; Effect of H-bonding, conjugation, resonance and ring size on IR absorptions; Fingerprint region and its significance; application in functional group analysis. (18 Lectures)

UNIT-II: Organic Spectroscopy-II

NMR Spectroscopy: Basic principles of Proton Magnetic Resonance, chemical shift and factors influencing it; Spin-spin coupling and coupling constant; Anisotropic effects in alkene, alkyne, aldehydes and aromatics; Interpretation of NMR spectra of simple compounds. Mass Spectroscopy-Basic principle, Fragmentation pattern, Instrumentation, Determination of m/e ratio. Application of Mass Spectroscopy on CH₄, C₂H₆, n-butane and neo-pentane. Applications of IR, UV and NMR for identification of simple organic molecules. (12 Lectures)

UNIT-III: Carbohydrates

Occurrence, classification and their biological importance. Monosaccharides: Constitution and absolute configuration of glucose and fructose, epimers and anomers, mutarotation, determination of ring size of glucose and fructose, Haworth projections and conformational structures; Interconversions of aldoses and ketoses; Killiani-Fischer synthesis and Ruff degradation; Disaccharides Structure elucidation of maltose. Polysaccharides Elementary treatment of starch, cellulose. (8 Lectures) **Dyes** Classification, colour and constitution; Mordant and Vat dyes; Chemistry of dyeing. Synthesis and applications of: Azo dyes Methyl orange and Congo red (mechanism of Diazo Coupling); Triphenyl methane dyes - Malachite Green, and crystal violet; Phthalein dyes Phenolphthalein and Fluorescein; Natural dyes Alizarin and Indigo; Edible dyes with examples. (8 Lectures)

UNIT-IV: Polymers

Introduction and classification including di-block, tri-block and amphiphilic polymers; Number average molecular weight, Weight average molecular weight, Degree of polymerization, Polydispersity Index. Polymerisation reactions -Addition and condensation -Mechanism of cationic, anionic and free radical addition polymerization; Metallocene-based Ziegler-Natta polymerisation of alkenes; Preparation and applications of plastics thermosetting (phenol-formaldehyde, Polyurethanes) and thermosoftening (PVC, polythene); Fabrics natural and synthetic (acrylic, polyamido, polyester); Rubbers natural and synthetic: Buna-S and Neoprene; Vulcanization; Polymer additives; Biodegradable and conducting polymers with examples. (14 Lectures)

Reference Books:

- Kalsi, P. S. Textbook of Organic Chemistry 1st Ed., New Age International (P) Ltd. Pub.
- Morrison, R. T. & Boyd, R. N. Organic Chemistry, Dorling Kindersley (India) Pvt. Ltd. (Pearson Education).
- Billmeyer, F. W. Textbook of Polymer Science, John Wiley & Sons, Inc.
- Gowariker, V. R.; Viswanathan, N. V. & Sreedhar, J. Polymer Science, New Age International (P) Ltd.

Pub.

- Finar, I. L. Organic Chemistry (Volume 2: Stereochemistry and the Chemistry of Natural Products), Dorling Kindersley (India) Pvt. Ltd. (Pearson Education).
- Graham Solomons, T.W. Organic Chemistry, John Wiley & Sons, Inc.
- Clayden, J.; Greeves, N.; Warren, S.; Wothers, P.; Organic Chemistry, Oxford University Press.
- Singh, J.; Ali, S.M. & Singh, J. Natural Product Chemistry, Pragati Prakashan (2010).
- Kemp, W. Organic Spectroscopy, Palgrave.

PRACTICAL: C-14 LAB.

1. Extraction of caffeine from tea leaves.
2. Preparation of sodium polyacrylate.
3. Preparation of urea formaldehyde.
4. Analysis of Carbohydrate: aldoses and ketoses, reducing and non-reducing sugars.
5. Qualitative analysis of unknown organic compounds containing mono-functional groups (carbohydrates, aryl halides, aromatic hydrocarbons, nitro compounds, amines and amides) and simple bifunctional groups, for e.g. salicylic acid, cinnamic acid, nitrophenols etc.

Reference Books:

- Vogel, A.I. Quantitative Organic Analysis, Part 3, Pearson (2012).
- Mann, F.G. & Saunders, B.C. Practical Organic Chemistry, Pearson Education (2009).
- Furniss, B.S., Hannaford, A.J.; Smith, P.W.G.; Tatchell, A.R. Practical Organic Chemistry, 5th Ed., Pearson (2012).
- Ahluwalia, V.K. & Aggarwal, R. Comprehensive Practical Organic Chemistry: Preparation and Quantitative Analysis, University Press (2000).
- Ahluwalia, V.K. & Dhingra, S. Comprehensive Practical Organic Chemistry: Qualitative Analysis, University Press (2000).

DISCIPLINE SPECIFIC ELECTIVE(DSE)

SEMESTER-V

DSE-1: POLYMER CHEMISTRY

(Credits-6: Theory-4, Practical-2)-Max. Marks: 100
THEORY (Each class 1 hr.): Marks-70 PRACTICAL
(Each class 2 hrs.): Marks-30 Lectures: 60 (40 Theory
+ 20 Practical classes)

UNIT-I: Introduction and history of polymeric materials:

Different schemes of classification of polymers, Polymer nomenclature, Molecular forces and chemical bonding in polymers, Texture of Polymers. (4 Lectures)

Functionality and its importance:

Criteria for synthetic polymer formation, classification of polymerization processes, Relationships between functionality, extent of reaction and degree of polymerization. Bi-functional systems, Poly-functional systems. (8 Lectures)

UNIT-II: Kinetics of Polymerization:

Mechanism and kinetics of step growth, radical chain growth, ionic chain (both cationic and anionic) and coordination polymerizations, Mechanism and kinetics of copolymerization, polymerization techniques. (8 lectures)

Crystallization and crystallinity:

Determination of crystalline melting point and degree of crystallinity, Morphology of crystalline polymers, Factors affecting crystalline melting point. (4 Lectures)

Nature and structure of polymers-Structure property relationships. (2 Lectures)

UNIT-III: Determination of molecular weight of polymers

(Mn, Mw, etc.) by end group analysis, viscometry, light scattering and osmotic pressure methods. Molecular weight distribution and its significance. Polydispersity index. (8 Lectures)

Glass transition temperature (T_g) and determination of T_g

WLF equation, Factors affecting glass transition temperature (T_g). (8 Lectures)

UNIT-IV: Polymer Solution

Criteria for polymer solubility, Solubility parameter, Thermodynamics of polymer solutions, entropy, enthalpy, and free energy change of mixing of polymers solutions. (8 Lectures)

Properties of Polymers

(Physical, thermal & mechanical properties). Brief introduction to preparation, structure, properties and application of the following polymers: polyolefins, polystyrene and styrene copolymers, poly(vinyl chloride) poly(vinyl acetate), polyacrylamide, fluoro polymers (Teflon), polyamides (nylon- 6 and nylon 6,6). Phenol formaldehyde resins (Bakelite, Novalac), polyurethanes, silicone polymers (polysiloxane), Polycarbonates, Conducting Polymers, (polyacetylene, polyaniline). (10 Lectures)

Reference Books:

- Seymours Polymer Chemistry, Marcel Dekker, Inc.

- G. Odian: Principles of Polymerization, John Wiley.
- F.W. Billmeyer: Text Book of Polymer Science, John Wiley.
- P. Ghosh: Polymer Science & Technology, Tata Mcgraw-Hill.
- R.W. Lenz: Organic Chemistry of Synthetic High Polymers.

PRACTICAL: DSE-1 LAB.

Polymer synthesis

1. Free radical solution polymerization of styrene (St) / Methyl Methacrylate (MMA) / Methyl Acrylate (MA) / Acrylic acid (AA).
 - (a) Purification of monomer.
 - (b) Polymerization using benzoyl peroxide (BPO) / 2,2-azo-bis-isobutyronitrile (AIBN).
2. Preparation of nylon 66/6.
3. Interfacial polymerization, preparation of polyester from isophthaloyl chloride (IPC) and phenolphthalein.
 - (a) Preparation of IPC.
 - (b) Purification of IPC.
 - (c) Interfacial polymerization.
4. Redox polymerization of acrylamide.
5. Precipitation polymerization of acrylonitrile.
6. Preparation of urea-formaldehyde resin.
7. Preparations of novalac resin/resold resin.
8. Microscale Emulsion Polymerization of poly(methylacrylate).

Polymer characterization

1. Determination of molecular weight by viscometry:
 - (a) Polyacrylamide-aq. NaNO₂ solution
 - (b) (Poly vinyl propylidene (PVP) in water
2. Determination of the viscosity-average molecular weight of poly(vinyl alcohol) (PVOH) and the fraction of head-to-head monomer linkages in the polymer.
3. Determination of molecular wt. by end group analysis: Polyethylene glycol (PEG) (OH group).
4. Determination of hydroxyl number of a polymer using colorimetric method.

Polymer analysis

1. Estimation of the amount of HCHO in the given solution by sodium sulphite method
2. Instrumental Techniques
3. IR studies of polymers

*at least 5 experiments to be carried out.

Reference Books:

- Malcolm P. Stevens, Polymer Chemistry: An Introduction, 3rd Ed.
- Harry R. Allcock, Frederick W. Lampe and James E. Mark, Contemporary Polymer Chemistry, 3rd ed. Prentice-Hall (2003).
- Fred W. Billmeyer, Textbook of Polymer Science, 3rd ed. Wiley-Interscience (1984).
- Joel R. Fried, Polymer Science and Technology, 2nd ed. Prentice-Hall (2003).
- Petr Munk and Tejraj M. Aminabhavi, Introduction to Macromolecular Science, 2nd ed. John

Wiley & Sons (2002).

- L.H. Sperling, Introduction to Physical Polymer Science, 4th ed. John Wiley & Sons (2005).
- Malcolm P. Stevens, Polymer Chemistry: An Introduction, 3rd ed. Oxford University Press (2005).
- Seymour/ Carrahers Polymer Chemistry, 9th ed. by Charles E. Carraher, Jr. (2013).

DSE-2: GREEN CHEMISTRY

(Credits-6: Theory-4, Practical-2)-Max. Marks: 100
THEORY (Each class 1 hr.): Marks-70 PRACTICAL
(Each class 2 hrs.): Marks-30 Lectures: 60 (40 Theory
+ 20 Practical classes)

UNIT-I: Introduction to Green Chemistry

What is Green Chemistry? Need for Green Chemistry. Goals of Green Chemistry. Limitations/Obstacles in the pursuit of the goals of Green Chemistry. (4 Lectures)

Principles of Green Chemistry and Designing a Chemical synthesis-I

Twelve principles of Green Chemistry with their explanations and examples with special emphasis on: Designing a Green Synthesis using these principles; Prevention of Waste/ byproducts; maximum incorporation of the materials used in the process into the final products, Atom Economy, calculation of atom economy of the rearrangement, addition, substitution and elimination reactions. Prevention/ minimization of hazardous/ toxic products reducing toxicity. risk = (function) hazard exposure; waste or pollution prevention hierarchy. Green solvents supercritical fluids, water as a solvent for organic reactions, ionic liquids, fluoruous biphasic solvent, PEG, solventless processes, immobilized solvents and how to compare greenness of solvents. (12 Lectures)

UNIT-II: Principles of Green Chemistry and Designing a Chemical synthesis-II

Explanation of principles with special emphasis on: Energy requirements for reactions alternative sources of energy: use of microwaves and ultrasonic energy. Selection of starting materials; avoidance of unnecessary derivatization careful use of blocking/protecting groups. Use of catalytic reagents (wherever possible) in preference to stoichiometric reagents; catalysis and green chemistry, comparison of heterogeneous and homogeneous catalysis, biocatalysis, asymmetric catalysis and photocatalysis. Prevention of chemical accidents designing greener processes, inherent safer design, principle of ISD What you dont have cannot harm you, greener alternative to Bhopal Gas Tragedy (safer route to carcarbaryl) and Flixiborough accident (safer route to cyclohexanol) subdivision of ISD, minimization, simplification, substitution, moderation and limitation. Strengthening/ development of analytical techniques to prevent and minimize the generation of hazardous substances in chemical processes. (14 Lectures)

UNIT-III: Examples of Green Synthesis/ Reactions and some real world cases-I Green Synthesis of the following compounds: adipic acid, catechol, disodium iminodiacetate (alternative to Strecker synthesis) Microwave assisted reactions in water: Hofmann Elimination, methyl benzoate to benzoic acid, oxidation of toluene and alcohols; microwave assisted reactions in organic solvents: Diels-Alder reaction and Decarboxylation reaction. Ultrasound assisted reactions: sonochemical Simmons-Smith Reaction (Ultrasonic alternative to Iodine). Surfactants for carbon dioxide replacing smog producing and ozone depleting solvents with CO₂ for precision cleaning and dry cleaning of garments. Designing of Environmentally safe marine antifoulant. (14 Lectures)

UNIT-IV: Examples of Green Synthesis/ Reactions and some real world cases-II Rightfit pigment: synthetic azopigments to replace toxic organic and inorganic pigments. An efficient, green synthesis of a compostable and widely applicable plastic (poly lactic acid) made from corn. Healthier Fats and oil by Green Chemistry: Enzymatic Inter esterification for production of

no Trans-Fats and Oils Development of Fully Recyclable Carpet: Cradle to Cradle Carpeting (6 Lectures)

Future Trends in Green Chemistry

Oxidation reagents and catalysts; Biomimetic, multifunctional reagents; Combinatorial green chemistry; Proliferation of solventless reactions; co crystal controlled solid state synthesis (C2S3); Green chemistry in sustainable development. (10 Lectures)

Reference Books:

- V.K. Ahluwalia & M.R. Kidwai: New Trends in Green Chemistry, • Anamalaya Publishers (2005).
- P.T. Anastas & J.K. Warner: Oxford Green Chemistry- Theory and Practical, University Press (1998).
- A.S. Matlack: Introduction to Green Chemistry, Marcel Dekker (2001).
- M.C. Cann & M.E. Connely: Real-World cases in Green Chemistry, American Chemical Society, Washington (2000).
- M.A. Ryan & M. Tinneland, Introduction to Green Chemistry, American Chemical Society, Washington (2002).

PRACTICAL: DSE-2

1. Safer starting materials.
 - The Vitamin C clock reaction using Vitamin C tablets, tincture of iodine, hydrogen peroxide and liquid laundry starch.
 - Effect of concentration on clock reaction.
 - Preparation and characterization of nanoparticles (Ag, Au) using plant extract.
2. Using renewable resources
 - Preparation of biodiesel from vegetable oil.
3. Avoiding waste
 - Principle of atom economy.
 - Use of molecular model kit to simulate the reaction to investigate how the atom economy can illustrate Green Chemistry.
 - Preparation of propene by two methods can be studied.
 - (I) Triethylamine ion + OH⁻ $\xrightarrow{H_2SO_4/O}$ propene + trimethylpropene + water
 - (II) 1-propanol $\xrightarrow{\quad}$ propene + $\overline{\text{water}}$
 - The other types of reactions, like addition, elimination, substitution and rearrangement should also be studied for the calculation of atom economy.
4. Use of enzymes as catalysts
 - Benzoin condensation using Thiamine Hydrochloride as a catalyst instead of cyanide
5. Alternative Green solvents
 - Diels Alder reaction in water
 - Reaction between furan and maleic acid in water and at room temperature rather than in benzene and reflux.
 - Extraction of D-limonene from orange peel using liquid CO₂ prepared from dry ice.
 - Mechanochemical solvent free synthesis of azomethines
4. Alternative sources of energy
 - Solvent free, microwave assisted one pot synthesis of phthalocyanine complex of Cu(II).

- Photoreduction of benzophenone to benzopinacol in the presence of sunlight.

Reference Books:

- Anastas, P.T & Warner, J.C. Green Chemistry: Theory and Practice, Oxford University Press (1998).
- Kirchoff, M. & Ryan, M.A. Greener approaches to undergraduate chemistry experiment. American Chemical Society, Washington DC (2002).
- Ryan, M.A. Introduction to Green Chemistry, Tinnesand; (Ed), American Chemical Society, Washington DC (2002).
- Sharma, R.K.; Sidhwani, I.T. & Chaudhari, M.K. I.K. Green Chemistry Experiment: A monograph International Publishing House Pvt Ltd. New Delhi. Bangalore CISBN 978-93-81141-55-7 (2013).
- Cann, M.C. & Connelly, M. E. Real world cases in Green Chemistry, American Chemical Society (2008).
- Cann, M. C. & Thomas, P. Real world cases in Green Chemistry, American Chemical Society (2008).

DSE-3: INDUSTRIAL CHEMICALS AND ENVIRONMENT

(Credits-6: Theory-4, Practical-2)-Max. Marks: 100

THEORY (Each class 1 hr.): Marks-70 PRACTICAL

(Each class 2 hrs.): Marks-30 Lectures: 60 (40 Theory
+ 20 Practical classes)

UNIT-I: Industrial Gases and Inorganic Chemicals

Industrial Gases: Large scale production, uses, storage and hazards in handling of the following gases: oxygen, nitrogen, argon, neon, helium, hydrogen, acetylene, carbon monoxide, chlorine, sulphur dioxide. Inorganic Chemicals: Manufacture, application and hazards in handling the following chemicals: hydrochloric acid, nitric acid, sulphuric acid, caustic soda, common salt, bleaching powder, sodium thiosulphate, hydrogen peroxide, potash alum, potassium dichromate and potassium permanganate. (10 Lectures)

Industrial Metallurgy

Preparation of metals (ferrous and nonferrous) and ultrapure metals for semiconductor technology. (4 Lectures)

UNIT-II: Environment and its segments

Ecosystems. Biogeochemical cycles of carbon, nitrogen and sulphur. Air Pollution: Major regions of atmosphere. Chemical and photochemical reactions in atmosphere. Air pollutants: types, sources, particle size and chemical nature; Photochemical smog: its constituents and photochemistry. Environmental effects of ozone. Major sources of air pollution. Pollution by SO_2 , CO_2 , CO , NO_x , and H_2S and control procedures. Effects of air pollution on living organisms and vegetation. Greenhouse effect and global warming, Ozone depletion by oxides of nitrogen, chlorofluorocarbons and halogens, removal of sulphur from coal. (14 Lectures)

UNIT-III: Water Pollution: Hydrological cycle, water resources, aquatic ecosystems, Sources and nature of water pollutants, Techniques for measuring water pollution, Impacts of water pollution on hydrological and ecosystems. Water purification methods. Effluent treatment plants (primary, sec-

ondary and tertiary treatment). Industrial effluents from the following industries and their treatment: electroplating, textile, tannery, dairy, petroleum and petrochemicals, fertilizer. Sludge disposal. Industrial waste management, incineration of waste. Water treatment and purification (reverse osmosis, ion exchange). Water quality parameters for waste water, industrial water and domestic water. (16 Lectures)

UNIT-IV: Energy & Environment

Sources of energy: Coal, petrol and natural gas. Nuclear fusion/fission, solar energy, hydrogen, geothermal, tidal and hydel. Nuclear Pollution: Disposal of nuclear waste, nuclear disaster and its management. (10 Lectures)

Biocatalysis: Introduction to biocatalysis: Importance in green chemistry and chemical industry. (6 Lectures)

Reference Books:

- E. Stocchi: Industrial Chemistry, Vol-I, Ellis Horwood Ltd. UK.
- R.M. Felder, R.W. Rousseau: Elementary Principles of Chemical Processes, Wiley Publishers, New Delhi.
- A. Kent: Riegels Handbook of Industrial Chemistry, CBS Publishers, New Delhi.
- S. S. Dara: A Textbook of Engineering Chemistry, S. Chand & Company Ltd. New Delhi.
- De, Environmental Chemistry: New Age International Pvt., Ltd, New Delhi.
- S. M. Khopkar, Environmental Pollution Analysis: Wiley Eastern Ltd, New Delhi.
- S.E. Manahan, Environmental Chemistry, CRC Press (2005).
- G.T. Miller, Environmental Science 11th edition. Brooks/ Cole (2006).
- Mishra, Environmental Studies. Selective and Scientific Books, New Delhi (2005).

PRACTICAL: DSE-3

1. Determination of dissolved oxygen in water.
2. Determination of Chemical Oxygen Demand (COD).
3. Determination of Biological Oxygen Demand (BOD).
4. Percentage of available chlorine in bleaching powder.
5. Measurement of chloride, sulphate and salinity of water samples by simple titration method ($AgNO_3$ and potassium chromate).
6. Estimation of total alkalinity of water samples (CO_3^{2-} , HCO_3^-) using double titration method.
7. Measurement of dissolved CO_2 .
8. Study of some of the common bio-indicators of pollution.
9. Estimation of SPM in air samples.
10. Preparation of borax/ boric acid.

Reference Books:

- E. Stocchi: Industrial Chemistry, Vol-I, Ellis Horwood Ltd. UK.
- R.M. Felder, R.W. Rousseau: Elementary Principles of Chemical Processes, Wiley Publishers, New Delhi.
- A. Kent: Riegels Handbook of Industrial Chemistry, CBS Publishers, New Delhi.
- S. S. Dara: A Textbook of Engineering Chemistry, S. Chand & Company Ltd. New Delhi.
- De, Environmental Chemistry: New Age International Pvt., Ltd, New Delhi.
- S. M. Khopkar, Environmental Pollution Analysis: Wiley Eastern Ltd, New Delhi.

DSE-4: DISSERTATION/PROJECT WORK

Marks:100

SKILL ENHANCEMENT COURSES (SEC)

SEMESTER- III

SEC-I: PESTICIDE CHEMISTRY

(Credits: 02)- Max. Marks: 50

30 Lectures(Each Lecture 1 hr.)

General introduction to pesticides (natural and synthetic), benefits and adverse effects, changing concepts of pesticides, structure activity relationship, synthesis and technical manufacture and uses of representative pesticides in the following classes: Organochlorines (DDT, Gammexene,); Organophosphates (Malathion, Parathion); Carbamates (Carbofuran and carbaryl); Quinones (Chloranil), Anilides (Alachlor and Butachlor).

Practical

- To calculate acidity/alkalinity in given sample of pesticide formulations as per BIS specifications.
- Preparation of simple organophosphates, phosphonates and thiophosphates.

Reference Book:

- R. Cremlyn: Pesticides, John Wiley.

SEMESTER- IV

SEC-II: FUEL CHEMISTRY

(Credits: 02)- Max. Marks: 50

30 Lectures(Each Lecture 1 hr.)

Review of energy sources (renewable and non-renewable). Classification of fuels and their calorific value Coal: Uses of coal (fuel and non-fuel) in various industries, its composition, carbonization of coal. Coal gas, producer gas and water gas composition and uses. Fractionation of coal tar, uses of coal tar bases chemicals, requisites of a good metallurgical coke, Coal gasification (Hydro gasification and Catalytic gasification), Coal liquefaction and Solvent Refining.

Petroleum and Petrochemical Industry: Composition of crude petroleum, Refining and different types of petroleum products and their applications. Fractional Distillation (Principle and process), Cracking (Thermal and catalytic cracking), Reforming Petroleum and non-petroleum fuels (LPG, CNG, LNG, bio-gas, fuels derived from biomass), fuel from waste, synthetic fuels (gaseous and liquids), clean fuels. Petrochemicals: Vinyl acetate, Propylene oxide, Isoprene, Butadiene, Toluene and its derivatives Xylene.

Lubricants: Classification of lubricants, lubricating oils (conducting and non-conducting) Solid and semisolid lubricants, synthetic lubricants. Properties of lubricants (viscosity index, cloud point, pore point) and their determination.

large Reference Books:

- E. Stocchi: Industrial Chemistry, Vol -I, Ellis Horwood Ltd. UK.
- P.C. Jain, M. Jain: Engineering Chemistry, Dhanpat Rai & Sons, Delhi.
- B.K. Sharma: Industrial Chemistry, Goel Publishing House, Meerut.

GENERIC ELECTIVE(GE)

B. Sc.(Hons.) Students other than Chemistry Honours will opt four Chemistry GE Papers.

SEMESTER-I

GE-I: ATOMIC STRUCTURE, BONDING, GENERAL ORGANIC CHEMISTRY & ALIPHATIC HYDROCARBONS

(Credits-6: Theory-4, Practical-2)-Max. Marks: 100
THEORY (Each class 1 hr.): Marks-70 PRACTICAL
(Each class 2 hrs.): Marks-30 Lectures: 60 (40 Theory
+ 20 Practical classes)

SECTION A: INORGANIC CHEMISTRY-1 (30 Periods)

Unit-I: Atomic Structure

Review of: Bohrs theory and its limitations, dual behaviour of matter and radiation, de-Broglies relation, Heisenberg Uncertainty principle. Hydrogen atom spectra.

What is Quantum mechanics ? Time independent Schrodinger equation and meaning of various terms in it. Significance of ψ and ψ^2 , Schrodinger equation for hydrogen atom. Radial and angular parts of the hydrogenic wave functions (atomic orbitals) and their variations for 1s, 2s, 2p, 3s, 3p and 3d orbitals (Only graphical representation). Significance of quantum numbers, orbital angular momentum and quantum numbers m_l and m_s . Shapes of s, p and d atomic orbitals, nodal planes. Discovery of spin, spin quantum number (s) and magnetic spin quantum number (m_s). Rules for filling electrons in various orbitals, Electronic configurations of the atoms. Stability of half-filled and completely filled orbitals, concept of exchange energy. Relative energies of atomic orbitals, Anomalous electronic configurations. (14 Lectures)

Unit-II: Chemical Bonding and Molecular Structure

Ionic Bonding: General characteristics of ionic bonding. Energy considerations in ionic bonding, lattice energy and solvation energy and their importance in the context of stability and solubility of ionic compounds. Statement of Born-Land equation for calculation of lattice energy, Born-Haber cycle and its applications, polarizing power and polarizability. Fajans rules, ionic character in covalent compounds, bond moment, dipole moment and percentage ionic character.

Covalent bonding: VB Approach: Shapes of some inorganic molecules and ions on the basis of VSEPR and hybridization with suitable examples of linear, trigonal planar, square planar, tetrahedral, trigonal bipyramidal and octahedral arrangements. Concept of resonance and resonating structures in various inorganic and organic compounds.

MO Approach: Rules for the LCAO method, bonding and antibonding MOs and their characteristics for s-s, s-p and p-p combinations of atomic orbitals, nonbonding combination of orbitals, MO treatment of homonuclear diatomic molecules (N_2 , O_2) and heteronuclear diatomic molecules (CO, NO). Comparison of VB and MO approaches. (16 Lectures)

Section B: Organic Chemistry-1 (30 Periods) Unit- III: Fundamentals of Organic Chemistry

Physical Effects, Electronic Displacements: Inductive Effect, Electromeric Effect, Resonance and Hyperconjugation. Cleavage of Bonds: Homolysis and Heterolysis.

Structure, shape and reactivity of organic molecules: Nucleophiles and electrophiles. Reactive Intermediates: Carbocations, Carbanions and free radicals. Strength of organic acids and bases: Comparative study with emphasis on factors affecting pK values. Aromaticity: Hckels rule. (8 Lectures)

Stereochemistry

Conformations with respect to ethane, butane and cyclohexane. Interconversion of Wedge Formula, Newmann, Sawhorse and Fischer representations. Concept of chirality (upto two carbon atoms). Configuration: Geometrical and Optical isomerism; Enantiomerism, Diastereomerism and Meso compounds). D and L; cis-trans nomenclature; CIP Rules: R/S (for one chiral carbon atoms) and E/Z Nomenclature (for up to two C=C systems). (10 Lectures)

Unit- IV: Aliphatic Hydrocarbons

Functional group approach for the following reactions (preparations & reactions) to be studied in context to their structure. Alkanes: (Upto 5 Carbons). Preparation: Catalytic hydrogenation, Wurtz reaction, Kolbes synthesis, from Grignard reagent. Reactions: Free radical Substitution: Halogenation.

Alkenes: (Upto 5 Carbons) Preparation: Elimination reactions: Dehydration of alkenes and dehydrohalogenation of alkyl halides (Saytzeffs rule); cis alkenes (Partial catalytic hydrogenation) and trans alkenes (Birch reduction). Reactions: cis-addition (alk. $KMnO_4$) and trans-addition (bromine), Addition of HX (Markownikoffs and anti-Markownikoffs addition), Hydration, Ozonolysis, Alkynes: (Upto 5 Carbons) Preparation: Acetylene from CaC_2 and conversion into higher alkynes; by dehalogenation of tetra halides and dehydrohalogenation of vicinal-dihalides.

Reactions: formation of metal acetylides, addition of bromine and alkaline $KMnO_4$, ozonolysis. (12 Lectures)

Reference Books:

- J. D. Lee: A new Concise Inorganic Chemistry, E L. B. S.
- F. A. Cotton & G. Wilkinson: Basic Inorganic Chemistry, John Wiley.
- Douglas, McDaniel and Alexander: Concepts and Models in Inorganic Chemistry, John Wiley.
- T. W. Graham Solomon: Organic Chemistry, John Wiley and Sons.
- Peter Sykes: A Guide Book to Mechanism in Organic Chemistry, Orient Longman.
- E. L. Eliel: Stereochemistry of Carbon Compounds, Tata McGraw Hill. I. L. Finar: Organic Chemistry (Vol. I & II), E. L. B. S.
- R. T. Morrison & R. N. Boyd: Organic Chemistry, Prentice Hall.
- Arun Bahl and B. S. Bahl: Advanced Organic Chemistry, S. Chand.

PRACTICAL: GE-I LAB.

Section A: Inorganic Chemistry-Volumetric Analysis

1. Estimation of sodium carbonate and sodium hydrogen carbonate present in a mixture.
2. Estimation of oxalic acid by titrating it with $KMnO_4$.
3. Estimation of water of crystallization in Mohrs salt by titrating with $KMnO_4$.

4. Estimation of Fe (II) ions by titrating it with $K_2Cr_2O_7$ using internal indicator.
5. Estimation of Cu (II) ions iodometrically using $Na_2S_2O_3$.

Section B: Organic Chemistry

1. Detection of extra elements (N, S, Cl, Br, I) in organic compounds (containing upto two extra elements).
2. Separation of mixtures by Chromatography: Measure the Rf value in each case (combination of two compounds to be given).
 - (a) Identify and separate the components of a given mixture of 2 amino acids (glycine, aspartic acid, glutamic acid, tyrosine or any other amino acid) by paper chromatography.
 - (b) Identify and separate the sugars present in the given mixture by paper chromatography.

large Reference Books:

- Vogels Qualitative Inorganic Analysis, A.I. Vogel, Prentice Hall, 7th Edition.
- Vogels Quantitative Chemical Analysis, A.I. Vogel, Prentice Hall, 6th Edition.
- Textbook of Practical Organic Chemistry, A.I. Vogel, Prentice Hall, 5th edition.
- Practical Organic Chemistry, F. G. Mann. & B. C. Saunders, Orient Longman, 1960.

SEMESTER-II

GE-II: CHEMICAL ENERGETICS, EQUILIBRIA & FUNCTIONAL ORGANIC CHEMISTRY-I

(Credits-6: Theory-4, Practical-2)-Max. Marks: 100
THEORY (Each class 1 hr.): Marks-70 PRACTICAL
(Each class 2 hrs.): Marks-30 Lectures: 60 (40 Theory
+ 20 Practical classes)

Section A: Physical Chemistry-1 (30 Lectures) Unit-I:

Chemical Energetics

Review of thermodynamics and the Laws of Thermodynamics. Important principles and definitions of thermochemistry. Concept of standard state and standard enthalpies of formations, integral and differential enthalpies of solution and dilution. Calculation of bond energy, bond dissociation energy and resonance energy from thermochemical data. Variation of enthalpy of a reaction with temperature Kirchhoffs equation. Statement of Third Law of thermodynamics (10 Lectures)

Chemical Equilibrium:

Free energy change in a chemical reaction. Thermodynamic derivation of the law of chemical equilibrium. Distinction between G and G_0 , Le Chateliers principle. Relationships between K_p , K_c and K_x for reactions involving ideal gases. (8 Lectures)

Unit- II: Ionic Equilibria

Strong, moderate and weak electrolytes, degree of ionization, factors affecting degree of ionization, ionization constant and ionic product of water. Ionization of weak acids and bases, pH scale, common ion effect. Salt hydrolysis-calculation of hydrolysis constant, degree of hydrolysis and pH for different

salts. Buffer solutions. Solubility and solubility product of sparingly soluble salts applications of solubility product principle. (12 Lectures)

Section B: Organic Chemistry-2 (30 Lectures) Unit- III:

Functional group approach for the following reactions (preparations & reactions) to be studied in context to their structure. Aromatic hydrocarbons: Preparation (Case benzene): from phenol, by decarboxylation, from acetylene, from benzene sulphonic acid. Reactions: (Case benzene): Electrophilic substitution: nitration, halogenation and sulphonation. Friedel-Crafts reaction (alkylation and acylation) (upto 4 carbons on benzene). Side chain oxidation of alkyl benzenes (up to 4 carbons on benzene). (8 Lectures)

Alkyl and Aryl Halides

Alkyl Halides (Up to 5 Carbons) Types of Nucleophilic Substitution (SN_1 , SN_2 and SN_i) reactions. Preparation: from alkenes and alcohols.

Reactions: hydrolysis, nitrite & nitro formation, nitrile & isonitrile formation. Williamsons ether synthesis: Elimination vs substitution.

Aryl Halides Preparation: (Chloro, bromo and iodo-benzene case): from phenol, Sandmeyer & Gattermann reactions. Reactions (Chlorobenzene): Aromatic nucleophilic substitution (replacement by OH group) and effect of nitro substituent. Benzyne Mechanism: KNH_2/NH_3 (or $NaNH_2/NH_3$). (8 Lectures)

Unit- IV: Alcohols, Phenols and Ethers (Upto 5 Carbons)

Alcohols: Preparation: Preparation of 1, 2 and 3 alcohols: using Grignard reagent, Esterhydrolysis, Reduction of aldehydes and ketones, carboxylic acid and esters.

Reactions: With sodium, HX (Lucas test), esterification, oxidation (with PCC, alk. $KMnO_4$, acidic dichromate, conc. HNO_3). Oppeneauer oxidation Diols: (Upto 6 Carbons) oxidation of diols. Pinacol-Pinacolone rearrangement.

Phenols: (Phenol case) Preparation: Cumene hydroperoxide method, from diazonium salts. Reactions: Electrophilic substitution: Nitration, halogenation and sulphonation. ReimerTiemann Reaction, Gattermann-Koch Reaction,

Ethers (aliphatic and aromatic): Cleavage of ethers with HI.

Aldehydes and ketones (aliphatic and aromatic): Formaldehyde, acetaldehyde, acetone and benzaldehyde

Preparation: from acid chlorides and from nitriles.

Reactions Reaction with HCN, ROH, $NaHSO_3$, $NH_2 - G$ derivatives. Iodoform test. Aldol Condensation, Cannizzaros reaction, Benzoin condensation. Clemensen reduction and Wolff Kishner reduction. (14 Lectures)

Reference Books:

- T. W. Graham Solomons: Organic Chemistry, John Wiley and Sons.
- Peter Sykes: A Guide Book to Mechanism in Organic Chemistry, Orient Longman.
- I.L. Finar: Organic Chemistry (Vol. I & II), E. L. B. S.
- R. T. Morrison & R. N. Boyd: Organic Chemistry, Prentice Hall.
- Arun Bahl and B. S. Bahl: Advanced Organic Chemistry, S. Chand.

- G. M. Barrow: Physical Chemistry Tata McGraw-Hill(2007).
- G. W. Castellan: Physical Chemistry 4th Edn. Narosa (2004).
- C. Kotz, P. M. Treichel & J. R. Townsend: General Chemistry Cengage Lening India Pvt. Ltd., New Delhi (2009).
- H. Mahan: University Chemistry 3rd Ed. Narosa (1998).
- R. H. Petrucci: General Chemistry 5th Ed. Macmillan Publishing Co.: New York (1985).

PRACTICAL: GE-II LAB.

Section A: Physical Chemistry Thermochemistry

1. Determination of heat capacity of calorimeter for different volumes.
2. Determination of enthalpy of neutralization of hydrochloric acid with sodium hydroxide.
3. Determination of enthalpy of ionization of acetic acid.
4. Determination of integral enthalpy of solution of salts (KNO₃, NH₄Cl).
5. Determination of enthalpy of hydration of copper sulphate.
6. Study of the solubility of benzoic acid in water and determination of H. **Ionic equilibria**
pH measurements a) Measurement of pH of different solutions like aerated drinks, fruit juices, shampoos and soaps (use dilute solutions of soaps and shampoos to prevent damage to the glass electrode) using pH-meter.
b) Preparation of buffer solutions:
(i) Sodium acetate-acetic acid.
(ii) Ammonium chloride-ammonium hydroxide.
Measurement of the pH of buffer solutions and comparison of the values with theoretical values.

Section B: Organic Chemistry

1. Purification of organic compounds by crystallization (from water and alcohol) and distillation.
2. Criteria of Purity: Determination of melting and boiling points.
3. Preparations: Mechanism of various reactions involved to be discussed. Recrystallisation, determination of melting point and calculation of quantitative yields to be done.
(a) Bromination of Phenol/Aniline.
(b) Benzoylation of amines/phenols.
(c) Oxime and 2,4 dinitrophenylhydrazone of aldehyde/ketone.

Reference Books:

- A.I. Vogel: Textbook of Practical Organic Chemistry, 5th edition, Prentice-Hall.
- F. G. Mann & B. C. Saunders, Practical Organic Chemistry, Orient Longman (1960).
- B.D. Khosla, Senior Practical Physical Chemistry, R. Chand & Co.

SEMESTER-III

GE-III: CHEMISTRY OF S- AND P-BLOCK ELEMENTS, STATES OF MATTER & CHEMICAL KINETICS

(Credits-6: Theory-4, Practical-2)-Max. Marks: 100

THEORY (Each class 1 hr.): Marks-70

PRACTICAL (Each class 2 hrs.): Marks-30

Lectures: 60 (40 Theory + 20 Practical classes)

UNIT-I: General Principles of Metallurgy

Chief modes of occurrence of metals based on standard electrode potentials. Ellingham diagrams for reduction of metal oxides using carbon as reducing agent. Hydrometallurgy, Methods of purification of metals (Al, Pb, Fe, Cu, Ni, Zn): electrolytic, oxidative refining, Parting process, van Arkel-de Boer process and Mond's process. (4 Lectures)

s- and p-Block Elements

Periodicity in s- and p-block elements with respect to electronic configuration, atomic and ionic size, ionization enthalpy, electronegativity (Pauling & Mulliken scales). Allotropy in C, S, and P. Oxidation states with reference to elements in unusual and rare oxidation states like carbides and nitrides), inert pair effect, diagonal relationship and anomalous behaviour of first member of each group. (11 Lectures)

UNIT-II: Compounds of s- and p-Block Elements

Hydrides and their classification (ionic, covalent and interstitial), structure and properties with respect to stability of hydrides of p- block elements. Concept of multicentre bonding (diborane).

Structure, bonding and their important properties like oxidation/reduction, acidic/basic nature of the following compounds and their applications in industrial, organic and environmental chemistry.

Hydrides of nitrogen (NH_3 , N_2H_4 , N_3H , NH_2OH)

Oxoacids of P, S and Cl.

Halides and oxohalides: PCl_3 , PCl_5 , $SOCl_2$. (15 Lectures)

Section B: Physical Chemistry-3 (30 Lectures) UNIT-III:

Kinetic Theory of Gases

Postulates of Kinetic Theory of Gases and derivation of the kinetic gas equation. Deviation of real gases from ideal behaviour, compressibility factor, causes of deviation. van der Waals equation of state for real gases. Boyle temperature (derivation not required). Critical phenomena, critical constants and their calculation from van der Waals equation. Maxwell Boltzmann distribution laws of molecular velocities and molecular energies (graphic representation derivation not required) and their importance.

Temperature dependence of these distributions. Most probable, average and root mean square velocities (no derivation). Collision cross section, collision number, collision frequency, collision diameter and mean free path of molecules. Viscosity of gases and effect of temperature and pressure on coefficient of viscosity (qualitative treatment only). (10 Lectures)

Liquids

Surface tension and its determination using stalagmometer. Viscosity of a liquid and determination of coefficient of viscosity using Ostwald viscometer. Effect of temperature on surface tension and coefficient of viscosity of a liquid (qualitative treatment only). (5 Lectures)

UNIT-IV: Solids

Forms of solids. Symmetry elements, unit cells, crystal systems, Bravais lattice types and identification of lattice planes. Laws of Crystallography - Law of constancy of interfacial angles, Law of

rational indices. Miller indices. XRay diffraction by crystals, Braggs law. Structures of NaCl, and CsCl (qualitative treatment only). Defects in crystals. (7 Lectures)

Chemical Kinetics

The concept of reaction rates. Effect of temperature, pressure, catalyst and other factors on reaction rates. Order and molecularity of a reaction. Derivation of integrated rate equations for zero, first and second order reactions (both for equal and unequal concentrations of reactants). Half-life of a reaction. General methods for determination of order of a reaction. Concept of activation energy and its calculation from Arrhenius equation. Theories of Reaction Rates: Collision theory and Activated Complex theory of bimolecular reactions. Comparison of the two theories (qualitative treatment only). (8 Lectures)

Reference Books:

- G. M. Barrow: Physical Chemistry Tata McGraw-Hill(2007).
- G. W. Castellan: Physical Chemistry 4th Edn. Narosa (2004).
- C. Kotz, P. M. Treichel & J. R. Townsend: General Chemistry Cengage Lening India Pvt. Ltd., New Delhi (2009).
- H. Mahan: University Chemistry 3rd Ed. Narosa (1998).
- R. H. Petrucci: General Chemistry 5th Ed. Macmillan Publishing Co.: New York (1985).
- D. Lee: A New Concise Inorganic Chemistry, E.L.B.S.
- F.A. Cotton & G. Wilkinson: Basic Inorganic Chemistry, John Wiley.
- F. Shriver and P. W. Atkins: Inorganic Chemistry, Oxford University Press.
- Gary Wulfsberg: Inorganic Chemistry, Viva Books Pvt. Ltd.

PRACTICAL: GE-III LAB.

Section A: Inorganic Chemistry

Semi-micro qualitative analysis using H_2S of mixtures- not more than four ionic species (two anions and two cations and excluding insoluble salts) out of the following:

Cations : NH_4^+ , Pb^{2+} , Ag^+ , Bi^{3+} , Cu^{2+} , Cd^{2+} , Sn^{2+} , Fe^{3+} , Al^{3+} , Co , Cr^{3+} ,

Ni^{2+} , Mn^{2+} , Zn^{2+} , Ba^{2+} , Sr^{2+} , Ca^{2+} , K^+

Anions: CO_3^{2-} , S^{2-} , SO_3^{2-} , NO_3^- , Cl^- , Br^- , I^- , NO_2^- , SO_4^{2-} , PO_4^{3-} , F^- (Spot tests should be carried out

wherever feasible)

Section B: Physical Chemistry Chemical Kinetics

Study the kinetics of the following reactions.

3. Initial rate method: Iodide-persulphate reaction.
4. Integrated rate method:
 - a) Acid hydrolysis of methyl acetate with hydrochloric acid.
 - b) Saponification of ethyl acetate.
 - c) Compare the strengths of HCl and H_2SO_4 by studying kinetics of hydrolysis of methyl acetate.

Reference Books:

- A.I. Vogel, Qualitative Inorganic Analysis, Prentice Hall, 7th Edn
- A.I. Vogel, Quantitative Chemical Analysis, Prentice Hall, 6th Edn.
- B.D. Khosla, Senior Practical Physical Chemistry, R. Chand & Co.

SEMESTER- IV

GE:IV ORGANOMETALLICS, BIOINORGANIC CHEMISTRY, POLYNUCLEAR HYDROCARBONS AND UV, IR SPECTROSCOPY

(Credits-6: Theory-4, Practical-2)-Max. Marks: 100
THEORY (Each class 1 hr.): Marks-70 PRACTICAL
(Each class 2 hrs.): Marks-30 Lectures: 60 (40 Theory
+ 20 Practical classes)

Section A: Inorganic Chemistry-4 (30 Lectures) UNIT-

I: Chemistry of 3d metals

Oxidation states displayed by Cr, Fe, Co, Ni and Cu. A study of the following compounds (including preparation and important properties); Peroxo compounds of Cr, $K_2Cr_2O_7$, $KMnO_4$, $K_4[Fe(CN)_6]$, sodium nitroprusside, $[Co(NH_3)_6]Cl_3$, $Na_3[Co(NO_2)_6]$. (6 Lectures)

Organometallic Compounds Definition and Classification with appropriate examples based on nature of metal-carbon bond (ionic, s, p and multicentre bonds). Structures of methyl lithium, Zeiss salt and ferrocene. EAN rule as applied to carbonyls. Preparation, structure, bonding and properties of mononuclear and polynuclear carbonyls of 3d metals. π -acceptor behaviour of carbon monoxide. Synergic effects (VB approach). (12 Lectures)

UNIT-II: Bio-Inorganic Chemistry

A brief introduction to bio-inorganic chemistry. Role of metal ions present in biological systems with special reference to Na^+ , K^+ and Mg^{2+} ions: Na/K pump; Role of Mg^{2+} ions in energy production and chlorophyll. Role of Ca^{2+} in blood clotting, stabilization of protein structures and structural role (bones). (12 Lectures)

Section B: Organic Chemistry-4 (30 Lectures)

UNIT-III: Polynuclear and heteronuclear aromatic compounds

Properties of the following compounds with reference to electrophilic and nucleophilic substitution: Naphthalene, Anthracene, Furan, Pyrrole, Thiophene, and Pyridine. (6 Lectures)

Active methylene compounds

Preparation: Claisen ester condensation. Keto-enol tautomerism. Reactions: Synthetic uses of ethylacetoacetate (preparation of non-heteromolecules having upto 6 carbon). (6 Lectures)

UNIT-IV: Application of Spectroscopy to Simple Organic Molecules

Applications of visible, ultraviolet and Infrared spectroscopy in organic molecules. Electromagnetic radiations, electronic transitions, λ_{max} and ϵ_{max} , chromophore, auxochrome, bathochromic and hypsochromic shifts. Application of electronic spectroscopy and Woodward rules for calculating λ_{max} of conjugated dienes and α , β -unsaturated compounds. Infrared radiation and types of molecular vibrations, functional group and fingerprint region. IR spectra of alkanes, alkenes and simple alcohols (inter and intramolecular hydrogen bonding), aldehydes, ketones, carboxylic acids and their derivatives (effect of substitution on $>C=O$ stretching absorptions). (18 Lectures)

Reference Books:

- James E. Huheey, Ellen Keiter & Richard Keiter: Inorganic Chemistry: Principles of Structure and

Reactivity, Pearson Publication.

- G.L. Miessler & Donald A. Tarr: Inorganic Chemistry, Pearson Publication.
- J.D. Lee: A New Concise Inorganic Chemistry, E.L.B.S.
- F.A. Cotton & G. Wilkinson: Basic Inorganic Chemistry, John Wiley & Sons.
- I.L. Finar: Organic Chemistry (Vol. I & II), E.L.B.S.
- John R. Dyer: Applications of Absorption Spectroscopy of Organic Compounds, • Prentice Hall.
- R.M. Silverstein, G.C. Bassler & T.C. Morrill: Spectroscopic Identification of Organic Compounds, John Wiley & Sons.
- R.T. Morrison & R.N. Boyd: Organic Chemistry, Prentice Hall.
- Peter Sykes: A Guide Book to Mechanism in Organic Chemistry, Orient Longman.
- Arun Bahl and B. S. Bahl: Advanced Organic Chemistry, S. Chand.

PRACTICAL: GE-IV LAB.

Section A: Inorganic Chemistry

1. Separation of mixtures by chromatography: Measure the R_f value in each case. (Combination of two ions to be given).

Paper chromatographic separation of Fe^{3+} , Al^{3+} and Cr^{3+} or Paper chromatographic separation of Ni^{2+} , Co^{2+} , Mn^{2+} and Zn^{2+}

Section B: Organic Chemistry

Systematic Qualitative Organic Analysis of Organic Compounds possessing mono-functional groups (-COOH, phenolic, aldehydic, ketonic, amide, nitro, amines) and preparation of one derivative.

Reference Books:

- A.I. Vogel: Qualitative Inorganic Analysis, Prentice Hall, 7th Edn.
- A.I. Vogel: Quantitative Chemical Analysis, Prentice Hall, 6th Edn.
- A.I. Vogel: Textbook of Practical Organic Chemistry, Prentice Hall, 5th Edn.
- F. G. Mann & B. C. Saunders: Practical Organic Chemistry, Orient Longman (1960).

SEMESTER- IV (CBZ Students)

GE:IV- MOLECULES OF LIFE

(Credits-6: Theory-4, Practical-2)-Max. Marks: 100
THEORY (Each class 1 hr.): Marks-70 PRACTICAL
(Each class 2 hrs.): Marks-30 Lectures: 60 (40 Theory
+ 20 Practical classes)

UNIT-I: Carbohydrates

Classification of carbohydrates, reducing and non reducing sugars, General Properties of Glucose and Fructose, their open chain structure. Epimers, mutarotation and anomers. Determination of configuration of Glucose (Fischer proof). Cyclic structure of glucose. Haworth projections. Cyclic structure of fructose. Linkage between monosachharides, structure of disacharrides (sucrose, maltose, lactose) and polysacharrides (starch and cellulose) excluding their structure elucidation. (12 Periods)

UNIT-II Amino Acids, Peptides and Proteins

Classification of Amino Acids, Zwitterion structure and Isoelectric point. Overview of Primary, Secondary, Tertiary and Quaternary structure of proteins. Determination of primary structure of peptides, determination of N-terminal amino acid (by DNFB and Edman method) and C-terminal amino acid (by thiohydantoin and with carboxypeptidase enzyme). Synthesis of simple peptides (upto dipeptides) by N-protection (t-butyloxycarbonyl and phthaloyl) & C-activating groups and Merrifield solid phase synthesis. (12 Periods)

UNIT-III: Enzymes and correlation with drug action

Mechanism of enzyme action, factors affecting enzyme action, Coenzymes and cofactors and their role in biological reactions, Specificity of enzyme action (Including stereospecificity), Enzyme inhibitors and their importance, phenomenon of inhibition (Competitive and Non competitive inhibition including allosteric inhibition). Drug action-receptor theory. Structure activity relationships of drug molecules, binding role of OH group, $-NH_2$ group, double bond and aromatic ring, (10 Periods)

Nucleic Acids

Components of Nucleic acids: Adenine, guanine, thymine and Cytosine (Structure only), other components of nucleic acids, Nucleosides and nucleotides (nomenclature), Structure of polynucleotides; Structure of DNA (Watson-Crick model) and RNA (types of RNA), Genetic Code, Biological roles of DNA and RNA: Replication, Transcription and Translation. (8 Periods)

UNIT-IV: Lipids

Introduction to lipids, classification. Oils and fats: Common fatty acids present in oils and fats, Omega fatty acids, Trans fats, Hydrogenation, Saponification value, Iodine number. Biological importance of triglycerides, phospholipids, glycolipids, and steroids (cholesterol). (8 Periods)

Concept of Energy in Biosystems

Calorific value of food. Standard caloric content of carbohydrates, proteins and fats. Oxidation of foodstuff (organic molecules) as a source of energy for cells. Introduction to Metabolism (catabolism, anabolism), ATP: the universal currency of cellular energy, ATP hydrolysis and free energy change. Conversion of food into energy. Outline of catabolic pathways of Carbohydrate- Glycolysis, Fermentation, Krebs Cycle. Overview of catabolic pathways of Fats and Proteins. Interrelationships in the metabolic pathways of Proteins, Fats and Carbohydrates. (10 Lectures)

Recommended Texts:

- Morrison, R. T. & Boyd, R. N. Organic Chemistry, Dorling Kindersley (India) Pvt. Ltd. (Pearson Education).
- Finar, I. L. Organic Chemistry (Volume 1), Dorling Kindersley (India) Pvt. Ltd. (Pearson Education).
- Finar, I. L. Organic Chemistry (Volume 2), Dorling Kindersley (India) Pvt. Ltd. (Pearson Education).
- Nelson, D. L. & Cox, M. M. Lehningers Principles of Biochemistry 7th Ed., W. H. Freeman.
- Berg, J. M., Tymoczko, J. L. & Stryer, L. Biochemistry 7th Ed., W. H. Freeman.

PRACTICAL: GE-IV(CBZ) LAB.

1. Separation of amino acids by paper chromatography.

2. To determine the concentration of glycine solution by formylation method.
3. Study of titration curve of glycine.
4. Action of salivary amylase on starch.
5. Effect of temperature on the action of salivary amylase on starch.
6. To determine the saponification value of an oil/fat.
7. To determine the iodine value of an oil/fat.
8. Differentiate between a reducing/ nonreducing sugar.
9. Extraction of DNA from onion/cauliflower.
10. To synthesise aspirin by acetylation of salicylic acid and compare it with the ingredient of an aspirin tablet by TLC.

Recommended Texts:

- Furniss, B.S.; Hannaford, A.J.; Rogers, V.; Smith, P.W.G.; Tatchell, A.R. *Vogels Textbook of Practical Organic Chemistry*, ELBS.
- Ahluwalia, V.K. & Aggarwal, R. *Comprehensive Practical Organic Chemistry*, Universities Press.

COMPUTER SCIENCE(HONOURS)

SEMESTER-I

C:1-PROGRAMMING USING C (Credit:6, Theory:4, Practical: 2)

UNIT- I

Introduction to Programming Language, Introduction to C Programming , Character Set, C Tokens, Keywords & Identifiers, Constants, Variables, Data Types, Variables , Storage Classes, Operators (Arithmetic, Relational, Logical , Assignment, Increment & Decrement, Conditional , Bitwise), Expressions , Input and Output Operations.

UNIT- II

Decision Making and Branching: Simple IF Statement, IF.. ELSE Statement, Nesting IF. ELSE Statement, ELSE IF Ladder, Switch Statement, Operator, GOTO Statement. Decision Making and Looping: The WHILE Statement, The DO Statement, The FOR Statement, Jumps in LOOPS. Arrays, Character Arrays and Strings.

UNIT- III

User-defined Functions: Need, Elements & Definition, Function Calls, Function Definition, Category of Functions, Recursion. Structures and Unions: Defining, Declaring, Accessing, Initialization Structure, Arrays of Structures, Arrays within Structures, Structures and Functions, Unions.

UNIT- IV

Pointers: Accessing the Address of a Variable, Declaring Pointer Variables, Initializations of Pointer Variable, Accessing a Variable through its Pointer, Chain of Pointers, Pointer Expressions, Pointer Increments and Scale Factor, Pointers and Arrays,, Pointers and Character Strings, Array of Pointers, Pointers as Function Arguments, Functions Returning Pointers, Pointers to Functions, Pointers to Structures, Troubles with Pointers.

UNIT- V

File Management in C: Defining and Opening a File, Closing a File, Input/ Output Operations on Files, Error Handling During I/O Operations, Random Access to Files, Command Line Arguments, Dynamic Memory Allocation.

Recommended Books:

1. E. Balaguruswamy, Programming in ANSI C,4/e, (TMH).
2. Paul Deitel, Harvey Deitel, C: How to Program, 8/e, Prentice Hall.
3. J. R. Hanly, Problem Solving & Program Design in C, 7/e, Pearson.
4. B. Kernighan & D.M. Ritchie, The C Programming Language, 2/e PHI.

C: 2-COMPUTER ORGANIZATION

(Credit:6, Theory:4, Practical: 2)

UNIT-I

Character Codes, Decimal System, Binary System, Decimal to Binary Conversion, Hexadecimal Notation, Boolean Algebra, Basic Logic Functions: Electronic Logic Gates, Synthesis of Logic Functions, Minimization of Logic Expressions, Minimization using Karnaugh Maps, Synthesis with NAND and NOR Gates.

UNIT-II

Flip-Flops, Gated Latches, Master-Slave Flip-Flops, Edge-Triggering, T Flip-Flops, JK Flip-Flops. Registers and Shift Registers, Counters, Decoders, Multiplexers, Programmable Logic Devices (PLDs), Programmable Array Logic (PAL), Complex Programmable Logic Devices (CPLDs), Field-Programmable Gate Array (FPGA), Sequential Circuits, Timing Diagrams, The Finite State Machine Model, Synthesis of Finite State Machines.

UNIT-III

Basic Structure of Computers: Computer Types, Functional Units, Input Unit, Memory Unit, Arithmetic and Logic Unit, Output Unit, Control Unit, Basic Operational Concepts, Bus Structures, Software. Machine Instructions and Programs: Numbers, Arithmetic Operations, and Characters: Number Representation, Addition of Positive Numbers, Addition and Subtraction of Signed Numbers, Overflow of Integer Arithmetic, Characters, Memory Locations and Addresses, Byte Addressability, Word Alignment, Accessing Numbers, Characters, and Character Strings, Memory Operations, Instructions and Instruction Sequencing, Register Transfer Notation, Basic Instruction Types, Instruction Execution and Straight-Line Sequencing, Branching, Condition Codes, Generating Memory Addresses, Addressing Modes, Implementation of Variables and Constants, Indirection and Pointers, Indexing and Arrays, Relative Addressing.

UNIT-IV

THE ARM EXAMPLE: Registers, Memory Access, and Data Transfer, Register Structure, Memory Access Instructions and Addressing Modes, Register Move Instructions, Arithmetic and Logic Instructions: Arithmetic Instructions, Logic Instructions, Branch Instructions, Setting Condition Codes, Assembly Language, Pseudo-Instructions, I/O Operations, Subroutines, Vector Dot Product Program, Byte-Sorting Program, Linked-List Insertion and Deletion Subroutines. Basic Input-Output Operations, Stacks and Queues, Subroutines. PowerPC Example: Basic PowerPC Processor Organization, Load and Store Instructions, Arithmetic and Logic Instructions, Flow Control Instructions, Compare Instructions, Logic Instructions, Subroutines.

UNIT-V

Memory System: Semiconductor RAM Memories, Internal Organization of Memory Chips, Static Memories, Asynchronous DRAMS, Synchronous DRAMS, Structure of Large Memories, Memory System Considerations, RAMBUS Memory. Read-Only Memories: ROM, PROM, EPROM, EEPROM, Flash Memory, Speed, Size, and Cost of Memory. Secondary Storage: Magnetic Hard Disks, Optical Disks, Magnetic Tape Systems.

Recommended Books:

1. Carl Hamacher, Z. Vranesic, S. Zaky: Computer Organization, 5/e (TMH)
2. William Stallings: Computer Organization and Architecture (Design for Performance), 9/e
3. S. Brown, & Z. Vranesic, Fundamentals of Digital Logic Design with VHDL, 2/e, McGraw-Hill
4. J. P. Uyemura, A First Course in Digital System Design, An Integrated Approach, Cengage Learning.

GE:1-PROBABILITY AND STATISTICS

Credits;4

UNIT-I

Probability and Probability Distribution: Events and the Sample Space, Calculating Probabilities using Simple events, Useful counting rules, Probability rules: Addition rule, Conditional probability and multiplication rule, Bayes rule.

UNIT-II

Probability Distributions: Random Variable, Discrete random variable, Mean and Standard deviation of discrete random variable, Discrete Probability Distributions: Binomial, Poisson and Hypergeometric probability distribution, Continuous Probability distribution: Normal distribution.

UNIT-III

Sampling Distribution: sampling plans and experimental designs, Sampling distribution of a statistic, Central Limit theorem, Sampling distribution of the Sample mean and Proportion. Large Sample Estimation: Point estimation, Interval estimation, Confidence interval of population mean, Population proportion, difference between two population means, difference between two population proportions.

UNIT-IV

Large Sample Tests of Hypothesis: Test of a Population mean, Test of difference of two population means, Test of hypothesis for a binomial proportion, Test of hypothesis for the difference between two binomial proportions. Inference from Small Samples: Students t Distribution, Small Sample inferences concerning a population mean and difference between two population means, Inferences concerning a population variance and difference between two population variances.

UNIT-V

Analysis of Variance: One-way classification, Two-way classification. Linear regression and Correlation: Method of least squares, Analysis of variance for linear regression, Testing the usefulness of the linear regression model, Estimation and Prediction using the fitted line. Carl Pearsons coefficient of Correlation, Test of hypothesis concerning the Correlation coefficient.

Recommended Books: 1. William Mendenhall, Robert J. Beaver, Barbara M. Beaver, Probability and Statistics 14/e, CENGAGE Learning. 2. W. W. Hines, D.C. Montgomery, D.M. Goldsman, & C.M. Borror, Probability & Statistics in Engineering”.

C: 3-PROGRAMMING USING C++

(Credit:6, Theory:4, Practical: 2)

UNIT-I

Principles of Object-Oriented Programming: Object-Oriented Programming (OOP) Paradigm, Basic Concepts of OOP, Benefits of OOP, Object Oriented Languages, Applications of OOP. Beginning with C++: Applications of C++, C++ statements, Example with Class, Structure of C++ Program, Creating the Source File, Compiling and Linking. Tokens, Expressions and Control Structures: Tokens, Keywords, Identifiers & Constants, Basic Data Types, User-Defined Data Types, Derived Data Types, Symbolic Constants, Type Compatibility, Declaration of Variables, Dynamic Initialization of Variables, Reference Variables, Operators in C++, Scope Resolution Operator, Member Deferencing Operators, Memory Management Operators, Manipulators, Type Cast Operators, Expressions and

their Types, Special Assignment Expressions, Implicit Conversions, Operator Overloading, Operator Precedence, Control Structures.

UNIT- II

Functions in C++: The Main Function, Function Prototyping, Call By Reference, Return by Reference, Inline Functions, Default Arguments, Const. Arguments, Function Overloading, Friend & Virtual Functions, Math. Library Functions. **Classes and Objects**: Specifying a Class, Defining Member Functions, Making an outside Function Inline, Nested Member Functions, Private Member Functions, Arrays within a Class, Memory Allocation for Objects, Static Data Members, Static Member Functions, Arrays of Objects, Objects as Function Arguments, Friendly Functions, Returning Objects, Const. Member Functions, Pointer to Members, Local Classes.

UNIT- III

Constructors & Destructors: Constructors, Parameterized Constructors, Multiple Constructors in a Class, Constructors with Default Arguments, Dynamic Initialization of Objects, Copy Constructor, Dynamic Constructors, Constructing Two-Dimensional Arrays, Const. Objects, Destructors. **Operator Overloading and Type Conversions**: Defining Operator Overloading, Overloading Unary Operators, Overloading Binary Operators, Overloading Binary Operators using Friends, Manipulation of Strings using Operators, Rules for Overloading Operators, Type Conversions.

UNIT- IV

Inheritance : Defining Derived Classes, Single Inheritance, Making a Private Member Inheritance, Multilevel Inheritance, Multiple Inheritance, Hierarchical Inheritance, Hybrid Inheritance, Virtual Base Classes, Abstract Classes, Constructors in Derived Classes, Member Classes, Nesting of Classes. Pointers, Virtual Functions and Polymorphism: Pointers, Pointers to Objects, this Pointer, Pointers to Derived Classes, Virtual Functions, Pure Virtual Functions.

UNIT- V

Managing Console I/O Operations: **C++ Streams**, C++ Stream Classes, Unformatted I/O Operations, Formatted Console I/O Operations, Managing Output with Manipulators. **Files**: Classes for File Stream Operations, Opening and Closing a File, Detecting end-of-file, File Modes, File Pointers and their Manipulations, Sequential Input and Output Operations, Updating a File: Random Access, Error Handling During File Operations, Command-line Arguments.

Recommended Books:

1. E. Balgurusamy, Object Oriented Programming with C++ :, 4/e (TMH).
2. Paul Deitel, Harvey Deitel, "C++: How to Program",9/e. Prentice Hall.
3. J. Farrell, Object-Oriented Programming, Cengage Learning.
4. Bjarne Stroustrup, "Programming – Principles and Practice using C++", 2/e, Addison-Wesley 2014.

C: 4-DATA STRUCTURES (Credit:6, Theory:4, Practical: 2)

UNIT-I

Introduction and Overview: Definitions, Concept of Data Structures, Overview of Data Structures, Implementation of Data Structures. Arrays: Terminology, One-Dimensional Array, Multi-Dimensional Arrays, Pointer Arrays.

UNIT-II

Linked Lists: Single Linked List, Circular Linked List, Double Linked List, Circular Double Linked List, Application of Linked Lists, Memory Representation, Boundary Tag System, De-allocation Strategy, Buddy System, Compaction.

UNIT-III

Stacks: Definition, Representation of Stack (Array, Linked List), Operations on Stacks, Applications of Stack (Evaluation of Arithmetic Expressions, Code Generation, Implementation of Recursion, Factorial Calculation, Quick Sort, Tower of Hanoi, Activation Record Management).

UNITIV

Queues: Definition, Representation of Queues (Array, Linked List), Circular Queue, Deque, Priority Queue, Application of Queues (Simulation, CPU Scheduling in Multiprogramming Environment, Round Robin Algorithm).

UNITV

Tree: Binary Trees, Properties of Binary Tree, Linear Representation of Binary a Binary Tree, Linked Representation of a Binary Tree, Physical Implementation of Binary Tree in Memory, Operations on Binary Tree (Insertion, Deletion, Traversal, Merging of two Binary Trees), Types of Binary Trees (Expression Tree, Binary Search Tree, Heap Tree, Threaded Binary Trees, Height Balanced Binary Tree, Weighted Binary Tree, Decision Trees).

Recommended Books:

1. D. Samanta, Classic Data Structures:, 2/e (PHI).
2. D.S Malik, Data Structure using C++, 2/e, Cengage Learning, 2010.
3. Adam Drozdek, "Data Structures and algorithm in C++", 3/e, Cengage Learning, 2012.
4. Robert L. Kruse, "Data Structures and Program Design in C++", Pearson.

GE: 2-NUMERICAL TECHNIQUES

Credits;4

UNIT-I

Introduction: Numbers and their accuracy, Chopping and Rounding off, Errors: Absolute and Relative errors, Floating point representations of numbers, Loss of significance. Solution of Algebraic and Transcendental Equations: Bisection Method, Newton-Raphson Method, Secant Method, Method of false position, Rate of convergence and comparison of iterative methods.

UNIT-II

Interpolation and Numerical Differentiation: Polynomial Interpolation, Interpolating polynomial: Lagrange form, Newton form, Nested form, Divided difference Interpolation, Inverse Interpolation, Errors in polynomial Interpolation. First derivative and second derivative via Taylor Series, Richardson Extrapolation.

UNIT-III

Numerical Integration: Trapezoidal Rule, Composite Trapezoidal rule, Simpsons 1/3 rule, Simpsons 3/8 rule, Gaussian Quadrature formulae (1-point, 2-point, 3-point)

UNIT-IV

Solution of System of Linear Equations: Gaussian Elimination method and Pivoting, LU factorization method, ill Conditioning, Iterative Methods: Jacobi iterative method, Gauss Seidel iterative method. Eigen Values and Eigen Vectors: Eigen value properties, Computation Eigen values by Power method.

UNIT-V

Solution of Ordinary Differential Equations: Taylor Series method, Runge-Kutta method of order 2 and order 4, Predictor-Corrector method: Adams-Bashforth-Moulton method. Smoothing of Data and the Method of Least Squares: Linear and non-linear least square method.

Recommended Books:

1. E. Ward Cheney and David R. Kincaid, Numerical Methods and Applications CENGAGE Learning India Private Ltd., New Delhi.
2. S.R.K. Iyengar, R.K. Jain, & M.K. Jain, Numerical Methods for Scientific & Engineering Computation, 6/e, New Age Int. Pub.
3. S.S. Sastry, Introductory Methods of Numerical Analysis, 5/e, EEE
4. Steven C. Chapra, Applied Numerical Methods with MATLAB, 2/e, McGraw-Hill.

SEMESTER-III

C: 5-OPERATING SYSTEMS (Credit:6, Theory:4, Practical: 2)

UNIT-I

Operating System, Computer-System Organization, Computer-System Architecture, Operating-System Structure, Operating-System Operations, Process Management, Memory Management, Storage Management, Protection and Security, Distributed Systems, Special Purpose Systems, Computing Environments, Open-Source Operating Systems. Operating System Services, User Operating System Interface, System Calls, Types of System Calls, System Programs, Operating-System Design and Implementation, Operating System Structure, Virtual Machines, Operating System Debugging, Operating System Generations. System Boot.

UNIT-II

Process: Process Concept, Process Scheduling, Operations on Processes, Inter-Process Communication, Examples of IPC Systems, Communication in Client-Server Systems. Multithreaded Programming: Multithreading Models, Thread Libraries, Threading Issues, Operating-System Examples.

UNIT-III

Process Scheduling: Basic Concepts, Scheduling Criteria, Scheduling Algorithms, Thread Scheduling. Multiple Process Scheduling. Synchronization: The Critical Section Problem, Peterson's Solution, Synchronization Hardware, Semaphores, Classical Problems of Synchronization, Monitors, Synchronization Examples, Atomic Transactions.

UNIT-IV

Deadlocks: System Model, Deadlock Characterization, Methods of Handling Deadlocks, Deadlock Prevention, Deadlock avoidance, Deadlock Detection, Recovery from Deadlock. Memory Management Strategies: Swapping, Contiguous Memory Allocation, Paging, Structure of the Page Table, Segmentation, Example: The Intel Pentium.

UNIT-V

Virtual-Memory Management: Demand Paging, Copy-on-Write, Page Replacement, Allocation of Frames, Thrashing, Memory-Mapped Files, Allocating Kernel Memory. File System: File Concept, Access Methods, Directory and Disk Structure, File-System Mounting, File Sharing, Protection.

Recommended Books:

1. A Silberschatz, P.B. Galvin, G. Gagne, Operating Systems Concepts, 8/e, John Wiley Publications 2008.
2. A.S. Tanenbaum, Modern Operating Systems, 3/e, Pearson Education 2007.
3. W. Stallings, Operating Systems, Internals & Design Principles, 5/e, Prentice Hall of India. 2008.
4. G. Nutt, Operating Systems: A Modern Perspective, 2/e, Pearson Education 1997.

C: 6-DATABASE MANAGEMENT SYSTEM**(Credit:6, Theory:4, Practical: 2)****UNIT-I**

Databases and Database Users, Database System Concepts and Architecture, Data Modelling using the Entity-Relationship (ER) Model, The Enhanced Entity-Relationship (EER) Model.

UNIT-II

Relational Model: The Relational Data Model and Relational Database Constraints, The Relational Algebra and Relational Calculus.

UNIT-III

Relational Database Design by ER- and EER-to-Relational Mapping, SQL-99: Schema Definition, Constraints, Queries, and Views, Introduction to SQL Programming Techniques.

UNIT-IV

Functional Dependencies and Normalization for Relational Databases, Relational Database Algorithms and Further Dependencies, Practical Database Design Methodology and use of UML Diagrams.

UNIT-V

Disk Storage, Basic File Structures, and Hashing, Indexing Structures for Files, Algorithms for Query Processing and Optimization, Physical Database Design and Tuning.

Recommended Books:

1. R. Elmasri, S.B. Navathe, Fundamentals of Database Systems, 6/e, Pearson Education, 2010.
2. A. Silberschatz, H.F. Korth, S. Sudarshan, Database System Concepts 6/e, McGraw Hill, 2010.
3. R. Ramakrishanan, J. Gehrke, Database Management Systems, McGraw-Hill.
4. C. Coronel, S. Morris, & P. Rob, Database Principles (Fundamentals of Design, Implementation, and Management), 9/e, Cengage Learning.

C: 7-DISCRETE STRUCTURES**(Credit:6, Theory:4, Practical: 2)**

UNIT-I Logic and Proofs: Propositional Logic, Propositional Equivalences, Predicates and Quantifiers, Nested Quantifiers, Rules of Inference, Introduction to Proofs, Normal Forms, Proof Methods and Strategy, Mathematical Induction, Strong Induction and Well-Ordering, Recursive Definitions and Structural Induction, Recursive Algorithms.

UNIT-II

Basic Structures: Sets, Set Operations, Functions, Recursive Functions, Sequences and Summations. **Relations:** Relations and their Properties, n-ary Relations and their Applications, Representing Relations, Closures of Relations, Equivalence Relations, Partial Ordering. Boolean.

UNIT-III

Algebra: Boolean Functions, Representing Boolean Functions, Logic Gates, Minimization of Circuits. Algebraic Structures & Coding Theory: The Structure of Algebras, Semi-groups, Monoids and Groups, Homomorphism, Normal Subgroups, and Congruence Relations, Rings, Integral Domains and Fields, Quotient and Product Algebras, Coding Theory. Polynomial Rings and Polynomial Codes.

UNIT-IV

Counting: Basics of Counting, The Pigeonhole Principle, Permutations and Combinations, Binomial Coefficients, Generalized Permutations and Combinations, Generating Permutations and Combinations. Advanced Counting Techniques, Applications of Inclusion-Exclusion, Discrete probability, Conditional probability, Bayes Theorem.

UNIT-V

Graphs: Graphs and Graph Models, Graph Terminology and Special Types of Graphs, Havel-Hakimi Theorem, Representing Graphs and Graph Isomorphism, Connectivity, Cut-Sets, Euler and Hamiltonian Paths, Shortest-Path Problem, Planar Graphs, Graph Coloring, Network Flows.

Recommended Books:

1. Kenneth H Rosen, Discrete Mathematics & Its Applications, McGraw-Hill. 7/e.
2. J. L. Hein, Discrete Structures, Logic, and Computability, 3rd Edition, Jones and Bartlett Publishers, 2009
3. C.L. Liu, D.P. Mahopatra, Elements of Discrete mathematics, 2nd Edition, Tata McGraw Hill, 1985
4. M. O. Albertson and J. P. Hutchinson, Discrete Mathematics with Algorithms, John Wiley Publication, 1988

GE:3-ELECTRICITY & MAGNETISM

(Credit: 06, Theory:04, Practical:02)

UNIT-I

Electric Field and Electric Potential: Electric field: Electric field lines. Electric flux. Gauss Law with applications to charge distributions with spherical, cylindrical and planar symmetry. Conservative nature of Electrostatic Field. Electrostatic Potential. Laplace and Poisson, equations. The Uniqueness Theorem. Potential and Electric Field of a dipole. Force and Torque on a dipole.

UNIT-II

Electrostatic energy of system of charges. Electrostatic energy of a charged sphere. Conductors in an electrostatic Field. Surface charge and force on a conductor. Capacitance of a system of charged conductors. Parallel-plate capacitor. Capacitance of an isolated conductor. Method of Images and its application to: (1) Plane Infinite Sheet, and (2) Sphere.

UNIT-III

Dielectric Properties of Matter: Electric Field in matter. Polarization, Polarization Charges. Electrical Susceptibility and Dielectric Constant. Capacitor (parallel plate, spherical, cylindrical) filled with dielectric. Displacement vector D. Relations between E, P and D. Gauss Law in dielectrics.

UNIT-IV

Magnetic Field: Magnetic force between current elements and definition of Magnetic Field B. Biot-Savarts Law and its simple applications: straight wire and circular loop. Current Loop as a Magnetic

Dipole and its Dipole Moment (Analogy with Electric Dipole). Amperes Circuital Law and its application to (1) Solenoid and (2) Toroid. Properties of B: curl and divergence. Vector Potential. Magnetic Force on (1) point charge (2) current carrying wire (3) between current elements. Torque on a current loop in a uniform Magnetic Field.

UNIT-V

Magnetic Properties of Matter: Magnetization vector (M). Magnetic Intensity(H). Magnetic Susceptibility and permeability. Relation between B, H, M. Ferromagnetism. B-H curve and hysteresis. Electromagnetic Induction: Faradays Law. Lenzs Law. Self Inductance and Mutual Inductance. Reciprocity Theorem. Energy stored in a Magnetic Field. Introduction to Maxwells Equations. Charge Conservation and Displacement current. Electrical Circuits: AC Circuits: Kirchhoffs laws for AC circuits. Complex Reactance and Impedance. Series LCR Circuit: (1) Resonance, (2) Power Dissipation and (3) Quality Factor, and (4) Band Width. Parallel LCR Circuit. Network theorems: Ideal Constant-voltage and Constant-current Sources. Network Theorems: Thevenin theorem, Norton theorem, Superposition theorem, Reciprocity theorem, Maximum Power Transfer theorem. Applications to dc circuits.

Recommended Books:

1. S. Mahajan & Choudhury, Electricity, Magnetism & Electromagnetic Theory, 2012, Tata McGraw Hill
2. Edward M. Purcell, Electricity and Magnetism, 1986 McGraw-Hill Education
3. M.N.O. Sadiku, Elements of Electromagnetics, 2010, Oxford University Press.
4. J.H.Fewkes & J.Yarwood , Electricity and Magnetism,. Vol. I, 1991, Oxford Univ. Press

SEMESTER-IV

C: 8-JAVA PROGRAMMING

(Credit:6, Theory:4, Practical: 2)

UNIT-I

Introduction to Java: Java Architecture and Features, Understanding the semantic and syntax differences between C++ and Java, Compiling and Executing a Java Program, Variables, Constants, Keywords **Data Types**, Operators (Arithmetic, Logical and Bitwise) and Expressions, Comments, Doing Basic Program Output, Decision Making Constructs (conditional statements and loops)and Nesting, Java Methods (Defining, Scope, Passing and Returning Arguments, Type Conversion and Type and Checking, Built-in Java Class Methods).

UNIT-II

Arrays, Strings and I/O: Creating & Using Arrays (One Dimension and Multi-dimensional), Referencing Arrays Dynamically, Java Strings: The Java String class, Creating & Using String Objects, Manipulating Strings, String Immutability & Equality, Passing Strings To & From Methods, String Buffer Classes. Simple I/O using System.out and the Scanner class, Byte and Character streams, Reading/Writing from console and files. Object-Oriented Programming Overview: Principles of Object-Oriented Programming, Defining & Using Classes, Controlling Access to Class Members, Class Constructors, Method Overloading, Class Variables & Methods, Objects as parameters, final classes, Object class, Garbage Collection.

UNIT-III

Inheritance, Interfaces, Packages, Enumerations, Autoboxing and Metadata: Inheritance: (Single Level and Multilevel, Method Overriding, Dynamic Method Dispatch, Abstract Classes), Interfaces and Packages, Extending interfaces and packages, Package and Class Visibility, Using Standard Java Packages (util, lang, io, net), **Wrapper Classes**, Autoboxing/Unboxing, Enumerations and Metadata.

UNIT-IV

Exception Handling, Threading, Networking and Database Connectivity: Exception types, uncaught exceptions, throw, built-in exceptions, Creating your own exceptions; Multi-threading: The Thread class and Runnable interface, creating single and multiple threads, Thread prioritization, synchronization and communication, suspending/resuming threads. Using java.net package, Overview of TCP/IP and Datagram programming. Accessing and manipulating databases using JDBC.

UNIT-V

Applets and Event Handling: Java Applets: Introduction to Applets, Writing Java Applets, Working with Graphics, Incorporating Images & Sounds. Event Handling Mechanisms, Listener Interfaces, Adapter and Inner Classes. The design and Implementation of GUIs using the AWT controls, Swing components of Java Foundation Classes such as labels, buttons, text fields, layout managers, menus, events and listeners; Graphic objects for drawing figures such as lines, rectangles, ovals, using different fonts. Overview of servlets.

Recommended Books:

1. E. Balagurusamy, Programming with Java, 4/e, TMH
2. Bruce Eckel, "Thinking Java", 8/e, Pearson India, 2010.
3. John R. Hubbard, "Programming with JAVA", Schaum's Series, 2/e, 2004.
4. Cay S. Horstmann, Gary Cornell, "Core Java 2 Volume 1", 9/e, Prentice Hall, 2012.

C: 9-COMPUTER NETWORK (Credit:6, Theory:4, Practical: 2)

UNIT-I

Introduction: Data Communications, Networks, The Internet, Protocols and Standards. Network Models: Layered Tasks, The OSI Model, **Layers in the OSI Model**, **TCP/ IP Protocol Suite**, **Addressing**.

UNIT-II

Data and Signals: Analog and Digital, Periodic Analog Signals, Digital Signals, Transmission Impairment, Data Rate Limits, Performance. **Digital Transmission: Digital-To-Digital Conversion, Analog-To-Digital Conversion, Transmission Modes. Analog Transmission: Digital-To-Analog Conversion, Analog-To-Analog Conversion.**

UNIT-III

Multiplexing and Spreading: Multiplexing, Spread Spectrum. **Transmission Media: Guided Media, Unguided Media (Wireless).** Switching: Circuit Switched, Datagrams, Virtual Circuit Networks, Structure of a Switch. Telephone Network, Dial-Up MODEMS, Digital Subscriber Line (DSL), Cable TV Networks, Cable TV for Data Transfer.

UNIT-IV

Error Detection and Correction: Introduction, Block Coding, Linear Block Codes, Cyclic Codes,

Checksum. Data Link Control: Framing, Flow and Error Control, Protocols, Noiseless Channels, Noisy Channels, HDLC, Point-To-Point Protocol. Multiple Access: Random Access, Controlled Access, Channelization. Wired LANs: IEEE Standards, Standard Ethernet, Changes in the Standard, Fast Ethernet, Gigabit Ethernet: Wireless LANs: IEEE 802.11, Bluetooth.

UNIT-V

Connecting LANs: Connecting Devices, Backbone Networks, Virtual LANs. Wireless LANs: Cellular Telephony, Satellite Networks. SONET: Architecture, SONET Layers, SONET Frames, STS Multiplexing, SONET Networks, Virtual Tributaries. Virtual-Circuit Networks. Frame Relay, ATM, ATM LANs,

Recommended Books:

1. B. A. Forouzan, Data Communications and Networking, 4/e, THM, 2007
2. A. S. Tanenbaum, & David J. Wetherall, Computer Networks, 5/e, Pearson

C: 10-COMPUTER GRAPHICS

(Credit:6, Theory:4, Practical: 2)

UNIT-I

Computer Graphics: A Survey of Computer graphics, Overview of Graphics System: Video Display Devices, Raster-Scan Systems, Input Devices, Hard-Copy Devices, Graphics Software, Introduction to OpenGL. Graphics Output Primitives: Point and Lines, Algorithms for line, circle & ellipse generation, Filled-Area Primitives. Attributes of Graphics Primitives: Point, line, curve attributes, fill area attributes, fill methods for areas with irregular boundaries, Antialiasing.

UNIT-II

Geometric Transformations (both 2-D & 3-D): Basic Geometric Transformations, Matrix Representation and Homogeneous Coordinates, Composite Transformations, Inverse Transformations, Other Transformations (Reflection, shear), Transformation between coordinate systems, Affine Transformations. Two Dimensional Viewing: Viewing pipeline, Clipping Window, Normalization & Viewport coordinate Transformations, Clipping Algorithms: Point clipping, Line clipping and Polygon clipping. Three Dimensional Viewing: 3-dimensional Viewing Concepts, Viewing pipeline, Projection Transformations (Orthogonal, Oblique parallel, Perspective), Clipping Algorithms.

UNIT-III

Three Dimensional Object Representations: Curved Surfaces, Quadratic Surfaces, Spline Representations, Bezier Spline Curves and Surfaces, B-Spline Curves and Surfaces, Octrees, BSP Trees, Fractal Geometry Methods, Gamma correction.

UNIT-IV

Visible Surface Detection Methods: Classification of Visible-Surface Detection Algorithms, Back-Face Detection, Depth-Buffer method, A-Buffer Method, Scan line and Depth Sorting, Area subdivision Method, Ray Casting Method.

UNIT-V

Illumination Models: Basic Illumination Models, Displaying light Intensities, Halftone Patterns and Dithering techniques, Polygon-Rendering Methods (Gouraud Shading, Phong Shading), Ray-Tracing Methods (Basic Ray-Tracing Algorithm, Ray-Surface Intersection Calculations). Computer Animation, Hierarchical Modeling (introductory idea only).

Recommended Books:

1. Donald Hearn & M. Pauline Baker, Computer Graphics with OpenGL, Pearson Education.
2. A.V. Dan, F.H. Jones, J.D. Foley, S.K. Feiner, Computer Graphics Principles & Practices in C, 2/e, Pearson.
3. D. F. Rogers, Procedural Elements for Computer Graphics, McGraw Hill.
4. D. F. Rogers, & J. A. Adams, Mathematical Elements for Computer Graphics, 2/e, McGraw Hill.

SEC: II-ANDROID PROGRAMMING**(Credit:02)****UNIT-I**

Introduction: History of Android, Introduction to Android Operating Systems, Android Development Tools, Android Architecture. Overview of object oriented programming using Java: OOPs Concepts: Inheritance, Polymorphism, Interfaces, Abstract class, Threads, Overloading and Overriding, Java Virtual Machine.

UNIT-II

Development Tools: Installing and using Eclipse with ADT plug-in, Installing Virtual machine for Android sandwich/Jelly bean (Emulator), configuring the installed tools, creating a androidproject , Hello Word, run on emulator, Deploy it on USB-connected Android device.

UNIT-III

User Interface Architecture: Application context, intents, Activity life cycle, multiple screen sizes.

UNIT-IV

User Interface Design: Form widgets, Text Fields, Layouts, Button control, toggle buttons, Spinners (Combo boxes), Images, Menu, Dialog.

UNIT-V

Database: Understanding of SQLite database, connecting with the database.

Recommended Books:

1. James C. Sheusi, Android application Development for Java Programmers, Cengage Learning, 2013.
2. M. Burton, & D. Felker, Android Application Development for Dummies, 2/e, Wiley India.

GE:IV-ELECTRONICS**(Credit: 06, Theory:04, Practical:02)****UNIT-I**

Semiconductor Diodes: P and N type semiconductors. Energy Level Diagram. Conductivity and Mobility, Concept of Drift velocity. PN Junction Fabrication (Simple Idea). Barrier Formation in PN Junction Diode. Static and Dynamic Resistance. Current. Flow Mechanism in Forward and Reverse Biased Diode. Drift Velocity. Derivation for Barrier Potential, Barrier Width and Current for Step Junction. Current Flow Mechanism in Forward and Reverse Biased Diode.

UNIT-II

Two-terminal Devices and their Applications: (1) Rectifier Diode: Half-wave Rectifiers. Centre-tapped and Bridge Full-wave Rectifiers, Calculation of Ripple Factor and Rectification Efficiency, C-filter (2) Zener Diode and Voltage Regulation. Principle and structure of (1) LEDs, (2) Photodiode

and (3) Solar Cell. Bipolar Junction Transistors: n-p-n and p-n-p Transistors. Characteristics of CB, CE and CC Configurations. Current gains α and β Relations between α and β . Load Line analysis of Transistors. DC Load line and Q-point. Physical Mechanism of Current Flow. Active, Cutoff and Saturation Regions.

UNIT-III

Amplifiers: Transistor Biasing and Stabilization Circuits. Fixed Bias and Voltage Divider Bias. Transistor as 2-port Network. h-parameter Equivalent Circuit. Analysis of a single-stage CE amplifier using Hybrid Model. Input and Output Impedance. Current, Voltage and Power Gains. Classification of Class A, B & C Amplifiers.

UNIT-IV

Coupled Amplifier: Two stage RC-coupled amplifier and its frequency response. Feedback in Amplifiers: Effects of Positive and Negative Feedback on Input Impedance, Output Impedance, Gain, Stability, Distortion and Noise. Sinusoidal Oscillators: Barkhausen's Criterion for self-sustained oscillations. RC Phase shift oscillator, determination of Frequency. Hartley & Colpitts oscillators. Operational Amplifiers (Black Box approach): Characteristics of an Ideal and Practical Op-Amp. (IC 741) Open-loop and Closed-loop Gain. Frequency Response. CMRR. Slew Rate and concept of Virtual ground.

UNIT-V

Applications of Op-Amps: (1) Inverting and non-inverting amplifiers, (2) Adder, (3) Subtractor, (4) Differentiator, (5) Integrator, (6) Log amplifier, (7) Zero crossing detector (8) Wein bridge oscillator. Conversion: Resistive network (Weighted and R-2R Ladder). Accuracy and Resolution. A/D Conversion (successive approximation)

Recommended Books:

1. J. Millman and C.C. Halkias, Integrated Electronics, 1991, Tata Mc-GrawHill.
2. J.D. Ryder, Electronics: Fundamentals and Applications, 2004, Prentice Hall.
3. B. G. Streetman & S. K. Banerjee, Solid State Electronic Devices, 6/e, 2009, PHI Learning.
4. S. Salivahanan & N. S. Kumar, Electronic Devices & Circuits, 3/e, 2012, Tata Mc-GrawHill.
5. R. A. Gayakwad, OP-Amps and Linear Integrated Circuit, 4/e, 2000, Prentice Hall.

SEMESTER-V

C: 11-INTERNET TECHNOLOGY

(Credit: 06, Theory:04, Practical:02)

UNIT-I

Java: Use of Objects, Array and Array List class

UNIT-II

JavaScript: Data types, operators, functions, control structures, events and event handling.

UNIT-III

JDBC: JDBC Fundamentals, Establishing Connectivity and working with connection interface, Working with statements, Creating and Executing SQL Statements, Working with Result Set Objects. **UNIT-IV**

JSP: Introduction to Java Server Pages, HTTP and Servlet Basics, The Problem with Servlets, The

Anatomy of a JSP Page, JSP Processing, JSP Application Design with MVC, Setting Up the JSP Environment, Implicit JSP Objects, Conditional Processing, Displaying Values, Using an expression to Set an Attribute, Declaring Variables and Methods, Error Handling and Debugging, Sharing Data Between JSP Pages, Requests, and Users, Database Access.

UNIT-V

Java Beans: Java Beans Fundamentals, JAR files, Introspection, Developing a simple Bean, Connecting to DB

Recommended Books:

1. Ivan Bayross, Web Enabled Commercial Application Development Using HTML, DHTML, Javascript, Perl CGI , BPB Publications, 2009.
2. Cay Horstmann, BIG Java, Wiley Publication , 3/e, 2009.
3. Herbert Schildt , Java 7, The Complete Reference, , 8/e, 2009.
4. Jim Keogh ,The Complete Reference J2EE, TMH, , 2002.

C: 12-SOFTWARE ENGINEERING

(Credit: 06, Theory:04, Practical:02)

UNIT-I

Professional Software Development, Software Engineering Ethics, Software Processes, Software Process Models, Process Activities, Coping with Change, The Rational Unified Process, Agile Software Development, Agile Methods, Plan-Driven and Agile Development, Extreme Programming, Agile Project Management, Scaling Agile Methods.

UNIT-II

Requirements Engineering, Functional and Non-Functional Requirements, The Software Requirements Document, Requirements Specification, Requirements Engineering Processes, Requirements Elicitation and Analysis, Requirements Validation, Requirements Management, System Modelling, Context Models, Interaction Models, Structural Models, Behavioural Models, Model-Driven, Engineering, Architectural Design, Architectural Design Decisions, Architectural Views, Architectural Patterns, Application Architectures.

UNIT-III

Design and Implementation: Object-Oriented Design using the UML, Design Patterns, Implementation Issues, Open Source Development, Software Testing: Development Testing, Test-Driven Development, Release Testing, User Testing, Software Evolution: Evolution Processes, Program Evolution Dynamics, Software Maintenance, Legacy System Management, Dependability and Security.

UNIT-IV

Socio-technical Systems: Complex Systems, Systems Engineering, System Procurement, System Development, System Operation. Dependability and Security: Dependability Properties, Availability and Reliability, Safety, Security. Dependability and Security Specification: Risk-Driven Requirements, Specification, Safety Specification, Reliability Specification, Security, Specification, Formal Specification.

UNIT-V

Dependability Engineering: Redundancy and Diversity, Dependable Processes, Dependable Systems Architectures, Dependable Programming. Security Engineering: Security Risk Management, Design

for Security, System Survivability. Dependability and Security Assurance: Static Analysis, Reliability Testing, Security Testing, Process Assurance, Safety and Dependability Cases.

Recommended Books:

1. I. Sommerville, Software Engineering, 9/e, Addison Wesley.
2. R. Mall, Fundamentals of Software Engineering, 3/e, PHI.
3. R.S. Pressman, Software Engineering, A Practitioners Approach, 7/e, McGraw-Hill, 2009.
4. K.K. Aggarwal and Y. Singh, Software Engineering, 2/e, New Age International Publishers, 2008.

**DSE:1-Information Security (Credit: 06,
Theory:04, Practical:02)**

UNIT-I

Introduction: Security, Attacks, Computer Criminals, Security Services, Security Mechanisms. Cryptography: Substitution ciphers, Transpositions Cipher, Confusion, diffusion, Symmetric, Asymmetric Encryption. DES Modes of DES, Uses of Encryption, Hash function, key exchange, Digital Signatures, Digital Certificates.

UNIT-II

Program Security: Secure programs, Non malicious Program errors, Malicious codes virus, Trap doors, Salami attacks, Covert channels, Control against program.

UNIT-III

Threats: Protection in OS: Memory and Address Protection, Access control, File Protection, User Authentication. Database Security: Requirements, Reliability, Integrity, Sensitive data, Inference, Multilevel Security.

UNIT-IV

Security in Networks: Threats in Networks, Security Controls, firewalls, Intrusion detection systems, Secure e-mails.

UNIT-V

Administrating Security: Security Planning, Risk Analysis, Organisational Security Policy, Physical Security. Ethical issues in Security: Protecting Programs and data. Information and law.

Recommended Books:

1. C. P. Pfleeger, S. L. Pfleeger; Security in Computing, PHI, 2006.
2. W. Stallings; Network Security Essentials: Applications and Standards, 4/E, 2010.

**DSE: 2-MICROPROCESSOR
(Credit: 06, Theory:04, Practical:02)**

UNIT-I

An Introduction to Processor Design: Processor architecture and organization, Abstraction in hardware design, MUO - a simple processor, Instruction set design, Processor design trade-offs, The Reduced Instruction Set Computer, Design for low power consumption. The ARM Architecture: The Acorn RISC Machine, Architectural inheritance, The ARM programmer's model, ARM development tools.

UNIT-II ARM Assembly Language Programming: Data processing instructions, Data transfer instructions, Control flow instructions, Writing simple assembly language programs. ARM Organization and Implementation: Pipeline, Types, 3-stage pipeline ARM organization, 5-stage pipeline

ARM organization, ARM instruction execution, ARM implementation, The ARM coprocessor interface.

UNIT-IIIThe ARM Instruction Set: Introduction, Exceptions, Conditional execution, Branch and Branch with Link (B, BL), Branch, Branch with Link and exchange (BX, BLX), Software Interrupt (SWI), Data processing instructions, Multiply instructions, Single word and unsigned byte data transfer instructions, Half-word and signed byte data transfer instructions, Multiple register transfer instructions, Status register to general register transfer instructions, General register to status register transfer instructions, Coprocessor instructions. Coprocessor data operations, Coprocessor data transfers, Coprocessor register transfers, Breakpoint instruction (BRK - architecture v5T only), Unused instruction space, Memory faults, ARM architecture variants.

UNIT-IV

Architectural Support for High-Level Languages: Abstraction in software design, Data types, Floating-point data types, The ARM floating-point architecture, Expressions, Conditional statements, Loops, Functions and procedures, Use of memory, Run-time environment, Examples and exercises.

UNIT-V

Thumb Instruction Set: The Thumb bit in the CPSR, The Thumb programmer's model, Thumb branch instructions, Thumb software interrupt instruction, Thumb data processing instructions, Thumb single register data transfer instructions, Thumb multiple register data transfer instructions, Thumb breakpoint instruction, Thumb implementation, Thumb applications. Architectural Support for System Development: The ARM memory interface, The Advanced Microcontroller Bus Architecture (AMBA), The ARM reference peripheral specification, Hardware system prototyping tools, The ARMulator.

Recommended Books:

Steve Furber :ARM System-On-Chip Architecture.

SEMESTER-VI

C: 13-ARTIFICIAL INTELLIGENCE (Credit: 06, Theory:04, Practical:02)

UNIT-I

Intelligent Agents, Solving problems by searching, Uninformed search strategies (BFS, DFS, DLS, IDS, BD and Uniform cost search), Informed search and exploration (Greedy Best first, A* and its variations) Constraint satisfaction Problems, Adversarial search (Alpha-beta pruning).

UNIT-II

Knowledge and reasoning, logical agent (Wumpus world), Propositional logic, First order logic, Inference in first order logic (Forward chaining, backward chaining, Resolution), Knowledge representation.

UNIT-III

Planning, Partial-Order planning, Planning Graphs, Planning and acting in the real world, Uncertain knowledge and reasoning.

UNIT-IV

Learning from Observations, Decision trees, Neural network (Multilayer), Reinforcement Learning.

UNIT-V

NLP, Communication, A formal grammar for a fragment of English, Syntactic analysis (chat parsing), semantic Interpretation, Ambiguity of grammar, Machine Translation.

Recommended Books:

1. Stuart Russell and Peter Norvig, ARTIFICIAL INTELLIGENCE A MODERN APPROACH, 2/e, PHI.
2. D.W. Patterson, Introduction to A.I and Expert Systems, PHI, 2007.

3. Rich & Knight, Artificial Intelligence, 2/e, Tata McGraw Hill, 1991.

C:14-DESIGN AND ANALYSIS OF ALGORITHMS

(Credit: 06, Theory:04, Practical:02)

UNIT-I

Analysis and Design of Algorithm (Case study insertion sort and merge sort) Asymptotic Analysis, Divide and Conquer, Recurrence Relations, Strassen's Matrix Multiplication.

UNIT-II

Sorting: Quick sort, heap sort, Counting sort, lower bound for sorting, Randomized quicksort, Order Statistics.

UNIT-III

Amortized Analysis (Aggregate analysis, Accounting analysis, Potential analysis), 2-3-4 tree Advanced Data structure: Fibonacci heap, Red black tree, hashing, data structure on disjoint set, Scicinet Data Structure.

UNIT-IV

Dynamic Programming: Matrix Chain multiplication, LCS, TSP, Branch and Bound. Greedy Algorithm: MST: Kruskal, Prim's, Dijkstra Algorithm, Huffman Coding, Maxflow matching, Computational geometry: Convex Hull, 0-1-knapsack, fractional knapsack, Backtracking (4-Queen Prob.) **UNIT-V**
Complexity Class: P, PSPACE, NP, NP-Hard, NP Complete, Satisfiability, Chequer, Vertex Cover, Independent set, Exact cover, Graph Coloring, Hamiltonian, Cycle Matching. Approximation Algorithm: Vertex Cover, TSP, Independent Set, Sum of subset.

Recommended Books:

1. T.H. Cormen, Charles E. Leiserson, Ronald L. Rivest, Clifford Stein Introduction to Algorithms, PHI, 3/e, 2009.
2. Sarabasse & A.V. Gelder Computer Algorithm, Introduction to Design and Analysis, Pearson 3/e, 1999.
3. E. Horowitz, S. Sahni, & S. Rajasekaran, Fundamentals of Computer Algorithms, 2/e, University Press.
4. A.V. Aho, J.E. Hopcroft, & J.D. Ullman, The Design and Analysis of Computer Algorithm, Pearson.

DSE:3-CLOUD COMPUTING
(Credit: 06, Theory:04, Practical:02)

Unit - I

Overview of Computing Paradigm: Recent trends in Computing: Grid Computing, Cluster Computing, Distributed Computing, Utility Computing, Cloud Computing. Introduction to Cloud Computing: Introduction to Cloud Computing, History of Cloud Computing, Cloud service providers, Benefits and limitations of Cloud Computing.

UNIT-II

Cloud Computing Architecture: Comparison with traditional computing architecture (client/server), Services provided at various levels, Service Models- Infrastructure as a Service (IaaS), Platform as a Service (PaaS), Software as a Service (SaaS), How Cloud Computing Works, Deployment, Models- Public cloud, Private cloud, Hybrid cloud, Community cloud, Case study of NIST architecture.

UNIT-III

Case Studies: Case Study of Service, Model using Google App Engine, Microsoft Azure, Amazon EC2, Eucalyptus.

UNIT-IV

Service Management in Cloud Computing, Service Level Agreements (SLAs), Billing & Accounting, Comparing Scaling Hardware: Traditional vs. Cloud, Economics of Scaling.

UNIT-V

Cloud Security: Infrastructure Security- Network level security, Host level security, Application level security, Data security and Storage- Data privacy and security Issues, Jurisdictional issues raised by Data location, Authentication in Cloud Computing.

Recommended Books:

1. Barrie Sosinsky, Cloud Computing Bible, Wiley-India, 2010.
2. Rajkumar Buyya, James Broberg, Andrzej, M. Goscinski, Cloud Computing Principles & Paradigms, Wiley-2011.
3. Nikos Antonopoulos, Lee Gillam, Cloud Computing: Principles, Systems and Applications, Springer, 2012.
4. Ronald L. Krutz, Russell Dean Vines, Cloud Security: A Comprehensive Guide to Secure Cloud Computing, Wiley-India, 2010.
5. Toby Velte, Anthony Velte, Robert Elsenpeter, Cloud Computing, A Practical Approach, Mc- Graw Hills, 2010.
6. Dimitris N. Chorafas, Cloud Computing Strategies, CRC Press, 2010.

DSE:4-PROJECT WORK(Credit: 06)

ELECTRONICS

CC 1: Basic Circuit Theory and Network Analysis (Credits: Theory-04, Practicals-02)

Theory Lectures 60

Unit- 1 (13 Lectures)

Basic Circuit Concepts: Voltage and Current Sources, Resistors: Fixed and Variable resistors, Construction and Characteristics, Color coding of resistors, resistors in series and parallel. Inductors: Fixed and Variable inductors, Self and mutual inductance, Faraday's law and Lenz's law of electromagnetic induction, Energy stored in an inductor, Inductance in series and parallel, Testing of resistance and inductance using multimeter. Capacitors: Principles of capacitance, Parallel plate capacitor, Permittivity, Definition of Dielectric Constant, Dielectric strength, Energy stored in a capacitor, Air, Paper, Mica, Teflon, Ceramic, Plastic and Electrolytic capacitor, Construction and application, capacitors in series and parallel, factors governing the value of capacitors, testing of capacitors using multimeter.

Unit- 2 (13 Lectures)

Circuit Analysis: Kirchhoff's Current Law (KCL), Kirchhoff's Voltage Law (KVL), Node Analysis, Mesh Analysis, Star-Delta Conversion. **DC Transient Analysis:** RC Circuit- Charging and discharging with initial charge, RL Circuit with Initial Current, Time Constant, RL and RC Circuits With Sources, DC Response of Series RLC Circuits.

Unit-3 (18 Lectures)

AC Circuit Analysis: Sinusoidal Voltage and Current, Definition of Instantaneous, Peak, Peak to Peak, Root Mean Square and Average Values. Voltage-Current relationship in Resistor, Inductor and Capacitor, Phasor, Complex Impedance, Power in AC Circuits: Instantaneous Power, Average Power, Reactive Power, Power Factor. Sinusoidal Circuit Analysis for RL, RC and RLC Circuits. Resonance in Series and Parallel RLC Circuits, Frequency Response of Series and Parallel RLC Circuits, Quality (Q) Factor and Bandwidth. Passive Filters: Low Pass, High Pass, Band Pass and Band Stop.

Unit-4 (16 Lectures)

Network Theorems: Principal of Duality, Superposition Theorem, Thevenin's Theorem, Norton's Theorem, Reciprocity Theorem, Millman's Theorem, Maximum Power Transfer Theorem. AC circuit analysis using Network theorems. Two Port Networks: Impedance (Z) Parameters, Admittance (Y) Parameters, Transmission (ABCD) Parameters.

Suggested books:

1. S. A. Nasar, Electric Circuits, Schaum's outline series, Tata McGraw Hill (2004)
2. Electrical Circuits, M. Nahvi and J. Edminister, Schaum's Outline Series, Tata McGraw-Hill.(2005)
3. Robert L. Boylestad,

Essentials of Circuit Analysis, Pearson Education (2004) 4. W. H. Hayt, J. E. Kemmerly, S. M. Durbin, Engineering Circuit Analysis, Tata McGraw Hill(2005) 5. Alexander and M. Sadiku, Fundamentals of Electric Circuits, McGraw Hill (2008)

Basic Circuit Theory and Network Analysis Lab (Hardware and Circuit Simulation Software) 60 Lectures

1. Familiarization with a) Resistance in series, parallel and series – Parallel. b) Capacitors & Inductors in series & Parallel. c) Multimeter – Checking of components. d) Voltage sources in series, parallel and series – Parallel e) Voltage and Current dividers
2. Measurement of Amplitude, Frequency & Phase difference using CRO. 3. Verification of Kirchoff's Law. 4. Verification of Norton's theorem. 5. Verification of Thevenin's Theorem. 6. Verification of Superposition Theorem. 7. Verification of the Maximum Power Transfer Theorem. 8. RC Circuits: Time Constant, Differentiator, Integrator. 9. Designing of a Low Pass RC Filter and study of its Frequency Response. 10. Designing of a High Pass RC Filter and study of its Frequency Response. 11. Study of the Frequency Response of a Series LCR Circuit and determination of its (a) Resonant Frequency (b) Impedance at Resonance (c) Quality Factor Q (d) Band Width.

CC 2: Mathematics Foundation for Electronics (Credits: Theory-04, Practicals-02)

Theory Lectures
60

Unit-1 (16 Lectures)

Ordinary Differential Equations: First Order Ordinary Differential Equations, Basic Concepts, Separable Ordinary Differential Equations, Exact Ordinary Differential Equations, Linear Ordinary Differential Equations. Second Order homogeneous and non-homogeneous Differential Equations. **Series solution of differential equations and special functions:** Power series method, Legendre Polynomials, Frobenius Method, Bessel's equations and Bessel's functions of first and second kind. Error functions and gamma function.

Unit-2 (14 Lectures)

Matrices: Introduction to Matrices, System of Linear Algebraic Equations, Gaussian Elimination Method, Gauss-Seidel Method, LU decomposition, Solution of Linear System by LU decomposition. Eigen Values and Eigen Vectors, Linear Transformation, Properties of Eigen Values and Eigen Vectors, Cayley-Hamilton Theorem, Diagonalization, Powers of a Matrix. Real and Complex Matrices, Symmetric, Skew Symmetric, Orthogonal Quadratic Form, Hermitian, Skew Hermitian, Unitary Matrices.

Unit-3 (14 Lectures)

Sequences and series: Sequences, Limit of a sequence, Convergence, Divergence and Oscillation of a sequence, Infinite series, Necessary condition for Convergence, Cauchy's Integral Test, D'Alembert's Ratio Test, Cauchy's nth Root Test, Alternating Series, Leibnitz's Theorem, Absolute Convergence and Conditional Convergence, Power Series.

Unit-4 (16 Lectures)

Complex Variables and Functions: Complex Variable, Complex Function, Continuity, Differentiability, Analyticity. Cauchy-Riemann (C- R) Equations, Harmonic and Conjugate Harmonic Functions, Exponential Function, Trigonometric Functions, Hyperbolic Functions. Line Integral in Complex Plane, Cauchy's Integral Theorem, Cauchy's Integral Formula, Derivative of Analytic Functions. Sequences, Series and Power Series, Taylor's Series, Laurent Series, Zeroes and Poles. Residue integration method, Residue integration of real Integrals.

Suggested Books

1. E. Kreyszig, advanced engineering mathematics, Wiley India (2008)
2. Murray Spiegel, Seymour Lipschutz, John Schiller, Outline of Complex Variables, Schaum Outline Series, Tata McGraw Hill (2007)
3. R. K. Jain, and S.R.K. Iyengar, Advanced Engineering Mathematics, Narosa Publishing House (2007)
4. C .R. Wylie and L. C. Barrett, Advanced Engineering Mathematics, Tata McGraw-Hill (2004)
5. B. V. Ramana, Higher Engineering Mathematics, Tata McGraw Hill Publishing Company Limited (2007)

Mathematics Foundation for Electronics Lab (Scilab/MATLAB/ any other Mathematical Simulation software) 60 Lectures

1. Solution of First Order Differential Equations
2. Solution of Second Order homogeneous Differential Equations
3. Solution of Second Order non-homogeneous Differential Equations
4. Convergence of a given series.
5. Divergence of a given series.
6. Solution of linear system of equations using Gauss Elimination method.
7. Solution of linear system of equations using Gauss – Seidel method.
8. Solution of linear system of equations using L-U decomposition method.

CC 3: Semiconductor Devices (Credits: Theory-04, Practicals-02)

Theory

Lectures 60 Unit 1 (14 Lectures)

Semiconductor Basics: Introduction to Semiconductor Materials, Crystal Structure, Planes and Miller Indices, Energy Band in Solids, Concept of Effective Mass, Density of States, Carrier Concentration at Normal Equilibrium in Intrinsic Semiconductors, Derivation of Fermi Level for Intrinsic & Extrinsic Semiconductors, Donors, Acceptors, Dependence of Fermi Level on Temperature and Doping Concentration,

Temperature Dependence of Carrier Concentrations. Carrier Transport Phenomena: Carrier Drift, Mobility, Resistivity, Hall Effect, Diffusion Process, Einstein Relation, Current Density Equation, Carrier Injection, Generation And Recombination Processes, Continuity Equation.

Unit 2 (14 Lectures)

P-N Junction Diode: Formation of Depletion Layer, Space Charge at a Junction, Derivation of Electrostatic Potential Difference at Thermal Equilibrium, Depletion Width and Depletion Capacitance of an Abrupt Junction. Concept of Linearly Graded Junction, Derivation of Diode Equation and I-V Characteristics. Zener and Avalanche Junction Breakdown Mechanism. Tunnel diode, varactor diode, solar cell: circuit symbol, characteristics, applications

Unit 3 (14 Lectures)

Bipolar Junction Transistors (BJT): PNP and NPN Transistors, Basic Transistor Action, Emitter Efficiency, Base Transport Factor, Current Gain, Energy Band Diagram of Transistor in Thermal Equilibrium, Quantitative Analysis of Static Characteristics (Minority Carrier Distribution and Terminal Currents), Base- Width Modulation, Modes of operation, Input and Output Characteristics of CB, CE and CC Configurations. Metal Semiconductor Junctions: Ohmic and Rectifying Contacts.

Unit 4 (18 Lectures)

Field Effect Transistors: JFET, Construction, Idea of Channel Formation, Pinch-Off and Saturation Voltage, Current-Voltage Output Characteristics. MOSFET, types of MOSFETs, Circuit symbols, Working and Characteristic curves of Depletion type MOSFET (both N channel and P Channel) and Enhancement type MOSFET (both N channel and P channel). Complimentary MOS (CMOS). **Power Devices:** UJT, Basic construction and working, Equivalent circuit, intrinsic Standoff Ratio, Characteristics and relaxation oscillator-expression. SCR, Construction, Working and Characteristics, Triac, Diac, IGBT, MESFET, Circuit symbols, Basic constructional features, Operation and Applications.

Suggested Books:

- 1) S. M. Sze, Semiconductor Devices: Physics and Technology, 2nd Edition, Wiley India edition (2002).
- 2) Ben G Streetman and S. Banerjee, Solid State Electronic Devices, Pearson Education (2006)
- 3) Dennis Le Croisette, Transistors, Pearson Education (1989)
- 4) Jasprit Singh, Semiconductor Devices: Basic Principles, John Wiley and Sons (2001)
- 5) Kanaan Kano, Semiconductor Devices, Pearson Education (2004)
- 6) Robert F. Pierret, Semiconductor Device Fundamentals, Pearson Education (2006)

Semiconductor Devices Lab (Hardware and Circuit Simulation Software) 60 Lectures

1. Study of the I-V Characteristics of Diode – Ordinary and Zener Diode.
2. Study of the I-V Characteristics of the CE configuration of BJT and obtain r_i , r_o , β .
3. Study of the I-V Characteristics of the

Common Base Configuration of BJT and obtain r_i, r_o, α . 4. Study of the I-V Characteristics of the Common Collector Configuration of BJT and obtain voltage gain, r_i, r_o . 5. Study of the I-V Characteristics of the UJT. 6. Study of the I-V Characteristics of the SCR. 7. Study of the I-V Characteristics of JFET. 8. Study of the I-V Characteristics of MOSFET. 9. Study of Characteristics of Solar Cell 10. Study of Hall Effect.

CC 4: Applied Physics (Credits: Theory- 04, Practicals-02)

Theory Lectures
60

Unit-1 (19 Lectures)

Quantum Physics: Inadequacies of Classical physics. Compton's effect, Photo-electric Effect, Wave-particle duality, de Broglie waves. Basic postulates and formalism of quantum mechanics: probabilistic interpretation of waves, conditions for physical acceptability of wave functions. Schrodinger wave equation for a free particle and in a force field (1 dimension), Boundary and continuity conditions. Operators in Quantum Mechanics, Conservation of probability, Time-dependent form, Linearity and superposition, Operators, Time-independent one dimensional Schrodinger wave equation, Stationary states, Eigen-values and Eigen functions. Particle in a one-dimensional box, Extension to a three dimensional box, Potential barrier problems, phenomenon of tunneling. Kronig Penney Model and development of band structure. Spherically symmetric potentials, the Hydrogen-like atom problem.

Unit-2 (11 Lectures)

Mechanical Properties of Materials: Elastic and Plastic Deformations, Hooke's Law, Elastic Moduli, Brittle and Ductile Materials, Tensile Strength, Theoretical and Critical Shear Stress of Crystals. Strengthening Mechanisms, Hardness, Creep, Fatigue, Fracture.

Unit-3 (15 Lectures)

Thermal Properties: Brief Introduction to Laws of Thermodynamics, Concept of Entropy, Concept of Phonons, Heat Capacity, Debye's Law, Lattice Specific Heat, Electronic Specific Heat, Specific Heat Capacity for Si and GaAs, Thermal Conductivity, Thermoelectricity, Seebeck Effect, Thomson Effect, Peltier Effect.

Unit-4 (15 Lectures)

Electric and Magnetic Properties: Conductivity of metals, Ohm's Law, relaxation time, collision time and mean free path, electron scattering and resistivity of metals, heat developed in current carrying conductor, Superconductivity. Classification of Magnetic Materials, Origin of Magnetic moment, Origin of dia, para, ferro and antiferro magnetism and their comparison, Ferrimagnetic materials, Saturation Magnetisation and Curie temperature, Magnetic domains, Concepts of Giant Magnetic Resistance (GMR), Magnetic recording.

Suggested Books:

1. S. Vijaya and G. Rangarajan, Material Science, Tata Mcgraw Hill (2003)
2. W. E. Callister, Material Science and Engineering: An Introduction, Wiley India (2006)
3. A. Beiser, Concepts of Modern Physics , McGraw-Hill Book Company (1987)
4. A. Ghatak & S. Lokanathan, Quantum Mechanics: Theory and Applications, Macmillan India (2004)

Applied Physics

Lab 60 Lectures

1. To determine Young's modulus of a wire by optical lever method.
2. To determine the modulus of rigidity of a wire by Maxwell's needle.
3. To determine the elastic constants of a wire by Searle's method.
4. To measure the resistivity of a Ge crystal with temperature by four –probe method from room temperature to 200 °C).
5. To determine the value of Boltzmann Constant by studying forward characteristics of diode.
6. To determine the value of Planck's constant by using LEDs of at least 4 different wavelengths. 7. To determine e/m of electron by Bar Magnet or by Magnetic Focusing.

CC 5: Electronics Circuits (Credits: Theory-04, Practicals-02)

Unit- 1 (14 Lectures)

Theory Lectures 60

Diode Circuits: Ideal diode, piecewise linear equivalent circuit, dc load line analysis, Quiescent (Q) point. Clipping and clamping circuits. Rectifiers: HWR, FWR (center tapped and bridge). Circuit diagrams, working and waveforms, ripple factor & efficiency, comparison. Filters: types, circuit diagram and explanation of shunt capacitor filter with waveforms. Zener diode regulator circuit diagram and explanation for load and line regulation, disadvantages of Zener diode regulator.

Unit- 2 (15 Lectures)

Bipolar Junction Transistor: Review of CE, CB Characteristics and regions of operation. Hybrid parameters. Transistor biasing, DC load line, operating point, thermal runaway, stability and stability factor, Fixed bias without and with RE, collector to base bias, voltage divider bias and emitter bias (+VCC and –VEE bias), circuit diagrams and their working. Transistor as a switch, circuit and working, Darlington pair and its applications. BJT amplifier (CE), dc and ac load line analysis, hybrid model of CE configuration, Quantitative study of the frequency response of a CE amplifier, Effect on gain and bandwidth for Cascaded CE amplifiers (RC coupled).

Unit- 3 (13 Lectures)

Feedback Amplifiers: Concept of feedback, negative and positive feedback, advantages and disadvantages of negative feedback, voltage (series and shunt), current (series and shunt) feedback amplifiers, gain, input and output impedances. Barkhausen criteria for oscillations, Study of phase shift oscillator, Colpitts oscillator and Hartley oscillator.

Unit- 4 (18 Lectures)

MOSFET Circuits: Review of Depletion and Enhancement MOSFET, Biasing of MOSFETs, Small Signal Parameters, Common Source amplifier circuit analysis, CMOS circuits. **Power Amplifiers:** Difference between voltage and power amplifier, classification of power amplifiers, Class A, Class B, Class C and their comparisons. Operation of a Class A single ended power amplifier. Operation of Transformer coupled Class A power amplifier, overall efficiency. Circuit operation of complementary symmetry Class B push pull power amplifier, crossover distortion, heat sinks. **Single tuned amplifiers:** Circuit diagram, Working and Frequency Response for each, Limitations of single tuned amplifier, Applications of tuned amplifiers in communication circuits.

Suggested Books:

1. Electronic Devices and circuit theory, Robert Boylestad and Louis Nashelsky, 9th Edition, 2013, PHI
2. Electronic devices, David A Bell, Reston Publishing Company
3. D. L. Schilling and C. Belove, Electronic Circuits: Discrete and Integrated, Tata McGraw Hill (2002)
4. Donald A. Neamen, Electronic Circuit Analysis and Design, Tata McGraw Hill (2002)
5. J. Millman and C. C. Halkias, Integrated Electronics, Tata McGraw Hill (2001)
6. J. R. C. Jaegar and T. N. Blalock, Microelectronic Circuit Design, Tata McGraw Hill (2010)
7. J. J. Cathey, 2000 Solved Problems in Electronics, Schaum's outline Series, Tata McGraw Hill (1991)
8. Allen Mottershed, Electronic Devices and Circuits, Goodyear Publishing Corporation

Simulation Software) 60 Lectures

1. Study of the half wave rectifier and Full wave rectifier.
2. Study of power supply using C filter and Zener diode.
3. Designing and testing of 5V/9 V DC regulated power supply and find its load-regulation
4. Study of clipping and clamping circuits .
5. Study of Fixed Bias, Voltage divider and Collector-to-Base bias Feedback configuration for transistors.
6. Designing of a Single Stage CE amplifier.
7. Study of Class A, B and C Power Amplifier.
8. Study of the Colpitt's Oscillator.
9. Study of the Hartley's Oscillator.
10. Study of the Phase Shift Oscillator
11. Study of the frequency response of Common Source FET amplifier.

CC 6: Digital Electronics and Verilog/VHDL (Credits: Theory-04, Practicals-02)

Theory Lectures
60

Unit-1 (11 Lectures)

Number System and Codes: Decimal, Binary, Hexadecimal and Octal number systems, base conversions, Binary, octal and hexadecimal arithmetic (addition, subtraction by complement method, multiplication), representation of signed and unsigned numbers, Binary Coded Decimal code. **Logic Gates and Boolean algebra:** Introduction to Boolean Algebra and Boolean operators, Truth Tables of OR, AND, NOT, Basic postulates and fundamental theorems of Boolean algebra, Truth tables, construction and symbolic representation of XOR, XNOR, Universal (NOR and NAND) gates. **Digital Logic families:** Fan-in, Fan out, Noise Margin, Power Dissipation, Figure of merit, Speed power product, TTL and CMOS families and their comparison.

Unit-2 (13 Lectures)

Combinational Logic Analysis and Design: Standard representation of logic functions (SOP and POS), Karnaugh map minimization, Encoder and Decoder, Multiplexers and Demultiplexers, Implementing logic functions with multiplexer, binary Adder, binary subtractor, parallel adder/subtractor.

Unit-3 (18 Lectures)

Sequential logic design: Latches and Flip flops , S-R Flip flop, J-K Flip flop, T and D type Flip flop, Clocked and edge triggered Flip flops, master slave flip flop, Registers, Counters (synchronous and asynchronous and modulo-N), State Table, State Diagrams, counter design using excitation table and equations. , Ring counter

and Johnson counter. **Programmable Logic Devices:** Basic concepts- ROM, PLA, PAL, CPLD, FPGA

Unit-4 (18 Lectures)

Introduction to Verilog: A Brief History of HDL, Structure of HDL Module, Comparison of VHDL and Verilog, Introduction to Simulation and Synthesis Tools, Test Benches. Verilog Modules, Delays, data flow style, behavioral style, structural style, mixed design style, simulating design. Introduction to Language Elements, Keywords, Identifiers, White Space Characters, Comments, format, Integers, reals and strings.

Logic Values, Data Types-net types, undeclared nets, scalars and vector nets, Register type, Parameters. Expressions, Operands, Operators, types of Expressions **Data flow Modeling and Behavioral Modeling:** Data flow Modeling: Continuous assignment, net declaration assignments, delays, net delays. Behavioral Modeling: Procedural constructs, timing controls, block statement, procedural assignments, conditional statement, loop statement, procedural continuous assignment. **Gate level modeling** - Introduction, built in Primitive Gates, multiple input gates, Tri-state gates, pull gates, MOS switches, bidirectional switches, gate delay, array instances, implicit nets, Illustrative Examples (both combinational and sequential logic circuits).

OR

Introduction to VHDL: A Brief History of HDL, Structure of HDL Module, Comparison of VHDL and Verilog, Introduction to Simulation and Synthesis Tools, Test Benches. VHDL Modules, Delays, data flow style, behavioral style, structural style, mixed design style, simulating design. Introduction to Language Elements, Keywords, Identifiers, White Space Characters, Comments, format. VHDL terms, describing hardware in VHDL, entity, architectures, concurrent signal assignment, event scheduling, statement concurrency, structural designs, sequential behavior, process statements, process declarative region, process statement region, process execution, sequential statements, architecture selection, configuration statements, power of configurations. **Behavioral Modeling:** Introduction to behavioral modeling, inertial delay, transport delay , inertial delay model, transport delay model, transport vs inertial delay, simulation delta drivers, driver creation, generics, block statements, guarded blocks. **Sequential Processing:** Process statement, sensitivity list, signal assignment vs variable assignment, sequential statements, IF, CASE ,LOOP, NEXT, ,EXIT and ASSERT statements, assertion BNF, WAIT ON signal, WAIT UNTIL expression, WAIT FOR time expression, multiple wait conditions, WAIT Time-Out, Sensitivity List vs WAIT Statement

Concurrent Assignment, Passive Processes. **Data types:** Object types-signal, variable, constant, Data types –scalar types, composite types, incomplete types, File Type caveats, subtypes, Subprograms and functions

Suggested Books:

1. M. Morris Mano Digital System Design, Pearson Education Asia, (Fourth Edition)
2. Thomas L. Floyd, Digital Fundamentals, Pearson Education Asia (1994)
3. W. H. Gothmann, Digital Electronics: An Introduction To Theory And Practice, Prentice Hall of India(2000)
4. R. L. Tokheim, Digital Principles, Schaum's Outline Series, Tata McGraw- Hill (1994)
5. A Verilog HDL Primer – J. Bhasker, BSP, 2003 II Edition.
6. Verilog HDL-A guide to digital design and synthesis-Samir Palnitkar, Pearson, 2nd edition.

Digital Electronics and Verilog/VHDL Lab (Hardware and Circuit Simulation Software) 60 lectures

1. To verify and design AND, OR, NOT and XOR gates using NAND gates.
2. To convert a Boolean expression into logic gate circuit and assemble it using logic gate IC's.
3. Design a Half and Full Adder.
4. Design a Half and Full Subtractor.
5. Design a seven segment display driver.
6. Design a 4 X 1 Multiplexer using gates.
7. To build a Flip- Flop Circuits using elementary gates. (RS, Clocked RS, D-type).
8. Design a counter using D/T/JK Flip-Flop.
9. Design a shift register and study Serial and parallel shifting of data.

Experiments in Verlog/VHDL

1. Write code to realize basic and derived logic gates.
2. Half adder, Full Adder using basic and derived gates.
3. Half subtractor and Full Subtractor using basic and derived gates. 4. Clocked D FF, T FF and JK FF (with Reset inputs).
5. Multiplexer (4x1, 8x1) and Demultiplexer using logic gates.
6. Decoder (2x4, 3x8), Encoders and Priority Encoders.
7. Design and simulation of a 4 bit Adder. 8. Code converters (Binary to Gray and vice versa). 9. 2 bit Magnitude comparator. 10. 3 bit Ripple counter.

CC 7: C Programming and Data Structures (Credits: Theory-04, Practicals-02)

Theory Lectures
60

Unit- 1 (12 Lectures)

C Programming Language: Introduction, Importance of C, Character set, Tokens, keywords, identifier, constants, basic data types, variables: declaration & assigning values. Structure of C program Arithmetic operators, relational operators, logical operators, assignment operators, increment and decrement operators, conditional operators, bit wise operators, expressions and evaluation of expressions, type cast operator, implicit conversions, precedence of operators. Arrays-concepts, declaration, accessing elements, storing elements, two-dimensional and multi-dimensional arrays. Input output statement and library functions (math and string related functions).

Unit-2 (19 Lectures)

Decision making, branching & looping: Decision making, branching and looping: if, if-else, else-if, switch statement, break, for loop, while loop and do loop. Functions: Defining functions, function arguments and passing, returning values from functions. **Structures:** defining and declaring a structure variables, accessing structure members, initializing a structure, copying and comparing structure variables, array of structures, arrays within structures, structures within structures, structures and functions. Pointers. **Introduction to C++:** Object oriented programming, characteristics of an object-oriented language.

Unit-3 (15 Lectures)

Data Structures: Definition of stack, array implementation of stack, conversion of infix expression to prefix, postfix expressions, evaluation of postfix expression. Definition of Queue, Circular queues, Array implementation of queues. Linked List and its implementation, Link list implementation of stack and queue, Circular and doubly linked list.

Unit-4 (14 Lectures)

Searching and sorting: Insertion sort, selection sort, bubble sort, merge sort, linear Search, binary search. **Trees :** Introduction to trees, Binary search tree, Insertion and searching in a BST, preorder, postorder and inorder traversal (recursive)

Suggested Books:

1. Yashavant Kanetkar, Let Us C , BPB Publications
2. Programming in ANSI C, Balagurusamy, 2nd edition, TMH.
3. Byron S Gottfried, Programming with C , Schaum Series
4. Brian W. Kernighan, Dennis M. Ritchie, The C Programming Language, Prentice Hall
5. Yashavant Kanetkar, Pointers in C, BPB Publications
6. S. Sahni and E. Horowitz, "Data Structures", Galgotia Publications
7. Tanenbaum: "Data Structures using C", Pearson/PHI.
8. Ellis Horowitz and Sartaz Sahani "Fundamentals of Computer Algorithms", Computer Science Press.

C Programming and Data Structures Lab

60 Lectures

1. Generate the Fibonacci series up to the given limit N and also print the number of elements in the series.
2. Find minimum and maximum of N numbers.
3. Find the GCD of two integer numbers.
4. Calculate factorial of a given number.
5. Find all the roots of a quadratic equation $Ax^2 + Bx + C = 0$ for non – zero coefficients A, B and C. Else report error.
6. Calculate the value of $\sin(x)$ and $\cos(x)$ using the series. Also print $\sin(x)$ and $\cos(x)$ value using

library function.

7. Generate and print prime numbers up to an integer N.
8. Sort given N numbers in ascending order.
9. Find the sum & difference of two matrices of order MxN and PxQ.
10. Find the product of two matrices of order MxN and PxQ.
11. Find the transpose of given MxN matrix.
12. Find the sum of principle and secondary diagonal elements of the given MxN matrix.
13. Calculate the subject wise and student wise totals and store them as a part of the structure.
14. Maintain an account of a customer using classes.
15. Implement linear and circular linked lists using single and double pointers.
16. Create a stack and perform Pop, Push, Traverse operations on the stack using Linear Linked list
17. Create circular linked list having information about a college and perform Insertion at front, Deletion at end.
18. Create a Linear Queue using Linked List and implement different operations such as Insert, Delete, and Display the queue elements.
19. Implement polynomial addition and subtraction using linked lists.
20. Implement sparse matrices using arrays and linked lists.
21. Create a Binary Tree to perform Tree traversals (Preorder, Postorder, Inorder) using the concept of recursion.
22. Implement binary search tree using linked lists. Compare its time complexity over that of linear search.
23. Implement Insertion sort, Merge sort, Bubble sort, Selection sort.

CC 8: Operational Amplifiers and Applications (Credits: Theory-04, Practicals-02)

Theory Lectures
60

Unit-1 (18 Lectures)

Basic Operational Amplifier: Concept of differential amplifiers (Dual input balanced and unbalanced output), constant current bias, current mirror, cascaded differential amplifier stages with concept of level translator, block diagram of an operational amplifier (IC 741)

Op-Amp parameters: input offset voltage, input offset current, input bias current, differential input resistance, input capacitance, offset voltage adjustment range, input voltage range, common mode rejection ratio, slew rate, supply voltage rejection ratio.

Unit-2 (18 Lectures)

Op-Amp Circuits: Open and closed loop configuration, Frequency response of an op-amp in open loop and closed loop configurations, Inverting, Non-inverting, Summing and difference amplifier, Integrator, Differentiator, Voltage to current converter, Current to voltage converter. **Comparators:** Basic comparator, Level detector, Voltage limiters, Schmitt Trigger. **Signal generators:** Phase shift oscillator, Wein bridge oscillator, Square wave generator, triangle wave generator, saw tooth wave generator, and Voltage controlled oscillator(IC 566).

Unit-3 (12 Lectures)

Multivibrators (IC 555): Block diagram, Astable and monostable multivibrator circuit, Applications of Monostable and Astable multivibrators. Phase locked loops (PLL): Block diagram, phase detectors, IC565. **Fixed and variable IC regulators:** IC 78xx and IC 79xx -concepts only, IC LM317- output voltage equation

Unit-4 (12 Lectures)

Signal Conditioning circuits: Sample and hold systems, Active filters: First order low pass and high pass butterworth filter, Second order filters, Band pass filter, Band reject filter, All pass filter, Log and antilog amplifiers.

Suggested Books:

1. R. A. Gayakwad, Op-Amps and Linear IC's, Pearson Education (2003)
2. R. F. Coughlin and F. F. Driscoll, Operational amplifiers and Linear Integrated circuits, Pearson Education (2001)
3. J. Millman and C.C. Halkias, Integrated Electronics, Tata McGraw-Hill,(2001)
4. A.P.Malvino, Electronic Principals,6th Edition , Tata McGraw-Hill,(2003)
5. K.L.Kishore,OP-AMP and Linear Integrated Circuits, Pearson(2011)

Operational Amplifiers and Application Lab (Hardware and Circuit Simulation Software) 60 Lectures

1. Study of op-amp characteristics: CMRR and Slow rate.
2. Designing of an amplifier of given gain for an inverting and non-inverting configuration using an op-amp.
3. Designing of analog adder and subtractor circuit.
4. Designing of an integrator using op- amp for a given specification and study its frequency response.

5. Designing of a differentiator using op- amp for a given specification and study its frequency response.
6. Designing of a First Order Low-pass filter using op-amp.
7. Designing of a First Order High-pass filter using op-amp.
8. Designing of a RC Phase Shift Oscillator using op-amp.
9. Study of IC 555 as an astable multivibrator.
10. Study of IC 555 as monostable multivibrator.
11. Designing of Fixed voltage power supply using IC regulators using 78 series and 79 series

CC 9: Signals & Systems **(Credits: Theory-04, Practicals-02)**

Theory Lectures
60

Unit-1 (17 Lectures)

Signals and Systems: Continuous and discrete time signals, Transformation of the independent variable, Exponential and sinusoidal signals, Impulse and unit step functions, Continuous-Time and Discrete-Time Systems, Basic System Properties.

Unit-2 (13 Lectures)

Linear Time -Invariant Systems (LTI): Discrete time LTI systems, the Convolution Sum, Continuous time LTI systems, the Convolution integral. Properties of LTI systems, Commutative, Distributive, Associative. LTI systems with and without memory, Invariability, Causality, Stability, Unit Step response. Differential and Difference equation formulation, Block diagram representation of first order systems.

Unit-3 (18 Lectures)

Fourier Series Representation of Periodic Signals: Continuous-Time periodic signals, Convergence of the Fourier series, Properties of continuous-Time Fourier series, Discrete-Time periodic signals, Properties of Discrete-Time Fourier series. Frequency-Selective filters, Simple RC highpass and lowpass filters **Fourier Transform:** Aperiodic signals, Periodic signals, Properties of Continuous-time Fourier transform, Convolution and Multiplication Properties, Properties of Fourier transform and basic Fourier transform Pairs.

Unit-4 (12 Lectures)

Laplace Transform: Laplace Transform, Inverse Laplace Transform, Properties of the Laplace Transform, Laplace Transform Pairs, Laplace Transform for signals, Laplace Transform Methods in Circuit Analysis, Impulse and Step response of RL, RC and RLC circuits.

Suggested Book:

1. V. Oppenheim, A. S. Wilsky and S. H. Nawab, Signals and Systems, Pearson Education (2007)
2. S. Haykin and B. V. Veen, Signal and Systems, John Wiley & Sons (2004)
3. C. Alexander and M. Sadiku, Fundamentals of Electric Circuits , McGraw Hill (2008)
4. H. P. Hsu, Signals and Systems, Tata McGraw Hill (2007)
5. S. T. Karris, Signal and Systems: with MATLAB Computing and Simulink Modelling, Orchard Publications (2008)
6. W. Y. Young, Signals and Systems with MATLAB, Springer (2009)
7. M. Roberts, Fundamentals of Signals and Systems, Tata McGraw Hill (2007)

Signals & Systems Lab (Scilab/MATLAB/ Other Mathematical Simulation software)

60

Lectures

1. Generation of Signals: continuous time
2. Generation of Signals: discrete time
3. Time shifting and time scaling of signals.
4. Convolution of Signals
5. Solution of Difference equations.
6. Fourier series representation of continuous time signals.
7. Fourier transform of continuous time signals.
8. Laplace transform of continuous time signals.
9. Introduction to Xcos/similar function and calculation of output of systems represented by block diagram

CC 10: Electronic Instrumentation (Credits: Theory-04, Practicals- 02)

Theory Lectures
60

Unit-1 (15 Lectures)

Qualities of Measurement: Specifications of instruments, their static and dynamic characteristics, Error (Gross error, systematic error, absolute error and relative error) and uncertainty analysis. Statistical analysis of data and curve fitting. **Basic Measurement Instruments:** PMMC instrument, galvanometer, DC measurement - ammeter, voltmeter, ohm meter, AC measurement, Digital voltmeter systems (integrating and non-integrating types), digital multimeters, digital frequency meter system (different modes and universal counter). **Connectors and Probes:** low capacitance probes, high voltage probes, current probes, identifying electronic connectors – audio and video, RF/Coaxial, USB etc.

Unit-2 (15 Lectures)

Measurement of Resistance and Impedance: Low Resistance: Kelvin's double bridge method, Medium

Resistance by Voltmeter Ammeter method, Wheatstone bridge method, High Resistance by Megger. A.C. bridges, Measurement of Self Inductance, Maxwell's bridge, Hay's bridge, and Anderson's bridge, Measurement of Capacitance, Schering's bridge, DeSauty's bridge, Measurement of frequency, Wien's bridge. **A-D and D-A Conversion:** 4 bit binary weighted resistor type D-A conversion, circuit and working. Circuit of R-2R ladder. A-D conversion characteristics, successive approximation ADC. (Mention of relevant ICs for all).

Unit-3 (16 Lectures)

Oscilloscopes: CRT, wave form display and electrostatic focusing, time base and sweep synchronization, measurement of voltage, frequency and phase by CRO, Oscilloscope probes, Dual trace oscilloscope, Sampling Oscilloscope, DSO and Powerscope: Block diagram, principle and working, Advantages and applications, CRO specifications (bandwidth, sensitivity, rise time). **Signal Generators:** Audio oscillator, Pulse Generator, Function generators.

Unit-4 (14 Lectures)

Transducers and sensors: Classification of transducers, Basic requirement/characteristics of transducers, active & passive transducers, Resistive (Potentiometer, Strain gauge – Theory, types, temperature compensation and applications), Capacitive (Variable Area Type – Variable Air Gap type – Variable Permittivity type), Inductive (LVDT) and piezoelectric transducers. Measurement of displacement, velocity and acceleration (translational and rotational). Measurement of pressure (manometers, diaphragm, bellows), Measurement of temperature (RTD, thermistor, thermocouple, semiconductor IC sensors), Light transducers (photoresistors, photovoltaic cells, photodiodes).

Suggested Books:

1. H. S. Kalsi, Electronic Instrumentation, TMH(2006)
2. W.D. Cooper and A. D. Helfrick, Electronic Instrumentation and Measurement Techniques, Prentice-Hall (2005).
3. Instrumentation Measurement and analysis: Nakra B C, Chaudry K, TMH
4. E.O.Doebelin, Measurement Systems: Application and Design, McGraw Hill Book - fifth Edition(2003).
5. Joseph J Carr, Elements of Electronic Instrumentation and Measurement, Pearson Education (2005)
6. David A. Bell, Electronic Instrumentation and Measurements, Prentice Hall (2013).
7. Oliver and Cage, "Electronic Measurements and Instrumentation", TMH (2009).
8. Alan S. Morris, "Measurement and Instrumentation Principles", Elsevier (Buterworth Heinmann- 2008).
9. A. K Sawhney, Electrical and Electronics Measurements and Instrumentation, DhanpatRai and Sons (2007).
10. C. S. Rangan, G. R. Sarma and V. S. Mani, Instrumentation Devices and Systems, Tata Mcgraw Hill (1998).

Electronic Instrumentation Lab 60 Lectures

1. Design of multi range ammeter and voltmeter using galvanometer.
2. Measurement of resistance by Wheatstone bridge and measurement of bridge sensitivity.
3. Measurement of Capacitance by de'Sautys.

4. Measure of low resistance by Kelvin's double bridge.
5. To determine the Characteristics of resistance transducer - Strain Gauge (Measurement of Strain using half and full bridge.)
6. To determine the Characteristics of LVDT.
7. To determine the Characteristics of Thermistors and RTD.
8. Measurement of temperature by Thermocouples and study of transducers like AD590 (two terminal temperature sensor), PT-100, J- type, K-type.
9. To study the Characteristics of LDR, Photodiode, and Phototransistor:Variable Illumination. (ii) Linear Displacement.
10. Characteristics of one Solid State sensor/ Fiber optic sensor

CC 11: Microprocessor and Microcontrollers (Credits: Theory- 04, Practicals-02)

Theory Lectures
60

Unit-1 (18 Lectures)

Introduction to Microprocessor: Introduction, Applications, Basic block diagram, Speed, Word size, Memory capacity, Classification of microprocessors (mention of different microprocessors being used) **Microprocessor 8085:** Features, Architecture -block diagram, General purpose registers, register pairs, flags, stack pointer, program counter, types of buses. Multiplexed address and data bus, generation of control signals, pin description of microprocessor 8085. Basic interfacing concepts, Memory mapped I/O and I/O mapped I/O. **8085 Instructions:** Operation code, Operand & Mnemonics. Instruction set of 8085, instruction classification, addressing modes, instruction format. Data transfer instructions, arithmetic instructions, increment & decrement instructions, logical instructions, branch instructions and machine control instructions. Assembly language programming examples.

Unit-2 (10 Lectures)

Stack operations, subroutine, call and return instructions. Delay loops, use of counters, timing diagrams-instruction cycle, machine cycle, T- states, time delay. Interrupt structure of 8085A microprocessor, processing of vectored and non-vectored interrupts, latency time and response time; Handling multiple interrupts

Microcontrollers: Introduction, different types of microcontrollers, embedded microcontrollers, processor architectures. Harvard vs. Princeton, CISC vs. RISC architectures, microcontroller memory types, microcontroller features, clocking, I/O pins, interrupts, timers, peripherals.

Unit-3 (18 Lectures)

PIC16F887 Microcontroller: Core features, Architecture, pin diagram, memory organization- Program and data memory organization, I/O Ports, oscillator module, Timer modules (Timer 0, Timer 1 and Timer 2), comparator module, analog-to-digital converter (ADC) module, data EEPROM, Enhanced capture/compare/PWM module, EUSART, master synchronous serial port (MSSP) module, special features of the CPU, interrupts, addressing modes, instruction set.

Unit-4 (14 Lectures)

Interfacing to PIC16F887: LED, Switches, Solid State Relay, Seven Segment Display, 16x2 LCD display, 4x4 Matrix Keyboard, Digital to Analog Converter, Stepper Motor and DC Motor. Interfacing program examples using C language.

Suggested Books:

1. Microprocessor Architecture, Programming and Applications with 8085, Ramesh S.Gaonkar - Wiley Eastern Limited- IV Edition.
2. Fundamentals of Microprocessor & Microcomputer: B. Ram—Danpat Rai Publications.
3. Microchip PIC16F87X datasheet
4. PIC Microcontrollers, Milan Verle, , mikro Elektronika, 1st edition (2008)
5. Muhammad Ali Mazidi, "Microprocessors and Microcontrollers", Pearson, 2006

Microprocessor and Microcontrollers Lab 60 Lectures 8085 Assembly language programs:

1. Program to transfer a block of data.
2. Program for multibyte addition
3. Program for multibyte subtraction
4. Program to multiply two 8-bit numbers.
5. Program to divide a 16 bit number by 8 bit number.
6. Program to search a given number in a given list.
7. Program to generate terms of Fibonacci series.
8. Program to find minimum and maximum among N numbers
9. Program to find the square root of an integer.
10. Program to find GCD of two numbers.
11. Program to sort numbers in ascending/descending order.
12. Program to verify the truth table of logic gates.

PIC Microcontroller Programming Note: Programs to be written using C programming language

1. LED blinking with a delay of 1 second.
2. Solid State Relay Interface
2. Interfacing of LCD (2X16).
3. Interfacing of stepper motor and Rotating stepper motor by N steps clockwise/anticlockwise with

speed control.

4. To test all the gates of a given IC74XX is good or bad.
5. Generate sine, square, saw tooth, triangular and staircase waveform using DAC interface.
6. Display of 4-digit decimal number using the multiplexed 7-segment display interface.
7. Analog to digital conversion using internal ADC and display the result on LCD.
8. Implementation of DC-Volt meter (0-5V) using internal ADC and LCD
9. Digital to analog conversion using PWM (pulse delay to be implemented using timers).
10. Speed control of DC motor using PWM (pulse delay to be implemented using timers).
11. Interfacing of matrix keyboard (4X4).
12. Serial communication between microcontroller and PC.

CC 12: Electromagnetics (Credits: Theory-04, Practicals-02)

Theory Lectures 60

Unit-1 (16 Lectures)

Vector Analysis: Scalars and Vectors, Vector Algebra, Rectangular (Cartesian) Coordinate System, Vector

Components and Unit Vector, Vector Field, Products, Cylindrical Coordinates, Spherical Coordinates, Differential Length, Area and Volume, Line Surface and Volume integrals, Del Operator, Gradient of a Scalar, Divergence and Curl of a Vector, the Laplacian. **Electrostatic Fields:** Coulomb's Law and Electric Field, Field due to Discrete and Continuous Charge Distributions, Electric Flux Density, Gauss's Law and Applications, Divergence Theorem and Maxwell's First Equation. Electric Potential, Potential due to a Charge and Charge distribution, Electric dipole. Electric Fields in Conductors, Current and Current Density, Continuity of Current, Metallic Conductor Properties and Boundary Conditions, Method of Images. Dielectric materials, Polarization, Dielectric Constant, Isotropic and Anisotropic dielectrics, Boundary conditions, Capacitance and Capacitors. Electrostatic Energy and Forces.

Unit- 2 (14 Lectures)

Poisson's Equation and Laplace's Equation: Derivation of Poisson's and Laplace's equation, Uniqueness Theorem, Examples of Solution of Laplace's Equation: Cartesian, Cylindrical and Spherical Coordinates.

Magnetostatics: Biot Savart's law and Applications, Magnetic dipole, Ampere's Circuital Law, Curl and Stoke's Theorem, Maxwell's Equation, Magnetic Flux and Magnetic Flux Density, Scalar and Vector Magnetic Potentials. Magnetization in Materials and Permeability, Anisotropic materials, Magnetic Boundary Conditions, Inductors and Inductances, Magnetic Energy, Magnetic Circuits. Inductances and Inductors, Magnetic Energy, Forces and Torques.

Unit-3 (13 Lectures)

Time-Varying Fields and Maxwell's Equations: Faraday's Law of Electromagnetic Induction, Stationary Circuit in Time-Varying Magnetic Field, Transformer and Motional EMF, Displacement Current, Maxwell's Equations in differential and integral form and Constitutive Relations. Potential Functions, Lorentz gauge and the Wave Equation for Potentials, Concept of Retarded Potentials. Electromagnetic Boundary Conditions. Time-Harmonic Electromagnetic Fields and use of Phasors

Unit-4 (17 Lectures)

Electromagnetic Wave Propagation: Time-Harmonic Electromagnetic Fields and use of Phasors, the Electromagnetic Spectrum, Wave Equation in a source free isotropic homogeneous media, Uniform Plane Waves in Lossless and Lossy unbounded homogeneous media, Wave Polarization, Phase and Group velocity, Flow of Electromagnetic Power and Poynting Vector. Uniform Plane wave incident on a Plane conductor boundary, concept of reflection and standing wave. **Guided Electromagnetic Wave Propagation:** Waves along Uniform Guiding Structures, TEM, TE and TM waves, Electromagnetic Wave Propagation in Parallel Plate and Rectangular Metallic Waveguides.

Suggested Books:

1. Murray. R. Spiegel, Vector Analysis, Schaum series, Tata McGraw Hill (2006)
2. M. N. O. Sadiku, Elements of Electromagnetics, Oxford University Press (2001)
3. W. H. Hayt and J. A. Buck, Engineering Electromagnetics, Tata McGraw Hill (2006)
4. D. C. Cheng, Field and Wave Electromagnetics, Pearson Education (2001)
5. J. A. Edminster, Electromagnetics, Schaum Series, Tata McGraw Hill (2006)
6. N. Narayan Rao, Elements of Engineering Electromagnetics, Pearson Education (2006)

7. Introduction to Electrodynamics, D.J. Griffiths, Pearson Education (2012)
8. Electromagnetic Wave and Radiating System, Jordan and Balmain, Prentice Hall (1979)

Electromagnetics Lab (using Scilab/ any other similar freeware) **60 Lectures**

1. Understanding and Plotting Vectors.
2. Transformation of vectors into various coordinate systems.
3. 2D and 3D Graphical plotting with change of view and rotation.
4. Representation of the Gradient of a scalar field, Divergence and Curl of Vector Fields.
5. Plots of Electric field and Electric Potential due to charge distributions.
6. Plots of Magnetic Flux Density due to current carrying wire.
7. Programs and Contour Plots to illustrate Method of Images
8. Solutions of Poisson and Laplace Equations – contour plots of charge and potential distributions
9. Introduction to Computational Electromagnetics: Simple Boundary Value Problems by FiniteDifference/Finite Element Methods.

**CC 13: Communication
Electronics (Credits: Theory-04,
Practicals- 02)**

**Theory Lectures
60**

Unit-1 (10 Lectures)

Electronic communication: Block diagram of an electronic communication system, electromagnetic spectrum-band designations and applications, need for modulation, concept of channels and base-band signals. Concept of Noise, Types of Noise, Signal to noise ratio, Noise Figure, Noise Temperature, Friss formula.

Unit-2 (20 Lectures)

Amplitude Modulation: Amplitude Modulation, modulation index and frequency spectrum. Generation of AM, Amplitude Demodulation (diode detector), Concept of Double side band suppressed carrier, Single side band suppressed carrier, other forms of AM (Pilot Carrier Modulation, Vestigial Side Band modulation, Independent Side Band Modulation). Block diagram of AM Transmitter and Receiver

Angle modulation: Frequency and Phase modulation, modulation index and frequency spectrum, equivalence between FM and PM, Generation of FM (direct and indirect methods), FM detector (PLL). Block diagram of FM Transmitter and Receiver Comparison between AM, FM and PM.

Unit -3 (14 Lectures)

Pulse Analog Modulation: Channel capacity, Sampling theorem, PAM, PDM, PPM modulation and detection techniques, Multiplexing, TDM and FDM. **Pulse Code**

Modulation: Need for digital transmission, Quantizing, Uniform and Non- uniform Quantization,

Quantization Noise, Companding, Coding, Decoding, Regeneration.

Unit -4 (16 Lectures)

Digital Carrier Modulation Techniques: Block diagram of digital transmission and reception, Information capacity, Bit Rate, Baud Rate and M-ary coding. Amplitude Shift Keying (ASK), Frequency Shift Keying (FSK), Phase Shift Keying (PSK), Binary Phase Shift Keying (BPSK) and Quadrature Phase Shift Keying (QPSK)

Suggested Books:

1. Electronic communication systems- Kennedy, 3rd edition, McGraw international publications
2. Principles of Electronic communication systems – Frenzel, 3rd edition, McGraw Hill
3. Communication Systems, S. Haykin, Wiley India (2006)
4. Advanced electronic communications systems – Tomasi, 6th edition, PHI.
5. Communication Systems, S. Haykin, Wiley India (2006)

Communication Electronics Lab (Hardware and Circuit Simulation Software) 60 Lectures

1. Study of Amplitude Modulation
2. Study of Amplitude Demodulation
3. Study of Frequency Modulation
4. Study of Frequency Demodulation
5. Study of Pulse Amplitude Modulation
6. AM Transmitter/Receiver
7. FM Transmitter/Receiver
8. Study of TDM, FDM
9. Study of Pulse Width Modulation
10. Study of Pulse Position Modulation
11. Study of Pulse Code Modulation
12. Study of Amplitude Shift Keying
13. Study of Phase Shift Keying,
14. Study of Frequency Shift Keying.

CC 14: Photonics (Credits: Theory-04, Practicals-02)

Theory Lectures
60

Unit-1 (22 Lectures)

Light as an Electromagnetic Wave: Plane waves in homogeneous media, concept of spherical waves. Reflection and transmission at an interface, total internal reflection, Brewster's Law. Interaction of electromagnetic waves with dielectrics: origin of refractive index, dispersion. **Interference :** Superposition of waves of same frequency, Concept of coherence, Interference by division of wavefront, Young's double slit, Division of Amplitude, thin film interference, anti-reflecting films, Newton's rings; Michelson interferometer. Holography. **Diffraction:** Huygen Fresnel Principle, Diffraction Integral, Fresnel and Fraunhofer approximations. Fraunhofer Diffraction by a single slit, rectangular aperture, double slit, Resolving power of microscopes and telescopes; Diffraction grating: Resolving power and Dispersive power

Unit-2 (13 Lectures)

Polarization: Linear, circular and elliptical polarization, polarizer-analyzer and Malus' law; Double refraction by crystals, Interference of polarized light, Wave propagation in uniaxial media. Half wave and quarter wave plates. Faraday rotation and electro-optic effect.

Unit-3 (13 Lectures)

Light Emitting Diodes: Construction, materials and operation. **Lasers:** Interaction of radiation and matter, Einstein coefficients, Condition for amplification, laser cavity, threshold for laser oscillation, line shape function. Examples of common lasers. The semiconductor injection laser diode. **Photodetectors:** Bolometer, Photomultiplier tube, Charge Coupled Device. Photo transistors and Photodiodes (p-i-n, avalanche), quantum efficiency and responsivity. **LCD Displays:** Types of liquid crystals, Principle of Liquid Crystal Displays, applications, advantages over LED displays.

Unit-4 (12 Lectures)

Guided Waves and the Optical Fiber: TE and TM modes in symmetric slab waveguides, effective index, field distributions, Dispersion relation and Group Velocity. Step index optical fiber, total internal reflection, concept of linearly polarized waves in the step index circular dielectric waveguides, single mode and multimode fibers, attenuation and dispersion in optical fiber.

Suggested Books:

1. Ajoy Ghatak, Optics, Tata McGraw Hill, New Delhi (2005)
2. E. Hecht, Optics, Pearson Education Ltd. (2002)
3. J. Wilson and J. F. B. Hawkes, Optoelectronics: An Introduction, Prentice Hall India (1996)
4. S. O. Kasap, Optoelectronics and Photonics: Principles and Practices, Pearson Education (2009)
5. Ghatak A.K. and Thyagarajan K., "Introduction to fiber optics," Cambridge Univ. Press. (1998)

Photonics Lab 60 Lectures

1. To verify the law of Malus for plane polarized light.
2. To determine wavelength of sodium light using Michelson's Interferometer.
3. To determine wavelength of sodium light using Newton's Rings.
4. To determine the resolving power and Dispersive power of Diffraction Grating.
5. Diffraction experiments using a laser.
6. Study of Faraday rotation.
7. Study of Electro-optic Effect.
8. To determine the specific rotation of scan sugar using polarimeter.
9. To determine characteristics of LEDs and Photo- detector.
10. To measure the numerical aperture of an optical fiber.

DSE 1: Power Electronics (Credits: Theory-04, Practicals-02)

Theory Lectures 60

Unit- 1 (12 Lectures)

Power Devices: Need for semiconductor power devices, Power diodes, Enhancement of reverse blocking capacity, Introduction to family of thyristors. **Silicon Controlled Rectifier (SCR):** structure, I-V characteristics, Turn-On and Turn-Off characteristics, ratings, Factors affecting the characteristics/ratings of SCR, Gate-triggering circuits, Control circuits design and Protection circuits, Snubber circuit.

Unit- 2 (14 Lectures)

Diac and Triac: Basic structure, working and V-I characteristic of, application of a Diac as a triggering device for a Triac. **Insulated Gate Bipolar Transistors (IGBT):** Basic structure, I-V Characteristics, switching characteristics, device limitations and safe operating area (SOA) etc. **Application of SCR:** SCR as a static switch, phase controlled rectification, single phase half wave, full wave and bridge rectifiers with inductive & non- inductive loads; AC voltage control using SCR and Triac as a switch. **Power MOSFETs:** operation modes, switching characteristics, power BJT, second breakdown, saturation and quasi-saturation state.

Unit- 3 (17 Lectures)

Power Inverters: Need for commutating circuits and their various types, d.c. link invertors, Parallel capacitor commutated invertors with and without reactive feedback and its analysis, Series Invertor, limitations and its improved versions, bridge invertors. **Choppers:** basic chopper circuit, types of choppers (Type A-D), step-down chopper, step-up chopper, operation of d.c. chopper circuits using self commutation (A & B-type commutating circuit), cathode pulse turn-off chopper (using class D commutation), load sensitive cathode pulse turn-off chopper (Jones Chopper), Morgan's chopper

Unit- 4 (17 Lectures)

Electromechanical Machines: DC Motors, Basic understanding of field and armature, Principle of operation, EMF equation, Back EMF, Factors controlling motor speed, Thyristor based speed control of dc motors, AC motor (Induction Motor only), Rotor and stator, torque & speed of induction motor, Thyristor control of ac motors(block diagrams only)

Suggested Books:

1. Power Electronics, P.C. Sen, TMH
2. Power Electronics & Controls, S.K. Dutta
3. Power Electronics, M.D. Singh & K.B. Khanchandani, TMH
4. Power Electronics Circuits, Devices and Applications, 3rd Edition, M.H. Rashid, Pearson Education
5. Power Electronics, Applications and Design, Ned Mohan, Tore.
6. Power Electronics, K. HariBabu, Scitech Publication.
7. Power Electronics, M.S. Jamil Asghar, PHI.
8. A Textbook of Electrical Technology-Vol-II, B.L. Thareja, A.K. Thareja, S.Chand

Power Electronics Lab 60 Lectures

1. Study of I-V characteristics of DIAC
2. Study of I-V characteristics of a TRIAC
3. Study of I-V characteristics of a SCR
4. SCR as a half wave and full wave rectifiers with R and RL loads
5. DC motor control using SCR.
6. DC motor control using TRIAC.
7. AC voltage controller using TRIAC with UJT triggering.
8. Study of parallel and bridge inverter.
9. Design of snubber circuit
10. VI Characteristic of MOSFET and IGBT (Both)
11. Study of chopper circuits

**DSE 2: Digital Signal Processing
(Credits: Theory-04, Practicals-02)**

Theory Lectures 60

Unit- 1 (15 Lectures)

Discrete Time systems: Discrete sequences, linear coefficient difference equation, Representation of DTS, LSI Systems. Stability and causality, frequency domain representations and Fourier transform of DT sequences.

Unit- 2 (15 Lectures)

Z-Transform: Definition and properties, Inverse Z Transform and stability. Parsevals Theorem and applications. **System Function:** signal flow graph, its use in representation and analysis of Discrete Time Systems. Techniques of representations. Matrix generation and solution for DTS evaluations.

Unit- 3 (15 Lectures)

Discrete Fourier Transform: DFT assumptions and Inverse DFT. Matrix relations, relationship with

FT and its inverse, circular convolution, DFT theorems, DCT. Computation of DFT. FFT Algorithms and processing gain, Discrimination, interpolation and extrapolation. Gibbs phenomena. FFT of real functions interleaving and resolution improvement. Word length effects.

Unit- 4 (15 Lectures)

Digital Filters: Analog filter review. System function for IIR and FIR filters, network representation. Canonical and decomposition networks. IIR filter realization methods and their limitations. FIR filter realization techniques. Discrete correlation and convolution; Properties and limitations.

Suggested Books:

1. A.V. Oppenheim and Schafer, Discrete Time Signal Processing, Prentice Hall, 1989.
2. John G. Proakis and D.G. Manolakis, Digital Signal Processing: Principles, Algorithms and Applications, Prentice Hall, 1997.

Digital Signal Processing Lab (Scilab/MATLAB/Other Mathematical Simulation software) 60 Lectures

1. Generation of unit sample sequence, unit step, ramp function, discrete time sequence, real sinusoidal sequence.
2. Generate and plot sequences over an interval.
3. Given $x[n]$, write program to find $X[z]$.
4. Fourier Transform, Discrete Fourier Transform and Fast Fourier Transform
5. Design of a Butterworth analog filter for low pass and high pass.
6. Design of digital filters.

DSE 3: Computer Networks (Credits: Theory-04, Practicals-02)

Theory Lectures 60

Unit- I (15 Lectures)

Data Communications: Components, protocols and standards, Network and Protocol Architecture, Reference Model ISO-OSI, TCP/IP-Overview, topology, transmission mode, digital signals, digital to digital encoding, digital data transmission, DTE-DCE interface, interface standards, modems, cable modem, transmission media- guided and unguided, transmission impairment, Performance, wavelength and Shannon capacity. Review of Error Detection and Correction codes. **Switching:** Circuit switching (space-division, time division and space-time division), packet switching (virtual circuit and Datagram approach), message switching.

Unit-2 (15 Lectures)

Data Link Layer: Design issues, Data Link Control and Protocols: Flow and Error Control, Stop-and-wait ARQ. Sliding window protocol, Go-Back-N ARQ, Selective Repeat

ARQ, HDLC, Point-to-Point Access: PPP Point-to-Point Protocol, PPP Stack, **Medium Access Sub layer**: Channel allocation problem, Controlled Access, Channelization, multiple access protocols, IEEE standard 802.3 & 802.11 for LANS and WLAN, high-speed LANs, Token ring, Token Bus, FDDI based LAN, Network Devices-repeaters, hubs, switches bridges.

Unit-3 (15 Lectures)

Network Layer: Design issues, Routing algorithms, Congestion control algorithms, Host to Host Delivery: Internetworking, addressing and routing, IP addressing (class full & Classless), Subnet, Network Layer Protocols: ARP, IPV4, ICMP, IPV6, ICMPV6.

Unit- 4 (15 Lectures)

Transport Layer: Process to Process Delivery: UDP; TCP, congestion control and Quality of service.

Application Layer: Client Server Model, Socket Interface, Domain Name System (DNS): Electronic Mail (SMTP), file transfer (FTP), HTTP and WWW.

Suggested Books:

1. S. Tannenbum, D. Wetherall, "Computer Networks", Prentice Hall, Pearson, 5thEd
2. Behrouz A. Forouzan, "Data Communications and Networking", Tata McGraw-Hill, 4thEd

Computer Networks Lab 60 Lectures

1. Introduction to Computer Network laboratory Introduction to Discrete Event Simulation Discrete Event Simulation Tools - ns2/ns3, Omnet++
2. Using Free Open Source Software tools for network simulation of telnet and ftp between N sources - N sinks (N = 1, 2, 3). Evaluate the effect of increasing data rate on congestion.
3. Using Free Open Source Software tools for network simulation to study the effect of queuing disciplines on network performance - Random Early Detection/Weighted RED / Adaptive RED.
4. Using Free Open Source Software tools for network simulation for http, ftp and DBMS access in networks
5. Using Free Open Source Software tools for network simulation to study effect of VLAN on network performance - multiple VLANs and single router.
6. Using Free Open Source Software tools for network simulation to study effect of VLAN on network performance - multiple VLANs with separate multiple routers.
7. Using Free Open Source Software tools for network simulation to study the performance of wireless networks

BACHELOR OF SCIENCE(ITM)

SEMESTER-I

C:1-PROGRAMMING USING C (Credit:6, Theory:4, Practical: 2)

UNIT- I

Introduction to Programming Language, Introduction to C Programming, Character Set, C Tokens, Keywords & Identifiers, Constants, Variables, Data Types, Variables, Storage Classes, Operators (Arithmetic, Relational, Logical, Assignment, Increment & Decrement, Conditional, Bitwise), Expressions, Input and Output Operations.

UNIT- II

Decision Making and Branching: Simple IF Statement, IF. ELSE Statement, Nesting IF. ELSE Statement, ELSE IF Ladder, Switch Statement, Operator, GOTO Statement. Decision Making and Looping: The WHILE Statement, The DO Statement, The FOR Statement, Jumps in LOOPS. Arrays, Character Arrays and Strings.

UNIT- III

User-defined Functions: Need, Elements & Definition, Function Calls, Function Definition, Category of Functions, Recursion. Structures and Unions: Defining, Declaring, Accessing, Initialization Structure, Arrays of Structures, Arrays within Structures, Structures and Functions, Unions.

UNIT- IV

Pointers: Accessing the Address of a Variable, Declaring Pointer Variables, Initializations of Pointer Variable, Accessing a Variable through its Pointer, Chain of Pointers, Pointer Expressions, Pointer Increments and Scale Factor, Pointers and Arrays, Pointers and Character Strings, Array of Pointers, Pointers as Function Arguments, Functions Returning Pointers, Pointers to Functions, Pointers to Structures, Troubles with Pointers.

UNIT- V

File Management in C: Defining and Opening a File, Closing a File, Input/ Output Operations on Files, Error Handling During I/O Operations, Random Access to Files, Command Line Arguments, Dynamic Memory Allocation.

Recommended Books:

1. E. Balaguruswamy, Programming in ANSI C,4/e, (TMH).
2. Paul Deitel, Harvey Deitel, C: How to Program, 8/e, Prentice Hall.
3. J. R. Hanly, Problem Solving & Program Design in C, 7/e, Pearson.
4. B. Kernighan & D.M. Ritchie, The C Programming Language, 2/e PHI.

C: 2-COMPUTER ORGANIZATION (Credit:6, Theory:4, Practical: 2)

UNIT-I

Character Codes, Decimal System, Binary System, Decimal to Binary Conversion, Hexadecimal Notation, Boolean Algebra, Basic Logic Functions: Electronic Logic Gates, Synthesis of Logic Functions, Minimization of Logic Expressions, Minimization using Karnaugh Maps, Synthesis with NAND and NOR Gates.

UNIT-II

Flip-Flops, Gated Latches, Master-Slave Flip-Flops, Edge-Triggering, T Flip-Flops, JK Flip-Flops.

Registers and Shift Registers, Counters, Decoders, Multiplexers, Programmable Logic Devices (PLDs), Programmable Array Logic (PAL), Complex Programmable Logic Devices (CPLDs), Field-Programmable Gate Array (FPGA), Sequential Circuits, Timing Diagrams, The Finite State Machine Model, Synthesis of Finite State Machines.

UNIT-III

Basic Structure of Computers: Computer Types, Functional Units, Input Unit, Memory Unit, Arithmetic and Logic Unit, Output Unit, Control Unit, Basic Operational Concepts, Bus Structures, Software. Machine Instructions and Programs: Numbers, Arithmetic Operations, and Characters: Number Representation, Addition of Positive Numbers, Addition and Subtraction of Signed Numbers, Overflow of Integer Arithmetic, Characters, Memory Locations and Addresses, Byte Addressability, Word Alignment, Accessing Numbers, Characters, and Character Strings, Memory Operations, Instructions and Instruction Sequencing, Register Transfer Notation, Basic Instruction Types, Instruction Execution and Straight-Line Sequencing, Branching, Condition Codes, Generating Memory Addresses, Addressing Modes, Implementation of Variables and Constants, Indirection and Pointers, Indexing and Arrays, Relative Addressing.

UNIT-IV

THE ARM EXAMPLE: **Registers**, Memory Access, and Data Transfer, Register Structure, Memory Access Instructions and Addressing Modes, Register Move Instructions, Arithmetic and Logic Instructions: Arithmetic Instructions, Logic Instructions, Branch Instructions, Setting Condition Codes, Assembly Language, Pseudo-Instructions, I/O Operations, Subroutines, Vector Dot Product Program, Byte-Sorting Program, Linked-List Insertion and Deletion Subroutines. Basic Input-Output Operations, Stacks and Queues, Subroutines. PowerPC Example: Basic PowerPC Processor Organization, Load and Store Instructions, Arithmetic and Logic Instructions, Flow Control Instructions, Compare Instructions, Logic Instructions, Subroutines.

UNIT-V

Memory System: Semiconductor RAM Memories, Internal Organization of Memory Chips, Static Memories, Asynchronous DRAMS, Synchronous DRAMS, Structure of Large Memories, Memory System Considerations, RAMBUS Memory. Read-Only Memories: ROM, PROM, EPROM, EEPROM, Flash Memory, Speed, Size, and Cost of Memory. Secondary Storage: Magnetic Hard Disks, Optical Disks, Magnetic Tape Systems.

Recommended Books:

1. Carl Hamacher, Z. Vranesic, S. Zaky: Computer Organization, 5/e (TMH)
2. William Stallings: Computer Organization and Architecture (Design for Performance), 9/e
3. S. Brown, & Z. Vranesic, Fundamentals of Digital Logic Design with VHDL, 2/e, McGraw-Hill
4. J. P. Uyemura, A First Course in Digital System Design, An Integrated Approach, Cengage Learning.

GE:1-DISCRETE STRUCTURES

(Credit:6, Theory:4, Practical: 2)

UNIT-I Logic and Proofs: Propositional Logic, Propositional Equivalences, Predicates and Quantifiers, Nested Quantifiers, Rules of Inference, Introduction to Proofs, Normal Forms, Proof Methods and Strategy, Mathematical Induction, Strong Induction and Well-Ordering, Recursive Definitions and Structural Induction, Recursive Algorithms.

UNIT-II

Basic Structures: Sets, Set Operations, Functions, Recursive Functions, Sequences and Summations. Relations: Relations and their Properties, n-ary Relations and their Applications, Representing Relations, Closures of Relations, Equivalence Relations, Partial Ordering. Boolean.

UNIT-III

Algebra: Boolean Functions, Representing Boolean Functions, Logic Gates, Minimization of Circuits. Algebraic Structures & Coding Theory: The Structure of Algebras, Semi-groups, Monoids and Groups, Homomorphism, Normal Subgroups, and Congruence Relations, Rings, Integral Domains and Fields, Quotient and Product Algebras, Coding Theory. Polynomial Rings and Polynomial Codes.

UNIT-IV

Counting: Basics of Counting, The Pigeonhole Principle, Permutations and Combinations, Binomial Coefficients, Generalized Permutations and Combinations, Generating Permutations and Combinations. Advanced Counting Techniques, Applications of Inclusion-Exclusion, Discrete probability, Conditional probability, Bayes Theorem.

UNIT-V

Graphs: Graphs and Graph Models, Graph Terminology and Special Types of Graphs, Havel-Hakimi Theorem, Representing Graphs and Graph Isomorphism, Connectivity, Cut-Sets, Euler and Hamiltonian Paths, Shortest-Path Problem, Planar Graphs, Graph Coloring, NetworkFlows.

Recommended Books:

1. Kenneth H Rosen, Discrete Mathematics & Its Applications, McGraw-Hill. 7/e.
2. J. L. Hein, Discrete Structures, Logic, and Computability, 3rd Edition, Jones and Bartlett Publishers, 2009
3. C.L. Liu , D.P. Mahopatra, Elements of Discrete mathematics, 2nd Edition , Tata McGraw Hill, 1985
4. M. O. Albertson and J. P. Hutchinson, Discrete Mathematics with Algorithms , John wiley Publication, 1988.

SEMESTER-II

C: 3-PERSONAL MANAGEMENT & ORGANIZATIONAL BEHAVIOUR

(Credit:6, Theory:4, Practical: 2)

C: 4-PROGRAMMING USING C++

(Credit:6, Theory:4, Practical: 2)

UNIT-I

Principles of Object-Oriented Programming: Object-Oriented Programming (OOP) Paradigm, Basic Concepts of OOP, Benefits of OOP, Object Oriented Languages, Applications of OOP. Beginning with C++: Applications of C++, C++ statements, Example with Class, Structure of C++ Program, Creating the Source File, Compiling and Linking. Tokens, Expressions and Control Structures: Tokens, Keywords, Identifiers & Constants, Basic Data Types, User-Defined Data Types, Derived Data Types, Symbolic Constants, Type Compatibility, Declaration of Variables, Dynamic Initialization of Variables, Reference Variables, Operators in C++, Scope Resolution Operator, Member Deferencing Operators, Memory Management Operators, Manipulators, Type Cast Operators, Expressions and their Types, Special Assignment Expressions, Implicit Conversions, Operator Overloading, Operator Precedence, Control Structures.

UNIT- II

Functions in C++: The Main Function, Function Prototyping, Call By Reference, Return by Reference, Inline Functions, Default Arguments, Const. Arguments, Function Overloading, Friend & Virtual Functions, Math. Library Functions. Classes and Objects: Specifying a Class, Defining Member Functions, Making an outside Function Inline, Nested Member Functions, Private Member Functions, Arrays within a Class, Memory Allocation for Objects, Static Data Members, Static Member Functions, Arrays of Objects, Objects as Function Arguments, Friendly Functions, Returning Objects, Const. Member Functions, Pointer to Members, Local Classes.

UNIT- III

Constructors & Destructors: Constructors, Parameterized Constructors, Multiple Constructors in a Class, Constructors with Default Arguments, Dynamic Initialization of Objects, Copy Constructor, Dynamic Constructors, Constructing Two-Dimensional Arrays, Const. Objects, Destructors. Operator Overloading and Type Conversions: Defining Operator Overloading, Overloading Unary Operators, Overloading Binary Operators, Overloading Binary Operators using Friends, Manipulation of Strings using Operators, Rules for Overloading Operators, Type Conversions.

UNIT- IV

Inheritance : Defining Derived Classes, Single Inheritance, Making a Private Member Inheritance, Multilevel Inheritance, Multiple Inheritance, Hierarchical Inheritance, Hybrid Inheritance, Virtual Base Classes, Abstract Classes, Constructors in Derived Classes, Member Classes, Nesting of Classes. Pointers, Virtual Functions and Polymorphism: Pointers, Pointers to Objects, this Pointer, Pointers to Derived Classes, Virtual Functions, Pure Virtual Functions.

UNIT- V

Managing Console I/O Operations: C++ Streams, C++ Stream Classes, Unformatted I/O Operations, Formatted Console I/O Operations, Managing Output with Manipulators. Files: Classes for File Stream Operations, Opening and Closing a File, Detecting end-of-file, File Modes, File Pointers and their Manipulations, Sequential Input and Output Operations, Updating a File: Random Access, Error Handling During File Operations, Command-line Arguments.

Recommended Books:

1. E. Balgurusamy, Object Oriented Programming with C++ :, 4/e (TMH).
2. Paul Deitel, Harvey Deitel, "C++: How to Program", 9/e. Prentice Hall.
3. J. Farrell, Object-Oriented Programming, Cengage Learning.
4. Bjarne Stroustrup, "Programming – Principles and Practice using C++", 2/e, Addison-Wesley 2014.

C: 5-DATA STRUCTURES

(Credit:6, Theory:4, Practical: 2)

UNIT-I

Introduction and Overview: Definitions, Concept of Data Structures, Overview of Data Structures, Implementation of Data Structures. Arrays: Terminology, One-Dimensional Array, Multi-Dimensional Arrays, Pointer Arrays.

UNIT-II

Linked Lists: Single Linked List, Circular Linked List, Double Linked List, Circular Double Linked List, Application of Linked Lists, Memory Representation, Boundary Tag System, De-allocation Strategy, Buddy System, Compaction.

UNIT-III

Stacks: Definition, Representation of Stack (Array, Linked List), Operations on Stacks, Applications of Stack (Evaluation of Arithmetic Expressions, Code Generation, Implementation of Recursion, Factorial Calculation, Quick Sort, Tower of Hanoi, Activation Record Management).

UNITIV

Queues: Definition, Representation of Queues (Array, Linked List), Circular Queue, Deque, Priority Queue, Application of Queues (Simulation, CPU Scheduling in Multiprogramming Environment, Round Robin Algorithm).

UNITV

Tree: Binary Trees, Properties of Binary Tree, Linear Representation of Binary a Binary Tree, Linked Representation of a Binary Tree, Physical Implementation of Binary Tree in Memory, Operations on Binary Tree (Insertion, Deletion, Traversal, Merging of two Binary Trees), Types of Binary Trees (Expression Tree, Binary Search Tree, Heap Tree, Threaded Binary Trees, Height Balanced Binary Tree, Weighted Binary Tree, Decision Trees).

Recommended Books:

1. D. Samanta, Classic Data Structures:, 2/e (PHI).
2. D.S Malik, Data Structure using C++, 2/e, Cengage Learning, 2010.
3. Adam Drozdek, "Data Structures and algorithm in C++", 3/e, Cengage Learning, 2012.
4. Robert L. Kruse, "Data Structures and Program Design in C++", Pearson.

GE:2-STATISTICS FOR BUSINESS**(Credit:6, Theory:4, Practical: 2)****UNIT-I**

Probability and Probability Distribution: Events and the Sample Space, Calculating Probabilities using Simple events, Useful counting rules, Probability rules: Addition rule, Conditional probability and multiplication rule, Bayes rule.

UNIT-II

Probability Distributions: Random Variable, Discrete random variable, Mean and Standard deviation of discrete random variable, Discrete Probability Distributions: Binomial, Poisson and Hypergeometric probability distribution, Continuous Probability distribution: Normal distribution.

UNIT-III

Sampling Distribution: sampling plans and experimental designs, Sampling distribution of a statistic, Central Limit theorem, Sampling distribution of the Sample mean and Proportion. Large Sample Estimation: Point estimation, Interval estimation, Confidence interval of population mean, Population proportion, difference between two population means, difference between two population proportions.

UNIT-IV

Large Sample Tests of Hypothesis: Test of a Population mean, Test of difference of two population means, Test of hypothesis for a binomial proportion, Test of hypothesis for the difference between two binomial proportions. Inference from Small Samples: Students t Distribution, Small Sample inferences concerning a population mean and difference between two population means, Inferences concerning a population variance and difference between two population variances.

UNIT-V

Analysis of Variance: One-way classification, Two-way classification. Linear regression and Correlation: Method of least squares, Analysis of variance for linear regression, Testing the usefulness of the linear regression model, Estimation and Prediction using the fitted line. Carl Pearsons coefficient of Correlation, Test of hypothesis concerning the Correlation coefficient.

Recommended Books:

1. William Mendenhall, Robert J. Beaver, Barbara M. Beaver, Probability and Statistics 14/e, CENGAGE Learning.
2. W. W. Hines, D.C. Montgomery, D.M. Goldsman, & C.M. Borror, Probability & Statistics in Engineering"

SEMESTER-III

C: 6-OPERATING SYSTEMS**(Credit:6, Theory:4, Practical: 2)****UNIT-I**

Operating System, Computer-System Organization, Computer-System Architecture, Operating-System Structure, Operating-System Operations, Process Management, Memory Management, Storage Management, Protection and Security, Distributed Systems, Special Purpose Systems, Computing

Environments, Open-Source Operating Systems. Operating System Services, User Operating System Interface, System Calls, Types of System Calls, System Programs, Operating-System Design and Implementation, Operating System Structure, Virtual Machines, Operating System Debugging, Operating System Generations. System Boot.

UNIT-II

Process: Process Concept, Process Scheduling, Operations on Processes, Inter-Process Communication, Examples of IPC Systems, Communication in Client-Server Systems. Multithreaded Programming: Multithreading Models, Thread Libraries, Threading Issues, Operating-System Examples.

UNIT-III

Process Scheduling: Basic Concepts, Scheduling Criteria, Scheduling Algorithms, Thread Scheduling. Multiple-Process Scheduling. Synchronization: The Critical Section Problem, Peterson's Solution, Synchronization Hardware, Semaphores, Classical Problems of Synchronization, Monitors, Synchronization Examples, Atomic Transactions.

UNIT-IV

Deadlocks: System Model, Deadlock Characterization, Methods of Handling Deadlocks, Deadlock Prevention, Deadlock avoidance, Deadlock Detection, Recovery from Deadlock. Memory Management Strategies: Swapping, Contiguous Memory Allocation, Paging, Structure of the Page Table, Segmentation, Example: The Intel Pentium.

UNIT-V

Virtual-Memory Management: Demand Paging, Copy-on-Write, Page Replacement, Allocation of Frames, Thrashing, Memory-Mapped Files, Allocating Kernel Memory. File System: File Concept, Access Methods, Directory and Disk Structure, File-System Mounting, File Sharing, Protection.

Recommended Books:

1. A Silberschatz, P.B. Galvin, G. Gagne, Operating Systems Concepts, 8/e, John Wiley Publications 2008.
2. A.S. Tanenbaum, Modern Operating Systems, 3/e, Pearson Education 2007.
3. W. Stallings, Operating Systems, Internals & Design Principles, 5/e, Prentice Hall of India. 2008.
4. G. Nutt, Operating Systems: A Modern Perspective, 2/e, Pearson Education 1997.

C: 7-BUSINESS ACCOUNTING

(Credit:6, Theory:4, Practical: 2)

UNIT-I

Introduction to Financial Accounting. Accounting as an Information System. Importance, Scope, and Limitations. Users of Accounting Information. Generally Accepted Accounting Principles. The Accounting Equation. Nature of Accounts and Rules of Debit and Credit. Recording Transactions in General Journal. Recording Transactions in three column Cash Book. An overview of Subsidiary books Purchase Book, Purchase Returns Book, Sales Book, and Sales Returns Book. Opening and Closing Entries. Preparation of Ledger Accounts.

UNIT-II

Introduction to International Financial Reporting Standards (IFRS). Understanding Accounting Standards issued by the ICAI related to Disclosure of Accounting Policies, Depreciation Accounting, and Revenue Recognition. Methods of charging Depreciation Straight-line Method, and Written-down-value Method. Preparation of Trial Balance. Adjustment Entries. Post-adjusted Trial Balance. Bank Reconciliation Statement.

UNIT-III

Preparation of Financial Statements: Preparing Trading Account, Profit & Loss Account and Balance Sheet for a Sole Proprietor. Understanding contents of Financial Statements of a Joint Stock Company as per Companies Act 2013. Understanding the contents of a Corporate Annual Report. Preparation of Cash Flow Statement as per AS-3 (revised).

UNIT-IV

Analyzing Financial Statements: Objectives of Financial Statement Analysis; Sources of Information; Standards of Comparison; Techniques of Financial Statement Analysis - Horizontal Analysis, Vertical Analysis, and Ratio Analysis. Meaning and Usefulness of Financial Ratios; Analysis of Financial Ratios from the perspective of different Stakeholders like Investors, Lenders, and Short-term Creditors; Profitability Ratios, Solvency Ratios, Liquidity Ratios, and Turnover Ratios; Limitations of Ratio Analysis.

Recommended Books:

1. S.N. Maheshwari, Suneel K. Maheshwari, and Sharad K. Maheshwari: An Introduction to Accountancy, Vikas Publishing House Pvt. Ltd.
2. R. Narayanaswamy, Financial Accounting: A Managerial Perspective, PHI Learning Pvt. Ltd.
3. Charles T. Horngren, Gart L. Sundem, John A. Elliott, and Donna R. Philbrick, Introduction to Financial Accounting, Pearson.
4. J.R. Monga, Financial Accounting: Concepts and Applications, Mayur Paperbacks.
5. T.P. Ghosh, Financial Accounting for Managers: Taxmann Allied Services Pvt. Ltd.

C: 8-MANAGERIAL ECONOMICS

(Credit:6, Theory:4, Practical: 2)

UNIT-I

Demand, Supply and Market equilibrium: individual demand, market demand, individual supply, market supply, market equilibrium; Elasticities of demand and supply : Price elasticity of demand, income elasticity of demand, cross price elasticity of demand, elasticity of supply; Theory of consumer behavior : cardinal utility theory, ordinal utility theory(indifference curves, budget line, consumer choice, price effect, substitution effect, income effect for normal, inferior and giffen goods), revealed preference theory.

UNIT-II

Producer and optimal production choice : optimizing behavior in short run(geometry of product curves, law of diminishing margin productivity, three stages of production), optimizing behavior in long run (isoquants, isocost line, optimal combination of resources) Costs and scale : traditional theory of cost (short run and long run, geometry of cot curves, envelope curves), modern theory of cost (short run and long run), economies of scale, economies of scope.

UNIT-III Theory of firm and market organization : perfect competition (basic features, short run equilibrium of firm/industry, long run equilibrium of firm/industry, effect of changes in demand, cost and imposition of taxes) ; monopoly (basic features, short run equilibrium, long run equilibrium, effect of changes in demand, cost and imposition of taxes, comparison with perfect competition, welfare cost of monopoly), price discrimination, multiplant monopoly ; monopolistic competition (basic features, demand and cost, short run equilibrium, long run equilibrium, excess capacity) ; oligopoly (Cournots model, kinked demand curve model, dominant price leadership model, prisoners dilemma)

UNIT-IV

Factor market : demand for a factor by a firm under marginal productivity theory (perfect competition in the product market, monopoly in the product market), market demand for a factor, supply of labour, market supply of labour, factor market equilibrium.

Recommended Books:

1. Dominick Salvatore (2009). Principles of Microeconomics (5th ed.) Oxford University Press.
2. Lipsey and Chrystal. (2008). Economics.(11th ed.) Oxford University Press.
3. Koutosyannis (1979). Modern Micro Economics. Palgrave Macmillan.

4. Pindyck, Rubinfeld and Mehta. (2009). Micro Economics. (7th ed.), Pearson.

SEC:1-BUSINESS COMMUNICATION

(Credits:2)

GE:1-NUMERICAL TECHNIQUES

(Credit:6, Theory:4, Practical: 2)

UNIT-I

Introduction: Numbers and their accuracy, Chopping and Rounding off, Errors: Absolute and Relative errors, Floating point representations of numbers, Loss of significance. Solution of Algebraic and Transcendental Equations: Bisection Method, Newton-Raphson Method, Secant Method, Method of false position, Rate of convergence and comparison of iterative methods.

UNIT-II

Interpolation and Numerical Differentiation: Polynomial Interpolation, Interpolating polynomial: Lagrange form, Newton form, Nested form, Divided difference Interpolation, Inverse Interpolation, Errors in polynomial Interpolation. First derivative and second derivative via Taylor Series, Richardson Extrapolation.

UNIT-III

Numerical Integration: Trapezoidal Rule, Composite Trapezoidal rule, Simpsons 1/3 rule, Simpsons 3/8 rule, Gaussian Quadrature formulae (1-point, 2-point, 3-point)

UNIT-IV

Solution of System of Linear Equations: Gaussian Elimination method and Pivoting, LU factorization method, ill Conditioning, Iterative Methods: Jacobi iterative method, Gauss Seidel iterative method. Eigen Values and Eigen Vectors: Eigen value properties, Computation Eigen values by Power method.

UNIT-V

Solution of Ordinary Differential Equations: Taylor Series method, Runge-Kutta method of order 2 and order 4, Predictor-Corrector method: Adams-Bashforth-Moulton method. Smoothing of Data and the Method of Least Squares: Linear and non-linear least square method.

Recommended Books:

1. E. Ward Cheney and David R. Kincaid, Numerical Methods and Applications CENGAGE Learning India Private Ltd., New Delhi.
2. S.R.K. Iyengar, R.K. Jain, & M.K. Jain, Numerical Methods for Scientific & Engineering Computation, 6/e, New Age Int. Pub.
3. S.S. Sastry, Introductory Methods of Numerical Analysis, 5/e, EEE
4. Steven C. Chapra, Applied Numerical Methods with MATLAB, 2/e, McGraw-Hill.

SEMESTER-IV

C: 9-JAVA PROGRAMMING

(Credit:6, Theory:4, Practical: 2)

UNIT-I

Introduction to Java: Java Architecture and Features, Understanding the semantic and syntax

differences between C++ and Java, Compiling and Executing a Java Program, Variables, Constants, Keywords Data Types, Operators (Arithmetic, Logical and Bitwise) and Expressions, Comments, Doing Basic Program Output, Decision Making Constructs (conditional statements and loops) and Nesting, Java Methods (Defining, Scope, Passing and Returning Arguments, Type Conversion and Type and Checking, Built-in Java Class Methods).

UNIT-II

Arrays, Strings and I/O: Creating & Using Arrays (One Dimension and Multi-dimensional), Referencing Arrays Dynamically, Java Strings: The Java String class, Creating & Using String Objects, Manipulating Strings, String Immutability & Equality, Passing Strings To & From Methods, String Buffer Classes. Simple I/O using System.out and the Scanner class, Byte and Character streams, Reading/Writing from console and files. Object-Oriented Programming Overview: Principles of Object-Oriented Programming, Defining & Using Classes, Controlling Access to Class Members, Class Constructors, Method Overloading, Class Variables & Methods, Objects as parameters, final classes, Object class, Garbage Collection.

UNIT-III

Inheritance, Interfaces, Packages, Enumerations, Autoboxing and Metadata: Inheritance: (Single Level and Multilevel, Method Overriding, Dynamic Method Dispatch, Abstract Classes), Interfaces and Packages, Extending interfaces and packages, Package and Class Visibility, Using Standard Java Packages (util, lang, io, net), Wrapper Classes, Autoboxing/Unboxing, Enumerations and Metadata.

UNIT-IV

Exception Handling, Threading, Networking and Database Connectivity: Exception types, uncaught exceptions, throw, built-in exceptions, Creating your own exceptions; Multi-threading: The Thread class and Runnable interface, creating single and multiple threads, Thread prioritization, synchronization and communication, suspending/resuming threads. Using java.net package, Overview of TCP/IP and Datagram programming. Accessing and manipulating databases using JDBC.

UNIT-V

Applets and Event Handling: Java Applets: Introduction to Applets, Writing Java Applets, Working with Graphics, Incorporating Images & Sounds. Event Handling Mechanisms, Listener Interfaces, Adapter and Inner Classes. The design and Implementation of GUIs using the AWT controls, Swing components of Java Foundation Classes such as labels, buttons, text fields, layout managers, menus, events and listeners; Graphic objects for drawing figures such as lines, rectangles, ovals, using different fonts. Overview of servlets.

Recommended Books:

1. E. Balagurusamy, Programming with Java, 4/e, TMH
2. Bruce Eckel, "Thinking Java", 8/e, Pearson India, 2010.
3. John R. Hubbard, "Programming with JAVA", Schaum's Series, 2/e, 2004.
4. Cay S. Horstmann, Gary Cornell, "Core Java 2 Volume 1", 9/e, Printice Hall. 2012.

C: 10-DATABASE MANAGEMENT SYSTEM

(Credit:6, Theory:4, Practical: 2)

UNIT-I

Databases and Database Users, Database System Concepts and Architecture, Data Modelling using

the Entity-Relationship (ER) Model, The Enhanced Entity-Relationship (EER) Model.

UNIT-II

Relational Model: The Relational Data Model and Relational Database Constraints, The Relational Algebra and Relational Calculus.

UNIT-III

Relational Database Design by ER- and EER-to-Relational Mapping, SQL-99: Schema Definition, Constraints, Queries, and Views, Introduction to SQL Programming Techniques.

UNIT-IV

Functional Dependencies and Normalization for Relational Databases, Relational Database Algorithms and Further Dependencies, Practical Database Design Methodology and use of UML Diagrams.

UNIT-V

Disk Storage, Basic File Structures, and Hashing, Indexing Structures for Files, Algorithms for Query Processing and Optimization, Physical Database Design and Tuning.

Recommended Books:

1. R. Elmasri, S.B. Navathe, Fundamentals of Database Systems, 6/e, Pearson Education, 2010.
2. A. Silberschatz, H.F. Korth, S. Sudarshan, Database System Concepts 6/e, McGraw Hill, 2010.
3. R. Ramakrishnan, J. Gehrke, Database Management Systems, McGraw-Hill.
4. C. Coronel, S. Morris, & P. Rob, Database Principles (Fundamentals of Design, Implementation, and Management), 9/e, Cengage Learning.

C: 11-MANAGEMENT ACCOUNTING

(Credit:6, Theory:4, Practical: 2)

UNIT-I

Nature, Scope of Management Accounting: Meaning, definition, nature and scope of Management Accounting; Comparison of Management Accounting with Cost Accounting and Financial Accounting. Cost concepts: Meaning, Scope, Objectives, and Importance of Cost Accounting; Cost, Costing, Cost Control, and Cost Reduction; Elements of Cost, Components of total Cost, Cost Sheet. Classification of Costs: Fixed, Variable, Semivariable, and Step Costs; Product, and Period Costs; Direct, and Indirect Costs; Relevant, and Irrelevant Costs; Shut-down, and Sunk Costs; Controllable, and Uncontrollable Costs; Avoidable, and Unavoidable Costs; Imputed / Hypothetical Costs; Out-of-pocket Costs; Opportunity Costs; Expired, and Unexpired Costs; Conversion Cost. Cost Ascertainment: Cost Unit and Cost Center. Introduction to Overhead allocation, Overhead apportionment, and Overhead absorption.

UNIT-II

Cost-Volume-Profit Analysis: Contribution, Profit-Volume Ratio, Margin of safety, Cost Break-even Point, Composite Break-even Point, Cash Break-even Point, Key Factor, Break-even Analysis. Relevant Costs and Decision Making: Pricing, Product Profitability, Make or Buy, Exploring new markets, Export Order, Sell or Process Further, Shut down vs. Continue.

UNIT-III

Budgets and Budgetary Control: Meaning, Types of Budgets, Steps in Budgetary Control, Fixed and Flexible Budgeting, Cash Budget. Responsibility Accounting: Concept, Significance, Different

responsibility centers, Divisional performance Financial measures, Transfer pricing.

UNIT-IV

Standard Costing and Variance Analysis: Meaning of Standard Cost and Standard Costing, Advantages, Limitations and Applications; Material, Labor, Overhead and Sales variances. Introduction to Target Costing, Life Cycle Costing, Quality Costing, and Activity based Costing.

Recommended Books:

1. C.T. Horngren, Gary L. Sundem, Jeff O. Schatzberg, and Dave Burgstahler: Introduction to Management Accounting, Pearson.
2. M.N. Arora: A Textbook of Cost and Management Accounting, Vikas Publishing House Pvt. Ltd.
3. M.Y. Khan, and P.K. Jain, Management Accounting: Text Problems and Cases, McGraw Hill Education (India) Pvt. Ltd.
4. S.N. Maheshwari, and S.N. Mittal, Cost Accounting: Theory and Problems, Shree Mahavir Book Depot (Publishers).

SEC: 2-HTML PROGRAMMING

(Credit:2)

UNIT-I

Introduction

The Basics: The Head, the Body, Colors, Attributes, Lists, ordered and unordered.

UNIT-II

Links: Introduction, Relative Links, Absolute Links, Link Attributes, Using the ID Attribute to Link within a Document.

UNIT-III

Images: Putting an Image on a Page, Using Images as Links, Putting an Image in the Background

UNIT-IV

Tables, Creating a Table , Table Headers, Captions, Spanning Multiple Columns, Styling Table

UNIT-V

Forms: Basic Input and Attributes, Other Kinds of Inputs, Styling forms with CSS, Where To Go From Here

Recommended Books:

Introduction to HTML and CSS -O' Reilly.

GE:4-QUANTITATIVE TECHNIQUES

(Credit:6, Theory:4, Practical: 2)

UNIT-I

Linear Programming: Formulation of L.P. Problems, Graphical Solutions (Specialcases: Multiple optimal solution, infeasibility, unbounded solution); Simplex Methods(Special cases: Multiple optimal solution, infeasibility, degeneracy, unbounded solution)Big-M method and Two-phase method; Duality and Sensitivity (emphasis on formulation & economic interpretation); Formulation of Integer programming, Zero-oneprogramming, Goal Programming.

UNIT-II

Elementary Transportation: Formulation of Transport Problem, Solution by N.W. Corner Rule, Least Cost method, Vogels Approximation Method (VAM), Modified Distribution Method. (Special cases: Multiple Solutions, Maximization case, Unbalanced case, prohibited routes) Elementary Assignment: Hungarian Method, (Special cases: Multiple Solutions, Maximization case, Unbalanced case, Restrictions on assignment).

UNIT-III

Network Analysis: Construction of the Network diagram, Critical Path- float and slack analysis (Total float, free float, independent float), PERT, Project Time Crashing.

UNIT-IV

Decision Theory: Pay off Table, Opportunity Loss Table, Expected Monetary Value, Expected Opportunity Loss, Expected Value of Perfect Information and Sample Information.

UNIT-V

Markov Chains: Predicting Future Market Shares, Equilibrium Conditions (Questions based on Markov analysis) Limiting probabilities, Chapman Kolmogorov equation. Introduction to Game Theory: Pay off Matrix- Two person Zero-Sum game, Pure strategy, Saddle point; Dominance Rule, Mixed strategy, Reduction of $m \times n$ game and solution of 2×2 , $2 \times s$, and $r \times 2$ cases by Graphical and Algebraic methods; Introduction to Simulation: Monte Carlo Simulation.

Recommended Books:

1. N. D. Vohra: Quantitative Management, Tata McGraw Hill.
2. P. K. Gupta, Man Mohan, Kanti Swarup: Operations Research, Sultan Chand.
3. V. K. Kapoor: Operations Research, Sultan Chand & Sons.
4. J. K. Sharma: Operations Research Theory & Applications, Macmillan India, Limited.

SEMESTER-V

C: 12-DATA COMMUNICATIONS

(Credit:6, Theory:4, Practical: 2)

UNIT-I

Introduction: Data Communications, Networks, The Internet, Protocols and Standards. Network Models: Layered Tasks, The OSI Model, Layers in the OSI Model, TCP/ IP Protocol Suite, Addressing.

UNIT-II

Data and Signals: Analog and Digital, Periodic Analog Signals, Digital Signals, Transmission Impairment, Data Rate Limits, Performance. Digital Transmission: Digital-To-Digital Conversion, Analog-To-Digital Conversion, Transmission Modes. Analog Transmission: Digital-To-Analog Conversion, Analog-To-Analog Conversion.

UNIT-III

Multiplexing and Spreading: Multiplexing, Spread Spectrum. Transmission Media: Guided Media, Unguided Media (Wireless). Switching: Circuit Switched, Datagram, Virtual Circuit Networks, Structure of a Switch. Telephone Network, Dial-Up MODEMS, Digital Subscriber Line (DSL), Cable TV Networks, Cable TV for Data Transfer.

UNIT-IV

Error Detection and Correction: Introduction, Block Coding, Linear Block Codes, Cyclic Codes, Checksum. Data Link Control: Framing, Flow and Error Control, Protocols, Noiseless Channels, Noisy Channels, HDLC, Point-To-Point Protocol. Multiple Access: Random Access, Controlled Access, Channelization. Wired LANs: IEEE Standards, Standard Ethernet, Changes in the Standard, Fast Ethernet, Gigabit Ethernet: Wireless LANs: IEEE 802.11, Bluetooth.

UNIT-V— Connecting LANs: Connecting Devices, Backbone Networks, Virtual LANs. Wireless LANs: Cellular Telephony, Satellite Networks. SONET: Architecture, SONET Layers, SONET Frames, STS Multiplexing, SONET Networks, Virtual Tributaries. Virtual-Circuit Networks. Frame Relay, ATM, ATM LANs.

Recommended Books:

1. B. A. Forouzan, Data Communications and Networking, 4/e, THM ,2007.
2. A. S. Tanenbaum, & David J. Wetherall, Computer Networks, 5/e, Pearson

C: 13-SOFTWARE ENGINEERING

(Credit:6, Theory:4, Practical: 2)

UNIT-I

Professional Software Development, Software Engineering Ethics, Software Processes, Software Process Models, Process Activities, Coping with Change, The Rational Unified Process, Agile Software Development, Agile Methods, Plan-Driven and Agile Development, Extreme Programming, Agile Project Management, Scaling Agile Methods.

UNIT-II

Requirements Engineering, Functional and Non-Functional Requirements, The Software Requirements Document, Requirements Specification, Requirements Engineering Processes, Requirements Elicitation and Analysis, Requirements Validation, Requirements Management, System Modelling, Context Models, Interaction Models, Structural Models, Behavioural Models, Model-Driven, Engineering, Architectural Design, Architectural Design Decisions, Architectural Views, Architectural Patterns, Application Architectures.

UNIT-III

Design and Implementation: Object-Oriented Design using the UML, Design Patterns, Implementation Issues, Open Source Development, Software Testing: Development Testing, Test-Driven Development, Release Testing, User Testing, Software Evolution: Evolution Processes, Program Evolution Dynamics, Software Maintenance, Legacy System Management, Dependability and Security.

UNIT-IV

Socio-technical Systems: Complex Systems, Systems Engineering, System Procurement, System Development, System Operation. Dependability and Security: Dependability Properties, Availability and Reliability, Safety, Security. Dependability and Security Specification: Risk-Driven Requirements, Specification, Safety Specification, Reliability Specification, Security, Specification, Formal Specification.

UNIT-V

Dependability Engineering: Redundancy and Diversity, Dependable Processes, Dependable Systems Architectures, Dependable Programming. Security Engineering: Security Risk Management, Design for Security, System Survivability. Dependability and Security Assurance: Static Analysis, Reliability Testing, Security Testing, Process Assurance, Safety and Dependability Cases.

Recommended Books:

1. I. Sommerville, Software Engineering, 9/e, Addison Wesley.
2. R. Mall, Fundamentals of Software Engineering, 3/e, PHI.
3. R.S. Pressman, Software Engineering, A Practitioners Approach, 7/e, McGraw-Hill, 2009.
4. K.K. Aggarwal and Y. Singh, Software Engineering, 2/e, New Age International Publishers, 2008.

DSE: 1-PROGRAMMING IN VISUAL BASIC

(Credit:6, Theory:4, Practical: 2)

UNIT-I

GUI Environment: Introduction to graphical user interface (GUI), programming language (procedural, object oriented, event driven), the GUI environment, compiling, debugging, and running the programs. Controls : Introduction to controls textboxes, frames, check boxes, option buttons, images, setting borders and styles, the shape control, the line control, working with multiple controls and their properties, designing the user interface, keyboard access, tab controls, default & cancel property, coding for controls.

UNIT-II

Operations: Data types, constants, named & intrinsic, declaring variables, scope of variables, val function, arithmetic operations, formatting data. Decision Making: If statement, comparing strings, compound conditions (and, or, not), nested if statements, case structure, using if statements with

option buttons & check boxes, displaying message in message box, testing whether input is valid or not.

UNIT-III

Modular programming: Menus, sub-procedures and sub-functions defining / creating and modifying a menu, using common dialog box, creating a new sub-procedure, passing variables to procedures, passing argument by value or by reference, writing a function/ procedure. Forms Handling : Multiple forms creating, adding, removing forms in project, hide, show method, load, unload statement, me keyword, referring to objects on a different forms.

UNIT-IV

Iteration Handling: Do/loops, for/next loops, using msgbox function, using string function Arrays and Grouped Data Control: Arrays - 1-dimension arrays, initializing an array using for each, user- defined data types, accessing information with user-defined data types, using list boxes with array, two dimensional arrays. lists, loops and printing list boxes & combo boxes, filling the list using property window/additem method, clear method, list box properties, removing an item from a list, list box/ combo box operations.

UNIT-V

Database Connectivity: Database connectivity of forms with back end tool like mysql, populating the data in text boxes, list boxes etc. searching of data in database. using forms. Updating/ editing of data based on a criterion.

Recommended Books:

Programming in Visual Basic 6.0 by Julia Case Bradley, Anita C. Millispangh (Tata Mcgraw Hill Edition 2000 (Fourteenth Reprint 2004).

DSE: 2-FINANCIAL MANAGEMENT

(Credit:6, Theory:4, Practical: 2)

UNIT-I

Nature of Financial Management: Finance and related disciplines; Scope of Financial Management; Profit Maximization, Wealth Maximization - Traditional and Modern Approach; Functions of finance Finance Decision, Investment Decision, Dividend Decision; Objectives of Financial Management; Organisation of finance function; Concept of Time Value of Money, present value, future value, and annuity; Risk & Return: Historical return, expected return, absolute return, holding period return, annualized return, arithmetic & geometric return; Risk - Systematic & unsystematic risk their sources and measures.

UNIT-II

Long -term investment decisions: Capital Budgeting - Principles and Techniques; Nature and meaning of capital budgeting; Estimation of relevant cash flows and terminal value; Evaluation techniques - Accounting Rate of Return, Net Present Value, Internal Rate of Return & MIRR, Net Terminal Value, Profitably Index Method. Concept and Measurement of Cost of Capital: Explicit and Implicit costs; Measurement of cost of capital; Cost of debt; Cost of perpetual debt; Cost of Equity Share; Cost of Preference Share; Cost of Retained Earning; Computation of over-all cost of capital based on Historical and Market weights.

UNIT-III

Capital Structures: Approaches to Capital Structure Theories - Net Income approach, Net Operating Income approach, Modigliani-Miller (MM) approach, Traditional approach, Capital Structure and Financial Distress, Trade-Off Theory.

Dividend Policy Decision - Dividend and Capital; The irrelevance of dividends: General, MM hypothesis; Relevance of dividends: Walter's model, Gordon's model; Leverage Analysis: Operating and Financial Leverage; EBIT -EPS analysis; Combined leverage.

UNIT-IV

Working Capital Management: Management of Cash - Preparation of Cash Budgets (Receipts and Payment Method only); Cash management technique, Receivables Management Objectives; Credit Policy, Cash Discount, Debtors.

Outstanding and Ageing Analysis; Costs - Collection Cost, Capital Cost, Default Cost, Delinquency Cost, Inventory Management (Very Briefly) - ABC Analysis; Minimum Level; Maximum Level; Reorder Level; Safety Stock; EOQ, Determination of Working Capital.

Recommended Books:

1. M.Y. Khan & P.K. Jain: Financial Management Text Problem and Cases, Tata McGraw Hill Publishing Co. Ltd.
2. R. P. Rustogi: Financial Management: Theory Concepts and Practices, Taxmann Publication.
3. I.M. Pandey: Financial Management: Theory and Practices, Vikas Publishing House.
4. R.A. Brealey, S.C. Myers, F. Allen & P. Mohanty: Principles of Corporate Finance, McGraw Hill Higher Education.
5. J.V. Horne & J.M. Wachowicz: Fundamentals of Financial Management Prentice Hall.

SEMESTER-VI

C: 14-INTERNET TECHNOLOGY

(Credit:6, Theory:4, Practical: 2)

UNIT-I

Java: Use of Objects, Array and Array List class.

UNIT-II

JavaScript: Data types, operators, functions, control structures, events and event handling.

UNIT-III

JDBC: JDBC Fundamentals, Establishing Connectivity and working with connection interface, Working with statements, Creating and Executing SQL Statements, Working with Result Set Objects. **UNIT-IV** JSP: Introduction to Java Server Pages, HTTP and Servlet Basics, The Problem with Servlets, The Anatomy of a JSP Page, JSP Processing, JSP Application Design with MVC, Setting Up the JSP Environment, Implicit JSP Objects, Conditional Processing, Displaying Values, Using an expression to Set an Attribute, Declaring Variables and Methods, Error Handling and Debugging, Sharing Data Between JSP Pages, Requests, and Users, Database Access.

UNIT-V

Java Beans: Java Beans Fundamentals, JAR files, Introspection, Developing a simple Bean, Connecting to DB.

Recommended Books:

1. Ivan Bayross, Web Enabled Commercial Application Development Using HTML, DHTML, Javascript, Perl CGI , BPB Publications, 2009.
2. Cay Horstmann, BIG Java, Wiley Publication , 3/e, 2009.
3. Herbert Schildt , Java 7, The Complete Reference, , 8/e, 2009.
4. Jim Keogh ,The Complete Reference J2EE, TMH, , 2002.

**C: 15-PROGRAMMING IN NET
(Credit:6, Theory:4, Practical: 2)****DSE: 3-E-COMMERCE
(Credit:6, Theory:4, Practical: 2)****UNIT-I**

An introduction to Electronic commerce: What is E-Commerce (Introduction And Definition), Main activities E-Commerce, Goals of E-Commerce, Technical Components of E-Commerce, Functions of E-Commerce, Advantages and disadvantages of E-Commerce, Scope of E-Commerce, Electronic Commerce Applications, Electronic Commerce and Electronic Business(C2C)(C2G,G2G, B2G, B2P, B2A, P2P, B2A, C2A, B2B, B2C).

UNIT-II

The Internet and WWW: Evolution of Internet, Domain Names and Internet Organization (.edu, .com, .mil, .gov, .net etc.) , Types of Network, Internet Service Provider, World Wide Web, Internet & Extranet, Role of Internet in B2B Application, building own Website, Cost, Time, Reach, Registering a Domain Name, Web promotion, Target email, Baner, Exchange, Shopping Bots.

UNIT-III

Internet Security: Secure Transaction, Computer Monitoring, Privacy on Internet, CorporateEmail privacy, Computer Crime(Laws , Types of Crimes), Threats, Attack on Computer System, Software Packages for privacy, Hacking, Computer Virus(How it spreads, Virus problem, virus protection, Encryption and Decryption, Secret key Cryptography, DES, Public Key Encryption, RSA, Authorisation and Authentication, Firewall, Digital Signature(How it Works).

UNIT-IV

Electronic Data Exchange: Introduction, Concepts of EDI and Limitation, Applications of EDI, Disadvantages of EDI, EDI model,Electronic Payment System: Introduction, Types of Electronic Payment System, Payment Types, Value Exchange System, Credit Card System, Electronic Fund Transfer, Paperless bill, Modern Payment Cash, Electronic Cash.

UNIT-V

Planning for Electronic Commerce: Planning Electronic Commerce initiates, Linking objectives to business strategies, Measuring cost objectives, Comparing benefits to Costs, Strategies for developing electronic commerce web sites.

Recommended Books:

1. E-Commerce Concepts, Models, Strategies-G.S.V.Murthy, Himalaya Publishing House.
2. E- Commerce:-Kamlesh K Bajaj and Debjani Nag.
3. Electronic commerce-Gray P. Schneider.
4. E-Commerce, Fundamentals & Applications: Chand (Wiley) Web and E-Commerce.

DSE: 4-PROJECT WORK
(Credit:6)

MATHEMATICS (HONOURS)

SEMESTER-I

C:1-CALCULUS-I

(Total Marks: 100)

Part-I (Marks: 70)

4 Lectures, 1 Tutorial (per week)

Unit-I

Hyperbolic functions, higher order derivatives, Leibnitz rule and its applications to problems of the type $e^{ax+b} \sin x$, $e^{ax+b} \cos x$, $(ax + b)^n \sin x$, $(ax + b)^n \cos x$, concavity and inflection points, asymptotes, curve tracing in Cartesian coordinates, tracing in polar coordinates of standard curves, L'Hospital's rule, applications in business, economics and life sciences.

Unit-II

Reduction formulae, derivations and illustrations of reduction formulae of the type $\int \sin^n x dx$, $\int \cos^n x dx$, $\int \tan^n x dx$, $\int \sec^n x dx$, $\int (\log x)^n dx$, $\int \sin^n x \cos^n x dx$, volumes by slicing, disks and washers methods, volumes by cylindrical shells, parametric equations, parameterizing a curve, arc length, arc length of parametric curves, area of surface of revolution.

Unit-III

Techniques of sketching conics, reflection properties of conics, rotation of axes and second degree equations, classification into conics using the discriminant, polar equations of conics. Sphere, Cone, Cylinder, Conicoids.

Unit-IV

Vector triple product, Introduction to vector functions, operations with vector-valued functions, limits and continuity of vector functions, differentiation and integration of vector functions, tangent and normal components of acceleration.

Part-II(PRACTICAL)

(Marks: 30)

List of Practical (Using any software/MATLAB) Practical/Lab work to be performed on a Computer.

1. Plotting the graphs of the functions e^{ax+b} , $\log(ax + b)$, $1/(ax + b)$, $\sin(ax + b)$, $\cos(ax + b)$, $|ax + b|$ and to illustrate the effect of a and b on the graph.
2. Plotting the graphs of the polynomial of degree 4 and 5, the derivative graph, the second derivative graph and comparing them.

3. Sketching parametric curves (eg. Trochoid, Cycloid, Epicycloids, Hypocycloid).
4. Obtaining the surface of revolution of curves.
5. Tracing of conics in cartesian/polar coordinates.
6. Sketching Ellipsoid, Hyperboloid of one and two sheets, Elliptic cone, Elliptic, Paraboloid, Hyperbolic paraboloid using cartesian coordinates.
7. Matrix operation (addition, multiplication, inverse, transpose).

Books Recommended:

1. H. Anton, I. Bivens and S. Davis: Calculus, 10-th Ed., John Wiley and Sons (Asia) P. Ltd., Singapore, 2002. Chapters: 3 (3.1, 3.2), 5 (5.2-5.5), 6(6.5, 6.8), 10 (10.1-10.5), 11(11.1, 11.4), 12(12.1, 12.2, 12.3, 12.6).
2. B.P. Acharya and D.C. Sahu: Analytical Geometry of Quadratic Surfaces, B.P. Acharya and D.C. Sahu, Kalyani Publishers, New Delhi, Ludhiana, Chapters: 2 and 3.
3. Shantinakaran: Text Book of Calculus(Part-II), S. Chand & Co. Pvt. Ltd., New Delhi, Chapters: 6,7, 10 (Art. 33-36).
4. Shantinakaran: Text Book of Calculus(Part-III), S. Chand & Co., Pvt. Ltd., New Delhi, Chapters: 1(Art.1,2), 3 (Art.7,8), 6 (15 restricted).

Books for Reference:

1. G.B. Thomas and R.L. Finney: Calculus, 9-th Ed., Pearson Education, Delhi, 2005.
2. R. Courant and F. John: Introduction to Calculus and Analysis (Volumes I & II), Springer- Verlag, New York, Inc., 1989.
3. Shanti Narayan and P.K. Mittal: Analytical Solid Geometry, S. Chand & Co. Pvt. Ltd., New Delhi.
4. M.J. Strauss, G.L. Bradley and K. J. Smith: Calculus, 3-rd Ed., Dorling Kindersley (India) P. Ltd. (Pearson Education), Delhi, 2007.

C:2-ALGEBRA-I

Total Marks: 100-(Theory: 80 Marks+Mid-Sem: 20 Marks)

5 Lectures, 1 Tutorial (per week)

Unit-I

Polar representation of complex numbers, n -th roots of unity, De Moivre's theorem for rational indices and its applications.

Unit-II

Equivalence relations, Basic Terminology, Functions, Inverse and composition of functions, One-to-One correspondence and cardinality of a set, Division algorithm, Divisibility and Euclidean algorithm, Prime numbers, Congruence relation between integers, Principles of Mathematical Induction, Statement of Fundamental Theorem of Arithmetic.

Unit-III

Systems of linear equations, row reduction and echelon forms, vector equations, the matrix equation $Ax = b$, solution sets of linear systems, applications of linear systems, linear independence.

Unit-IV

Introduction to linear transformations, Matrix of a linear transformation, Inverse of a matrix, Characterizations of invertible matrices. Subspaces of \mathbb{R}^n , Dimension of subspaces of \mathbb{R}^n and Rank of a matrix, Eigen values, Eigen Vectors and Characteristic equation of a matrix.

Books Recommended:

1. Titu Andreescu and Dorin Andrica: Complex Numbers from A to Z , Birkhauser, 2006. Chapter: 2.
2. Edgar G. Goodaire and Michael M. Parmenter: Discrete Mathematics with Graph Theory, 3-rd Ed., Pearson Education (Singapore) P. Ltd., Indian Reprint, 2005. Chapters: 2(2.4), 3, 4(4.1 – 4.1.6, 4.2 – 4.2.12, 4.3 – 4.3.9, 4.4 – 4.4.8), 5(5.1 – 5.1.4).
3. David C. Lay: Linear Algebra and its Applications, 3rd Ed., Pearson Education Asia, Indian Reprint, 2007. Chapters: 1(1.1 – 1.9), 2(2.1 – 2.3, 2.8, 2.9), 5(5.1, 5.2).

SEMESTER-II

C:3-REAL ANALYSIS (ANALYSIS-I)

Total Marks: 100-(Theory: 80 Marks+Mid-Sem: 20 Marks)

5 Lectures, 1 Tutorial (per week)

Unit-I

Review of Algebraic and Order Properties of \mathbb{R} , Upper bound & Lower bound, Least upper bound (LUB), Greatest lower bound (GLB), LUB & GLB property of an ordered field, Completeness of an ordered field, Incompleteness of \mathbb{Q} , Supremum and Infimum, Roots, Archimedean property, Rational & Irrational density theorems, Decimal representations of real numbers.

Unit-II

Idea of countable, uncountable sets and theorems relating to these sets, Sequences, Convergence & divergence of sequences, Limit of a sequence & Limit Theorems, Monotonic sequences, Weierstrass completeness principle, Nested Intervals, Cantor's completeness principle, Idea about higher order cardinals (restricted).

Unit-III

Subsequences, Bolzano Weierstrass theorem for sequences, Cluster points, Cauchy(Fundamental)

sequence, Cauchy's Convergence Criterion, Limit superior and Limit inferior, Convergence and divergence of infinite series, Series of positive terms, Tests of convergence.

Unit-IV

Absolute convergence, Rearrangement of terms of a series, Conditional convergence of a series, Open sets, Closed sets, Limit points, Closure, Interior and Boundary of sets. Bolzano Weierstrass theorem for sets.

Book Recommended:

1. G. Das and S. Pattanayak: Fundamentals of Mathematics Analysis, TMH Publishing Co. , Chapters: 2(2.1-2.7), 3(3.1-3.4), 4(4.1-4.8, 4.11-4.13), 5(5.1-5.5).

Books for Reference:

1. R.G. Bartle and D. R. Sherbert: Introduction to Real Analysis, 3-rd Ed., John Wiley and Sons (Asia) Pvt. Ltd., Singapore, 2002.
2. Gerald G. Bilodeau , Paul R. Thie, G.E. Keough: An Introduction to Analysis, 2-nd Ed., Jones & Bartlett, 2010.
3. Brian S. Thomson, Andrew. M. Bruckner and Judith B. Bruckner: Elementary Real Analysis, Prentice Hall, 2001.
4. S.K. Berberian: A First Course in Real Analysis, Springer Verlag, New York, 1994.
5. S.C. Mallik and S. Arora: Mathematical Analysis, New Age International Publications.
6. D. Somasundaram and B. Choudhury: A First Course in Mathematical Analysis, Narosa Publishing House.
7. S.L. Gupta and Nisha Rani: Real Analysis, Vikas Publishing House Pvt. Ltd., New Delhi.

C-:4-DIFFERENTIAL EQUATIONS

(Total Marks:100)

Part-I (Marks: 70)

4 Lectures, 1 Tutorial (per week)

Unit-I

Basic concepts of Differential equations and mathematical models. First order and first degree Ordinary differential equations(variables separable, homogeneous, exact, and linear). Applications of first order differential equations(Growth, Decay and Chemical Reactions, Heat flow, Oxygen debt, Economics). Equations of first order but of higher degree.

Unit-II

Second order linear equations(both homogeneous and non-homogeneous) with constant coefficients, second order equations with variable coefficients, variation of parameters, method of undetermined coefficients, Euler's equation, Second order differential equations with variable coefficients, Equations reducible to linear equations with constant coefficients.

Unit-III

Power series solutions of second order differential equations.

Unit-IV

Laplace transforms and its applications to solutions of differential equations.

Part-II(PRACTICAL)

(Marks: 30)

List of Practical (Using any Software/MATLAB) Practical/Lab work to be performed on a Computer.

1. Plotting of second order solution of family of differential equations.
2. Plotting of third order solution of family of differential equations.
3. Growth model (exponential case only).
4. Decay model (exponential case only).
5. Oxygen debt model.
6. Economic model.
7. Vibration problems.

Book Recommended:

1. J. Sinha Roy and S. Padhy: A Course of Ordinary and Partial Differential Equations, Kalyani Publishers, New Delhi. Chapters: 1, 2, 3, 4(4.1-4.8), 5, 7, 9(9.1-9.5, 9.10, 9.11, 9.13).

Books for Reference:

1. Martin Braun: Differential Equations and their Applications, Springer International.
2. M.D. Raisinghania: Advanced Differential Equations, S. Chand & Company Ltd., New Delhi.
3. G. Dennis Zill: A First Course in Differential Equations with Modelling Applications, Cengage Learning India Pvt. Ltd.
4. S.L. Ross: Differential Equations, John Wiley & Sons, India, 2004.

SEMESTER-III

C-5: THEORY OF REAL FUNCTIONS (ANALYSIS-II)

Total Marks: 100-(Theory: 80 Marks+Mid-Sem: 20 Marks)

5 Lectures, 1 Tutorial (per week)

Unit-I

Limits of functions ($\epsilon - \delta$ approach), Sequential criterion for limits, Divergence criteria. Limit theorems, one-sided limits. Infinite limits and limit at infinity. Continuous functions, Sequential criterion for continuity, Algebra of continuous functions and theorems related to continuity of functions.

Unit-II

Discontinuity and kinds of discontinuity, Further properties of continuity, Uniform continuity, Differentiable functions, Left hand & Right hand derivatives, Algebra of differentiable functions, Caratheodory's theorem.

Unit-III

Mean value conditions, Global and local maximum & minimum, Rolle's theorem, Generalized mean value theorem, Cauchy mean value theorem, Lagrange's mean value theorem and their applications, Darboux's theorem, Indeterminant forms, Higher order derivatives (Leibnitz theorem), Taylor's theorem and its applications to approximating functions by means of polynomials.

Unit-IV

Maxima and Minima, Taylor's theorem with different forms of remainder, Maclaurin's theorem, Deduction of Taylor's theorem from mean value theorem, Taylor's and Maclaurin's infinite series, Taylor's series and Maclaurin's series expansions of exponential and trigonometric functions, $\ln(1+x)$, $1/(ax+b)$ and $(1+x)^n$.

Books Recommended:

1. G. Das and S. Pattanayak: Fundamentals of Mathematics Analysis, TMH Publishing Co., Chapters: 6(6.1-6.7), 7(7.1-7.7), 9(9.7 only).
2. S.C. Mallik and S. Arora: Mathematical Analysis, New Age International Publications, Chapter: 6(8.1-8.6).

Books for Reference:

1. R. Bartle and D.R. Sherbert, Introduction to Real Analysis, John Wiley and Sons, 2003.
2. K.A. Ross, Elementary Analysis: The Theory of Calculus, Springer, 2004.
3. A. Mattuck, Introduction to Analysis, Prentice Hall, 1999.
4. S.R. Ghorpade and B.V. Limaye, A Course in Calculus and Real Analysis, Springer, 2006.

C-6: GROUP THEORY (ALGEBRA-II)

Total Marks: 100-(Theory: 80 Marks+Mid-Sem: 20 Marks)

5 Lectures, 1 Tutorial (per week)

Unit-I

Symmetries of a square, Dihedral groups, Definition and examples of groups including permutation groups and quaternion groups (illustration through matrices), Elementary properties of groups.

Subgroups and examples of subgroups, Centralizer, Normalizer, Center of a group, Product of two subgroups.

Unit-II

Properties of cyclic groups, Classification of subgroups of cyclic groups. Cycle notation for permutations, Properties of permutations, Even and Odd permutations, Alternating group, Properties of cosets, Lagranges theorem and consequences including Fermats Little theorem.

Unit-III

External direct product of a finite number of groups, Normal subgroups, Factor groups, Cauchy's theorem for finite abelian groups.

Unit-IV

Group homomorphisms, properties of homomorphisms, Cayley's theorem, Properties of isomorphisms, First isomorphism theorem, Second and Third isomorphism theorems (Statements only).

Book Recommended:

1. Joseph A. Gallian: Contemporary Abstract Algebra(4-th Edn.), Narosa Publishing House, New Delhi, Chapters: I, II, III, IV, V, VI(up to Theorem 6.2 only), VII, VIII, IX, X, XI.

Books for Reference:

1. D.S. Malik, J.M. Mordeson, and M.K. Sen: Fundamentals of Abstract Algebra, McGraw-Hill, 1997.
2. John B. Fraleigh: A First Course in Abstract Algebra, 7-th Ed., Pearson, 2002.
3. M. Artin: Abstract Algebra, 2-nd Ed., Pearson, 2011.
4. Joseph J. Rotman: An Introduction to the Theory of Groups, 4-th Ed., Springer Verlag, 1995.
5. I.N. Herstein: Topics in Algebra, Wiley Eastern Limited, India, 1975.

C-7: PARTIAL DIFFERENTIAL EQUATIONS & SYSTEMS OF ORDINARY DIFFERENTIAL EQUATIONS

(Total Marks: 100)

Part-I (Marks: 70)

04 Lectures (per week)

Unit-I

Systems of Linear Differential Equations: Basic theory of linear systems, Trial solution method for linear system with constant coefficients, Simultaneous linear first order equations in three variables, Methods of solution, Pfaffian differential equations, methods of solutions of Pfaffian differential equations in three variables.

Unit-II

Formation of first order partial differential equations, Linear and non-linear partial differential equations of first order, Special types of first-order equations, Solutions of partial differential equations of first order satisfying given conditions.

Unit-III

Linear partial differential equations with constant coefficients, Equations reducible to linear partial differential equations with constant coefficients, Partial differential equations with variable coefficients, Some standard forms of variable coefficients.

Unit-IV

Laplace equation, Solution of Laplace equations by separation of variables, One-dimensional Wave equation, Solution of the Wave equation (method of separation of variables), Diffusion equation, Solution of one-dimensional diffusion equation, Method of separation of variables.

Part-II(PRACTICAL)

(Marks: 30)

List of Practical (Using any Software/MATLAB) Practical/Lab work to be performed on a Computer.

1. To find the general solution of the non-homogeneous system of the form:

$$\frac{dx}{dt} = a_1x + b_1y + f_1(t), \quad \frac{dy}{dt} = a_2x + b_2y + f_2(t)$$

with given conditions.

2. Plotting the integral surfaces of a given first order PDE with initial data.

3. Solution of wave equation $\frac{\partial^2 u}{\partial t^2} - c^2 \frac{\partial^2 u}{\partial x^2} = 0$ for the following associated conditions:

(a) $u(x, 0) = \varphi(x)$, $u_t(x, 0) = \psi(x)$, $x \in \mathbb{R}$, $t > 0$. (b) $u(x, 0) = \varphi(x)$, $u_t(x, 0) = \psi(x)$, $u_x(0, t) = 0$, $x \in (0, \infty)$, $t > 0$. (c) $u(x, 0) = \varphi(x)$, $u_t(x, 0) = \psi(x)$, $u(0, t) = 0$, $x \in (0, \infty)$, $t > 0$. (d) $u(x, 0) = \varphi(x)$, $u_t(x, 0) = \psi(x)$, $u(0, t) = 0$, $u(1, t) = 0$, $0 < x < 1$, $t > 0$.

4. Solution of Diffusion equation $\frac{\partial u}{\partial t} - k^2 \frac{\partial^2 u}{\partial x^2} = 0$ for the following associated conditions:

(a) $u(x, 0) = \varphi(x)$, $u(0, t) = a$, $u(l, t) = b$, $0 < x < l$, $t > 0$.

(b) $u(x, 0) = \varphi(x)$, $x \in \mathbb{R}$, $0 < t < T$.

(c) $u(x, 0) = \varphi(x)$, $u(0, t) = a$, $x \in (0, \infty)$, $t \geq 0$.

Book Recommended:

1. J.Sinha Roy and S. Padhy: A Course on Ordinary and Partial Differential Equations, Kalyani Publishers, New Delhi, Ludhiana, 2012.
Chapters: 8 (8.1-8.3), 11, 12, 13(13.1-13.5), 15(15.1 & 15.5 only), 16(16.1 & 16.1.1 only), 17(17.1-17.3).

Books for References:

1. Tyn Myint-U and Lokenath Debnath: Linear Partial Differential Equations for Scientists and Engineers, 4-th edition, Springer, Indian reprint, 2006.

2. S.L. Ross: Differential equations, 3-rd Ed., John Wiley and Sons, India, 2004.

SEMESTER-IV

C-8: NUMERICALMETHODS

(Total Marks: 100)

Part-I (Marks: 70)

04 Lectures (per week)

Unit-I

Rate of convergence, Algorithms, Errors: Relative, Absolute, Round off, Truncation. Numerical solution of non-linear equations : Bisection method, Regular-Falsi method, Secant method, Newton-Raphson method, Fixed-point Iteration method, Newton-Raphson method for multiple roots, Aitken's O^2 process, Muller's method. Rate of convergence of these methods.

Unit-II

System of linear equations: Gaussian Elimination method, Gauss-Jordan method, Gauss Jacobi method, Gauss-Seidel method and their convergence analysis, .

Unit-III

Polynomial interpolation: Existence uniqueness of interpolating polynomials, Lagrange and Newtons divided difference interpolation, Error in interpolation, Central difference & averaging operators, Gauss-forward and backward difference interpolation, Simple numerical methods for derivatives, Interpolatory formulas.

Unit-IV

Numerical Integration: Some simple quadrature rules, Newton-Cotes rules, Trapezoidal rule, Simpsons rule, Simpsons $\frac{3}{8}$ -th rule, Compound quadrature rules, Compound mid-point rule, Compound

Trapezoidal rule, Compound Simpsons rule, Gauss-Legendre 2-point & 3-point rules. Numerical solutions of Differential Equations: Eulers method. Runge-Kutta methods of orders two, three and four.

Part-II(PRACTICAL)

(Marks: 30)

List of Practical (Using any Software/MATLAB) Practical/Lab work to be performed on a Computer.

1. Calculate the sum $1/1 + 1/2 + 1/3 + 1/4 + \dots + 1/N$.
2. To find the absolute value of an integer.
3. Enter 100 integers into an array and sort them in an ascending order.

4. Bisection Method.
5. Newton-Raphson Method.
6. Secant Method.
7. Regular-Falsi Method.
8. LU decomposition Method.
9. Gauss-Jacobi Method.
10. SOR Method or Gauss-Siedel Method.
11. Lagrange Interpolation or Newton Interpolation.
12. Simpsons rule.

Note: For any of the CAS (Computer aided software) Data types-simple data types, floating data types, character data types, arithmetic operators and operator precedence, variables and constant declarations, expressions, input/output, relational operators, logical operators and logical expressions, control statements and loop statements, arrays should be introduced to the students.

Book Recommended:

1. B.P. Acharya and R.N. Das: A Course on Numerical Analysis, Kalyani Publishers, New Delhi, Ludhiana. Chapters: 0(0.2, 0.8), 1(1.8, 1.9), 2(2.1-2.4, 2.6-2.9), 3(3.1-3.4, 3.6-3.11), 5(5.1- 5.3), 6(6.1-6.3, 6.5, 6.10, 6.11), 7(7.1-7.5 & 7.7).
2. Brian Bradie, A Friendly Introduction to Numerical Analysis, Pearson Education, India, 2007.

Books for Reference:

1. M.K. Jain, S.R.K. Iyengar and R.K. Jain: Numerical Methods for Scientific and Engineering Computation, 6th Ed., New age International Publisher, India, 2007.
2. C.F. Gerald and P.O. Wheatley: Applied Numerical Analysis, Pearson Education, India, 2008.
3. Uri M. Ascher and Chen Greif: A First Course in Numerical Methods, 7th Ed., PHI Learning Private Limited, 2013.
4. John H. Mathews and Kurtis D. Fink: Numerical Methods using Matlab, 4th Ed., PHI Learning Private Limited, 2012.
5. P. Khandasamy, K. Thilagavathy and K. Gunavathi: Numerical Methods, S. Chand & Company Ltd., 2012.
6. E. Balagurusamy: Numerical Methods, Tata McGraw-Hill Pub. Co. Ltd., 1999.

C-9: RIEMANN INTEGRATION & SERIES OF FUNCTIONS (ANALYSIS-III)

Total Marks: 100-(Theory: 80 Marks+Mid-Sem: 20 Marks)

5 Lectures, 1 Tutorial (per week)

Unit-I

Riemann integration, Inequalities of upper and lower sums, Riemann conditions of integrability. Riemann sum and definition of Riemann integral through Riemann sums, Equivalence of two definitions, Riemann integrability of monotone and continuous functions, Properties of the Riemann integral, Definition and integrability of piecewise continuous and monotone functions, Fundamental theorems of Calculus.

Unit-II

Improper integrals; Series and Integrals, Absolute convergence of integrals, Convergence of Beta and Gamma functions.

Unit-III

Point-wise and Uniform convergence of sequence of functions, Cauchy's criterion & Weierstrass M-test for uniform convergence, Dedekind test, Uniform convergence and Continuity, Term by term integration of series, Term by term differentiation of series.

Unit-IV

Power series (Cauchy Hadamard Theorem), Radius of convergence, Differentiation and integration of power series, Abels Limit Theorem, Stirling's formula, More about Taylor's series, Weierstrass Approximation Theorem.

Books Recommended:

1. G. Das and S. Pattanayak: Fundamentals of Mathematics Analysis, TMH Publishing Co., Chapters: 4(4.14 only), 8 (8.1-8.6), 9 (9.1-9.6, 9.8).
2. S.C. Mallik and S. Arora: Mathematical Analysis, New Age International Ltd., New Delhi, Chapters: 11(3.3, 4.3 only), 12(Restricted).

Books for Reference:

1. K.A. Ross, Elementary Analysis: The Theory of Calculus, Undergraduate Texts in Mathematics, Springer (SIE), Indian reprint, 2004.
2. R.G. Bartle D.R. Sherbert: Introduction to Real Analysis, 3rd Ed., John Wiley and Sons (Asia) Pvt. Ltd., Singapore, 2002.
3. Charles G. Denlinger: Elements of Real Analysis, Jones & Bartlett (Student Edition), 2011.
4. Shanti Narayan and M.D. Raisinghania: Elements of Real Analysis, S. Chand & Co. Pvt. Ltd.

C-10: RING THEORY & LINEAR ALGEBRA (ALGEBRA-III)

Total Marks: 100-(Theory: 80 Marks+Mid-Sem: 20 Marks)

5 Lectures, 1 Tutorial (per week)

Unit-I

Definition and examples of rings, Properties of rings, Subrings, Integral domains and Fields, Characteristic of a ring, Ideal, Ideal generated by a subset of a ring, Factor rings, Operations on Ideals, Prime and Maximal ideals.

Unit-II

Ring homomorphisms, Properties of ring homomorphisms, Isomorphism Theorems I, II and III, Field of quotients.

Unit-III

Vector spaces, Subspaces, Algebra of subspaces, Quotient spaces, Linear combination of vectors, Linear span, Linear independence, Basis and Dimension, Dimension of subspaces.

Unit-IV

Linear transformations, Null space, Range, Rank and Nullity of a linear transformation, Matrix representation of a linear transformation, Algebra of linear transformations. Isomorphisms, Isomorphism theorems, Invertibility and Isomorphisms, Change of co-ordinate matrix.

Book Recommended:

1. Joseph A. Gallian: Contemporary Abstract Algebra(8th Edn.), Narosa Publishing House, New Delhi. Chapters: 12, 13, 14, 15.
2. Stephen H. Friedberg, Arnold J. Insel, and Lawrence E. Spence: Linear Algebra, 4th Ed., Prentice- Hall of India Pvt. Ltd., New Delhi, 2004. Chapters: 1 (1.2-1.6), 2(2.1-2.5).

Books for Reference:

1. John B. Fraleigh: A First Course in Abstract Algebra, 7th Ed., Pearson, 2002.
2. M. Artin: Abstract Algebra, 2nd Ed., Pearson, 2011.
3. S. Lang: Introduction to Linear Algebra, 2nd Ed., Springer, 2005.
4. Gilbert Strang: Linear Algebra and its Applications, Cengage Learning India Pvt. Ltd.
5. S. Kumaresan: Linear Algebra- A Geometric Approach, Prentice Hall of India,1999.
6. Kenneth Hoffman, and Ray Alden Kunze: Linear Algebra, 2nd Ed., Prentice-Hall of India Pvt. Ltd., 1971.
7. I.N. Herstein: Topics in Algebra, Wiley Eastern Pvt. Ltd.

SEMESTER-V

C-11: MULTIVARIATE CALCULUS (CALCULUS-II)

Total Marks: 100-(Theory:80 Marks+Mid-Sem: 20 Marks)

5 Lectures, 1 Tutorial (per week)

Unit-I

Functions of several variables, limit and continuity of functions of two variables, Partial differentiation, Tangent planes, Approximation and Differentiability, Chain rule for one and two independent parameters.

Unit-II

Directional derivatives and gradient, Maximal property of the gradient, Normal property of the gradient, Tangent planes and the normal lines, Extrema of functions of two variables, Method of Lagrange multipliers, Lagrange Multipliers, Constrained optimization problems, A geometrical interpretation.

Unit-III

Double integration over rectangular region and over non-rectangular region, Double integrals in polar co-ordinates, Triple integrals, Triple integral over a parallelepiped and solid regions, Volume by triple integrals. cylindrical and spherical co-ordinates. Change of variables in double integrals and triple integrals.

Unit-IV

Definition of vector field, Divergence and Curl, Line integrals, Applications of line integrals: Mass and Work, Fundamental theorem and path independence for line integrals.

Unit-V

Green's theorem, Area as a line integral, Alternative forms of Green's theorem, Normal derivatives, Surface integrals, Integrals over parametrically defined surfaces. Stokes theorem, The Divergence theorem.

Book Recommended:

1. M.J. Strauss, G.L. Bradley and K. J. Smith: Calculus, 3rd Ed., Dorling Kindersley (India) Pvt. Ltd. (Pearson Education), Delhi, 2007. Chapters: 11(11.1(Pages: 541-543), 11.2- 11.6, 11.7(Pages:598-605), 11.8(Pages:610-614)), 12 (12.1, -12.3, 12.4(Pages:652-660), 12.5, 12.6), 13 (13.1-13.3, 13.4(Pages:712-716, 718-720), 13.5(Pages:723-726; 729-730), 13.6 (Pages:733-737), 13.7(Pages:742-745)).

Books for Reference:

1. G.B. Thomas and R.L. Finney: Calculus, 9th Ed., Pearson Education, Delhi, 2005.
2. E. Marsden, A.J. Tromba and A. Weinstein: Basic Multivariable Calculus, Springer (SIE), Indian reprint, 2005.
3. Santosh K. Sengar and S.P. Singh: Advanced Calculus, Cengage Learning India Pvt. Ltd.

C-12: PROBABILITY & STATISTICS

Total Marks:100-(Theory: 80 Marks+Mid-Sem: 20 Marks)

4 Lectures, 1 Tutorial (per week)

Unit-I

Sample space, Probability axioms, Independent events, Conditional probability & Bayes' theorem, Real random variables (discrete and continuous), Cumulative distribution function, Expectation of random variables, Some special expectations.

Unit-II

Multivariate distributions, Joint cumulative distribution functions, Joint probability distributions, Marginal & conditional distributions, Some probability distributions(Discrete case), Uniform distribution, Binomial distribution, Negative Binomial & Geometric distributions, Poisson distribution.

Unit-III

Some probability distributions(Continuous case), Uniform, Gamma, Exponential, Beta distributions, Normal distributions, Normal approximation to the Binomial distribution, Bivariate normal distribution.

Unit-IV

Distribution of two random variables, Expectation of function of two random variables, Moment generating functions, Conditional distributions & expectations, Correlation coefficient, Co-variance, Independent random variables, Linear regression for two variables.

Unit-V

Limit theorems, Markov's inequality, Chebyshev's inequality, Statement and interpretation of Weak and Strong law of large numbers, Central Limit theorem for independent and identically distributed random variables with finite variance, Markov Chains: Introduction, Chapman-Kolmogorov equations.

Books Recommended:

1. Irwin Miller and Marylees Miller, John E. Freund: Mathematical Statistics with Applications, 7th Ed., Pearson Education, Asia, 2006. Chapters: 2 (excluding Art.9), 3 (excluding Art.8), 4, 5(5.1, 5.2, 5.4, 5.5,5.7), 6(6.1-6.7), 14(14.1, 14.2)
2. Sheldon Ross: Introduction to Probability Models, 9th Ed., Academic Press, Indian Reprint, 2007. Chapters:8(8.1-8.4(up to pages 428)), 9(9.1, 9.2).

Books for Reference:

1. Alexander M. Mood, Franklin A. Graybill and Duane C. Boes: Introduction to the Theory of Statistics, 3rd Ed., Tata McGraw- Hill, Reprint 2007.
2. S.C. Gupta and V.K. Kapoor: Fundamentals of Mathematical Statistics, S. Chand and Company Pvt. Ltd., New Delhi.
3. Sheldon Ross: A First Course in Probability, Pearson Education.
4. Robert V. Hogg, Joseph W. McKean and Allen T. Craig: Introduction to Mathematical Statistics, Pearson Education, Asia, 2102.

5. Kai Lai Chung: Elementary Probability Theory with Stochastic Processes, 3-rd Edn., Springer International Student Edition.

SEMESTER-VI

C-13: METRIC SPACES & COMPLEX ANALYSIS (ANALYSIS-IV)

Total Marks: 100-(Theory: 80 Marks+Mid-Sem: 20 Marks)

5 Lectures, 1 Tutorial (per week)

Unit-I

Metric spaces: Definition and examples, Open & Closed spheres, Neighborhoods, Interior points, Open set, Closed set, Boundary points, Limit points & isolated points, Closure of a set, Dense sets, Separable metric spaces, Sequences in metric spaces, Convergent sequences, Cauchy sequences, Complete metric spaces, Distance between sets & diameter of a set, Subspaces, Cantor's theorem.

Unit-II

Continuous functions: Definition & characterizations, Sequential criterion and other characterizations of continuity, Uniform continuity, Homeomorphism, Connectedness, Connected subsets of \mathbb{R} , Separated sets, Disconnected sets, Contraction mappings, Banach Fixed point theorem.

Unit-III

Properties of complex numbers, Regions in the complex plane, Functions of complex variable, Mappings, Limits & Continuity of complex functions, Derivatives, Differentiation formulas, Cauchy-Riemann equations, Sufficient conditions for differentiability, Polar Co-ordinates, Analytic functions, Examples of analytic functions.

Unit-IV

Exponential function, Logarithmic function, Trigonometric function, Derivatives of these functions, Definite integrals of functions, Contours, Contour integrals and its examples, Upper bounds for moduli of contour integrals, Theorems on antiderivatives, Cauchy- Goursat theorem (statement only), Cauchy integral formula, Its extension and consequences.

Unit-V

Liouville's theorem and the Fundamental theorem of Algebra, Convergence of sequences and series, Taylor series with examples, Laurent series (without proof) with examples, Absolute and uniform convergence of power series.

Books Recommended:

1. P.K. Jain and K. Ahmad: Metric Spaces, Narosa Publishing House, New Delhi. Chapters: 2(1-9, 12), 3(1-4), 4(1-4), 6(1-2, 4), 7(1 only).
2. James Ward Brown and Ruel V. Churchill: Complex Variables and Applications, 8th Ed., McGraw Hill International Edition, 2009. Chapters: 1(11 only), 2(12, 13, 15-25), 3(29, 30, 34), 4(37-41, 43-46, 50-53), 5(55-60, 62,63,66).

Books for Reference:

1. Satish Shirali and Harikishan L. Vasudeva: Metric Spaces, Springer Verlag, London, 2006.
2. S. Kumaresan: Topology of Metric Spaces, 2nd Ed., Narosa Publishing House, 2011.
3. S. Arumgum, A.T. Issac and A. Somasundaram: Complex Analysis, Scitech Publ. Pvt. Ltd.
4. S. Ponnusamy: Foundations of Complex Analysis, Alpha Science International Ltd.
5. J.B. Conway: Functions of one complex variable, Springer International Student Edn..
6. N. Das: Complex Function Theory, Allied Publishers Pvt. Ltd., Mumbai.

C-14: LINEAR PROGRAMMING

Total Marks: 100-(Theory: 80 Marks+Mid-Sem: 20 Marks)

5 Lectures, 1 Tutorial (per week)

Unit-I

Introduction to linear programming problems(LPP), Mathematical formulation of the LPP with illustrations, Graphical method, General Linear programming problems, Canonical & standard form of LPP.

Unit-II

Theory of Simplex method, Optimality and unboundedness, the Simplex algorithm, Simplex method in tableau format, Introduction to artificial variables, Two-phase method, Big-M method and their comparisons.

Unit-III

Duality in LPP: Introduction, General Primal-Dual pair, Formulation of the Dual problem, Primal- Dual relationships, Duality theorems, Complementary slackness theorem, Duality & Simplex method, Economic interpretation of the Duality.

Unit-IV

Transportation Problem(TP): LP formulation of TP, Existence of solution and Duality in TP, Solution of Transportation problems, North-West corner method, Least-Cost method and Vogel approximation method for determination of starting basic solution, Algorithm for solving transportation problem, Assignment problem and its mathematical formulation, Solution methods of Assignment problem, Special cases in Assignment problems.

Unit-V

Games and Strategies: Introduction, Formulation of two person zero sum games, solving two person zero sum games, Maximin-Minimax principle, Games without saddle points, Games with mixed strategies, Graphical solution procedure to $(2 \times n)$ and $(m \times 2)$ games.

Book Recommended:

1. Kanti Swarup, P.K. Gupta and Man Mohan: Operations Research, S. Chand and Co. Pvt. Ltd., Chapters: 2, 3, 4, 5(5.1-5.8), 10(10.1-10.10), 11(11.1-11.4), 17(17.1-17.6).

Books for Reference:

1. G. Hadley: Linear Programming, Narosa Publishing House, New Delhi, 2002.
2. N.V.R. Naidu, G. Rajendra and T. Krishna Rao: Operations Research, I.K. International Publishing House Pvt. Ltd., New Delhi, Bangalore.
3. R. Veerachamy and V. Ravi Kumar: Operations Research- I.K. International Publishing House Pvt. Ltd., New Delhi, Bangalore.
4. P.K. Gupta and D.S. Hira: Operations Research, S. Chand and Company Pvt. Ltd., New Delhi.
5. Mokhtar S. Bazaraa, John J. Jarvis and Hanif D. Sherali: Linear Programming and Network Flows, 2-nd Ed., John Wiley and Sons, India, 2004.
6. F.S. Hillier and G.J. Lieberman: Introduction to Operations Research, 9-th Ed., Tata McGraw Hill, Singapore, 2009.
7. Hamdy A. Taha: Operations Research, An Introduction, 8-th Ed., PrenticeHall India, 2006.

DISCIPLINE SPECIFIC ELECTIVES(DES)

DSE-1 Programming in C++ (Compulsory)

(Total Marks; 100)

Part-I(Marks: 70)

Introduction to structured programming: data types- simple data types, floating data types, character data types, string data types, arithmetic operators and operators precedence, variables and constant declarations, expressions, input using the extraction operator `&&` and `cin`, output using the insertion operator `ij` and `cout`, preprocessor directives, increment(++) and decrement(–) operations, creating a C++ program, input/ output, relational operators, logical operators and logical expressions, if and if-else statement, switch and break statements. for, while and do-while loops and continue statement, nested control statement, value returning functions, value versus reference parameters, local and global variables, one dimensional array, two dimensional array, pointer data and pointer variables.

Book Recommended:

1. D. S. Malik: C++ Programming Language, Edition-2009, Course Technology, Cengage Learning, India Edition. Chapters: 2(Pages:37-95), 3(Pages:96-129), 4(Pages:134-178), 5(Pages:181- 236), 6, 7(Pages:287-304), 9 (pages: 357-390), 14(Pages:594-600).

Books for Reference:

1. E. Balaguruswami: Object oriented programming with C++, fifth edition, Tata McGraw Hill Education Pvt. Ltd.
2. R. Johnsonbaugh and M. Kalin-Applications Programming in ANSI C, Pearson Education.
3. S. B. Lippman and J. Lajoie, C++ Primer, 3rd Ed., Addison Wesley, 2000.
4. Bjarne Stroustrup , The C++ Programming Language, 3rd Ed., Addison Welsley.

Part-II(PRACTICAL, Marks:30)

List of Practicals (Using any software) Practical/Lab work to be performed on a Computer.

1. Calculate the Sum of the series $\frac{1}{1} \pm \frac{1}{2} \pm \frac{1}{3} + \frac{1}{N}$ for any positive integer N .
2. Write a user defined function to find the absolute value of an integer and use it to evaluate the function $(-1)^n/|n|$, for $n = -2, -1, 0, 1, 2$.
3. Calculate the factorial of any natural number.
4. Read floating numbers and compute two averages: the average of negative numbers and the average of positive numbers.
5. Write a program that prompts the user to input a positive integer. It should then output a message indicating whether the number is a prime number.
6. Write a program that prompts the user to input the value of a, b and c involved in the equation $ax^2+bx+c=0$ and outputs the type of the roots of the equation. Also the program should outputs all the roots of the equation.
7. write a program that generates random integer between 0 and 99. Given that first two Fibonacci numbers are 0 and 1, generate all Fibonacci numbers less than or equal to generated number.
8. Write a program that does the following:
 - a. Prompts the user to input five decimal numbers.
 - b. Prints the five decimal numbers.
 - c. Converts each decimal number to the nearest integer.
 - d. Adds these five integers.
 - e. Prints the sum and average of them.
9. Write a program that uses whileloops to perform the following steps:
 - a. Prompt the user to input two integers :first Num and second Num (first Num shoul be less than second Num).
 - b. Output all odd and even numbers between first Num and second Num.
 - c. Output the sum of all even numbers between first Num and second Num.
 - d. Output the sum of the square of the odd numbers firs tNum and second Num.
 - e. Output all uppercase letters corresponding to the numbers between first Num and second Num, if any.

10. Write a program that prompts the user to input five decimal numbers. The program should then add the five decimal numbers, convert the sum to the nearest integer, and print the result.
11. Write a program that prompts the user to enter the lengths of three sides of a triangle and then outputs a message indicating whether the triangle is a right triangle or a scalene triangle.
12. Write a value returning function smaller to determine the smallest number from a set of numbers. Use this function to determine the smallest number from a set of 10 numbers.
13. Write a function that takes as a parameter an integer (as a long value) and returns the number of odd, even, and zero digits. Also write a program to test your function.
14. Enter 100 integers into an array and sort them in an ascending/ descending order and print the largest/ smallest integers.
15. Enter 10 integers into an array and then search for a particular integer in the array.
16. Multiplication/ Addition of two matrices using two dimensional arrays.
17. Using arrays, read the vectors of the following type: $A = (12345678)$, $B = (02340156)$ and compute the product and addition of these vectors.
18. Read from a text file and write to a text file.
19. Write a function, reverse Digit, that takes an integer as a parameter and returns the number with its digits reversed. For example, the value of function reverse Digit 12345 is 54321 and the value of reverse Digit -532 is -235.

DSE-2

Total Marks:100-(Theory: 80 Marks+Mid-Sem: 20 Marks)

5 Lectures, 1 Tutorial (per week)

(Any one of the following)

1-DISCRETE MATHEMATICS

Unit-I

Propositional Logic, Propositional equivalences, Predicates and Quantifiers, Nested quantifiers, Rules of Inference, Methods of proof, Relations and their properties, n-ary relations and their applications, The basic counting, the Pigeon-hole principle, Generalized Permutations and Combinations.

Unit-II

Recurrence relations, Modelling with recurrence relations, Solving linear homogeneous recurrence relations with constant coefficients, Generating functions, Solving recurrence relations using generating functions, Principle of Inclusion-Exclusion & applications.

Unit-III

Partially ordered sets, Hasse diagram of partially ordered sets, maps between ordered sets, Boolean

expressions and Boolean functions, Duality principle, Lattices as ordered sets, Lattices as algebraic structures, sublattices, Boolean algebra and its properties.

Unit-IV

Graphs: Basic concepts and graph terminology, representing graphs and graph isomorphism, Cut-vertices and Cut-edges, Distance in a graph (restricted), Connectivity, Euler and Hamiltonian path, Shortest-Path problems, Planar graphs, Graph coloring.

Book Recommended:

1. Kenneth H. Rosen: Discrete Mathematics and Applications, Tata McGraw Hill Publications, Chapters: 1(1.1-1.6), 4(4.1, 4.2, 4.5), 5(5.1, 5.2, 5.5), 6(6.1, 6.2, 6.4-6.6), 7(7.1, 7.2), 8, 10(10.1, 10.2).

Books for References:

1. B A. Davey and H. A. Priestley: Introduction to Lattices and Order, Cambridge University Press, Cambridge, 1990.
2. Edgar G. Goodaire and Michael M. Parmenter: Discrete Mathematics with Graph Theory (2nd Edition), Pearson Education (Singapore) Pte. Ltd., Indian Reprint 2003.
3. Rudolf Lidl and Gnter Pilz: Applied Abstract Algebra (2nd Edition), Undergraduate Texts in Mathematics, Springer (SIE), Indian reprint, 2004.
4. D.S. Malik: Discrete Mathematics: Theory & Applications, Cengage Learning India Pvt. Ltd.
5. Kevin Ferland: Discrete Mathematical Structures, Cengage Learning India Pvt. Ltd.

2-MATHEMATICAL MODELLING

Unit-I

Simple situations requiring Mathematical modelling. The technique of Mathematical modelling, Mathematical modelling through differential equations, linear growth and decay models, non-linear growth and decay models, compartment models, Mathematical modelling of geometrical problems through ordinary differential equations of first order.

Unit-II

Mathematical modelling in population dynamics, Mathematical modelling of epidemics through systems of ordinary differential equations of first order, compartment models through systems of ordinary differential equations, Mathematical modelling in economics through systems of ordinary differential equations of first order.

Unit-III

Mathematical models in medicine, arms race, battles and international trade in terms of systems of ordinary differential equations, Mathematical modelling of planetary motions, Mathematical modelling of circular motion and motion of satellites, mathematical modelling through linear differential equations of second order.

Unit-IV

Situation giving rise to partial differential equations models, mass balance equations: First method of getting PDE models, momentum balance equations. The second method of obtaining partial differential models, variational principles, third function, fourth method of obtaining partial differential equation models, models for traffic flow of a highway. Situation that can be modelled through graphs, mathematical models in terms of directed graphs, optimization principles and techniques, Mathematical modelling through calculus of variations.

Book Recommended:

1. J.N. Kapur: Mathematical Modelling, Chapters: 1(1.1 and 1.2), 2(2.1 to 2.4, 2.6), 3(3.1 to 3.5), 4(4.1 to 4.3), 6(6.1 to 6.6), 7(7.1 to 7.2), 9(9.1 and 9.2).

3-NUMBER THEORY

Unit-I

Divisibility theorem in integers, Primes and their distributions, Fundamental theorem of arithmetic, Greatest common divisor, Euclidean algorithms, Modular arithmetic, Linear Diophantine equation, prime counting function, statement of prime number theorem, Goldbach conjecture.

Unit-II

Introduction to congruences, Linear Congruences, Chinese Remainder theorem, Polynomial congruences, System of linear congruences, complete set of residues, Chinese remainder theorem, Fermats little theorem, Wilsons theorem.

Unit-III

Number theoretic functions, sum and number of divisors, totally multiplicative functions, definition and properties of the Dirichlet product, the Mbius inversion formula, the greatest integer function, Eulers phi function, Eulers theorem, reduced set of residues, some properties of Eulers phi-function.

Unit-IV

Order of an integer modulo n , primitive roots for primes, composite numbers having primitive roots, Eulers criterion, the Legendre symbol and its properties, quadratic reciprocity, quadratic congruences with composite moduli.

Book Recommended:

1. D.M. Burton: Elementary Number Theory, McGraw Hill, Chapters: 2(2.1 to 2.4), 3(3.1 to 3.3), 4(4.1 to 4.4), 5(5.1 to 5.4), 6(6.1 to 6.3), 7(7.1 to 7.3), 8(8.1 to 8.2), 9(9.1 to 9.3).

Books for Reference:

1. K.H. Rosen: Elementary Number Theory & its Applications, Pearson Addition Wesley.
2. I. Niven and H.S. Zuckerman: An Introduction to Theory of Numbers, Wiley Eastern Pvt. Ltd.

3. Tom M. Apostol: Introduction to Analytic Number Theory, Springer International Student Edn.
4. Neville Robinns: Beginning Number Theory (2nd Edition), Narosa Publishing House Pvt. Limited, Delhi, 2007.

4-BOOLEAN ALGEBRA & AUTOMATA THEORY

Unit-I

Definition, examples and basic properties of ordered sets, maps between ordered sets, duality principle, lattices as ordered sets, lattices as algebraic structures, sublattices, products and homomorphisms. Definition, examples and properties of modular and distributive lattices, Boolean algebras, Boolean polynomials, minimal forms of Boolean polynomials, QuinnMcCluskey method, Karnaugh diagrams, switching circuits and applications of switching circuits.

Unit-II

Introduction: Alphabets, strings, and languages. Finite Automata and Regular Languages: deterministic and non-deterministic finite automata, regular expressions, regular languages and their relationship with finite automata, pumping lemma and closure properties of regular languages.

Unit-III

Context Free Grammars and Pushdown Automata: Context free grammars (CFG), parse trees, ambiguities in grammars and languages, pushdown automaton (PDA) and the language accepted by PDA, deterministic PDA, Non- deterministic PDA, properties of context free languages; normal forms, pumping lemma, closure properties, decision properties.

Unit-IV

Turing Machines: Turing machine as a model of computation, programming with a Turing machine, variants of Turing machine and their equivalence. Undecidability: Recursively enumerable and recursive languages, undecidable problems about Turing machines: halting problem, Post Correspondence Problem, and undecidability problems About CFGs.

Books Recommended:

1. B A. Davey and H. A. Priestley, Introduction to Lattices and Order, Cambridge University Press, Cambridge, 1990.
2. Edgar G. Goodaire and Michael M. Parmenter, Discrete Mathematics with Graph Theory, (2nd Ed.), Pearson Education (Singapore) P.Ltd., Indian Reprint 2003.
3. Rudolf Lidl and Gnter Pilz, Applied Abstract Algebra, 2nd Ed., Undergraduate Texts in Mathematics, Springer (SIE), Indian reprint, 2004.
4. J. E. Hopcroft, R. Motwani and J. D. Ullman, Introduction to Automata Theory, Languages, and Computation, 2nd Ed., Addison-Wesley, 2001.
5. H.R. Lewis, C.H. Papadimitriou, C. Papadimitriou, Elements of the Theory of Computation, 2nd Ed., Prentice-Hall, NJ, 1997.

6. J.A. Anderson, Automata Theory with Modern Applications, Cambridge University Press, 2006.

DSE-3

**Total Marks:100-(Theory:80 Marks+Mid-Sem:20 Marks) 5 Lectures,
1 Tutorial (per week)
(Any one of the following)**

1-DIFFERENTIAL GEOMETRY

Unit-I

Theory of Space Curves: Space curves, Planer curves, Curvature, torsion and Serret-Frenet formulae. Osculating circles, Osculating circles and spheres. Existence of space curves. Evolutes and involutes of curves.

Unit-II

Osculating circles, Osculating circles and spheres. Existence of space curves. Evolutes and involutes of curves.

Unit-III

Developables: Developable associated with space curves and curveson surfaces, Minimal surfaces.

Unit-IV

Theory of Surfaces: Parametric curves on surfaces. Direction coefficients. First and second Fundamental forms. Principal and Gaussian curvatures. Lines of curvature, Eulers theorem. Rodrigues formula, Conjugate and Asymptotic lines.

Book Recommended:

1. C.E. Weatherburn, Differential Geometry of Three Dimensions, Cambridge University Press 2003. Chapters:1(1-4, 7,8,10), 2(13, 14, 16, 17), 3, 4(29-31, 35, 37, 38).

Books for References

1. T.J. Willmore, An Introduction to Differential Geometry, Dover Publications, 2012.
2. S. Lang, Fundamentals of Differential Geometry, Springer, 1999.
3. B. O'Neill, Elementary Differential Geometry, 2nd Ed., Academic Press, 2006.
4. A.N. Pressley-Elementary Differential Geometry, Springer.
5. B.P. Acharya and R.N. Das-Fundamentals of Differential Geometry, Kalyani Publishers, Ludhiana, New Delhi.

2-MECHANICS

Unit-I

Moment of a force about a point and an axis, couple and couple moment, Moment of a couple about a line, resultant of a force system, distributed force system, free body diagram, free body involving interior sections, general equations of equilibrium, two point equivalent loading, problems arising from structures, static indeterminacy.

Unit-II

Laws of Coulomb friction, application to simple and complex surface contact friction problems, transmission of power through belts, screw jack, wedge, first moment of an area and the centroid, other centers, Theorem of Pappus-Guldinus, second moments and the product of area of a plane area, transfer theorems, relation between second moments and products of area, polar moment of area, principal axes.

Unit-III

Conservative force field, conservation for mechanical energy, work energy equation, kinetic energy and work kinetic energy expression based on center of mass, moment of momentum equation for a single particle and a system of particles.

Unit-IV

Translation and rotation of rigid bodies, Chasles theorem, general relationship between time derivatives of a vector for different references, relationship between velocities of a particle for different references, acceleration of particle for different references.

Book Recommended:

1. I.H. Shames and G. Krishna Mohan Rao, Engineering Mechanics: Statics and Dynamics, (4th Ed.), Dorling Kindersley (India) Pvt. Ltd. (Pearson Education), Delhi, 2009. Chapters:3, 4, 5, 6(6.1-6.7), 7, 11, 12(12.5, 12.6), 13.

Books for Reference:

1. R.C. Hibbeler and Ashok Gupta, Engineering Mechanics: Statics and Dynamics, 11th Ed., Dorling Kindersley (India) Pvt. Ltd. (Pearson Education), Delhi.
2. Grant R Fowles, Analytical Mechanics, Cengage Learning India Pvt. Ltd.

3-MATHEMATICAL FINANCE

Unit-I

Basic principles: Comparison, arbitrage and risk aversion, Interest (simple and compound, discrete and continuous), time value of money, inflation, net present value, internal rate of return (calculation by bisection and Newton-Raphson methods), comparison of NPV and IRR. Bonds, bond prices and yields, Macaulay and modified duration, term structure of interest rates: spot and forward rates, explanations of term structure, running present value, floating-rate bonds, immunization, convexity, puttable and callable bonds.

Unit-II

Asset return, short selling, portfolio return, (brief introduction to expectation, variance, covariance

and correlation), random returns, portfolio mean return and variance, diversification, portfolio diagram, feasible set, Markowitz model (review of Lagrange multipliers for 1 and 2 constraints), Two fund theorem, risk free assets, One fund theorem, capital market line, Sharpe index. Capital Asset Pricing Model (CAPM), betas of stocks and portfolios, security market line, use of CAPM in investment analysis and as a pricing formula, Jensen's index.

Unit-III

Forwards and futures, marking to market, value of a forward/futures contract, replicating portfolios, futures on assets with known income or dividend yield, currency futures, hedging (short, long, cross, rolling), optimal hedge ratio, hedging with stock index futures, interest rate futures, swaps.

Unit-IV

Lognormal distribution, Lognormal model / Geometric Brownian Motion for stock prices, Binomial Tree model for stock prices, parameter estimation, comparison of the models. Options, Types of options: put / call, European / American, pay off of an option, factors affecting option prices, put call parity.

Books Recommended:

1. David G. Luenberger, Investment Science, Oxford University Press, Delhi, 1998. Chapters:1, 2, 3, 4, 6, 7, 8(8.5-8.8), 10(except 10.11, 10.12), 11(except 11.2 11.8).
2. John C. Hull, Options, Futures and Other Derivatives (6th Edition), Prentice-Hall India, Indian reprint, 2006. Chapters: 3, 5, 6, 7(except 7.10, 7.11), 8, 9.
3. Sheldon Ross, An Elementary Introduction to Mathematical Finance (2nd Edition), Cambridge University Press, USA, 2003. Chapter:3

Books for References:

1. R.C. Hibbeler and Ashok Gupta, Engineering Mechanics: Statics and Dynamics, 11th Ed., Dorling Kindersley (India) Pvt. Ltd. (Pearson Education), Delhi.
2. Grant R Fowles, Analytical Mechanics, Cengage Learning India Pvt. Ltd.

4-RING THEORY & LINEAR ALGEBRA-II

Unit-I

Polynomial rings over commutative rings, division algorithm and consequences, principal ideal domains, factorization of polynomials, reducibility tests, irreducibility tests, Eisenstein criterion, unique factorization in $\mathbb{Z}[x]$.

Unit-II

Divisibility in integral domains, irreducibles, primes, unique factorization domains, Euclidean domains.

Unit-III

Dual spaces, dual basis, double dual, transpose of a linear transformation and its matrix in the

dual basis, annihilators, Eigenspaces of a linear operator, diagonalizability, invariant subspaces and Cayley-Hamilton theorem, the minimal polynomial for a linear operator.

Unit-IV

Inner product spaces and norms, Gram-Schmidt orthogonalisation process, orthogonal complements, Bessels inequality, the adjoint of a linear operator, Least Squares Approximation, minimal solutions to systems of linear equations, Normal and self-adjoint operators, Orthogonal projections and Spectral theorem.

Books Recommended:

1. Joseph A. Gallian: Contemporary Abstract Algebra (4th Ed.), Narosa Publishing House, 1999. Chapters: 16, 17, 18.
2. Stephen H. Friedberg, Arnold J. Insel, Lawrence E. Spence: Linear Algebra (4th Edition), Prentice-Hall of India Pvt. Ltd., New Delhi, 2004. Chapters: 2(2.6 only), 5(5.1, 5.2, 5.4), 6(6.1, 6.4, 6.6), 7(7.3 only).

Books for Reference:

(For LINEAR ALGEBRA)

1. S Lang: Introduction to Linear Algebra (2nd edition), Springer, 2005
2. Gilbert Strang: Linear Algebra and its Applications, Thomson, 2007
3. S. Kumaresan: Linear Algebra- A Geometric Approach, Prentice Hall of India, 1999.
4. 4. Kenneth Hoffman, Ray Alden Kunze: Linear Algebra 2nd Ed., Prentice-Hall Of India Pvt. Limited, 1971.

(For RING THEORY)

1. John B. Fraleigh: A first course in Abstract Algebra, 7th Edition, Pearson Education India, 2003.
2. Herstein: Topics in Algebra (2nd edition), John Wiley & Sons, 2006
3. Michael Artin: Algebra (2nd edition), Pearson Prentice Hall, 2011
4. Robinson, Derek John Scott.: An introduction to abstract algebra, Hindustan book agency, 2010.

DSE-4

PROJECT WORK/DISSERTATION (Compulsory)

Total Marks:100-(Project:75 Marks+Viva-Voce:25 Marks)

SKILL ENHANCEMENT COURSES (SEC)
(Credit: 2 each, Total Marks:50) SEC-1
to SEC-4

SEC-1

COMMUNICATIVE ENGLISH & WRITING SKILL (Compulsory)

SEC-2

(Any one of the following)

1-COMPUTER GRAPHICS

Development of computer Graphics: Raster Scan and Random Scan graphics storages, displays processors and character generators, colour display techniques, interactive input/output devices. Points, lines and curves: Scan conversion, line-drawing algorithms, circle and ellipse generation, conic-section generation, polygon filling anti aliasing. Two-dimensional viewing: Coordinate systems, linear transformations, line and polygon clipping algorithms.

Books Recommended:

1. D. Hearn and M.P. Baker-Computer Graphics, 2nd Ed., PrenticeHall of India, 2004.
2. J.D. Foley, A van Dam, S.K. Feiner and J.F. Hughes-Computer Graphics: Principals and Practices, 2nd Ed., Addison-Wesley, MA, 1990.
3. D.F. Rogers-Procedural Elements in Computer Graphics, 2nd Ed., McGraw Hill Book Company, 2001.
4. D.F. Rogers and A.J. Admas-Mathematical Elements in Computer Graphics, 2nd Ed., McGraw Hill Book Company, 1990.

2-LOGIC & SETS

Introduction, propositions, truth table, negation, conjunction and disjunction. Implications, biconditional propositions, converse, contra positive and inverse propositions and precedence of logical operators. Propositional equivalence: Logical equivalences. Predicates and quantifiers: Introduction, Quantifiers, Binding variables and Negations. Sets, subsets, Set operations and the laws of set theory and Venn diagrams. Examples of finite and infinite sets. Finite sets and counting principle. Empty set, properties of empty set. Standard set operations. Classes of sets. Power set of a set. Difference and Symmetric difference of two sets. Set identities, Generalized union and intersections. Relation: Product set, Composition of relations, Types of relations, Partitions, Equivalence Relations with example of congruence modulo relation, Partial ordering relations, nary relations.

Books Recommended:

1. R.P. Grimaldi-Discrete Mathematics and Combinatorial Mathematics, Pearson Education, 1998.
2. P.R. Halmos-Naive Set Theory, Springer, 1974.
3. E. Kamke-Theory of Sets, Dover Publishers, 1950.

3-COMBINATORIAL MATHEMATICS

Basic counting principles, Permutations and Combinations (with and without repetitions), Binomial theorem, Multinomial theorem, Counting subsets, Set-partitions, Stirling numbers Principle of Inclusion and Exclusion, Derangements, Inversion formulae Generating functions: Algebra of formal power series, Generating function models, Calculating generating functions, Exponential generating functions. Recurrence relations: Recurrence relation models, Divide and conquer relations, Solution of recurrence relations, Solutions by generating functions. Integer partitions, Systems of distinct representatives.

Books Recommended:

1. J.H. van Lint and R.M. Wilson-A Course in Combinatorics, 2nd Ed., Cambridge University Press, 2001.
2. V. Krishnamurthy-Combinatorics, Theory and Application, Affiliated East-West Press 1985.
3. P.J. Cameron-Combinatorics, Topics, Techniques, Algorithms, Cambridge University Press, 1995.
4. M. Jr. Hall-Combinatorial Theory, 2nd Ed., John Wiley & Sons, 1986.
5. S.S. Sane-Combinatorial Techniques, Hindustan Book Agency, 2013.
6. R.A. Brualdi-Introductory Combinatorics, 5th Ed., Pearson Education Inc., 2009.

4-INFORMATION SECURITY

Overview of Security: Protection versus security; aspects of security data integrity, data availability, privacy; security problems, user authentication, Orange Book. Security Threats: Program threats, worms, viruses, Trojan horse, trap door, stack and buffer over flow; system threats- intruders; communication threats- tapping and piracy. Security Mechanisms: Intrusion detection, auditing and logging, tripwire, system-call monitoring.

Books Recommended:

1. C. Pfleeger and S.L. Pfleeger-Security in Computing , 3rd Ed., Prentice-Hall of India, 2007.
2. D. Gollmann-Computer Security, John Wiley and Sons, NY, 2002.
3. J. Piwprzyk, T. Hardjono and J. Seberry-Fundamentals of Computer Security, Springer- Verlag Berlin, 2003.

4. J.M. Kizza-Computer Network Security, Springer, 2007.
5. M. Merkow and J. Breithaupt-Information Security: Principles and Practices, Pearson Education, 2006.

GENERIC ELECTIVES(Interdisciplinary)
(04 Papers, 02 papers each from two Allied disciplines) (Credit: 06 each,
Marks:100)
GE-1 to GE-4

GE-1 : CALCULUS & ORDINARY DIFFERENTIAL EQUATIONS

Total Marks:100-(Theory: 80 Marks+Mid-Sem: 20 Marks)

Unit-I

Curvature, Asymptotes, Tracing of Curves (Cartenary, Cycloid, Folium of Descartes), Rectification, Quadrature, Elementary ideas about Sphere, Cones, Cylinders and Conicoids.

Unit-II

Review of limits, continuity and differentiability of functions of one variables and their properties, Limit and Continuity of functions of several variables, Partial derivatives, Partial derivatives of higher orders, Homogeneous functions, Change of variables, Mean value theorem, Taylors theorem and Maclaurins theorem for functions of two variables(statements & applications).

Unit-III

Maxima and Minima of functions of two and three variables, Implicit functions, Lagranges multipliers (Formulae & its applications), Concepts of Multiple integrals & its applications.

Unit-IV

Ordinary Differential Equations of order one and degree one (variables separable, homogeneous, exact and linear). Equations of order one but higher degree. Second order linear equations with constant coefficients, homogeneous forms, Second order equations with variable coefficients, Variation of parameters.

Books Recommended:

1. S.K. Sengar and S.P. Singh: Advanced Calculus, Cengage Learning India Pvt. Ltd.(6th Indian Reprint), Chapters: 1(1.11-1.14 restricted), 2(2.1-2.13 restricted), 4(4.1-4.11), 5, 7(7.1-7.3 restricted), 11(restricted).
2. Shantinayakan: Text Book of Calculus, Part-II, S. Chand and Co., Chapter-8 (Art. 24, 25, 26)
3. Shantinayakan: Text Book of Calculus, Part-III, S. Chand and Co., Chapter-1 (Art 1,2), 3, 4(Art. 10 to 12 ommitting Simpsons Rule), 5(Art-13) and 6(Art-15).
4. B.P. Acharya and D.C. Sahu: Analytical Geometry of Quadratic Surfaces, Kalyani Publishers, New Delhi, Ludhiana.

5. J. Sinharoy and S. Padhy: A Course of Ordinary and Partial Differential Equations, Kalyani Publishers. Chapters: 2(2.1 to 2.7), 3, 4(4.1 to 4.7), 5.

Books for Reference:

1. Shanti Narayan and P.K. Mittal: Analytical Solid Geometry, S. Chand & Company Pvt.Ltd., New Delhi.
2. David V. Weider: Advanced Calculus, Dover Publications.
3. Martin Braun: Differential Equations and their Applications-Martin Braun, Springer International.
4. M.D. Raisinghania: Advanced Differential Equations, S. Chand & Company Ltd., New Delhi.
5. G. Dennis Zill: A First Course in Differential Equations with Modelling Applications, Cengage Learning India Pvt. Ltd.

GE-2: LINEAR ALGEBRA, ABSTRACT ALGEBRA & NUMERICAL ANALYSIS

Total Marks:100-(Theory: 80 Marks+Mid-Sem: 20 Marks)

Unit-I

Vector space, Subspace, Span of a set, Linear dependence and Independence, Dimensions and Basis. Linear transformations, Range, Kernel, Rank, Nullity, Inverse of a linear map, Rank-Nullity theorem.

Unit-II

Matrices and linear maps, Rank and Nullity of a matrix, Transpose of a matrix, Types of matrices. Elementary row operations, System of linear equations, Matrix inversion using row operations, Determinant and Rank of matrices, Eigen values, Eigen vectors.

Unit-III

Group Theory: Definition and examples, Subgroups, Normal subgroups, Cyclic groups, Cosets, Quotient groups, Permutation groups, Homomorphism. Elementary ideas about Rings, Field (definitions, statements, and examples only).

Unit-IV

Convergence, Errors: Relative, Absolute, Round off, Truncation. Transcendental and Polynomial equations: Bisection method, Newtons method, Secant method. Rate of convergence of these methods. System of linear algebraic equations: Gaussian Elimination and Gauss Jordan methods. Interpolation: Lagrange and Newtons methods. Error bounds. Finite difference operators. Gregory forward and backward difference interpolation (statements, definitions and uses/examples only).

Books Recommended:

1. V. Krishnamurty, V. P. Mainra, J. L. Arora: An introduction to Linear Algebra, Affiliated East-West Press Pvt. Ltd., New Delhi, Chapters: 3, 4(4.1 to 4.7), 5(except 5.3), 6(6.1, 6.2, 6.5, 6.6, 6.8), 7(7.4 only).

2. I.N. Herstein: Topics in Algebra, Wiley Eastern Pvt. Ltd. Chapters: 2(2.1-2.7), 3(3.1, 3.2).
3. B.P. Acharya and R.N. Das: A Course on Numerical Analysis, Kalyani Publishers, New Delhi, Ludhiana. Chapters: 1, 2(2.1 to 2.4, 2.6, 2.8, 2.9), 3(3.1 to 3.4), 4(4.1, 4.2), 5(5.1- 5.3), 6(6.1- 6.3, 6.10, 6.11).

Books for References:

1. I.H. Seth: Abstract Algebra, Prentice Hall of India Pvt. Ltd., New Delhi.
2. S. Kumaresan: Linear Algebra, A Geometric Approach, Prentice Hall of India.
3. Rao and Bhimasankaran: Linear Algebra, Hindustan Publishing House.
4. S. Singh: Linear Algebra, Vikas Publishing House Pvt. Ltd., New Delhi.
5. Gilbert Strang: Linear Algebra & its Applications, Cengage Learning India Pvt. Ltd.
6. Gallian: Contemporary Abstract Algebra, Narosa publishing House.
7. Artin: Algebra, Prentice Hall of India.
8. V.K. Khanna and S.K. Bhambri: A Course in Abstract Algebra, Vikas Publishing House Pvt. Ltd., New Delhi.

PHYSICS(HONOURS)

SEMESTER-I

C-I: MATHEMATICAL PHYSICS-I

(Credits: Theory-04, Practicals-02)
Marks:100 (Theory:70, Practical: 30)
Theory: 40 Classes (1 hr. duration)

The emphasis of course is on applications in solving problems of interest to physicists. The students are to be examined entirely on the basis of problems, seen and unseen.

UNIT-I

Calculus: Calculus of functions of more than one variable: Partial derivatives, exact and inexact differentials, Integrating factor, with simple illustration. Constrained Maximization using Lagrange Multipliers. (4 Lectures)

Vector Calculus: Recapitulation of vectors: Properties of vectors under rotations. Scalar product and its invariance under rotations. Vector product, Scalar triple product and their interpretation in terms of area and volume respectively. Scalar and Vector fields. (5 Lectures)

UNIT-II

Orthogonal Curvilinear Coordinates: Orthogonal Curvilinear Coordinates, Derivation of Gradient, Divergence, Curl and Laplacian in Cartesian, Spherical and Cylindrical Coordinate Systems. Comparison of velocity and acceleration in cylindrical and spherical coordinate system. (7 Lectures)

Dirac Delta function and its properties: Definition of Dirac delta function. Representation as limit of a Gaussian function and rectangular function. Properties of Dirac delta function. (3 Lectures)

UNIT-III

Vector Differentiation: Directional derivatives and normal derivative. Gradient of a scalar field and its geometrical interpretation. Divergence and curl of a vector field. Del and Laplacian operators. Vector identities, Gradient, divergence, curl and Laplacian in spherical and cylindrical coordinates. (8 Lectures)

UNIT-IV

Vector Integration: Ordinary Integrals of Vectors. Multiple integrals, Jacobian. Notion of infinitesimal line, surface and volume elements. Line, surface and volume integrals of Vector fields. Flux of a vector field. Gauss' divergence theorem, Green's and Stokes Theorems and their applications (no rigorous proofs). (13 Lectures)

Reference Books:

1. Mathematical Methods for Physicists, G.B. Arfken, H.J. Weber, F.E. Harris, 2013, 7th Edn., Elsevier.
2. An introduction to ordinary differential equations, E.A. Coddington, 2009, PHI learning.

3. Differential Equations, George F. Simmons, 2007, McGraw Hill.
4. Mathematical Tools for Physics, James Nearing, 2010, Dover Publications.
5. Mathematical methods for Scientists and Engineers, D.A. McQuarrie, 2003, Viva Book
6. Advanced Engineering Mathematics, D.G. Zill and W.S. Wright, 5 Ed., 2012, Jones and Bartlett Learning
7. Advanced Engineering Mathematics, Erwin Kreyszig, 2008, Wiley India.
8. Essential Mathematical Methods, K.F.Riley & M.P.Hobson, 2011, Cambridge Univ. Press
9. Mathematical Physics and Special Relativity-M. Das, P.K. Jena and B.K. Dash (Srikrishna Prakashan) 2nd Edition 2009
10. Mathematical Physics–H. K. Dass, Dr. Rama Verma (S. Chand Higher Academics), th Edition 2011.
11. Mathematical PhysicsC. Harper, (Prentice Hall India) 2006.
12. Mathematical Physics-Goswami (Cengage Learning) 2014
13. Mathematical Method for Physical Sciences- M. L. Boas (Wiley India) 2006

PHYSICS LAB-C:I

20 Classes (2 hrs. duration)

The aim of this Lab is not just to teach computer programming and numerical analysis but to emphasize its role in solving problems in Physics.

- Highlights the use of computational methods to solve physical problems.
- The course will consist of lectures (both theory and practical) in the Lab.
- Evaluation done not on the programming but on the basis of formulating the problem.
- Aim at teaching students to construct the computational problem to be solved.
- Students can use any one operating system Linux or Microsoft Windows.

Topics	Description with Applications
Introduction and Overview	Computer architecture and organization, memory and Input/output devices.
Basics of scientific computing	Binary and decimal arithmetic, Floating point numbers, algorithms, Sequence, Selection and Repetition, single and double precision arithmetic, underflow & overflow emphasize the importance of making equations in terms of dimensionless variables, Iterative methods.
Errors and error Analysis	Truncation and round off errors, Absolute and relative errors, Floating point computations.
Review of C & C++ programming fundamentals	Introduction to Programming, constants, variables and data types, operators and Expressions, I/O statements, scanf and printf, c in and c out, Manipulators for data formatting, Control statements (decision making and looping statements) (If-statement. If-else Statement. Nested if Structure. Else-if Statement. Ternary Operator.

	Goto Statement. Switch Statement. Unconditional and Conditional Looping. While Loop. Do-While Loop. FOR Loop. Break and Continue Statements. Nested Loops), Arrays (1D & 2D) and strings, user defined functions, Structures and Unions, Idea of classes and objects.
Programs	Sum & average of a list of numbers, largest of a given list of numbers and its location in the list, sorting of numbers in ascending descending order, Binarysearch.
Random number generation	Area of circle, area of square, volume of sphere, value of π .

Referred Books:

1. Introduction to Numerical Analysis, S.S. Sastry, 5th Edn. , 2012, PHI Learning Pvt. Ltd.
2. Schaum's Outline of Programming with C++. J. Hubbard, 2000, McGraw-Hill Pub.
3. Numerical Recipes in C: The Art of Scientific Computing, W.H. Pressetal, 3rd Edn. 2007, Cambridge University Press.
4. A first course in Numerical Methods, U.M. Ascher & C. Greif, 2012, PHI Learning.
5. Elementary Numerical Analysis, K.E. Atkinson, 3 rd Edn. , 2007 , Wiley India Edition.
6. Numerical Methods for Scientists & Engineers, R.W. Hamming, 1973, Courier Dover Pub.
7. An Introduction to computational Physics, T. Pang, 2nd Edn., 2006,Cambridge Univ. Press.

C-2: MECHANICS

(Credits: Theory-04, Practicals-02)

Marks:100 (Theory:70, Practical: 30)

Theory: 40 Classes (1 hr. duration)

UNIT-I

Rotational Dynamics: Centre of Mass and Laboratory frames. Angular momentum of a particle and system of particles. Torque. Principle of conservation of angular momentum. Rotation about a fixed axis. **Moment of Inertia.** Calculation of moment of inertia for rectangular, cylindrical and spherical bodies. Kinetic energy of rotation. Motion involving both translation and rotation. (9 Lectures)

Non-Inertial Systems: Non-inertial frames and fictitious forces. Uniformly rotating frame. Laws of Physics in rotating coordinate systems. Centrifugal force. Coriolis force and its applications. (3 Lectures)

UNIT-II

Elasticity: Relation between Elastic constants. Twisting torque on a Cylinder or Wire. (3 Lectures)

Fluid Motion: Kinematics of Moving Fluids: Poiseuilles Equation for Flow of a Liquid through a Capillary Tube . (3 Lectures)

Oscillations: SHM: **Simple Harmonic Oscillations.** Differential equation of SHM and its solution. Kinetic energy, potential energy, total energy and their time-average values. Damped oscillation. Forced oscillations: Transient and steady states; Resonance, sharpness of resonance; powerdissipation and Quality Factor. (5 Lectures)

UNIT-III

Gravitation and Central Force Motion: Law of gravitation. Gravitational potential energy. Inertial and gravitational mass. Potential and field due to spherical shell and solid sphere. (3 Lectures)

Motion of a particle under a central force field. Two-body problem and its reduction to one-body problem and its solution. The energy equation and energy diagram. **Keplers Laws.** Satellite in circular orbit and applications. Geosynchronous orbits. Weightlessness. Basic idea of global positioning system (GPS). Physiological effects on astronauts.(5 Lectures)

UNIT-IV

Special Theory of Relativity: Michelson-Morley Experiment and its outcome. Postulates of Special Theory of Relativity. Lorentz Transformations. Simultaneity and order of events. Lorentz contraction. Time dilation. Relativistic transformation of velocity, frequency and wave number. Relativistic addition of velocities. Variation of mass with velocity. Massless Particles. Mass-energy Equivalence. Relativistic Doppler effect. Relativistic Kinematics. Transformation of Energy and Momentum. Energy-Momentum Four Vector. (9 Lectures)

Reference Books:

1. An introduction to mechanics, D. Kleppner, R.J. Kolenkow, 1973, McGraw-Hill.
2. Mechanics, Berkeley Physics, vol.1, C.Kittel, W.Knight, et.al. 2007, Tata McGraw-Hill.
3. Physics, Resnick, Halliday and Walker 8/e. 2008, Wiley.
4. Analytical Mechanics, G.R. Fowles and G.L. Cassiday. 2005, Cengage Learning.

5. Feynman Lectures, Vol. I, R.P.Feynman, R.B.Leighton, M.Sands, 2008, Pearson Education
6. Introduction to Special Relativity, R. Resnick, 2005, John Wiley and Sons.
7. University Physics, Ronald Lane Reese, 2003, Thomson Brooks/Cole.
(Additional Books for Reference)
8. Mechanics, D.S. Mathur, S. Chand and Company Limited, 2000
9. University Physics. F.W Sears, M.W Zemansky, H.D Young 13/e, 1986, Addison Wesley
10. Physics for scientists and Engineers with Modern Phys., J.W. Jewett, R.A.Serway, 2010, Cengage Learning
11. Theoretical Mechanics, M.R. Spiegel, 2006, Tata McGraw Hill.
12. Mechanics - J. C. Slater and N. H. Frank (McGraw-Hill)

PHYSICS LAB-C:II

20 Classes (2 hrs. duration)

1. To study the random error in observations.
2. To determine the height of a building using a Sextant.
3. To study the Motion of Spring and calculate (a) Spring constant, (b) g and (c) Modulus of rigidity.
4. To determine the Moment of Inertia of a Flywheel.
5. To determine g and velocity for a freely falling body using Digital Timing Technique
6. To determine Coefficient of Viscosity of water by Capillary Flow Method (Poiseuilles method).
7. To determine the Young's Modulus of a Wire by Optical Lever Method.
8. To determine the Modulus of Rigidity of a Wire by Maxwells needle. 9. To determine the elastic Constants of a wire by Searles method.
9. To determine the value of g using Bar Pendulum.
10. To determine the value of g using Katers Pendulum

Reference Books:

1. Advanced Practical Physics for students, B. L. Flint and H.T. Worsnop, 1971, AsiaPublishing House
2. Advanced level Physics Practicals, Michael Nelson and Jon M. Ogborn, 4th Edition, reprinted 1985, Heinemann Educational Publishers
3. A Text Book of Practical Physics, I.Prakash & Ramakrishna, 11th Edn, 2011, Kitab Mahal

SEMESTER-II

C-3: ELECTRICITY AND MAGNETISM

(Credits: Theory-04, Practicals-02)

Marks:100 (Theory:70, Practical: 30)

Theory: 40 Classes (1 hr. duration)

UNIT-I

Electric Field and Electric Potential: Electric field: Electric field lines. Electric flux. Gauss Law with applications to charge distributions with spherical, cylindrical and planar symmetry. (3 Lectures)

Conservative nature of Electrostatic Field. Electrostatic Potential. Laplaces and Poissonequations. The Uniqueness Theorem. Potential and Electric Field of a dipole. Force and Torque on a dipole. (3 Lectures)

Electrostatic energy of system of charges. Electrostatic energy of a charged sphere. Conductors in an electrostatic Field. Surface charge and force on a conductor. Capacitance of a system of charged conductors. Parallel-plate capacitor. Capacitance of an isolated conductor. Method of Images and its application to: (1) Plane Infinite Sheet and (2) Sphere. (4 Lectures)

UNIT-II

Magnetic Field: Magnetic force between current elements and definition of Magnetic Field B. Biot-Savarts Law and its simple applications: straight wire and circular loop. Current Loop as a Magnetic Dipole and its Dipole Moment (Analogy with Electric Dipole). Amperes Circuital Law and its application to (1) Solenoid and (2) Toroid. Properties of B: curl and divergence. Vector Potential. Magnetic Force on (1) point charge (2) current carrying wire (3) between current elements. Torque on a current loop in a uniform Magnetic Field. Ballistic Galvanometer: Torque on a current Loop. Ballistic Galvanometer: Current and Charge Sensitivity. Electromagnetic damping. Logarithmic damping. CDR. (10 Lectures)

UNIT-III

Dielectric Properties of Matter: Electric Field in matter. Polarization, Polarization Charges. Electrical Susceptibility and Dielectric Constant. Capacitor (parallel plate, spherical, cylindrical) filled with dielectric. Displacement vector D. Relations between E, P and D. Gauss Law in dielectrics. (4 Lecturers)

Magnetic Properties of Matter: Magnetization vector (M). Magnetic Intensity (H). Magnetic Susceptibility and permeability. Relation between B, H, M. Ferromagnetism. B-H curve and hysteresis. (4 Lecturers)

Electromagnetic Induction: Faradays Law. Lenzs Law. Self Inductance and Mutual Inductance. Reciprocity Theorem. Energy stored in a Magnetic Field. (2 Lectures)

UNIT-IV

Electrical Circuits: AC Circuits: Kirchhoffs laws for AC circuits. Complex Reactance and Impedance. Series LCR Circuit: (1) Resonance, (2) Power Dissipation and (3) Quality Factor, and (4) Band Width,. Parallel LCR Circuit. (5 Lectures)

Network theorems: Ideal Constant-voltage and Constant-current Sources. Network Theorems:

Thevenin theorem, Norton theorem, Superposition theorem, Reciprocity theorem, Maximum Power Transfer theorem. Growth & decay of currents in RC, RL, and LCR Series circuits for DC. (5 Lectures)

Reference Books:

1. Electricity, Magnetism & Electromagnetic Theory, S. Mahajan and Choudhury, 2012, Tata McGraw
2. Electricity and Magnetism, Edward M. Purcell, 1986 McGraw-Hill Education
3. Introduction to Electrodynamics, D.J. Griffiths, 3rd Edn., 1998, Benjamin Cummings.
4. Feynman Lectures Vol.2, R.P.Feynman, R.B.Leighton, M. Sands, 2008, Pearson Education
5. Elements of Electromagnetics, M.N.O. Sadiku, 2010, Oxford University Press.
6. Electricity and Magnetism, J.H.Fewkes & J.Yarwood. Vol. I, 1991, Oxford Univ. Press.

PHYSICS LAB-C:III

20 Classes (2 hrs. duration)

1. Use a Multimeter for measuring (a) Resistances, (b) AC and DC Voltages, (c) DC Current, (d) Capacitances, and (e) Checking electrical fuses.
2. To study the characteristics of a series RC Circuit.
3. To determine an unknown Low Resistance using Potentiometer.
4. To determine an unknown Low Resistance using Carey Fosters Bridge.
5. To compare capacitances using DeSautys bridge.
6. Measurement of field strength B and its variation in a solenoid (determine dB/dx)
7. To verify the Thevenin and Norton theorems.
8. To verify the Superposition, and Maximum power transfer theorems.
9. To determine self inductance of a coil by Andersons bridge.
10. To study response curve of a Series LCR circuit and determine its (a) Resonant frequency, (b) Impedance at resonance, (c) Quality factor Q, and (d) Band width.
11. To study the response curve of a parallel LCR circuit and determine its (a) Antiresonant frequency and (b) Quality factor Q.
12. Measurement of charge and current sensitivity and CDR of Ballistic Galvanometer
13. Determine a high resistance by leakage method using Ballistic Galvanometer.
14. To determine self-inductance of a coil by Rayleighs method.

15. To determine the mutual inductance of two coils by Absolute method.

Reference Books:

1. Advanced Practical Physics for students, B.L. Flint and H.T. Worsnop, 1971, Asia Publishing House
2. A Text Book of Practical Physics, I.Prakash & Ramakrishna, 11th Ed., 2011, Kitab Mahal
3. Advanced level Physics Practicals, Michael Nelson and Jon M. Ogborn, 4th Edition, reprinted 1985, Heinemann Educational Publishers
4. A Laboratory Manual of Physics for undergraduate classes, D.P.Khandelwal, 1985, Vani Pub.

C-4: WAVES AND OPTICS

(Credits: Theory-04, Practicals-02)

Marks:100 (Theory:70, Practical: 30)

Theory: 40 Classes (1 hr. duration)

UNIT-I

Geometrical optics: Fermats principle, reflection and refraction at plane interface, Matrix formulation of geometrical Optics. Idea of dispersion. Application to thick lense, Ramsden and Huygens eyepiece.(5 Lecturers)

Wave Optics: Electromagnetic nature of light. Definition and properties of wave front. Huygens Principle. Temporal and Spatial Coherence. Division of amplitude and wavefront. Youngs double slit experiment. Lloyds Mirror and Fresnels Biprism. Phase change on reflection: Stokestreatment. (5 Lecturers)

UNIT-II

Wave Motion: Plane and Spherical Waves. Longitudinal and Transverse Waves. Plane Progressive (Travelling) Waves. Wave Equation. Particle and Wave Velocities. Differential Equation. Pressure of a Longitudinal Wave. Energy Transport. Intensity of Wave. Water Waves: Ripple and Gravity Waves. (5 Lectures)

Superposition of two perpendicular Harmonic Oscillations: Graphical and Analytical Methods. Lissajous Figures (1:1 and 1:2) and their uses. Superposition of N harmonic waves. (3 Lectures)

UNIT-III

Interference: Interference in Thin Films: parallel and wedge-shaped films. Fringes of equal inclination (Haidinger Fringes); Fringes of equal thickness (Fizeau Fringes). Newtons Rings: Measurement of wavelength and refractive index. (5 Lecturers)

Interferometer: Michelson Interferometer-(1) Idea of form of fringes (No theory required), (2) Determination of Wavelength, (3) Wavelength Difference, (4) Refractive Index, and (5) Visibility of Fringes. Fabry-Perot interferometer. . (5 Lectures)

UNIT-IV

Fraunhofer diffraction: Single slit. Circular aperture, Resolving Power of a telescope. Double slit. Multiple slits. Diffraction grating. Resolving power of grating. (6 Lectures)

Fresnel Diffraction: Fresnel's Assumptions. Fresnel's Half-Period Zones for Plane Wave. Explanation of Rectilinear Propagation of Light. Theory of a Zone Plate: Multiple Foci of a Zone Plate. Fresnel's Integral, Fresnel diffraction pattern of a straight edge, a slit and a wire. (6 Lectures)

Reference Books:

1. Waves: Berkeley Physics Course, vol. 3, Francis Crawford, 2007, Tata McGraw-Hill.
2. Fundamentals of Optics, F.A. Jenkins and H.E. White, 1981, McGraw-Hill
3. Principles of Optics, Max Born and Emil Wolf, 7th Edn., 1999, Pergamon Press.
4. Optics, Ajoy Ghatak, 2008, Tata McGraw Hill
5. The Physics of Vibrations and Waves, H. J. Pain, 2013, John Wiley and Sons.
6. The Physics of Waves and Oscillations, N.K. Bajaj, 1998, Tata McGraw Hill.
7. Optics - Brijlal & Subramaniam- (S. Chand Publication) 2014.
8. Geometrical and Physical Optics R.S. Longhurst, Orient Blackswan, 01-Jan-1986
9. Vibrations and Waves - A. P. French, (CBS) Indian print 2003
10. Optics, E. Hecht (Pearson India)

PHYSICS LAB-C:IV

20 Classes (2 hrs. duration)

1. To determine the frequency of an electric tuning fork by Melde's experiment and verify $2T$ law.
2. To investigate the motion of coupled oscillators.
3. To study Lissajous Figures.
4. Familiarization with: Schuster's focusing; determination of angle of prism.
5. To determine refractive index of the material of a prism using sodium source.
6. To determine the dispersive power and Cauchy constants of the material of a prism using mercury source.
7. To determine the wavelength of sodium source using Michelson's interferometer.
8. To determine wavelength of sodium light using Fresnel Biprism.
9. To determine wavelength of sodium light using Newton's Rings.
10. To determine the thickness of a thin paper by measuring the width of the interference fringes produced by a wedge-shaped film.

11. To determine wavelength of (1) Na source and (2) spectral lines of Hg source using plane diffraction grating.
12. To determine dispersive power and resolving power of a plane diffraction grating.

Reference Books:

1. Advanced Practical Physics for students, B.L. Flint and H.T. Worsnop, 1971, Asia Publishing House
2. A Text Book of Practical Physics, I. Prakash & Ramakrishna, 11th Ed., 2011, Kitab Mahal
3. Advanced level Physics Practicals, Michael Nelson and Jon M. Ogborn, 4th Edition, reprinted 1985, Heinemann Educational Publishers
4. A Laboratory Manual of Physics for undergraduate classes, D.P. Khandelwal, 1985, Vani

SEMESTER-III

C-5: MATHEMATICAL PHYSICS-II

(Credits: Theory-04, Practicals-02)
 Marks:100 (Theory:70, Practical: 30)
 Theory: 40 Classes (1 hr. duration)

The emphasis of the course is on applications in solving problems of interest to physicists. Students are to be examined on the basis of problems, seen and unseen.

UNIT-I

Fourier series: Periodic functions. Orthogonality of sine and cosine functions, Dirichlet Conditions (Statement only). Expansion of periodic functions in a series of sine and cosine functions and determination of Fourier coefficients. Complex representation of Fourier series. Expansion of functions with arbitrary period. Expansion of non-periodic functions over an interval. Even and odd functions and their Fourier expansions. Application. Summing of Infinite Series. Term-by-Term differentiation and integration of Fourier series. Parseval Identity. (11 Lectures)

UNIT-II

Frobenius Method and Special Functions: Singular Points of Second Order Linear Differential Equations and their importance, Frobenius method and its applications to differential equations: Legendre & Hermite Differential Equations. Properties of Legendre & Hermite Polynomials: Rodrigues Formula, Generating Function, Orthogonality. Simple recurrence relations. Expansion of function in a series of Legendre Polynomials. Associated Legendre polynomials and spherical harmonics. (10 Lectures)

UNIT-III

Some Special Integrals: Beta and Gamma Functions and Relation between them. Expression of Integrals in terms of Gamma Functions. Error Function (Probability Integral). (5 Lectures) Theory of Errors: Systematic and Random Errors. Propagation of Errors. Normal Law of Errors. Standard and Probable Error. (4 Lectures)

UNIT-IV

Partial Differential Equations: Solutions to partial differential equations, using separation of variables: Laplace's Equation in problems of rectangular, cylindrical and spherical symmetry. Conducting and dielectric sphere in an external uniform electric field. Wave equation and its solution for vibrational modes of a stretched string. (10 Lectures)

Reference Books:

1. Mathematical Methods for Physicists: Arfken, Weber, 2005, Harris, Elsevier.
2. Fourier Analysis by M.R. Spiegel, 2004, Tata McGraw-Hill.
3. Mathematics for Physicists, Susan M. Lea, 2004, Thomson Brooks/Cole.
4. Differential Equations, George F. Simmons, 2006, Tata McGraw-Hill.
5. Partial Differential Equations for Scientists & Engineers, S.J. Farlow, 1993, Dover Pub.
6. Mathematical methods for Scientists & Engineers, D.A. McQuarrie, 2003, Viva Books
7. Mathematical Physics and Special Relativity –M. Das, P.K. Jena and B.K. Dash (Srikrishna Prakashan) 2nd Edition 2009
8. Mathematical Physics–H. K. Dass, Dr. Rama Verma (S. Chand Higher Academics) 6th Edition 2011.
9. Mathematical Physics C. Harper, (Prentice Hall India) 2006.
10. Mathematical Physics–Goswami (CENGAGE Learning) 2014
11. Mathematical Method for Physical Sciences – M. L. Boas (Wiley India) 2006
12. Mathematics for Physicists, P. Dennery and A. Krzywicki Dover)
13. Advanced Engineering Mathematics, E. Kreyszig (New Age Publication) 2011.

PHYSICS LAB-C:V

20 Classes (2 hrs. duration)

The aim of this Lab is to use the computational methods to solve physical problems. Course will consist of lectures (both theory and practical) in the Lab. Evaluation done not on the programming but on the basis of formulating the problem.

Topics	Description with Applications
Introduction to Numerical computation software Scilab	Introduction to Scilab, Advantages and disadvantages, Scilab environment, Command window, Figure window, Edit window, Variables and arrays, Initialising variables in Scilab, Multidimensional arrays, Subarray, Special values, Displaying output data, data file, Scalar and array operations, Hierarchy of operations, Built in Scilab functions, Introduction to plotting, 2D and 3D plotting (2), Branching Statements and program design, Relational & logical operators, the while loop, for loop, details of loop operations, break & continue statements, nested loops, logical arrays and vectorization (2) User defined functions, Introduction to Scilab functions, Variable passing in Scilab, optional arguments, preserving data between calls to a function, Complex and Character data, string function, Multidimensional arrays (2) an introduction to Scilab file processing, file opening and closing, Binary I/o functions, comparing binary and formatted functions, Numerical methods and developing the skills of writing a program (2).
Curve fitting, Least square fit, Goodness of fit, standard deviation	Ohms law to calculate R, Hookes law to calculate spring constant
Solution of Linear system of equations by Gauss elimination method and Gauss Seidal method. Diagonalization of matrices, Inverse of a matrix, Eigen vectors, eigen values problems.	Solution of mesh equations of electric circuits (3 meshes) Solution of coupled spring mass systems (3 masses)

<p>Solution of ODE First order Differential equation Euler, modified Euler and Runge-Kutta second order methods Second order differential equation. Fixed difference method.</p>	<p>First order differential equation</p> <ul style="list-style-type: none"> • Radioactive decay • Current in RC, LC circuits with DC source • Newtons law of cooling • Classical equations of motion <p>Second order Differential Equation</p> <ul style="list-style-type: none"> • Harmonic oscillator (no friction) • Damped Harmonic oscillator • Over damped • Critical damped • Oscillatory • Forced Harmonic oscillator • Transient and • Steady state solution • Apply above to LCR circuits also.
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Reference Books:

1. Mathematical Methods for Physics and Engineers, K.F Riley, M.P. Hobson and S. J.20 Bence, 3rd ed., 2006, Cambridge University Press
2. Complex Variables, A.S. Fokas & M.J. Ablowitz, 8th Ed., 2011, Cambridge Univ. Press
3. First course in complex analysis with applications, D.G. Zill and P.D. Shanahan, 1940, Jones & Bartlett
4. Simulation of ODE/PDE Models with MATLAB, OCTAVE and SCILAB: Scientific and Engineering Applications: A.V. Wouwer, P. Saucez, C.V. Fernandez. 2014 Springer
5. Scilab by example: M. Affouf 2012, ISBN: 978-1479203444
6. Scilab (A free software to Matlab): H.Ramchandran, A.S.Nair. 2011 S.Chand & Company
7. Scilab Image Processing: Lambert M. Surhone. 2010 Betascript Publishing

C-6: THERMAL PHYSICS

(Credits: Theory-04, Practicals-02)
Marks:100 (Theory:70, Practical: 30)
Theory: 40 Classes (1 hr. duration)

UNIT-I

Introduction to Thermodynamics: Recapitulation of Zeroth and First law of thermodynamics: Second Law of Thermodynamics: Reversible and Irreversible process with examples. Conversion of Work into Heat and Heat into Work. Heat Engines. Carnots Cycle, Carnot engine & efficiency. Refrigerator & coefficient of performance, 2nd Law of Thermodynamics: Kelvin-Planck and Clausius Statements and their Equivalence. **Carnots Theorem. Applications of Second Law of Thermodynamics:** Thermodynamic Scale of Temperature and its Equivalence to Perfect Gas Scale. (5 Lectures)

Entropy: Concept of Entropy, Clausius Theorem. Clausius Inequality, Second Law of Thermodynamics in terms of Entropy. Entropy of a perfect gas. Principle of Increase of Entropy. Entropy Changes in Reversible and Irreversible processes with examples. Entropy of the Principle of Increase of Entropy. Temperature Entropy diagrams for Carnots Cycle. Third Law of Thermodynamics. Unattainability of Absolute Zero. (6 Lectures)

UNIT-II

Thermodynamic Potentials: Extensive and Intensive Thermodynamic Variables. Thermodynamic Potentials: Internal Energy, Enthalpy, Helmholtz Free Energy, Gibbs Free Energy. Their Definitions, Properties and Applications. Surface Films and Variation of Surface Tension with Temperature. Magnetic Work, Cooling due to adiabatic demagnetization, first and second order Phase Transitions with examples, Clausius Clapeyron Equation and Ehrenfest equations (5 Lectures)

Maxwells Thermodynamic Relations: Derivations and applications of Maxwells Relations, Maxwells Relations:(1) Clausius Clapeyron equation, (2) Values of C_p-C_v , (3) Tds Equations, (4) Joule-Kelvin coefficient for Ideal and Van der Waal Gases, (5) Energy equations, (6) Change of Temperature during Adiabatic Process. (5 Lectures)

UNIT-III

Kinetic Theory of Gases

Distribution of Velocities: Maxwell-Boltzmann Law of Distribution of Velocities in an Ideal Gas and its Experimental Verification. Sterns Experiment. Mean, RMS and Most Probable Speeds. Degrees of Freedom. Law of Equipartition of Energy (No proof required). Specific heats of Gases. (5 Lectures)

Molecular Collisions: Mean Free Path. Collision Probability. Estimates of Mean Free Path. Transport Phenomenon in Ideal Gases: (1) Viscosity, (2) Thermal Conductivity and (3) Diffusion. Brownian motion and its Significance. (4 Lectures)

UNIT-IV

Real Gases: Behavior of Real Gases: Deviations from the Ideal Gas Equation. The Virial Equation. Andrews Experiments on CO_2 Gas. Critical Constants. Continuity of Liquid and Gaseous State. Vapour and Gas. Boyle Temperature. Van der Waals Equation of State for Real Gases. Values of Critical Constants. Law of Corresponding States. Comparison with Experimental Curves. P-V Diagrams. Joules Experiment. Free Adiabatic Expansion of a Perfect Gas. Joule-Thomson Porous Plug Experiment. Joule-Thomson Effect for Real and Van der Waal Gases. Temperature of Inversion. Joule-Thomson Cooling. (10 Lectures)

Reference Books:

1. Heat and Thermodynamics, M.W. Zemansky, Richard Dittman, 1981, McGraw-Hill.
2. A Treatise on Heat, Meghnad Saha, and B.N.Srivastava, 1958, Indian Press
3. Thermal Physics, S. Garg, R. Bansal and Ghosh, 2nd Edition, 1993, Tata McGraw-Hill
4. Modern Thermodynamics with Statistical Mechanics, Carl S. Helrich, 2009, Springer.
5. Thermodynamics, Kinetic Theory & Statistical Thermodynamics, Sears & Salinger. 1988, Narosa.

6. Concepts in Thermal Physics, S.J. Blundell and K.M. Blundell, 2nd Ed., 2012, Oxford University Press
7. Heat and Thermal Physics-Brijlal & Subramaiam (S.Chand Publication)2014
8. Thermal Physics– C. Kittel and H. Kroemer (McMillan Education India)2010

PHYSICS LAB-C:VI

20 Classes (2hr duration)

1. To determine Mechanical Equivalent of Heat, J, by Callender and Barnes constant flow method.
2. To determine the Coefficient of Thermal Conductivity of Cu by Searles Apparatus.
3. To determine the Coefficient of Thermal Conductivity of Cu by Angstroms Method.
4. To determine the Coefficient of Thermal Conductivity of a bad conductor by Lee and Charltons disc method.
5. To determine the Temperature Coefficient of Resistance by Platinum Resistance Thermometer (PRT).
6. To study the variation of Thermo-Emf of a Thermocouple with Difference of Temperature of its Two Junctions.
7. To calibrate a thermocouple to measure temperature in a specified Range using (1) Null Method, (2) Direct measurement using Op-Amp difference amplifier and to determine Neutral Temperature.
8. To determine J by Calorimeter.

Reference Books:

1. Advanced Practical Physics for students, B. L. Flint and H.T. Worsnop, 1971, Asia Publishing House
2. A Text Book of Practical Physics, I.Prakash & Ramakrishna, 11th Ed., 2011, Kitab Mahal
3. Advanced level Physics Practicals, Michael Nelson and Jon M. Ogborn, 4th Edition, reprinted 1985, Heinemann Educational Publishers
4. A Laboratory Manual of Physics for undergraduate classes,D.P.Khandelwal,1985, Vani Pub.

C-7: DIGITAL SYSTEMS AND APPLICATIONS

(Credits: Theory-04, Practicals-02)

Marks:100 (Theory:70, Practical: 30)

Theory: 40 Classes (1 hr. duration)

UNIT-I

Digital Circuits: Difference between Analog and Digital Circuits. Binary Numbers. Decimal to Binary and Binary to Decimal Conversion. BCD, Octal and Hexadecimal numbers. AND, OR and NOT Gates (realization using Diodes and Transistor). NAND and NOR Gates as Universal Gates. XOR and XNOR Gates and application as Parity Checkers. (5 Lectures)

Boolean algebra: De Morgan's Theorems. Boolean Laws. Simplification of Logic Circuit using Boolean algebra. Fundamental Products. Idea of Minterms and Maxterms. Conversion of a Truth table into Equivalent Logic Circuit by (1) Sum of Products Method and (2) Karnaugh Map. (5 Lectures)

UNIT-II

Data processing circuits: Basic idea of Multiplexers, De-multiplexers, Decoders, Encoders. (3 Lectures)

Arithmetic Circuits: Binary Addition. Binary Subtraction using 2's Complement. Half and Full Adders. Half & Full Subtractors, 4-bit binary Adder/Subtractor. (4 Lectures)

Timers: IC 555: block diagram and applications: Astable multivibrator and Monostable multivibrator. (3 Lectures)

UNIT-III

Integrated Circuits (Qualitative treatment only): Active & Passive components. Discrete components. Wafer. Chip. Advantages and drawbacks of ICs. Scale of integration: SSI, MSI, LSI and VLSI (basic idea and definitions only). Classification of ICs. Examples of Linear and Digital ICs. (5 Lectures)

Introduction to CRO: Block Diagram of CRO. Electron Gun, Deflection System and Time Base. Deflection Sensitivity. Applications of CRO: (1) Study of Waveform, (2) Measurement of Voltage, Current, Frequency, and Phase Difference. (5 Lectures)

UNIT-IV

Introduction to Computer Organization: Input/output Devices. Data storage (idea of RAM and ROM). Computer memory. Memory organization & addressing. Memory Interfacing. Memory Map. (4 Lectures)

Shift registers: Serial-in-Serial-out, Serial-in-Parallel-out, Parallel-in-Serial-out and Parallel-in-Parallel-out Shift Registers (only up to 4 bits). (2 Lectures)

Counters (4 bits): Ring Counter. Asynchronous counters, Decade Counter. Synchronous Counter. (4 Lectures)

Reference Books:

1. Digital Principles and Applications, A.P. Malvino, D.P. Leach and Saha, 7th Ed., 2011, Tata McGraw
2. Fundamentals of Digital Circuits, Anand Kumar, 2nd Edn, 2009, PHI Learning Pvt. Ltd.
3. Digital Circuits and systems, Venugopal, 2011, Tata McGraw Hill.
4. Digital Systems: Principles & Applications, R.J. Tocci, N.S. Widmer, 2001, PHI Learning

5. Logic circuit design, Shimon P. Vingron, 2012, Springer.
6. Digital Electronics, Subrata Ghoshal, 2012, Cengage Learning.
7. Microprocessor Architecture Programming & applications with 8085, 2002, R.S. Goankar, Prentice Hall.
8. Concept of Electronics: D.C.Tayal (Himalay Publication) 2011.
9. Electronics-V. K. Meheta (S. Chand Publication),2013
10. The Art of Electronics, P. Horowitz and W. Hill, CUP.

PHYSICS PRACTICAL-C:VII

20 Classes (2 hrs. duration)

1. To measure (a) Voltage, and (b) Time period of a periodic waveform using CRO.
2. To test a Diode and Transistor using a Multimeter.
3. To design a switch (NOT gate) using a transistor.
4. To verify and design AND, OR, NOT and XOR gates using NAND gates.
5. To design a combinational logic system for a specified Truth Table.
6. To convert a Boolean expression into logic circuit and design it using logic gate ICs.
7. To minimize a given logic circuit.
8. Half Adder, Full Adder and 4-bit binary Adder.
9. Half Subtractor, Full Subtractor, Adder-Subtractor using Full Adder I.C.
10. To build Flip-Flop (RS, Clocked RS, D-type and JK) circuits using NAND gates.
11. To build JK Master-slave flip-flop using Flip-Flop ICs
12. To build a 4-bit Counter using D-type/JK Flip-Flop ICs and study timing diagram.
13. To make a 4-bit Shift Register (serial and parallel) using D-type/JK Flip-Flop ICs.
14. To design an astable multivibrator of given specifications using 555 Timer.
15. To design a monostable multivibrator of given specifications using 555 Timer.

Reference Books:

1. Modern Digital Electronics, R.P. Jain, 4th Edition, 2010, Tata McGraw Hill.
2. Basic Electronics: A text lab manual, P.B. Zbar, A.P. Malvino, M.A. Miller, 1994, Mc-Graw Hill.

3. Microprocessor Architecture Programming and applications with 8085, R.S. Goankar, 2002, Prentice Hall.
4. Microprocessor 8085:Architecture, Programming and interfacing, A. Wadhwa, 2010, PHI Learning.

SEMESTER-IV

C-VIII: MATHEMATICAL PHYSICS-III

(Credits: Theory-04, Practicals-02)
 Marks:100 (Theory:70, Practical: 30)
 Theory: 40 Classes (1 hr. duration)

The emphasis of the course is on applications in solving problems of interest to physicists. Students are to be examined on the basis of problems, seen and unseen.

UNIT-I

Complex Analysis: Brief Revision of Complex Numbers and their Graphical Representation. Euler's formula, De Moivre's theorem, Roots of Complex Numbers. Functions of Complex Variables. Analyticity and Cauchy-Riemann Conditions. Examples of analytic functions. Singular functions: poles and branch points, order of singularity, branch cuts. Integration of a function of a complex variable. Cauchy's Inequality. Cauchy's theorem, Cauchy's Integral formula. Simply and multiply connected. (10 Lectures)

UNIT-II

Integrals Transforms: Laurent and Taylor's expansion. Residues and Residue Theorem. Application in solving Definite Integrals. Fourier Transforms: Fourier Integral theorem. Fourier Transform. Examples. Fourier transform of trigonometric, Gaussian, finite wave train & other functions. Representation of Dirac delta function as a Fourier Integral. (10 Lectures)

UNIT-III

Integrals Transforms: Fourier transform of derivatives, Inverse Fourier transform, Convolution theorem. Properties of Fourier transform (translation, change of scale, complex conjugation, etc.). Three dimensional Fourier transforms with examples. Application of Fourier Transforms to differential equations: One dimensional Wave and Diffusion/Heat Flow Equations. (10 Lectures)

UNIT-IV

Laplace Transforms: Laplace Transform (LT) of Elementary functions. Properties of LTs: Change of Scale Theorem, Shifting Theorem. LTs of Derivatives and Integrals of Functions, Derivatives and Integrals of LTs. LT of Unit Step function, Dirac Delta function, Periodic Functions. Convolution Theorem. Inverse LT. Application of Laplace Transforms to Differential Equations: Damped Harmonic Oscillator, Simple Electrical Circuits. (10 Lectures)

Reference Books:

1. Mathematical Methods for Physics and Engineers, K.F Riley, M.P. Hobson and S. J. Bence, 3rd ed., 2006, Cambridge University Press
2. Mathematical Methods for Physicists: Arfken, Weber, 2005, Harris, Elsevier.
3. Advanced Engineering Mathematics, E. Kreyszig (New Age Publication) 2011.
4. Mathematics for Physicists, P. Dennery and A. Krzywicki, 1967, Dover Publications
5. Complex Variables, A. S. Fokas & M. J. Ablowitz, 8th Ed., 2011, Cambridge Univ. Press

6. Complex Variables and Applications, J.W. Brown & R.V. Churchill, 7th Ed. 2003, Tata McGraw-Hill
7. First course in complex analysis with applications, D.G. Zill and P.D. Shanahan, 1940, Jones & Bartlett.
8. Mathematical Physics—H. K. Dass, Dr. Rama Verma (S. Chand Higher Academics) 6th Edition 2011.
9. Mathematical Physics C. Harper, (Prentice Hall India) 2006.
10. Mathematical Physics-Goswami (Cengage Learning) 2014
11. Mathematical Method for Physical Sciences - M. L. Boas (Wiley India) 2006
12. Introduction to the theory of functions of a complex variable- E.T. Copson (Oxford) Univ. Press, 1970

PHYSICS PRACTICAL-C:VIII

20 Classes (2 hrs. duration)

Scilab based simulations experiments based on Mathematical Physics problems like

1. Solve differential equations:

(i) $\frac{dy}{dx} = e^{-x}$ with $y = 0$ for $x = 0$. (ii) $\frac{dy}{dx} + e^{-xy} = x^2$. (iii) $\frac{d^2y}{dt^2} + 2\frac{dy}{dt} = -y$.

(iv) $\frac{d^2y}{dt^2} + e^{-t}\frac{dy}{dt} = -y$.

1 2. Dirac Delta Function: Evaluate $\int_{-\infty}^{\infty} \frac{e^{-x^2}}{\sqrt{2\pi\sigma^2}} (x+3) dx$ for $\sigma = 1, 0.1, 0.01$ and show it tends to 5.

3. Fourier Series: Program to $\sum_{n=1}^{\infty} (0.2)^n$.
Evaluate the Fourier coefficients of a given periodic function (square wave)

4. Frobenius method and Special functions: $\int_{-1}^1 P_n(\mu)P_m(\mu) d\mu = \delta_{n,m}$. Plot $P_n(x)$, $J(x)$. Show recursion relation.

5. Calculation of error for each data point of observations recorded in experiments done in previous semesters (choose any two).

6. Calculation of least square fitting manually without giving weightage to error. Confirmation of least square fitting of data through computer program.

7. Evaluation of trigonometric functions e.g. $\sin \theta$, Given Bessels function at N — points, find its value at an intermediate point. Complex analysis: Integrate $1/(x^2 + 2)$ numerically and check with computer integration.

8. Integral transform: FFT of e^{-x^2} .

Reference Books:

1. Mathematical Methods for Physics and Engineers, K.F Riley, M.P. Hobson and S. J. Bence, 3rd ed., 2006, Cambridge University Press
2. Mathematics for Physicists, P. Dennery and A. Krzywicki, 1967, Dover Publications
3. Simulation of ODE/PDE Models with MATLAB, OCTAVE and SCILAB: Scientific and Engineering Applications: A. Vande Wouwer, P. Saucez, C. V. Fernandez. 2014 Springer ISBN: 978-3319067896
4. Scilab by example: M. Affouf, 2012. ISBN: 978-1479203444
5. Scilab (A free software to Matlab): H.Ramchandran, A.S.Nair. 2011 S.Chand & Company
6. Scilab Image Processing: Lambert M. Surhone. 2010 Betascript Publishing.

C-IX: ELEMENTS OF MODERN PHYSICS

(Credits: Theory-04, Practicals-02)

Marks:100 (Theory:70, Practical: 30)

Theory: 40 Classes (1 hr. duration)

UNIT-I

Atomic Spectra and Models: Inadequacy of classical physics, Brief Review of Black body Radiation , **Photoelectric effect**, Compton effect, dual nature of radiation, wave nature of particles. Atomic spectra, Line spectra of hydrogen atom, Ritz Rydberg combination principle. Alpha Particle Scattering, Rutherford Scattering Formula, Rutherford Model of atom and its limitations, Bohrs model of H atom, explanation of atomic spectra, correction for finite mass of the nucleus, Bohr correspondence principle, limitations of Bohr model, discrete energy exchange by atom, Frank Hertz Expt. Sommerfeld's Modification of Bohrs Theory. (11 Lectures)

UNIT-II

Wave Particle Duality: de Broglie hypothesis, Experimental confirmation of matter wave, Davis- son Germer Experiment, velocity of de Broglie wave, wave particle duality, Complementarity. Superposition of two waves, phase velocity and group velocity , wave packets ,Gaussian WavePacket , spatial distribution of wave packet, Localization of wave packet in time.

Time development of a wave Packet ; Wave Particle Duality, Complementarity . **Heisenberg Uncertainty Principle** ,Illustration of the Principle through thought Experiments of Gamma ray microscope and electron diffraction through a slit. Estimation of ground state energy of harmonic oscillator and hydrogen atom, non existence of electron in the nucleus. **Uncertainty and Complementarities**. (11 Lectures)

UNIT-III

Nuclear Physics: Size and structure of atomic nucleus and its relation with atomic weight; Impossibility of an electron being in the nucleus as a consequence of the uncertainty principle. Nature of nuclear force, NZ graph, **Liquid Drop model: semi-empirical mass formula and binding energy**,

Nuclear Shell Model and magic numbers. Radioactivity: stability of the nucleus; Law of radioactive decay; Mean life and half-life (8 Lectures)

UNIT-IV

Alpha decay; Beta decay- energy released, spectrum and Pauli's prediction of neutrino; Gamma ray emission, energy-momentum conservation: electron-positron pair creation by gamma photons in the vicinity of a nucleus.

Fission and fusion- mass deficit, relativity and generation of energy; Fission - nature of fragments and emission of neutrons. Nuclear reactor: slow neutrons interacting with Uranium 235; Fusion and thermonuclear reactions driving stellar energy (brief qualitative discussions). (10 Lectures)

Reference Books:

1. Concepts of Modern Physics, Arthur Beiser, 2002, McGraw-Hill.
2. Introduction to Modern Physics, Rich Meyer, Kennard, Coop, 2002, Tata McGraw Hill
3. Introduction to Quantum Mechanics, David J. Griffith, 2005, Pearson Education.
4. Physics for scientists and Engineers with Modern Physics, Jewett and Serway, 2010, Cengage Learning.
5. Quantum Mechanics: Theory & Applications, A.K.Ghatak & S.Lokanathan, 2004, Macmillan
6. Modern Physics Bernstein, Fishbane and Gasiorowicz (Pearson India) 2010
7. Quantum Physics of Atoms, Molecules, Solids, Nuclei and Particles – R. Eisberg (Wiley India), 2012.

(Additional Books for Reference)

8. Modern Physics, J.R. Taylor, C.D. Zafiratos, M.A. Dubson, 2004, PHI Learning.
9. Theory and Problems of Modern Physics, Schaum's outline, R. Gautreau and W. Savin, 2nd Edn, Tata McGraw-Hill Publishing Co. Ltd.
10. Quantum Physics, Berkeley Physics, Vol.4. E.H.Wichman, 1971, Tata McGraw-Hill Co.
11. Basic ideas and concepts in Nuclear Physics, K.Heyde, 3rd Edn., Institute of Physics Pub.
12. Six Ideas that Shaped Physics: Particle Behave like Waves, T.A.Moore, 2003, McGraw Hill
13. Modern Physics-Serway (CENGAGE Learnings) 2014
14. Modern Physics —Murugesan and Sivaprasad (S. Chand Higher Academics)
15. Physics of Atoms and Molecules Bransden (Pearson India) 2003

PHYSICS PRACTICAL-C:IX

20 Classes (2 hrs. duration)

1. Measurement of Planck's constant using black body radiation and photo-detector

2. Photo-electric effect: photo current versus intensity and wavelength of light; maximum energy of photo-electrons versus frequency of light
3. To determine work function of material of filament of directly heated vacuum diode.
4. To determine the Planck's constant using LEDs of at least 4 different colours.
5. To determine the wavelength of H-alpha emission line of Hydrogen atom.
6. To determine the ionization potential of mercury.
7. To determine the absorption lines in the rotational spectrum of Iodine vapour.
8. To determine the value of e/m by (a) Magnetic focusing or (b) Bar magnet.
9. To setup the Millikan oil drop apparatus and determine the charge of an electron.
10. To show the tunneling effect in tunnel diode using I-V characteristics.
11. To determine the wavelength of laser source using diffraction of single slit.
12. To determine the wavelength of laser source using diffraction of double slits.
13. To determine (1) wavelength and (2) angular spread of He-Ne laser using plane diffraction grating

Reference Books:

1. Advanced Practical Physics for students, B.L. Flint and H.T. Worsnop, 1971, Asia Publishing House
2. Advanced level Physics Practicals, Michael Nelson and Jon M. Ogborn, 4th Edition, reprinted 1985, Heinemann Educational Publishers
3. A Text Book of Practical Physics, I. Prakash & Ramakrishna, 11th Edn, 2011, Kitab Mahal

C-X: ANALOG SYSTEMS AND APPLICATIONS

(Credits: Theory-04, Practicals-02)
 Marks:100 (Theory:70, Practical: 30)
 Theory: 40 Classes (1 hr. duration)

UNIT-I

Semiconductor Diodes: P and N type semiconductors. Energy Level Diagram. Conductivity and Mobility, Concept of Drift velocity. PN Junction Fabrication (Simple Idea). Barrier Formation in PN Junction Diode. Static and Dynamic Resistance. Current Flow Mechanism in Forward and Reverse Biased Diode. Drift Velocity. Derivation for Barrier Potential, Barrier Width and Current for Step Junction. (5 Lectures)

Two-terminal Devices and their Applications: (1) Rectifier Diode: Half-wave Rectifiers.

Centre-tapped and Bridge Full-wave Rectifiers, Calculation of Ripple Factor and Rectification Efficiency, (2) Zener Diode and Voltage Regulation. Principle and structure of (1) LEDs, (2) Photodiode, (3) Solar Cell. (5 Lectures)

UNIT-II

Bipolar Junction transistors: n-p-n and p-n-p Transistors. Characteristics of CB, CE and CC Configurations. Current gains α and β Relations between α and β . Load Line analysis of Transistors. DC Load line and Q-point. Physical Mechanism of Current Flow. Active, Cutoff and Saturation Regions. (5 Lectures)

Amplifiers: Transistor Biasing and Stabilization Circuits. Fixed Bias and Voltage Divider Bias. Transistor as 2-port Network. h-parameter Equivalent Circuit. Analysis of a single-stage CE amplifier using Hybrid Model. Input and Output Impedance. Current, Voltage and Power Gains. Classification of Class A, B & C Amplifiers. (5 Lectures)

UNIT:III

Coupled Amplifier: RC-coupled amplifier and its frequency response. (4 Lectures)

Feedback in Amplifiers: Effects of Positive and Negative Feedback on Input Impedance, Output Impedance, Gain, Stability, Distortion and Noise. (2 Lectures)

Sinusoidal Oscillators: Barkhausen's Criterion for self-sustained oscillations. RC Phase shift oscillator, determination of Frequency. Hartley & Colpitts oscillators. (4 Lectures)

UNIT-IV

Operational Amplifiers (Black Box approach): Characteristics of an Ideal and Practical Op-Amp. (IC 741) Open-loop and Closed-loop Gain. Frequency Response. CMRR. Slew Rate and concept of Virtual ground. (5 Lectures)

Applications of Op-Amps: (1) Inverting and non-inverting amplifiers, (2) Adder, (3) Subtractor, (4) Differentiator, (5) Integrator, (6) Log amplifier, (7) Zero crossing detector (8) Wein bridge oscillator. (5 Lectures)

Reference Books:

1. Integrated Electronics, J. Millman and C.C. Halkias, 1991, Tata Mc-Graw Hill.
2. Electronics: Fundamentals and Applications, J.D. Ryder, 2004, Prentice Hall.
3. Solid State Electronic Devices, B.G. Streetman & S.K. Banerjee, 6th Edn., 2009, PHI Learning
4. Electronic Devices & circuits, S. Salivahanan & N.S. Kumar, 3rd Ed., 2012, Tata Mc-Graw Hill
5. OP-Amps and Linear Integrated Circuit, R. A. Gayakwad, 4th edition, 2000, Prentice Hall
6. Electronic circuits: Handbook of design & applications, U. Tietze, C. Schenk, 2008, Springer
7. Semiconductor Devices: Physics and Technology, S.M. Sze, 2nd Ed., 2002, Wiley India
8. Electronic Devices, 7/e Thomas L. Floyd, 2008, Pearson India
9. Concept of Electronics: D.C. Tayal (Himalay Publication) 2011
10. Electronic devices :Circuits and Applications :W.D. Stanley Prentice Hall

11. Electronics- V. K. Meheta (S. Chand Publication)2013
12. Electronic Circuits :L.Schilling and Velove: 3rd Ed Mc Graw Hill
13. ElectronicsRaskhit & Chattopadhyay (New age International Publication)2011
14. Electricity and Electronic-D.C.Tayal (Himalaya Pub.)2011
15. Electronic devices and circuits R.L. Boylstad (Pearson India) 2009.

PHYSICS PRACTICAL-C:X

20 Classes (2 hrs. duration)

1. To study V-I characteristics of PN junction diode, and Light emitting diode.
2. To study the V-I characteristics of a Zener diode and its use as voltage regulator.
3. Study of V-I & power curves of solar cells, and find maximum power point & efficiency.
4. To study the characteristics of a Bipolar Junction Transistor in CE configuration.
5. To study the various biasing configurations of BJT for normal class A operation.
6. To design a CE transistor amplifier of a given gain (mid-gain) using voltage divider bias.
7. To study the frequency response of voltage gain of a RC-coupled transistor amplifier.
8. To design a Wien bridge oscillator for given frequency using an op-amp.
9. To design a phase shift oscillator of given specifications using BJT.
10. To study the Colpitt's oscillator.
11. To design a digital to analog converter (DAC) of given specifications.
12. To study the analog to digital convertor (ADC) IC.
13. To design an inverting amplifier using Op-amp (741,351) for dc voltage of given gain
14. To design inverting amplifier using Op-amp (741,351) and study its frequency response
15. To design non-inverting amplifier using Op-amp (741,351) & study its frequency response
16. To study the zero-crossing detector and comparator
17. To add two dc voltages using Op-amp in inverting and non-inverting mode
18. To design a precision Differential amplifier of given I/O specification using Op-amp.
19. To investigate the use of an op-amp as an Integrator.
20. To investigate the use of an op-amp as a Differentiator.

21. To design a circuit to simulate the solution of a 1st/2nd order differential equation.

Reference Books:

1. Basic Electronics: A text lab manual, P.B. Zbar, A.P. Malvino, M.A. Miller, 1994, Mc-Graw Hill.
2. OP-Amps and Linear Integrated Circuit, R. A. Gayakwad, 4th edition, 2000, Prentice Hall.
3. Electronic Principle, Albert Malvino, 2008, Tata Mc-Graw Hill.
4. Electronic Devices & circuit Theory, R.L. Boylestad & L.D. Nashelsky, 2009, Pearson

SEMESTER-V

C-XI: QUANTUM MECHANICS AND APPLICATIONS

(Credits: Theory-04, Practicals-02)

Marks:100 (Theory:70, Practical: 30)

Theory: 40 Classes (1hr duration)

UNIT:I

Schrodinger equation & the operators: Time dependent Schrodinger equation and dynamical evolution of a quantum state; Properties of Wave Function. Interpretation of Wave Function Probability and probability current densities in three dimensions; Conditions for Physical Acceptability of Wave Functions. Normalization. Linearity and Superposition Principles. Hermitian operator, Eigen values and Eigen functions. Position, momentum and Energy operators; commutator of position and momentum operators; Expectation values of position and momentum. Wave Function of a Free Particle. (8 Lectures)

UNIT:II

Time independent Schrodinger equation: Hamiltonian, stationary states and energy eigen values; expansion of an arbitrary wave function as a linear combination of energy eigen functions; General solution of the time dependent Schrodinger equation in terms of linear combinations of stationary states; Application to spread of Gaussian wave-packet for a free particle in one dimension; wave packets, Fourier transforms and momentum space wave function; Position-momentum uncertainty principle. (6 Lectures)

UNIT:III

General discussion of bound states in an arbitrary potential: continuity of wave function, boundary condition and emergence of discrete energy levels; application to one-dimensional problem-square well potential; Quantum mechanics of simple harmonic oscillator-energy levels and energy eigen functions ground state, zero point energy & uncertainty principle. One dimensional infinitely rigid box- energy eigen values and eigen functions, normalization; Quantum dot as example; Quantum mechanical scattering and tunnelling in one dimension-across a step potential & rectangular potential barrier. (14 Lectures)

UNIT-IV

Atoms in Electric & Magnetic Fields: Electron angular momentum. Space quantization. Electron Spin and Spin Angular Momentum. Larmors Theorem. Spin Magnetic Moment. Stern- Gerlach Experiment. Zeeman Effect: Electron Magnetic Moment and Magnetic Energy, Gyromagnetic Ratio and Bohr Magneton.

Atoms in External Magnetic Fields: Normal and Anomalous Zeeman Effect. Paschen Back and Stark Effect (Qualitative Discussion only). (12 Lectures)

Reference Books:

1. A Text book of Quantum Mechanics, P. M.Mathews and K.Venkatesan, 2nd Ed., 2010, Mc-Graw Hill
2. Quantum Mechanics, Robert Eisberg and Robert Resnick, 2nd Edn., 2002, Wiley.
3. Quantum Mechanics, Leonard I. Schiff, 3rd Edn. 2010, Tata McGraw Hill.
4. Quantum Mechanics, G. Aruldas, 2nd Edn. 2002, PHI Learning of India.
5. Quantum Mechanics, Bruce Cameron Reed, 2008, Jones and Bartlett Learning. Quantum Mechanics: Foundations & Applications, Arno Bohm, 3rd Edn., 1993, Springer
6. Quantum Mechanics for Scientists & Engineers, D.A.B. Miller, 2008, Cambridge University Press
7. Quantum Physics-S. Gasiorowicz (Wiley India) 2013
8. Quantum Mechanics -J.L. Powell and B. Craseman (Narosa) 1988
9. Introduction to Quantum Mechanics- M.Das, P.K.Jena,(SriKrishna Prakashan)
10. Basic Quantum Mechanics A.Ghatak (Mc Millan India) 2012
11. Introduction to Quantum Mechanics R. Dicke and J. Wittke
12. Quantum Mechanics- Eugen Merzbacher, 2004, John Wiley and Sons, Inc.
13. Introduction to Quantum Mechanics, D.J. Griffith, 2nd Ed. 2005, Pearson Education
14. Quantum Mechanics, Walter Greiner, 4th Edn., 2001, Springer
15. Quantum Mechanics - F. Mandl (CBS) 2013
16. Cohen-Tannoudji, B Diu and F Lalo, Quantum Mechanics (2 vols) Wiley-VCH 1977

PHYSICS PRACTICAL-C:XI

20 Classes (2hr duration)

Use C/C++/Scilab for solving the following problems based on Quantum Mechanics like

1. Solve the s-wave Schrodinger equation for the ground state and the first excited state of the hydrogen atom:
Here, m is the reduced mass of the electron. Obtain the energy eigenvalues and plot the corresponding wavefunctions. Remember that the ground state energy of the hydrogen atom is -13.6 eV. Take $e = 3.795$ (eV)^{1/2}, $c = 1973$ (eV) and $m = 0.511 \times 10^6$ eV/c².
2. Solve the s-wave radial Schrodinger equation for an atom:
where m is the reduced mass of the system (which can be chosen to be the mass of an electron), for the screened coulomb potential Find the energy (in eV) of the ground state of the atom to an accuracy of three significant digits. Also, plot the corresponding wavefunction. Take $e = 3.795$ (eV)^{1/2}, $m = 0.511 \times 10^6$ eV/c², and $a = 3, 5, 7$. In these units $c = 1973$ (eV). The ground state energy is expected to be above -12 eV in all three cases.

3. Solve the s-wave radial Schrodinger equation for a particle of mass m :
For the anharmonic oscillator potential for the ground state energy (in MeV) of particle to an accuracy of three significant digits. Also, plot the corresponding wave function. Choose $m = 940 \text{ MeV}/c^2$, $k = 100 \text{ MeV fm}^{-2}$, $b = 0, 10, 30 \text{ MeV fm}^{-3}$ In these units, $c = 197.3 \text{ MeV fm}$. The ground state energy is expected to lie between 90 and 110 MeV for all three cases.
4. Solve the s-wave radial Schrodinger equation for the vibrations of hydrogen molecule:
Where is the reduced mass of the two-atom system for the Morse potential Find the lowest vibrational energy (in MeV) of the molecule to an accuracy of three significant digits. Also plot the corresponding wave function.
Take: $m = 940 \times 10^6 \text{ eV}/c^2$, $D = 0.755501 \text{ eV}$, $\alpha = 1.44$, $\rho = 0.131349$ Laboratory based experiments:
5. Study of Electron spin resonance- determine magnetic field as a function of the resonance frequency.
6. Study of Zeeman effect: with external magnetic field; Hyperfine splitting
7. To show the tunneling effect in tunnel diode using I-V characteristics.
8. Quantum efficiency of CCDs

Reference Books:

1. Schaum's outline of Programming with C++. J.Hubbard, 2000, McGraw-Hill Publication
2. Numerical Recipes in C: The Art of Scientific Computing, W.H. Press et al., 3rd Edn., 2007, Cambridge University Press.
3. An introduction to computational Physics, T.Pang, 2nd Edn., 2006, Cambridge Univ. Press
4. Simulation of ODE/PDE Models with MATLAB, OCTAVE and SCILAB: Scientific & Engineering Applications: A. Vande Wouwer, P. Saucez, C. V. Fernandez. 2014 Springer.
5. Scilab (A Free Software to Matlab): H. Ramchandran, A.S. Nair. 2011 S. Chand & Co.
6. Scilab Image Processing: L.M. Surhone. 2010 Betascript Publishing ISBN:978-6133459274

C-XII: SOLID STATE PHYSICS

(Credits: Theory-04, Practicals-02)
Marks:100 (Theory:70, Practical: 30)
Theory: 40 Classes (1 hr. duration)

UNIT:I

Crystal Structure: Solids- Amorphous and Crystalline Materials. Lattice Translation Vectors. Lattice with a Basis Central and Non-Central Elements. Unit Cell. Miller Indices. Types of Lattices, Reciprocal Lattice. Brillouin Zones. **Diffraction of X-rays by Crystals. Bragg's Law.** Atomic and

Geometrical Factor. (8 Lectures)

UNIT:II

Elementary Lattice Dynamics: Lattice Vibrations and Phonons: Linear **Monoatomic and Di-atomic Chains**. Acoustical and Optical Phonons. Qualitative Description of the Phonon Spectrum in Solids. Dulong and Petits Law, **Einstein and Debye theories of specific heat of solids. T3 law** (6 Lectures)

Magnetic Properties of Matter: Dia-, Para-, Ferri- and Ferromagnetic Materials. Classical Langevin Theory of diaand Paramagnetic Domains. Curies law, Weiss Theory of Ferromagnetism and Ferromagnetic Domains. (6 Lectures)

UNIT:III

Dielectric Properties of Materials: Polarization. Local Electric Field at an Atom. Depolar- ization Field. Electric Susceptibility. Polarizability. Clausius Mosotti Equation. Classical Theory of Electric Polarizability. (4 Lectures)

Lasers: Einsteins A and B coefficients. Metastable states. Spontaneous and Stimulated emissions. Optical Pumping and Population Inversion. Three-Level and Four-Level Lasers. **Ruby Laser and He-Ne Laser**. (4 Lectures)

UNIT-IV

Elementary band theory: Kronig Penny model. Band Gap. Conductor, Semiconductor (P and N type) and insulator. Conductivity of Semiconductor, mobility, Hall Effect. Measurement of conductivity (O4 probe method) & Hall coefficient. (8 Lectures)

Superconductivity: Experimental Results. Critical Temperature. Critical magnetic field. **Meissner effect. Type I and type II Superconductors**, Londons Equation and Penetration Depth. Isotope effect. Idea of BCS theory (No derivation).(4 Lectures)

Reference Books:

1. Introduction to Solid State Physics, Charles Kittel, 8th Edition, 2004, Wiley India Pvt. Ltd.
2. Elements of Solid State Physics, J.P. Srivastava, 2nd Edition, 2006, Prentice-Hall of India
3. Introduction to Solids, Leonid V. Azaroff, 2004, Tata Mc-Graw Hill
4. Solid State Physics, N.W. Ashcroft and N.D. Mermin, 1976, Cengage Learning
5. Solid-state Physics, H. Ibach and H. Luth, 2009, Springer
6. Elementary Solid State Physics, 1/e M. Ali Omar, 1999, Pearson India
7. Solid State Physics, M.A. Wahab, 2011, Narosa Publications
8. Solid State Physics S. O. Pillai (New Age Publication)
9. Solid State Physics- R.K.Puri & V.K. Babbar (S.Chand Publication)2013
10. Lasers and Non linear Optics B.B.Laud-Wiley Eastern.
11. LASERS: Fundamentals and Applications Thyagarajan and Ghatak (McMillanIndia), 2012

PHYSICS PRACTICAL-C:XII

20 Classes (2 hrs. duration)

1. Measurement of susceptibility of paramagnetic solution (Quinck's Tube Method)
2. To measure the Magnetic susceptibility of Solids.
3. To determine the Coupling Coefficient of a Piezoelectric crystal.
4. To measure the Dielectric Constant of a dielectric Materials with frequency
5. To determine the complex dielectric constant and plasma frequency of metal using Surface Plasmon resonance (SPR)
6. To determine the refractive index of a dielectric layer using SPR
7. To study the PE Hysteresis loop of a Ferroelectric Crystal.
8. To draw the BH curve of Fe using Solenoid & determine energy loss from Hysteresis.
9. To measure the resistivity of a semiconductor (Ge) with temperature by four-probe method (room temperature to 150 oC) and to determine its band gap.
10. To determine the Hall coefficient of a semiconductor sample.

Reference Books:

1. Advanced Practical Physics for students, B.L. Flint and H.T. Worsnop, 1971, Asia Publishing House.
2. Advanced level Physics Practicals, Michael Nelson and Jon M. Ogborn, 4th Edition, reprinted 1985, Heinemann Educational Publishers.
3. A Text Book of Practical Physics, I.Prakash & Ramakrishna, 11th Ed., 2011, Kitab Mahal
4. Elements of Solid State Physics, J.P. Srivastava, 2nd Ed., 2006, Prentice-Hall of India.

C-XIII: ELECTROMAGNETIC THEORY

(Credits: Theory-04, Practicals-02)

Marks:100 (Theory:70, Practical: 30)

Theory: 40 Classes (1 hr. duration)

UNIT:I

Maxwell Equations: Maxwells equations. Displacement Current. Vector and Scalar Potentials. Gauge

Transformations: Lorentz and Coulomb Gauge. Boundary Conditions at Interface between Different Media. Wave Equations. Plane Waves in Dielectric Media. Poynting Theorem and Poynt- ing Vector. Electromagnetic (EM) Energy Density. Physical Concept of Electromagnetic Field Energy Density. (8 Lectures)

UNIT:II

EM Wave Propagation in Unbounded Media: Plane EM waves through vacuum and isotropic dielectric medium, transverse nature of plane EM waves, refractive index and dielectric constant, wave impedance.

Propagation through conducting media, relaxation time, skin depth. Electrical conductivity of ionized gases, plasma frequency, refractive index, skin depth, application to propagation through ionosphere. (8 Lectures)

UNIT:III

EM Wave in Bounded Media: Boundary conditions at a plane interface between two media. Reflection & Refraction of plane waves at plane interface between two dielectric media-Laws of Reflection & Refraction. Fresnel's Formulae for perpendicular & parallel polarization cases, Brewster's law. Reflection & Transmission coefficients. Total internal reflection, evanescent waves. Metallic reflection (normal Incidence).

Optical Fibres: Numerical Aperture. Step and Graded Indices (Definitions Only). Single and Multiple Mode Fibres (Concept and Definition Only). (12 Lectures)

UNIT-IV

Polarization of Electromagnetic Waves: Description of Linear, Circular and Elliptical Polarization. Propagation of E.M. Waves in Anisotropic Media. Symmetric Nature of Dielectric Tensor. Fresnel's Formula. Uniaxial and Biaxial Crystals. Light Propagation in Uniaxial Crystal. Double Refraction. Polarization by Double Refraction. Nicol Prism. Ordinary & extraordinary refractive indices. Production & detection of Plane, Circularly and Elliptically Polarized Light. Phase Retardation Plates: Quarter-Wave and Half-Wave Plates. Babinet Compensator and its Uses. Analysis of Polarized Light.

Rotatory Polarization: Optical Rotation. Biot's Laws for Rotatory Polarization. Fresnel's Theory of optical rotation. Calculation of angle of rotation. Experimental verification of Fresnel's theory. Specific rotation. Laurent's half-shade polarimeter. (12 Lectures)

Reference Books:

1. Introduction to Electrodynamics, D.J. Griffiths, 3rd Ed., 1998, Benjamin Cummings.
2. Elements of Electromagnetics, M.N.O. Sadiku, 2001, Oxford University Press.
3. Introduction to Electromagnetic Theory, T.L. Chow, 2006, Jones & Bartlett Learning
4. Fundamentals of Electromagnetics, M.A.W. Miah, 1982, Tata McGraw Hill
5. Electromagnetic field Theory, R.S. Kshetrimayun, 2012, Cengage Learning
6. Electromagnetic Field Theory for Engineers & Physicists, G. Lehner, 2010, Springer
7. Electricity and Magnetism —D C Tayal (Himalaya Publication)2014
8. Introduction to Electrodynamics-A.Z.Capri & P.V.Panat (Alpha Science) 2002
9. Optics E.Hecht, (Pearson India) **(Additional Books for Reference)**
10. Electromagnetic Fields & Waves, P.Lorrain & D.Corson, 1970, W.H.Freeman & Co.

11. Electromagnetics, J.A. Edminster, Schaum Series, 2006, Tata McGraw Hill.
12. Electromagnetic field theory fundamentals, B. Guru and H. Hiziroglu, 2004, Cambridge University Press
13. Electromagnetic Theory-A. Murthy (S. Chand Publication)2014
14. Classical Electrodynamics, J. D. Jackson (Wiley India)

PHYSICS PRACTICAL-C:XIII

20 Classes (2 hrs. duration)

1. To verify the law of Malus for plane polarized light.
2. To determine the specific rotation of sugar solution using Polarimeter.
3. To analyze elliptically polarized Light by using a Babinets compensator.
4. To study dependence of radiation on angle for a simple Dipole antenna.
5. To determine the wavelength and velocity of ultrasonic waves in a liquid (Kerosene Oil, Xylene, etc.) by studying the diffraction through ultrasonic grating.
6. To study the reflection, refraction of microwaves
7. To study Polarization and double slit interference in microwaves.
8. To determine the refractive index of liquid by total internal reflection using Wollastons air-film.
9. To determine the refractive Index of (1) glass and (2) a liquid by total internal reflection using a Gaussian eyepiece.
10. To study the polarization of light by reflection and determine the polarizing angle for air- glass interface.
11. To verify the Stefan's law of radiation and to determine Stefans constant.
12. To determine the Boltzmann constant using V-I characteristics of PN junction diode.

Reference Books:

1. Advanced Practical Physics for students, B.L. Flint and H.T. Worsnop, 1971, Asia Publishing House.
2. Advanced level Physics Practicals, Michael Nelson and Jon M. Ogborn, 4th Edition, reprinted 1985, Heinemann Educational Publishers
3. A Text Book of Practical Physics, I.Prakash & Ramakrishna, 11th Ed., 2011, Kitab Mahal
4. Electromagnetic Field Theory for Engineers & Physicists, G. Lehner, 2010, Springer

C-XIV: STATISTICAL MECHANICS

(Credits: Theory-04, Practicals-02)

Marks:100 (Theory:70, Practical: 30)

Theory: 40 Classes (1 hr. duration)

UNIT:I

Classical Statistics: Macrostate & Microstate, Elementary Concept of Ensemble, Microcanonical, Canonical and grand canonical ensemble. Phase Space, Entropy and Thermodynamic Probability, Maxwell-Boltzmann Distribution Law, Partition Function, Thermodynamic Functions of an Ideal Gas, Classical Entropy Expression. (12 Lectures)

UNIT:II

Gibbs Paradox, Sackur Tetrode equation, Law of Equipartition of Energy (with proof) Applications to Specific Heat and its Limitations, Thermodynamic Functions of a Two-Energy Levels System, Negative Temperature.(8 Lectures)

UNIT:III

Radiation: Properties of Thermal Radiation. Blackbody Radiation. Pure temperature dependence. Kirchhoffs law. Stefan-Boltzmann law: Thermodynamic proof. Radiation Pressure. Wiens Displacement law. Wiens Distribution Law. **Sahas Ionization Formula. Rayleigh-Jeans Law. Ultraviolet Catastrophe.** Plancks Law of Blackbody Radiation: Experimental Verification. Deduction of (1) Wiens Distribution Law, (2) Rayleigh-Jeans Law, (3) Stefan-Boltzmann Law, (4) Wiens Displacement law from Plancks law.(12 Lectures)

UNIT=IV

Quantum Statistics: Identical particles, macrostates and micro states. Fermions and Bosons, **Bose Einstein distribution function and Fermi-Dirac Distribution function.** Bose-Einstein Condensation, Bose deviation from Planck's law, Effect of temperature on F-D distribution function, degenerate Fermigas, Density of States, Fermi energy.(8 Lectures)

Reference Books:

1. Statistical Mechanics-R.K.Pathria & Paul D. Beale (Academic Press) 3rd Edition (2011)
2. Statistical Physics, Berkeley Physics Course, F. Reif, 2008, Tata McGraw-Hill
3. Statistical and Thermal Physics, S. Lokanathan and R.S. Gambhir. 1991, Prentice Hall
4. Thermodynamics, Kinetic Theory and Statistical Thermodynamics, Francis W. Sears and Gerhard L. Salinger, 1986, Narosa.
5. Modern Thermodynamics with Statistical Mechanics, Carl S. Helrich, 2009, Springer
6. An Introduction to Statistical Mechanics & Thermodynamics, R.H. Swendsen, 2012, Oxford Univ. Press.
7. An introduction to Equilibrium Statistical Mechanics: Palash Das (I.K.International Publication) 2012
8. Statistical Physics - F. Mandl (CBS) 2012

9. Statistical Physics of Particles-M. Kardar (CUP 2007)

PHYSICS PRACTICAL-C:XIV

20 Classes (2 hrs. duration)

Use C/C++/Scilab for solving the problems based on Statistical Mechanics like

1. Plot Plancks law for Black Body radiation and compare it with Weins Law and Raleigh- Jeans Law at high temperature (room temperature) and low temperature.
2. Plot Specific Heat of Solids by comparing (a) Dulong-Petit law, (b) Einstein distribution function, (c) Debye distribution function for high temperature (room temperature) and low temperature and compare them for these two cases
3. Plot Maxwell-Boltzmann distribution function versus temperature.
4. Plot Fermi-Dirac distribution function versus temperature.
5. Plot Bose-Einstein distribution function versus temperature.

Reference Books:

1. Elementary Numerical Analysis, K.E. Atkinson, 3 r d Edn. 2007, Wiley India Edition
2. Statistical Mechanics, R.K. Pathria, Butterworth Heinemann: 2nd Ed., 1996, Oxford Univer- sity Press.
3. Thermodynamics, Kinetic Theory and Statistical Thermodynamics, Francis W. Sears and Gerhard L. Salinger, 1986, Narosa.
4. Modern Thermodynamics with Statistical Mechanics, Carl S. Helrich, 2009, Springer
5. Simulation of ODE/PDE Models with MATLAB, OCTAVE and SCILAB: Scientific and En- gineering Applications: A. Vande Wouwer, P. Saucez, C. V. Fernndez. 2014 Springer ISBN: 978-3319067896
6. Scilab by example: M. Affouf, 2012. ISBN: 978-1479203444
7. Scilab Image Processing: L.M.Surhone. 2010, Betascript Pub., ISBN: 978- 6133459274

Discipline Specific Elective (DSE)
(4 papers including the Project) DSE-1 to
DSE-4 (6 Credits each)

CLASSICAL DYNAMICS
(Credits: Theory-05, Tutorial-01) Theory: 50
Classes (1 hr. duration)

The emphasis of the course is on applications in solving problems of interest to physicists. Students are to be examined on the basis of problems, seen and unseen.

UNIT-I

Classical Mechanics of Point Particles: Generalised coordinates and velocities. Hamilton's Principle, Lagrangian and Euler-Lagrange equations. Applications to simple systems such as coupled oscillators. Canonical momenta & Hamiltonian. **Hamilton's equations of motion.** Applications: Hamiltonian for a harmonic oscillator, particle in a central force field. **Motion of charged particles in external electric and magnetic fields.** (25 Lectures)

UNIT-II

Special Theory of Relativity: Postulates of Special Theory of Relativity. **Lorentz Transformations.** Minkowski space. The invariant interval, light cone and world lines. Space-time diagrams. **Time-dilation, length contraction & twin paradox.** Four-vectors: space-like, time-like & light-like. Four-velocity and acceleration. Metric and alternating tensors. Four-momentum and energy-momentum relation. Doppler effect from a four vector perspective. Concept of four-force. **Conservation of four-momentum.** Relativistic kinematics. **Application to two-body decay of an unstable particle.** (25 Lectures) **Reference Books:**

1. Classical Mechanics, H.Goldstein, C.P. Poole, J.L. Safko, 3rd Edn. 2002, Pearson Education.
2. Mechanics, L. D. Landau and E. M. Lifshitz, 1976, Pergamon.
3. Classical Mechanics: An introduction, Dieter Strauch, 2009, Springer.
4. Solved Problems in classical Mechanics, O.L. Delange and J. Pierrus, 2010, Oxford Press
5. Classical Mechanics-J. C.Upadhyay (Himalaya Publication) 2014
6. Classical Dynamics of Particles and Systems S. T. Thornton (Cengage Learning) 2012
7. Introduction to Classical Mechanics-R. K. Takwale, S.Puranik-(Tata Mc Graw Hill)
8. Classical Mechanics-M. Das, P.K.Jena, M. Bhuyan, R.N.Mishra (Srikrishna Prakashan)

NUCLEAR & PARTICLE PHYSICS
(Credits: Theory-05, Tutorials-01) Theory: 50
Classes (1 hr. duration)

UNIT-I

General Properties of Nuclei: Constituents of nucleus and their Intrinsic properties, quantitative facts about mass, radii, charge density (matter density), binding energy, average binding energy and its variation with mass number, main features of binding energy versus mass number curve, N/A plot, angular momentum, parity, magnetic moment, electric moments, nuclear excited states. **Nuclear Models:** Liquid drop model approach, semi empirical mass formula and significance of its various terms, condition of nuclear stability, two nucleon separation energies, evidence for nuclear shell structure, nuclear magic numbers, basic assumption of shell model,

Radioactivity decay: (a) α -decay: basics of α -decay processes, theory of α -emission, Gamow factor, Geiger Nuttall law. (b) β -decay: energy kinematics for β -decay, positron emission, electron capture, neutrino hypothesis. (c) Elementary idea of Gamma decay.

Nuclear Reactions: Types of Reactions, Conservation Laws, kinematics of reactions, Q-value, (25 Lectures)

UNIT-II

Detector for Nuclear Radiations: Gas detectors: estimation of electric field, mobility of particle, for ionization chamber and GM Counter. Basic principle of Scintillation Detectors and construction of photo-multiplier tube (PMT). Semiconductor Detectors (Si and Ge) for charge particle and photon detection (concept of charge carrier and mobility), neutron detector.

Particle Accelerators: Van-de Graaff generator (Tandem accelerator), Linear accelerator, Cyclotron, Synchrotrons.

Particle physics: Particle interactions; basic features, types of particles and its families. Symmetries and Conservation Laws: energy and momentum, angular momentum, parity, baryon number, Lepton number, Isospin, Strangeness and charm. Elementary ideas of quarks and gluons. (25 Lectures)

Reference Books:

1. Introductory nuclear Physics by Kenneth S. Krane (Wiley India Pvt. Ltd., 2008).
2. Concepts of nuclear physics by Bernard L. Cohen. (Tata Mcgraw Hill, 1998).
3. Introduction to High Energy Physics, D.H. Perkins, Cambridge Univ. Press
4. Introduction to Elementary Particles, D. Griffith, John Wiley & Sons
5. Basic ideas and concepts in Nuclear Physics - An Introductory Approach by K. Heyde (IOP-Institute of Physics Publishing, 2004).
6. Theoretical Nuclear Physics, J.M. Blatt & V.F. Weisskopf (Dover Pub.Inc., 1991)
7. Atomic and Nuclear Physics -A. B. Gupta, Dipak Ghosh. (Books and Allied Publishers)
8. Physics of Atoms and Molecules Bransden (Pearson India) 2003
9. Subatomic Physics - Henley and Gracia (World Scientific) 2012

10. Introduction to Nuclear and Particle Physics-A.Das and T.Ferbel (World Scientific)

11. Radiation detection and measurement, G.F. Knoll (John Wiley & Sons, 2000).

COMPUTATIONAL PHYSICS

(Credits: Theory-05, Tutorials-01) Theory: 50
Classes (1 hr. duration)

The aim of this course is not just to teach computer programming and numerical analysis but to emphasize its role in solving problems in Physics.

- Highlights the use of computational methods to solve physical problems
- Use of computer language as a tool in solving physics problems (applications)
- Course will consist of hands on training on the Problem solving on Computers.

UNIT-I

Introduction: Importance of computers in Physics, paradigm for solving physics problems for solution. Usage of linux as an Editor. **Algorithms and Flowcharts:** Algorithm- Definition, properties and development. Flowchart- Concept of flowchart, symbols, guidelines, types. Examples: Cartesian to Spherical Polar Coordinates, Roots of Quadratic Equation, Sum of twomatrices, Sum and Product of a finite series, calculation of $\sin(x)$ as a series, algorithm for plotting (1) lissajous figures and (2) trajectory of a projectile thrown at an angle with the horizontal.

Scientific Programming: Some fundamental Linux Commands (Internal and External com- mands). Development of FORTRAN, Basic elements of FORTRAN: Character Set, Constants and their types, Variables and their types, Keywords, Variable Declaration and concept of instruction and program. Operators: Arithmetic, Relational, Logical and Assignment Operators. Expressions: Arithmetic, Relational, Logical, Character and Assignment Expressions. Fortran Statements: I/O Statements (unformatted/formatted), Executable and Non-Executable Statements, Layout of For- tran Program, Format of writing Program and concept of coding, Initialization and Replacement Logic. Examples from physics problems. (25 Lectures)

UNIT-II

Control Statements: Types of Logic (Sequential, Selection, Repetition), Branching Statements (Logical IF, Arithmetic IF, Block IF, Nested Block IF, SELECT CASE and ELSE IF Ladder state- ments), Looping Statements (DO-CONTINUE, DO-ENDDO, DOWHILE, Implied and Nested DO Loops), Jumping Statements (Unconditional GOTO, Computed GOTO, Assigned GOTO) Sub- scripted Variables (Arrays: Types of Arrays, DIMENSION Statement, Reading and Writing Arrays), Functions and Subroutines (Arithmetic Statement Function, Function Subprogram and Subroutine), RETURN, CALL, COMMON and EQUIVALENCE Statements), Structure, Disk I/O Statements, open a file, writing in a file, reading from a file. Examples from physics problems.

Programming:

1. Exercises on syntax on usage of FORTRAN
2. To print out all natural even/ odd numbers between given limits.
3. To find maximum, minimum and range of a given set of numbers.
4. To find a set of prime numbers and Fibonacci series.

(25 Lectures)

Reference Books:

1. Introduction to Numerical Analysis, S.S. Sastry, 5th Edn., 2012, PHI Learning Pvt. Ltd.
2. Computer Programming in Fortran 77. V. Rajaraman (Publisher: PHI).
3. Schaums Outline of Theory and Problems of Programming with Fortran, S Lipsdutz and A Poe, 1986Mc-Graw Hill Book Co.
4. Computational Physics: An Introduction, R. C. Verma, et al. New Age International Publish- ers, New Delhi(1999)
5. A first course in Numerical Methods, U.M. Ascher and C. Greif, 2012, PHI Learning
6. Elementary Numerical Analysis, K.E. Atkinson, 3 rd Edn., 2007, Wiley India Edition.

NANO MATERIALS & APPLICATIONS

(Credits: Theory-05, Tutorial-01) Theory: 50
Classes (1 hr. duration)

UNIT-I

Nanoscale Systems: Length scales in physics, Nanostructures: 1D, 2D and 3D nanostructures (nanodots, thin films, nanowires, nanorods), Band structure and density of states of materials at nanoscale, Size Effects in nano systems, Quantum confinement: Applications of Schrodinger equation- Infinite potential well, potential step, potential box, quantum confinement of carriers in 3D, 2D, 1D nanostructures and its consequences.

Synthesis Of Nanostructure Materials: Top down and Bottom up approach, Photolithogra- phy. Ball milling. Gas phase condensation. Vacuum deposition. Physical vapor deposition (PVD): Thermal evaporation, E-beam evaporation, Pulsed Laser deposition. Chemical vapor deposition (CVD). Sol-Gel. Electro deposition. Spray pyrolysis. Hydrothermal synthesis. Preparation through colloidal methods. MBE growth of quantum dots. (25 Lectures)

UNIT-II

Characterization: X-Ray Diffraction. Optical Microscopy. Scanning Electron Microscopy. Trans- mission Electron Microscopy. Atomic Force Microscopy. Scanning Tunneling Microscopy.

Applications: Applications of nanoparticles, quantum dots, nanowires and thin films for photonic devices (LED, solar cells). Single electron devices (no derivation). CNT based transistors. Nano- material Devices: Quantum dots heterostructure lasers, optical switching and optical data storage. Magnetic quantum well; magnetic dots - magnetic data storage. Micro Electromechanical Systems (MEMS), Nano Electromechanical Systems (NEMS). (25 Lectures)

Reference books:

1. C.P. Poole, Jr. Frank J. Owens, Introduction to Nanotechnology (Wiley India Pvt. Ltd.).
2. S.K. Kulkarni, Nanotechnology: Principles & Practices (Capital Publishing Company)

3. K.K. Chattopadhyay and A. N. Banerjee, Introduction to Nanoscience and Technology (PHI Learning Private Limited).
4. Richard Booker, Earl Boysen, Nanotechnology (John Wiley and Sons).
5. M. Hosokawa, K. Nogi, M. Naita, T. Yokoyama, Nanoparticle Technology Handbook (Elsevier, 2007).
6. Bharat Bhushan, Springer Handbook of Nanotechnology (Springer-Verlag, Berlin, 2004).
7. Nanotechnology- Rakesh Rathi (S Chand & Company, New Delhi)

BIO-PHYSICS

**(Credits: Theory-05, Tutorials-01) Theory: 50
Classes (1 hr. duration)**

UNIT-I

Building Blocks & Structure of Living State: Atoms and ions, molecules essential for life, what is life. Living state interactions: Forces and molecular bonds, electric & thermal interactions, electric dipoles, Casimir interactions, domains of physics in biology.

Heat Transfer in bio-materials: Heat Transfer Mechanism, The Heat equation, Joule heating of tissue.

Living State Thermodynamics: Thermodynamic equilibrium, first law of thermodynamics and conservation of energy. Entropy and second law of thermodynamics, Physics of many particle systems, Two state systems, continuous energy distribution, Composite systems, Casimir contribution of free energy, Protein folding and unfolding. (25 Lectures)

UNIT-II

Open systems and chemical thermodynamics: Enthalpy, Gibbs Free Energy and chemical potential, activation energy and rate constants, enzymatic reactions, ATP hydrolysis & synthesis, Entropy of mixing, The grand canonical ensemble, Hemoglobin.

Diffusion and transport: Maxwell-Boltzmann statistics, Fick's law of diffusion, sedimentation of Cell Cultures, diffusion in a centrifuge, diffusion in an electric field, Lateral diffusion in membranes, Navier-Stokes equation, low Reynolds Number Transport, Active and passive membrane transport. **Fluids:** Laminar and turbulent fluid flow, Bernoulli's equation, equation of continuity, Venturi effect, Fluid dynamics of circulatory systems, capillary action.

Bio-energetics and Molecular motors: Kinesins, Dyneins, and microtubule dynamics, Brownian motion, ATP synthesis in Mitochondria, Photosynthesis in Chloroplasts, Light absorption in biomolecules, vibrational spectra of bio-biomolecules. (25 Lectures)

Reference Books:

1. Introductory Biophysics, J. Claycomb, JQP Tran, Jones & Bartlett Publishers
2. Aspects of Biophysics, Hugh S W, John Wiley and Sons.
3. Essentials of Biophysics by P Narayanan, New Age International.

4. Molecular Biophysics- P.K.Banarjee (S. Chand Publication), 2014.
5. Essentials of Biophysics : P. Narayanan, (New Age International, New Delhi), 2005 .
6. Biophysics: An introduction : Rodney Cotterill, John Wiley and Sons Ltd, 2002.
7. Biophysics- Dr.G.R.Chatwal (Himalaya Pub.),2011.

**Project Work (Credits:
06) (Compulsory)**

SKILL ENHANCEMENT COURSE
(Credit: 04 each)- SEC-1 and SEC-2

1- Communicative English and English Writing Skill(Compulsory) (Credits: 02)
Theory: 20 Classes (1 hr.duration)

2-BASIC INSTRUMENTATION SKILLS
(Credits: 02)
Theory: 20 Classes (1 hr. duration)

This course is to get exposure with various aspects of instruments and their usage through hands-on mode. Experiments listed below are to be done in continuation of the topics.

UNIT-I

Basic of Measurement: Instruments accuracy, precision, sensitivity, resolution range etc. Errors in measurements and loading effects.

Multimeter: Principles of measurement of dc voltage and dc current, ac voltage, ac current and resistance. Specifications of a multimeter and their significance.

Electronic Voltmeter: Advantage over conventional multimeter for voltage measurement with respect to input impedance and sensitivity. Principles of voltage, measurement (block diagram only). Specifications of an electronic Voltmeter/ Multimeter and their significance.

AC millivoltmeter: Type of AC millivoltmeters: Amplifier- rectifier, and rectifier- amplifier. Block diagram ac millivoltmeter, specifications and their significance.

Cathode Ray Oscilloscope: Block diagram of basic CRO. Construction of CRT, Electron gun, electrostatic focusing and acceleration (Explanation only no mathematical treatment), brief discussion on screen phosphor, visual persistence & chemical composition. Time base operation, synchronization. Front panel controls. Specifications of a CRO and their significance. Use of CRO for the measurement of voltage (dc and ac frequency, time period. Special features of dual trace, introduction to digital oscilloscope, probes. Digital storage Oscilloscope: Block diagram and principle of working. (10 Lectures)

UNIT-II

Signal Generators and Analysis Instruments: Block diagram, explanation and specifications of low frequency signal generators. pulse generator, and function generator. Brief idea for testing, specifications. Distortion factor meter, wave analysis.

Digital Instruments: Principle and working of digital meters. Comparison of analog & digital instruments. Characteristics of a digital meter. Working principles of digital voltmeter.

Digital Multimeter: Block diagram and working of a digital multimeter. Working principle of time interval, frequency and period measurement using universal counter/ frequency counter, time- base stability, accuracy and resolution. (10 Lectures)

The test of lab skills will be of the following test items:

1. Use of an oscilloscope.
2. CRO as a versatile measuring device.
3. Circuit tracing of Laboratory electronic equipment,
4. Use of Digital multimeter/VTVM for measuring voltages
5. Circuit tracing of Laboratory electronic equipment,
6. Winding a coil / transformer.
7. Study the layout of receiver circuit.
8. Trouble shooting a circuit
9. Balancing of bridges

Laboratory Exercises:

1. To observe the loading effect of a multimeter while measuring voltage across a low resistance and high resistance.
2. To observe the limitations of a multimeter for measuring high frequency voltage and currents.
3. To measure Q of a coil and its dependence on frequency, using a Q- meter.
4. Measurement of voltage, frequency, time period and phase angle using CRO.
5. Measurement of time period, frequency, average period using universal counter/ frequency counter.
6. Measurement of rise, fall and delay times using a CRO.
7. Measurement of distortion of a RF signal generator using distortion factor meter.
8. Measurement of R, L and C using a LCR bridge/ universal bridge.

Open Ended Experiments:

1. Using a Dual Trace Oscilloscope.
2. Converting the range of a given measuring instrument (voltmeter, ammeter).

Reference Books:

1. A text book in Electrical Technology - B L Theraja - S Chand and Co.
2. Performance and design of AC machines - M G Say ELBS Edn.
3. Digital Circuits and systems, Venugopal, 2011, Tata McGraw Hill.
4. Logic circuit design, Shimon P. Vingron, 2012, Springer.

5. Digital Electronics, Subrata Ghoshal, 2012, Cengage Learning.
6. Electronic Devices and circuits, S. Salivahanan & N. S.Kumar, 3rd Ed., 2012, Tata Mc-Graw Hill.
7. Electronic circuits: Handbook of design and applications, U.Tietze, Ch.Schenk, 2008, Springer
8. Electronic Devices, 7/e Thomas L. Floyd, 2008, Pearson India.

3-RENEWABLE ENERGY & ENERGY HARVESTING

(Credits: 02)

Theory: 20 Classes (1hr duration)

The aim of this course is not just to impart theoretical knowledge to the students but to provide them with exposure and hands-on learning wherever possible.

UNIT-I

Fossil fuels and Alternate Sources of energy: Fossil fuels and nuclear energy, their limitation, need of renewable energy, non-conventional energy sources. An overview of developments in Offshore Wind Energy, Tidal Energy, Wave energy systems, Ocean Thermal Energy Conversion, solar energy, biomass, biochemical conversion, biogas generation, geothermal energy tidal energy, Hydroelectricity.

Solar energy: Solar energy, its importance, storage of solar energy, solar pond, non plate collector, solar distillation, solar cooker, solar green houses, solar cell, absorption air conditioning. Need and characteristics of photovoltaic (PV) systems, PV models and equivalent circuits, and sun tracking systems.(10 Lectures)

UNIT-II

Wind Energy harvesting: Fundamentals of Wind energy, Wind Turbines and different electrical machines in wind turbines, Power electronic interfaces, and grid interconnection topologies.

Ocean Energy: Ocean Energy Potential against Wind and Solar, Wave Characteristics and Statistics, Wave Energy Devices. Tide characteristics and Statistics, Tide Energy Technologies, Ocean Thermal Energy, Osmotic Power, Ocean Bio-mass. Geothermal Energy: Geothermal Resources, Geothermal Technologies.

Hydro Energy: Hydropower resources, hydropower technologies, environmental impact of hydro power sources. (10 Lectures)

Reference Books:

1. Non-conventional energy sources - G.D Rai - Khanna Publishers, New Delhi
2. Solar energy - M P Agarwal - S Chand and Co. Ltd.
3. Solar energy - Suhas P Sukhative Tata McGraw - Hill Publishing Company Ltd.
4. Godfrey Boyle, Renewable Energy, Power for a sustainable future, 2004, Oxford University Press, in association with The Open University.
5. Dr. P Jayakumar, Solar Energy: Resource Assesment Handbook, 2009

6. J.Balfour, M.Shaw and S. Jarosek, Photovoltaics, Lawrence J Goodrich (USA).

7. [http://en.wikipedia.org/wiki/Renewable energy](http://en.wikipedia.org/wiki/Renewable_energy).

4-APPLIED OPTICS

(Credits: 02)

THEORY: 20 Classes (1 hr. duration)

Theory includes only qualitative explanation. Minimum five experiments should be performed covering minimum three sections.

UNIT-I

Sources and Detectors: Lasers, Spontaneous and stimulated emissions, Theory of laser action, Einsteins coefficients, Light amplification, Characterization of laser beam, He-Ne laser, Semiconductor lasers.

Elementary ideas of Fourier Optics.

Concept of Spatial frequency filtering, Fourier transforming property of a thin lens. (10 Lectures)

UNIT-II

Holography

Basic principle and theory: coherence, resolution, Types of holograms, white light reflection hologram, application of holography in microscopy, interferometry, and character recognition.

Photonics: Fibre Optics

Optical fibres and their properties, Principal of light propagation through a fibre, The numerical aperture, Attenuation in optical fibre and attenuation limit, Single mode and multimode fibres, Fibre optic sensors: Fibre Bragg Grating. (10 Lectures)

Reference Books:

1. Fundamental of optics, F. A. Jenkins & H. E. White, 1981, Tata McGraw Hill.
2. LASERS: Fundamentals & applications, K.Thyagrajan & A.K.Ghatak, 2010, Tata McGraw Hill
3. Fibre optics through experiments, M.R.Shenoy, S.K.Khijwania, et.al. 2009, Viva Books.
4. Nonlinear Optics, Robert W. Boyd, (Chapter-I), 2008, Elsevier.
5. Optics, Karl Dieter Moller, Learning by computing with model examples, 2007, Springer.
6. Optical Systems and Processes, Joseph Shamir, 2009, PHI Learning Pvt. Ltd.
7. Optoelectronic Devices and Systems, S.C. Gupta, 2005, PHI Learning Pvt. Ltd.
8. Optical Physics, A.Lipson, S.G.Lipson, H.Lipson, 4th Edn., 1996, Cambridge Univ. Press.
9. Optics E.Hecht, (Pearson India).

GENERIC ELECTIVE (GE) (Minor-Physics)
For other Departments/Disciplines-(Credit: 06 each)

**GE:I-MECHANICS & PROPERTIES OF MATTER, OSCILLATION & WAVES,
THERMAL PHYSICS, ELECTRICITY, MAGNETISM & ELECTRONICS**

(Credits: Theory - 04, Practicals 02)

Theory: 40 classes (1 hr. duration each)-Full Marks: 70

UNIT-I: Mechanics & Properties of Matter

Moment of Inertia Parallel axis and perpendicular axis theorem, M.I. of a Solid sphere and Solid cylinder, Gravitational potential and field due to a thin spherical shell and a solid sphere at external points and internal points. Relation among elastic constants, depression at free end of a light cantilever. Surface tension, pressure difference across a curved membrane, viscous flow, Poiseulle's formula. (8 classes) 14 Marks

UNIT-II: Oscillation and Waves

Simple harmonic motion, damped harmonic motion, under damped, over damped and critically damped motion, Forced vibration, Resonance. Wave equation in a medium, Velocity of Longitudinal waves in an elastic medium and velocity of transverse wave in a stretched string. Composition of SHM, Lissajous figures for superposition of two orthogonal simple harmonic vibrations (a) with same frequency, (b) frequency with 2:1.(8 classes) 14 Marks

UNIT-III: Thermal Physics

Entropy, change in entropy in reversible and irreversible process, Carnot engine and its efficiency. Carnot Theorem, Second law of thermodynamics, Kelvin-Planck, Clausius formula. Thermal conductivity, differential equation for heat flow in one dimension. Maxwell thermodynamic relation (statement only), Clausius-Clapeyron equation. Black body radiation, Planck radiation formula (No derivation).(8 classes) 14 Marks

UNIT-IV: Electricity and Magnetism

Gauss law of electrostatics, use of Gauss law to compute electrostatic field due to a linear charge distribution. Magnetic induction B, Lorentz force law. Biot-Savarts law, Magnetic induction due to long straight current carrying conductor, and in the axis of a current carrying circular coil. Amperes Circuital law, its differential form. The law of electromagnetic equations, its differential and integral form. Maxwells electro-magnetic equations and their physical significance.

Growth and decay of currents in LR and RC circuits, time constant, alternating currents in RC, RL and LCR circuits, impedance, power factor, resonance.(8 classes) 14 Marks

UNIT-V: Electronics

Extrinsic and intrinsic semiconductors, P-type and N-type semiconductors. PN-Junction as rectifier, Half wave and Full wave rectifiers (Bridge type), efficiency, ripple factor, use of RC, LC, and filters, working of PNP and NPN transistors, transistor configurations in CE and CB circuits and relation between α and β . JFET, its operation and characteristics of V-I curve.(8 classes) 14 Marks

Reference Books:

1. Properties of Matter D.S. Mathur (S. Chand Publication).
2. Heat and Thermodynamics A.B. Gupta & H.B. Ray (New Central Book Agency).
3. Sound M. Ghosh (S. Chand Publication).
4. Introduction to Electrodynamics D.I. Griffith (Prentice Hall of India).
5. Foundations of Electronics Chattopadhyaya and Rakshit.
6. Physics of Degree students Vol.I M. Das, P.K. Jena, M. Bhuyan, D.K. Rout (Srikrishna Prakashan).
7. Physics of Degree students Vol.I M. Das, P.K. Jena, M. Bhuyan, and others (Srikrishna Prakashan).
8. University Physics Sears, Zemansky, H.D. Young (Addison Wesley).

GE:I LAB.

20 classes (2 hours duration each)-Full Marks: 30

1. Measurement of length (or diameter) using Vernier calipers, Screw gauge and travelling microscope.
2. To determine the moment of inertia of a fly wheel.
3. To determine the Young's modulus Y of a wire by Searls method.
4. To determine the modulus of rigidity of a wire by Maxwells needle/Torsion Pendulum (Dynamic method).
5. To determine g by bar pendulum.
6. To determine the elastic constants of a wire by Searls method.
7. To determine the value of Y of a rubber by using travelling microscope.
8. To determine the Rigidity of modulus by static method.
9. To determine the frequency of a telescope by using Sonometer.
10. Verification of Laws of Vibration of a string by using Sonometer.
11. To compare capacitances using DeSauty bridge.
12. To determine the Law of resistance by using Foster bridge.
13. To determine the Mechanical equivalent of heat J by Callender and Barnes constants flow method.
14. To determine the J by Joules Calorimeter.
15. To determine the coefficient of viscosity of water by Capillary flow method (Poiseilles method).
16. Compare the specific heat of two liquids by method of Cooling.

Reference Books:

1. Advanced Practical Physics for students, B.L.Flint & H.T.Worsnop, 1971, Asia Publishing House B.B. Swain.
2. A Laboratory Manual of Physics for Undergraduate Classes, D.P.Khandelwal (1985), VaniPublication.
3. A Text book of Practical Physics, Indu Prakash and Ramakrishna, 11th Edition (2011), Kitab Mahal, New Delhi.

GE:II-OPTICS, SPECIAL THEORY OF RELATIVITY, ATOMIC PHYSICS, QUANTUM MECHANICS & NUCLEAR PHYSICS

(Credits: Theory - 04, Practicals 02) Theory:
40 classes (1hr duration each)-Full Marks: 70

UNIT-I: Optics-I

Elementary ideas of monochromatic aberrations and their minimization, chromatic aberration, achromatic combination. Theory of formation of Primary and Secondary rainbow. Condition of interference. Coherent sources. Youngs Double Slit experiment. Biprism and measurement of wave length of light of by it. Colour of thin films and Newtons rings. Fresnel and Fraunhofer diffraction, diffraction by Single slit Plane transmission grating.(8 classes) 14 Marks

UNIT-II: Optics-II and Relativity

Electromagnetic nature of light, polarized and unpolarized light, polarization by reflection and refraction. Brewsters Law, Malus Law, Double refraction. Ordinary and extraordinary rays. Galilean transformation, Newtonian relativity and its limitation, Michelson Morley experiment and its consequence, postulates of special theory of relativity. Lorentz transformation, length contraction, time dilation, relativistic mass and momentum, mass energy relation.(8 classes) 14 Marks

UNIT-III: Atomic Physics

Inadequacy of classical physics, brief outline of Rayleigh Jeans theory and Plancks quantum theory of radiation, particle nature of electromagnetic radiation photo electric effect, Compton effect, dual nature of radiation, wave nature of particles, de-Broglie hypothesis, matter wave, wave-particle duality, Davisson-Germer experiment.

Bohrs theory of Hydrogen atom, explanation of Hydrogen Spectra correction for finite mass of the nucleus. Bohrs correspondence principle, limitations of Bohrs theory. Discrete energy, exchange by atom Frank Hertz experiment.(8 classes) 14 Marks

UNIT-IV: Quantum Mechanics

Heisenbergs Uncertainty relation. Time dependent Schrodingers wave equation in one dimension and three dimensions. The physical interpretation of the wave function. Probability density and probability current density. Equation of continuity. Normalization of the Wave function, Expectation value of an observable, Ehrenfests theorem.

Time independent Schrodingers wave equation in one dimension particle in a box, energy eigen values and eigen functions.(8 classes) 14 Marks

UNIT-V: Nuclear Physics

Properties of the nucleus Charge, Size, Spin, Magnetic Moment, Mass, Mass defect, Binding energy, Packing fraction, Nuclear force, and its characteristics features. Radioactive decay laws, average life, half life, nuclear fission, nuclear fusion, Linear accelerators, and cyclotron.(8 classes) 14 Marks

Reference Books:

1. Principles of Optics A.B. Gupta.
2. Fundamentals of Optics Jenkins and White.
3. Relativity R. Resnick.
4. Modern Physics H.S. Mani and G.K. Meheta.

5. Quantum Mechanics J.L. Powel and B. Craseman.
6. Atomic and Nuclear Physics Gupta and Ghosh (Books and allied).
7. Physics of Degree students Vol. III M. Das, P.K. Jena and others (SrikrishnaPrakashan).
8. Physics of Degree students Vol. IV M. Das, P.K. Jena and others (SrikrishnaPrakashan).
9. Concept of Modern Physics Arthur Beiser (Mc-graw Hill) (2009).
10. University Physics Sears, Zemansky, H.D. Young (Addison Wesley).

GE:II LAB.

20 classes (2 hours duration each)-Full Marks: 30

1. Determination of Horizontal component of Earths magnetic field and magnetic moment of a bar magnet using deflection and oscillation magnetometer.
2. Determination of E.C.E. of a Copper by taking 3 readings.
3. Familiarization with Schuster focusing and determination of angle of prism.
4. Determination of Refractive index of the material of a prism using Sodium light.
5. To determine the wavelength of light using plane diffraction grating.
6. To determine the wavelength of light using Newtons ring.
7. Determination of refractive index of (a) glass and (b) liquid by using travelling microscope.
8. Determination of radius of curvature of a convex/concave mirror by using Kohlrauschs method.
9. To determine the magnifying power of a given telescope.
10. Verification of inverse square law of magnetism by using a deflection magnetometer.
11. To draw the static characteristics of a P-N junction diode.
12. Obtain the static characteristics of a P-N-P / N-P-N transistor / Triode Valve.
13. To determine the reduction factor of a tangent Galvanometer.
14. Variation of magnetic field along the axis of a circular coil carrying current.
15. To study the characteristics of a series RC circuit.

Reference Books:

1. Advanced Practical Physics for students, B.L.Flint & H.T.Worsnop, 1971, Asia Publishing House.
2. A Laboratory Manual of Physics for Undergraduate Classes, D.P.Khandelwal (1985), VaniPublication.
3. A Text book of Practical Physics, Indu Prakash And Ramakrishna, 11th Edition (2011), Kitab Mahal, New Delhi.

PHYSICS(PASS)

SEMESTER-I

DSC 1A: MECHANICS

(Credits: Theory-04, Practicals-02) Theory:
40 Classes (1 hr. duration)-Marks: 70

UNIT-I

Vectors: Vector algebra. Scalar and vector products. Derivatives of a vector with respect to a parameter. (2 Lectures)

Ordinary Differential Equations: 1st order homogeneous differential equations. 2nd order homogeneous differential equations with constant coefficients. (2 Lectures)

Laws of Motion: Frames of reference. Newtons Laws of motion. Dynamics of a system of particles. Centre of Mass. (4 Lectures)

Momentum and Energy: Conservation of momentum. Work and energy. Conservation of energy. Motion of rockets. (2 Lectures)

Rotational Motion: Angular velocity and angular momentum. Torque. Conservation of angular momentum. (3 Lectures)

Gravitation: Newtons Law of Gravitation. Motion of a particle in a central force field (motion is in a plane, angular momentum is conserved, areal velocity is constant). Keplers Laws (statement only). Satellite in circular orbit and applications. Geosynchronous orbits. Basic idea of global positioning system (GPS). Weightlessness. Physiological effects on astronauts. (7 Lectures)

UNIT-II

Oscillations: Simple harmonic motion. Differential equation of SHM and its solutions. Kinetic and Potential Energy, Total Energy and their time averages. Damped oscillations. (6 Lectures) **Elasticity:**

Hooke's law - Stress-strain diagram - Elastic moduli-Relation between elastic constants - Poissons Ratio-Expression for Poissons ratio in terms of elastic constants - Work done in stretching and work done in twisting a wire - Twisting couple on a cylinder - Determination of Rigidity modulus by static torsion - Torsional pendulum-Determination of Rigidity modulus and moment of inertia - q , η and σ by Searles method. (8 Lectures)

Special Theory of Relativity: Constancy of speed of light. Postulates of Special Theory of Relativity. Length contraction. Time dilation. Relativistic addition of velocities. (6 Lectures)

Note: *Students are not familiar with vector calculus. Hence all examples involve differentiation either in one dimension or with respect to the radial coordinate.*

Reference Books:

1. University Physics. F.W. Sears, M.W. Zemansky and H.D. Young, 13/e, 1986. Addison- Wesley
2. Mechanics Berkeley Physics, v.1: Charles Kittel, et. al. 2007, Tata McGraw-Hill.

3. Physics Resnick, Halliday & Walker 9/e, 2010, Wiley
4. University Physics, Ronald Lane Reese, 2003, Thomson Brooks/Cole.
5. Properties of Matter - D.S. Mathur (S.Chand publication) 2013
6. Mechanics- D.C.Tayal (Himalaya Publication) 2013
7. Classical Dynamics of Particles and Systems S. T. Thornton (Cengage Learning) 2012
8. Analytical Mechanics-Fowles (Cengage Learnings) 2014

DSC 1A-LAB: MECHANICS

20 Classes (2 hrs. duration)-Marks:30

1. Measurements of length (or diameter) using vernier caliper, screw gauge and travelling microscope.
2. To determine the Height of a Building using a Sextant.
3. To determine the Moment of Inertia of a Flywheel.
4. To determine the Young's Modulus of a Wire by Optical Lever Method.
5. To determine the Modulus of Rigidity of a Wire by Maxwells needle.
6. To determine the Elastic Constants of a Wire by Searles method.
7. To determine g by Bar Pendulum.
8. To determine g by Katers Pendulum.
9. To study the Motion of a Spring and calculate (a) Spring Constant, (b) g.

Reference Books:

1. Advanced Practical Physics for students, B.L. Flint and H.T. Worsnop, 1971, Asia Publishing House.
2. Advanced level Physics Practicals, Michael Nelson and Jon M. Ogborn, 4th Edition, reprinted 1985, Heinemann Educational Publishers.
3. A Text Book of Practical Physics, Indu Prakash and Ramakrishna, 11th Edition, 2011, Kitab Mahal, New Delhi.

SEMESTER-II

DSC 1B: ELECTRICITY, MAGNETISM AND EMT

(Credits: Theory-04, Practicals-02) Theory:
40 Classes (1 hr. duration)-Marks:70

UNIT-I

Vector Analysis: Scalar and Vector product, gradient, divergence, Curl and their significance, Vector Integration, Line, surface and volume integrals of Vector fields, Gauss-divergence theorem and Stoke's theorem of vectors (statement only). (8 Lectures)

Electrostatics: Electrostatic Field, electric flux, Gauss's theorem of electrostatics. Applications of Gauss theorem- Electric field due to point charge, infinite line of charge, uniformly charged spherical shell and solid sphere, plane charged sheet, charged conductor. Electric potential as line integral of electric field, potential due to a point charge, electric dipole, uniformly charged spherical shell and solid sphere. Calculation of electric field from potential. Capacitance of an isolated spherical conductor. Parallel plate, spherical and cylindrical condenser. Energy per unit volume in electrostatic field. Dielectric medium, Polarisation, Displacement vector. Gauss's theorem in dielectrics. Parallel plate capacitor completely filled with dielectric. (12 Lectures)

UNIT-II

Magnetism:

Magnetostatics: Biot-Savart's law and its applications- straight conductor, circular coil, solenoid carrying current. Divergence and curl of magnetic field. Magnetic vector potential. Ampere's circuital law. Magnetic properties of materials: Magnetic intensity, magnetic induction, permeability, magnetic susceptibility. Brief introduction of dia-, para-and ferromagnetic materials. (6 Lectures)

Electromagnetic Induction: Faraday's laws of electromagnetic induction, Lenz's law, self and mutual inductance, L of single coil, M of two coils. Energy stored in magnetic field. (4 Lectures)

Maxwell's equations and Electromagnetic wave propagation: Equation of continuity of current, Displacement current, Maxwell's equations, Poynting vector, energy density in electro- magnetic field, electromagnetic wave propagation through vacuum and isotropic dielectric medium, transverse nature of EM waves, polarization. (10 Lectures)

Reference Books:

1. Electricity and Magnetism, Edward M. Purcell, 1986, McGraw-Hill Education
2. Electricity & Magnetism, J.H. Fewkes & J.Yarwood. Vol. I, 1991, Oxford Univ. Press
3. Electricity and Magnetism, D C Tayal, 1988, Himalaya Publishing House.
4. University Physics, Ronald Lane Reese, 2003, Thomson Brooks/Cole.
5. D.J.Griffiths, Introduction to Electrodynamics, 3rd Edn, 1998, Benjamin Cummings.
6. Electricity and Magnetism- K.K Tewari (S. Chand Higher Academics)2013
7. Electricity and Magnetism -D. C. Tayal (Himalay Pub.)2014

DSC 1B-LAB: ELECTRICITY, MAGNETISM AND EMT

20 Classes (2 hrs. duration)-Marks:30

1. To use a Multimeter for measuring (a) Resistances, (b) AC and DC Voltages, (c) DC Current, and (d) checking electrical fuses.
2. Ballistic Galvanometer:
 - (i) Measurement of charge and current sensitivity
 - (ii) Measurement of CDR
 - (iii) Determine a high resistance by Leakage Method

- (iv) To determine Self Inductance of a Coil by Rayleighs Method. 3. To compare capacitances using DeSautys bridge.
4. Measurement of field strength B and its variation in a Solenoid (Determine dB/dx) 5. To study the Characteristics of a Series RC Circuit.
6. To study a series LCR circuit LCR circuit and determine its (a) Resonant frequency, (b) Quality factor
7. To study a parallel LCR circuit and determine its (a) Anti-resonant frequency and (b) Quality factor Q
8. To determine a Low Resistance by Carey Fosters Bridge.
9. To verify the Thevenin and Norton theorems.
10. To verify the Superposition, and Maximum Power Transfer Theorems.

Reference Books:

1. Advanced Practical Physics for students, B.L.Flint & H.T.Worsnop, 1971, Asia Publishing House.
2. Advanced level Physics Practicals, Michael Nelson and Jon M. Ogborn, 4th Edition, reprinted 1985, Heinemann Educational Publishers
3. A Text Book of Practical Physics, I.Prakash & Ramakrishna, 11th Ed.2011, Kitab Mahal

SEMESTER-III

DSC 1C: THERMAL PHYSICS AND STATISTICAL MECHANICS

(Credits: Theory-04, Practicals-02) Theory:

40 Classes (1 hr. duration)-Marks: 70

UNIT-I

Laws of Thermodynamics: Thermodynamic Description of system: Zeroth Law of thermo- dynamics and temperature. First law and internal energy, conversion of heat into work, Various Thermodynamical Processes, Applications of First Law: General Relation between CP and CV, Work Done during Isothermal and Adiabatic Processes, Compressibility and Expansion Coefficient, Reversible and irreversible processes, Second law and Entropy, Carnots cycle & theorem, Entropy changes in reversible & irreversible processes, Entropy-temperature diagrams, Third law ofthermo- dynamics, Unattainability of absolute zero. (10 Lectures)

Thermodynamical Potentials: Enthalpy, Gibbs, Helmholtz and Internal Energy functions, Maxwells relations and applications - Joule-Thompson Effect, Clausius- Clapeyron Equation, Ex- pression for (CP CV), CP/CV, TdS equations. (10 Lectures)

UNIT-II

Kinetic Theory of Gases: Derivation of Maxwells law of distribution of velocities and its exper- imental verification, Mean free path (Zeroth Order), Transport Phenomena: Viscosity, Conduction and Diffusion (for vertical case), Law of equipartition of energy (no derivation) and its applications to specific heat of gases; mono-atomic and diatomic gases. (10 Lectures)

Theory of Radiation: Blackbody radiation, Spectral distribution, Concept of Energy Density,

Derivation of Planck's law, Deduction of Wiens distribution law, Rayleigh- Jeans Law, Stefan Boltzmann Law and Wiens displacement law from Plancks law. (6 Lectures)

Statistical Mechanics: Maxwell-Boltzmann law - distribution of velocity - Quantum statistics- Phase space - Fermi-Dirac distribution law - electron gas - Bose-Einstein distribution law - photon gas - comparison of three statistics. (4 Lectures)

Reference Books:

1. Thermal Physics, S. Garg, R. Bansal and C. Ghosh, 1993, Tata McGraw-Hill.
2. A Treatise on Heat, Meghnad Saha, and B.N. Srivastava, 1969, Indian Press.
3. Thermodynamics, Enrico Fermi, 1956, Courier Dover Publications.
4. Thermodynamics, Kinetic theory & Statistical thermodynamics, F.W.Sears and G.L. Salinger. 1988, Narosa
5. University Physics, Ronald Lane Reese, 2003, Thomson Brooks/Cole.
6. Thermal and Statistical Physics —M. Das , P. K. Jena and others (Sri Krishna Prakashan)
7. Heat and Thermal Physics-Brijlal & Subramaiaam (S.Chand Publication)2014
8. Thermal Physics– C. Kittel and H. Kroemer (McMillan Education India)2010
9. Thermodynamics & Statistical Physics-J.K.Sharma, K.K.Sarkar (Himalaya Pub.)2014

DSC 1C-LAB: THERMAL PHYSICS AND STATISTICAL MECHANICS

20 Classes (2 hrs. duration)-Marks:30

1. To determine Mechanical Equivalent of Heat, J, by Callender and Barnes constant flow method.
2. Measurement of Plancks constant using black body radiation.
3. To determine Stefans Constant.
4. To determine the coefficient of thermal conductivity of Cu by Searles Apparatus.
5. To determine the Coefficient of Thermal Conductivity of Cu by Angstroms Method.
6. To determine the coefficient of thermal conductivity of a bad conductor by Lee and Charltons disc method.
7. To determine the temperature co-efficient of resistance by Platinum resistance thermometer.
8. To study the variation of thermo emf across two junctions of a thermocouple with temperature.
9. To record and analyze the cooling temperature of an hot object as a function of time using a thermocouple and suitable data acquisition system.
10. To calibrate Resistance Temperature Device (RTD) using Null Method/Off- Balance Bridge.

Reference Books:

1. Advanced Practical Physics for students, B.L.Flint & H.T.Worsnop, 1971, Asia Publishing House.

2. A Text Book of Practical Physics, Indu Prakash and Ramakrishna, 11th Edition, 2011, Kitab Mahal, New Delhi.
3. A Laboratory Manual of Physics for Undergraduate Classes, D.P.Khandelwal, 1985, Vani Publication.

SEMESTER-IV

DSC 1D: WAVES AND OPTICS

(Credits: Theory-04, Practicals-02) Theory:
40 Classes (1hr duration)-Marks: 70

UNIT-I

Fluids: Surface Tension- Synclastic and anticlastic surface - Excess of pressure - Application to spherical and cylindrical drops and bubbles - variation of surface tension with temperature - Jaegers method. Viscosity - Rate flow of liquid in a capillary tube - Poiseuilles formula - Determination of coefficient of viscosity of a liquid - Variations of viscosity of liquid with temperature- lubrication. (6 Lectures)

Sound: Simple harmonic motion - forced vibrations and resonance - Fouriers Theorem - Application to saw tooth wave and square wave - Intensity and loudness of sound - Decibels - Intensity levels - musical notes - musical scale. Acoustics of buildings: Reverberation and time of reverberation - Absorption coefficient - Sabines formula - measurement of reverberation time - Acoustic aspects of halls and auditoria. (6 Lectures)

Superposition of Two Perpendicular Harmonic Oscillations: Graphical and Analytical Methods. Lissajous Figures (1:1 and 1:2) and their uses. (2 Lectures)

Waves Motion- General: Transverse waves on a string. Travelling and standing waves on a string. Normal Modes of a string. Group velocity, Phase velocity. Plane waves. Spherical waves, Wave intensity. (2 Lectures)

Wave Optics: Electromagnetic nature of light. Definition and Properties of wave front. Huygens Principle. (2 Lectures)

UNIT-II

Interference: Interference: Division of amplitude and division of wavefront. Youngs Double Slit experiment. Lloyds Mirror and Fresnels Biprism. Phase change on reflection: Stokes treatment. Interference in Thin Films: parallel and wedge-shaped films. Fringes of equal inclination (Haidinger Fringes); Fringes of equal thickness (Fizeau Fringes). Newtons Rings: measurement of wavelength and refractive index. (10 Lectures)

Michelsons Interferometer: (1) Idea of form of fringes (no theory needed), (2) Determination of wavelength, (3) Wavelength difference, (4) Refractive index, and (5) Visibility of fringes. (2 Lectures)

Diffraction: Fraunhofer diffraction- Single slit; Double Slit. Multiple slits and Diffraction grating. Fresnel Diffraction: Half-period zones. Zone plate. Fresnel Diffraction pattern of a straight edge, a slit and a wire using half-period zone analysis. (7 Lectures)

Polarization: Transverse nature of light waves. Plane polarized light production and analysis. Circular and elliptical polarization. (3 Lectures)

Reference Books:

1. Fundamentals of Optics, F.A Jenkins and H.E White, 1976, McGraw-Hill
2. Principles of Optics, B.K. Mathur, 1995, Gopal Printing
3. Fundamentals of Optics, H.R. Gulati and D.R. Khanna, 1991, R. Chand Publications
4. University Physics. F.W. Sears, M.W. Zemansky and H.D. Young. 13/e, 1986. Addison- Wesley.

DSC 1D-LAB: WAVES AND OPTICS

20 Classes (2 hrs. duration)-Marks: 30

1. To investigate the motion of coupled oscillators.
2. To determine the Frequency of an Electrically Maintained Tuning Fork by Melde's Experiment and to verify $2T$ Law.
3. To study Lissajous Figures.
4. Familiarization with Schuster's focussing; determination of angle of prism.
5. To determine the Coefficient of Viscosity of water by Capillary Flow Method (Poiseuille's method).
6. To determine the Refractive Index of the Material of a Prism using Sodium Light.
7. To determine Dispersive Power of the Material of a Prism using Mercury Light.
8. To determine the value of Cauchy Constants.
9. To determine the Resolving Power of a Prism.
10. To determine wavelength of sodium light using Fresnel Biprism.
11. To determine wavelength of sodium light using Newton's Rings.
12. To determine the wavelength of Laser light using Diffraction of Single Slit.
13. To determine wavelength of (1) Sodium and (2) Spectral lines of the Mercury light using plane diffraction Grating
14. To determine the Resolving Power of a Plane Diffraction Grating.
15. To measure the intensity using photosensor and laser in diffraction patterns of single and double slits.

Reference Books:

1. Advanced Practical Physics for students, B.L. Flint and H.T. Worsnop, 1971, Asia Publishing House.
2. Advanced level Physics Practicals, Michael Nelson and Jon M. Ogborn, 4th Edition, reprinted 1985, Heinemann Educational Publishers
3. A Text Book of Practical Physics, Indu Prakash and Ramakrishna, 11th Edition, 2011, Kitab Mahal, New Delhi.

DISCIPLINE SPECIFIC ELECTIVE(DSE)

(Select Two Papers).

DSE: DIGITAL AND ANALOG CIRCUITS AND INSTRUMENTATION

(Credits: Theory-04, Practicals-02)

Theory: 40 Lectures-Marks: 70

UNIT-1:

Digital Circuits

Difference between Analog and Digital Circuits. Binary Numbers. Decimal to Binary and Binary to Decimal Conversion, AND, OR and NOT Gates (Realization using Diodes and Transistor). NAND and NOR Gates as Universal Gates. XOR and XNOR Gates. (5 Lectures)

De Morgan's Theorems. Boolean Laws. Simplification of Logic Circuit using Boolean Algebra. Fundamental Products. Minterms and Maxterms. Conversion of a Truth Table into an Equivalent Logic Circuit by (1) Sum of Products Method and (2) Karnaugh Map. (5 Lectures)

UNIT-2:

Semiconductor Devices and Amplifiers:

Semiconductor Diodes: p and n type semiconductors. Barrier Formation in PN Junction Diode. Qualitative Idea of Current Flow Mechanism in Forward and Reverse Biased Diode. PN junction and its characteristics. Static and Dynamic Resistance. Principle and structure of (1) LEDs (2) Photodiode (3) Solar Cell. (5 Lectures)

Bipolar Junction transistors: n-p-n and p-n-p Transistors. Characteristics of CB, CE and CC Configurations. Current gains α and β . Relations between α and β . Load Line analysis of Transistors. DC Load line and Q-point. Active, Cutoff, and Saturation Regions. Voltage Divider Bias Circuit for CE Amplifier. h-parameter Equivalent Circuit. Analysis of a single-stage CE amplifier using Hybrid Model. Input and Output Impedance. Current, Voltage and Power Gains. Class A, B, and C Amplifiers. (10 Lectures)

UNIT-3:

Operational Amplifiers (Black Box approach):

Characteristics of an Ideal and Practical Op-Amp (IC 741), Open-loop & Closed-loop Gain. CMRR, concept of Virtual ground. Applications of Op-Amps: (1) Inverting and Non-inverting Amplifiers, (2) Adder, (3) Subtractor, (4) Differentiator, (5) Integrator, (6) Zero Crossing Detector. (7 Lectures)

Instrumentations:

Introduction to CRO: Block Diagram of CRO. Applications of CRO: (1) Study of Waveform, (2) Measurement of Voltage, Current, Frequency, and Phase Difference. (3 Lectures)

Power Supply: Half-wave Rectifiers. Centre-tapped and Bridge Full-wave Rectifiers Calculation of Ripple Factor and Rectification Efficiency, Basic idea about capacitor filter, Zener Diode and Voltage Regulation (5 Lectures)

Reference Books:

1. Integrated Electronics, J. Millman and C.C. Halkias, 1991, Tata Mc-Graw Hill.
2. Electronic devices and circuits, S. Salivahanan and N.Suresh Kumar, 2012, Tata Mc-Graw Hill.
3. Microelectronic Circuits, M.H. Rashid, 2ndEdn.,2011, Cengage Learning.
4. Modern Electronic Instrumentation & Measurement Tech., Helfrick & Cooper, 1990, PHI Learning
5. Digital Principles & Applications, A.P.Malvino, D.P.Leach & Saha, 7th Ed.,2011, Tata Mc- Graw Hill
6. Fundamentals of Digital Circuits, A. Anand Kumar, 2nd Edition, 2009, PHI Learning Pvt. Ltd.
7. OP-AMP and Linear Digital Circuits, R.A. Gayakwad, 2000, PHI Learning Pvt. Ltd.

DSC-LAB: DIGITAL AND ANALOG CIRCUITS AND INSTRUMENTATION

20 Classes (2 hrS. duration)-Marks:30

1. To measure (a) Voltage, and (b) Frequency of a periodic waveform using a CRO.
2. To verify and design AND, OR, NOT and XOR gates using NAND gates.
3. To minimize a given logic circuit.
4. Half adder, Full adder and 4-bit Binary Adder.
5. Adder-Subtractor using Full Adder I.C.
6. To design an astable multivibrator of given specifications using 555 Timer.
7. To design a monostable multivibrator of given specifications using 555 Timer.
8. To study IV characteristics of PN diode, Zener and Light emitting diode.
9. To study the characteristics of a Transistor in CE configuration.
10. To design a CE amplifier of a given gain (mid-gain) using voltage divider bias.
11. To design an inverting amplifier of given gain using Op-amp 741 and study its frequency response.
12. To design a non-inverting amplifier of given gain using Op-amp 741 and study its Frequency Response.
13. To study a precision Differential Amplifier of given I/O specification using Opamp.
14. To investigate the use of an op-amp as a Differentiator.
15. To design a Wien Bridge Oscillator using an op-amp.

Reference Books:

1. Basic Electronics: A text lab manual, P.B.Zbar, A.P.Malvino, M.A.Miller, 1994,Mc-Graw Hill.
2. Electronics: Fundamentals and Applications, J.D. Ryder, 2004, Prentice Hall.
3. OP-Amps and Linear Integrated Circuit, R. A. Gayakwad, 4th edition, 2000, Prentice Hall.
4. Electronic Principle, Albert Malvino, 2008, Tata Mc-Graw Hill.

DSE: SOLID STATE PHYSICS
(Credits: Theory-04, Practicals-02)
Theory: 40 Lectures-Marks: 70

Prerequisites: Knowledge of Elements of Modern Physics

UNIT-1:

Crystal Structure: Solids-Amorphous and Crystalline Materials. Lattice Translation Vectors. Lattice with a Basis Central and Non-Central Elements. Unit Cell. Miller Indices. Reciprocal Lattice. Types of Lattices. Brillouin Zones. Diffraction of X-rays by Crystals. Bragg's Law. Atomic and Geometrical Factor. (8 Lectures)

Elementary Lattice Dynamics: Lattice Vibrations and Phonons-Linear Monoatomic and Di-atomic Chains. Acoustical and Optical Phonons. Qualitative Description of the Phonon Spectrum in Solids. Dulong and Petits Law, Einstein and Debye theories of specific heat of solids. T₃ law (6 Lectures)

Magnetic Properties of Matter: Dia-, Para-, Ferri- and Ferromagnetic Materials. Classical Langevin Theory of dia and Paramagnetic Domains. Quantum Mechanical Treatment of Paramagnetism. Curie's law, Weiss Theory of Ferromagnetism and Ferromagnetic Domains. Discussion of B-H Curve. Hysteresis and Energy Loss. (8 Lectures)

UNIT-II

Dielectric Properties of Materials: Polarization. Local Electric Field at an Atom. Depolarization Field. Electric Susceptibility. Polarizability. Clausius Mosotti Equation. Classical Theory of Electric Polarizability. Normal and Anomalous Dispersion. Cauchy and Sellmeier relations. Langevin-Debye equation. Complex Dielectric Constant. Optical Phenomena. Application: Plasma Oscillations, Plasma Frequency, Plasmons. (6 Lectures)

Elementary band theory: Kronig Penny model. Band Gaps. Conductors, Semiconductors and insulators. P and N type Semiconductors. Conductivity of Semiconductors, mobility, Hall Effect, Hall coefficient. (6 Lectures)

Superconductivity: Experimental Results. Critical Temperature. Critical magnetic field. Meissner effect. Type I and type II Superconductors, London's Equation and Penetration Depth. Isotope effect. (6 Lectures)

Reference Books:

1. Introduction to Solid State Physics, Charles Kittel, 8th Ed., 2004, Wiley India Pvt. Ltd.
2. Elements of Solid State Physics, J.P. Srivastava, 2nd Ed., 2006, Prentice-Hall of India
3. Introduction to Solids, Leonid V. Azaroff, 2004, Tata Mc-Graw Hill
4. Solid State Physics, N.W. Ashcroft and N.D. Mermin, 1976, Cengage Learning
5. Solid-state Physics, H. Ibach and H. Luth, 2009, Springer
6. Elementary Solid State Physics, 1/e M. Ali Omar, 1999, Pearson India

7. Solid State Physics, M.A. Wahab, 2011, Narosa Publications

DSC LAB: SOLID STATE PHYSICS

20 Classes (2 hrs. duration)-Marks: 30

1. Measurement of susceptibility of paramagnetic solution (Quinck's Tube Method).
2. To measure the Magnetic susceptibility of Solids.
3. To determine the Coupling Coefficient of a Piezoelectric crystal.
4. To measure the Dielectric Constant of a dielectric Materials with frequency.
5. To determine the complex dielectric constant and plasma frequency of metal using Surface Plasmon resonance (SPR).
6. To determine the refractive index of a dielectric layer using SPR.
7. To study the PE Hysteresis loop of a Ferroelectric Crystal.
8. To study the BH curve of iron using a Solenoid and determine the energy loss.
9. To measure the resistivity of a semiconductor (Ge) crystal with temperature by four-probe method (room temperature to 150 oC) and to determine its band gap.
10. To determine the Hall coefficient of a semiconductor sample.

Reference Books:

1. Advanced Practical Physics for students, B.L. Flint and H.T. Worsnop, 1971, Asia Publishing House.
2. Advanced level Physics Practicals, Michael Nelson and Jon M. Ogborn, 4th Edition, reprinted 1985, Heinemann Educational Publishers
3. A Text Book of Practical Physics, I.Prakash & Ramakrishna, 11th Edn., 2011, Kitab Mahal
4. Elements of Solid State Physics, J.P. Srivastava, 2nd Ed., 2006, Prentice-Hall of India

DSE: ELEMENTS OF MODERN PHYSICS

(Credits: Theory-04, Practicals-02)

Theory: 40 Lectures-Marks: 70

UNIT-I

Plancks quantum, Plancks constant and light as a collection of photons; Photoelectric effect and Compton scattering. De Broglie wavelength and matter waves; Davisson-Germer experiment.(6 Lectures)

Problems with Rutherford model-instability of atoms and observation of discrete atomic spectra; Bohr's quantization rule and atomic stability; calculation of energy levels for hydrogen like atoms and their spectra. (4 Lectures)

Position measurement-gamma ray microscope thought experiment; Wave-particle duality, Heisenberg uncertainty principle- impossibility of a particle following a trajectory; Estimating minimum energy of a confined particle using uncertainty principle; Energy-time uncertainty principle. (4 Lectures)

Two slit interference experiment with photons, atoms & particles; linear superposition principle as a consequence; Matter waves and wave amplitude; Schrodinger equation for non-relativistic particles; Momentum and Energy operators; stationary states; physical interpretation of wavefunction, probabilities and normalization; Probability and probability current densities in one dimension. (8 Lectures)

UNIT-II

One dimensional infinitely rigid box-energy eigenvalues and eigenfunctions, normalization; Quantum dot as an example; Quantum mechanical scattering and tunnelling in one dimension - across a step potential and across a rectangular potential barrier. (8 Lectures)

Size and structure of atomic nucleus and its relation with atomic weight; Impossibility of an electron being in nucleus as a consequence of the uncertainty principle. Nature of nuclear force, NZ graph, semi-empirical mass formula and binding energy. (4Lectures)

Radioactivity: stability of nucleus; Law of radioactive decay; Mean life and half-life; α decay; β decay-energy released, spectrum and Pauli's prediction of neutrino; γ -ray emission.(4 Lectures) Fission and fusion-mass deficit, relativity and generation of energy; Fission - nature of fragments and emission of neutrons. Nuclear reactor: slow neutrons interacting with Uranium 235; Fusion and thermonuclear reactions. (2 Lectures)

Reference Books:

1. Concepts of Modern Physics, Arthur Beiser, 2009, McGraw-Hill.
2. Modern Physics, J.R. Taylor, C.D. Zafiratos, M.A. Dubson,2009, PHI Learning
3. Six Ideas that Shaped Physics:Particle Behave like Waves, Thomas A. Moore, 2003, McGraw Hill
4. Quantum Physics, Berkeley Physics,Vol.4. E.H. Wichman, 2008, Tata McGraw-Hill Co.
5. Modern Physics, R.A. Serway, C.J. Moses, and C.A.Moyer, 2005, Cengage Learning

DSC LAB: ELEMENTS OF MODERN PHYSICS

20 Classes (2 hrs. duration)-Marks: 30

1. To determine value of Boltzmann constant using V-I characteristic of PN diode.
2. To determine work function of material of filament of directly heated vacuum diode.
3. To determine the ionization potential of mercury.
4. To determine value of Plancks constant using LEDs of at least 4 different colours.
5. To determine the wavelength of H-alpha emission line of Hydrogen atom.
6. To determine the absorption lines in the rotational spectrum of Iodine vapour.
7. To study the diffraction patterns of single and double slits using laser and measure its intensity variation using Photosensor & compare with incoherent source Na.
8. Photo-electric effect: photo current versus intensity and wavelength of light; maximum energy of photo-electrons versus frequency of light.
9. To determine the value of e/m by (a) Magnetic focusing or (b) Bar magnet.

10. To setup the Millikan oil drop apparatus and determine the charge of an electron.

Reference Books:

1. Advanced Practical Physics for students, B.L. Flint and H.T. Worsnop, 1971, Asia Publishing House.
2. Advanced level Physics Practicals, Michael Nelson and Jon M. Ogborn, 4th Edition, reprinted 1985, Heinemann Educational Publishers
3. A Text Book of Practical Physics, Indu Prakash and Ramakrishna, 11th Edition, 2011, Kitab Mahal, New Delhi.

SKILL ENHANCEMENT COURSE(Four)

(Credit: 02 each)-SEC:1 to SEC:4

1. COMMUNICATIVE ENGLISH & ENGLISH WRITINGSKILL(Compulsory)

(Credits: Theory-02)

2. COMPUTATIONAL PHYSICS

(Credits: Theory-02) Theory:
20 Classes (1 hr. duration)

UNIT-I

Introduction: Importance of computers in Physics, paradigm for solving physics problems for solution. Usage of linux as an Editor. Algorithms and Flowcharts: Algorithm: Definition, properties and development. Flowchart: Concept of flowchart, symbols, guidelines, types. Examples: Cartesian to Spherical Polar Coordinates, Roots of Quadratic Equation, Sum of a finite series.

Scientific Programming: Development of FORTRAN, Basic elements of FORTRAN: Character Set, Constants and their types, Variables and their types, Keywords, Variable Declaration and concept of instruction and program. Fortran Statements: I/O Statements (unformatted/formatted), Executable and Non-Executable Statements, Layout of Fortran Program, Format of writing. (10 Lectures)

UNIT-II

Control Statements: Types of Logic (Sequential, Selection, Repetition), Branching Statements (Logical IF, Arithmetic IF, Block IF, Nested Block IF, SELECT CASE and ELSE IF Ladder statements), DO Loop Statements, Jumping Statements (Unconditional GOTO, Computed GOTO, Assigned GOTO) Subscripted Variables (Arrays: Types of Arrays, DIMENSION Statement, Reading and Writing Arrays), Functions and Subroutines (Arithmetic Statement Function, Function Subprogram and Subroutine), RETURN, CALL Statements), open a file, writing in a file, reading from a file.

Programming:

1. Exercises on syntax on usage of FORTRAN.
2. To print out all natural even/ odd numbers between given limits.
3. To find maximum, minimum and range of a given set of numbers.
4. To find a set of prime numbers and Fibonacci series. (10 Lectures)

Reference Books:

1. Introduction to Numerical Analysis, S.S. Sastry, 5th Edn., 2012, PHI Learning Pvt. Ltd.
2. Computer Programming in Fortran 77. V. Rajaraman (Publisher: PHI).
3. Schaums Outline of Theory and Problems of Programming with Fortran, S Lipsdutz and A Poe, 1986Mc-Graw Hill Book Co.

4. Computational Physics: An Introduction, R. C. Verma, et al. New Age International Publishers, New Delhi(1999).
5. A first course in Numerical Methods, U.M. Ascher and C. Greif, 2012, PHI Learning.
6. Elementary Numerical Analysis, K.E. Atkinson, 3 r d Edn., 2007, Wiley India Edition.

3. BASIC INSTRUMENTATION SKILLS

(Credits: Theory-02) Theory: 20
Classes (1 hr. duration)

This course is to get exposure with various aspects of instruments and their usage through hands-on mode. Experiments listed below are to be done in continuation of the topics.

UNIT-I

Basic of Measurement: Instruments accuracy, precision, sensitivity, resolution range etc. Errors in measurements and loading effects. Multimeter: Principles of measurement of dc voltage and dc current, ac voltage, ac current and resistance. Specifications of a multimeter and their significance.

Electronic Voltmeter: Advantage over conventional multimeter for voltage measurement with respect to input impedance and sensitivity. Principles of voltage, measurement (block diagram only). Specifications of an electronic Voltmeter/ Multimeter and their significance.

AC millivoltmeter: Type of AC millivoltmeters: Amplifier- rectifier, and rectifier- amplifier. Block diagram ac millivoltmeter, specifications and their significance.

Cathode Ray Oscilloscope: Block diagram of basic CRO. Construction of CRT, Electron gun, electrostatic focusing and acceleration (Explanation only no mathematical treatment), brief discussion on screen phosphor, visual persistence & chemical composition. Time base operation, synchronization. Front panel controls. Specifications of a CRO and their significance.

Use of CRO for the measurement of voltage (dc and ac frequency, time period. Special features of dual trace, introduction to digital oscilloscope, probes. Digital storage Oscilloscope: Block diagram and principle of working. (10 Lectures)

UNIT-II

Signal Generators and Analysis Instruments: Block diagram, explanation and specifications of low frequency signal generators. pulse generator, and function generator. Brief idea for testing, specifications. Distortion factor meter, wave analysis.

Digital Instruments: Principle and working of digital meters. Comparison of analog & digital instruments. Characteristics of a digital meter. Working principles of digital voltmeter.

Digital Multimeter: Block diagram and working of a digital multimeter. Working principle of time interval, frequency and period measurement using universal counter/ frequency counter, time- base stability, accuracy and resolution. (10 Lectures)

The test of lab skills will be of the following test items:

1. Use of an oscilloscope.
2. CRO as a versatile measuring device.

3. Circuit tracing of Laboratory electronic equipment.
4. Use of Digital multimeter/VTVM for measuring voltages,
5. Circuit tracing of Laboratory electronic equipment.
6. Winding a coil / transformer.
7. Study the layout of receiver circuit.
8. Trouble shooting a circuit.
9. Balancing of bridges.

Laboratory Exercises:

1. To observe the loading effect of a multimeter while measuring voltage across a low resistance and high resistance.
2. To observe the limitations of a multimeter for measuring high frequency voltage and currents.
3. To measure Q of a coil and its dependence on frequency, using a Q- meter.
4. Measurement of voltage, frequency, time period and phase angle using CRO.
5. Measurement of time period, frequency, average period using universal counter/ frequency counter.
6. Measurement of rise, fall and delay times using a CRO.
7. Measurement of distortion of a RF signal generator using distortion factor meter.
8. Measurement of R, L and C using a LCR bridge/ universal bridge.

Open Ended Experiments:

1. Using a Dual Trace Oscilloscope.
2. Converting the range of a given measuring instrument (voltmeter, ammeter).

Reference Books:

1. A text book in Electrical Technology - B L Theraja - S Chand and Co.
2. Performance and design of AC machines - M G Say ELBS Edn.
3. Digital Circuits and systems, Venugopal, 2011, Tata McGraw Hill.
4. Logic circuit design, Shimon P. Vingron, 2012, Springer.
5. Digital Electronics, Subrata Ghoshal, 2012, Cengage Learning.
6. Electronic Devices and circuits, S. Salivahanan & N. S.Kumar, 3rd Ed., 2012, Tata Mc-Graw Hill.
7. Electronic circuits: Handbook of design and applications, U.Tietze, Ch.Schenk, 2008, Springer.
8. Electronic Devices, 7/e Thomas L. Floyd, 2008, Pearson India.

4. RENEWABLE ENERGY AND ENERGY HARVESTING

(Credits: Theory-02) Theory:
20 Classes (1 hr. duration)

The aim of this course is not just to impart theoretical knowledge to the students but to provide them with exposure and hands-on learning wherever possible.

UNIT-I

Fossil fuels and Alternate Sources of energy: Fossil fuels and nuclear energy, their limitation, need of renewable energy, non-conventional energy sources. An overview of developments in Offshore Wind Energy, Tidal Energy, Wave energy systems, Ocean Thermal Energy Conversion, solar energy, biomass, biochemical conversion, biogas generation, geothermal energy tidal energy, Hydroelectricity.

Solar energy: Solar energy, its importance, storage of solar energy, solar pond, non plate collector, solar distillation, solar cooker, solar green houses, solar cell, absorption air conditioning. Need and characteristics of photovoltaic (PV) systems, PV models and equivalent circuits, and sun tracking systems. (10 Lectures)

UNIT-II

Wind Energy harvesting: Fundamentals of Wind energy, Wind Turbines and different electrical machines in wind turbines, Power electronic interfaces, and grid interconnection topologies.

Ocean Energy: Ocean Energy Potential against Wind and Solar, Wave Characteristics and Statistics, Wave Energy Devices.

Tide characteristics and Statistics, Tide Energy Technologies, Ocean Thermal Energy, Osmotic Power, Ocean Bio-mass.

Geothermal Energy: Geothermal Resources, Geothermal Technologies.

Hydro Energy: Hydropower resources, hydropower technologies, environmental impact of hydro power sources.(10 Lectures)

Reference Books:

1. Non-conventional energy sources - G.D Rai - Khanna Publishers, New Delhi
2. Solar energy - M P Agarwal - S Chand and Co. Ltd.
3. Solar energy - Suhas P Sukhative Tata McGraw - Hill Publishing Company Ltd.
4. Godfrey Boyle, Renewable Energy, Power for a sustainable future, 2004, Oxford University Press, in association with The Open University.
5. Dr. P Jayakumar, Solar Energy: Resource Assesment Handbook, 2009
6. J.Balfour, M.Shaw and S. Jarosek, Photovoltaics, Lawrence J Goodrich (USA).
7. [http://en.wikipedia.org/wiki/Renewable energy](http://en.wikipedia.org/wiki/Renewable_energy).

5. APPLIED OPTICS

(Credits: Theory-02) Theory:

20 Classes (1 hr. duration)

Theory includes only qualitative explanation. Minimum five experiments should be performed covering minimum three sections.

UNIT-I

Sources and Detectors: Lasers, Spontaneous and stimulated emissions, Theory of laser action, Einsteins coefficients, Light amplification, Characterization of laser beam, He-Ne laser, Semiconductor lasers.

Elementary ideas of Fourier Optics: Concept of Spatial frequency filtering, Fourier trans- forming property of a thin lens. (10 Lectures)

UNIT-II

Holography

Basic principle and theory: coherence, resolution, Types of holograms, white light reflection hologram, application of holography in microscopy, interferometry, and character recognition. **Photonics:** Fibre Optics, Optical fibres and their properties, Principal of light propagation through a fibre, The numerical aperture, Attenuation in optical fibre and attenuation limit, Single mode and multimode fibres, Fibre optic sensors: Fibre Bragg Grating. (10 Lectures)

Reference Books:

1. Fundamental of optics, F. A. Jenkins & H. E. White, 1981, Tata McGraw hill.
2. LASERS: Fundamentals & applications, K.Thyagrajan & A.K.Ghatak, 2010, Tata McGraw Hill
3. Fibre optics through experiments, M.R.Shenoy, S.K.Khijwania, et.al. 2009, Viva Books
4. Nonlinear Optics, Robert W. Boyd, (Chapter-I), 2008, Elsevier.
5. Optics, Karl Dieter Moller, Learning by computing with model examples, 2007, Springer.
6. Optical Systems and Processes, Joseph Shamir, 2009, PHI Learning Pvt. Ltd.
7. Optoelectronic Devices and Systems, S.C. Gupta, 2005, PHI Learning Pvt. Ltd.
8. Optical Physics, A.Lipson, S.G.Lipson, H.Lipson, 4th Edn., 1996, Cambridge Univ. Press.

ZOOLOGY(HONOURS)

SEMESTER-I

C:1-DIVERSITY AND EVOLUTION OF NON-CHORDATA (PROTISTA TO PSEUDOCOELOMATES)

(Credits:6, Theory-4, Practical-2) Lectures:
60 (Theory:40, Practical:20) Max.
Marks:100 (Theory:70, Practical:30)

UNIT-I: Kingdom Protista

General characteristics and classification up to classes; Life cycle, pathogenicity and prophylaxis of *Plasmodium vivax*, *Trypanosoma gambiense* and *Entamoeba histolytica*; Locomotion and reproduction in Protista.

UNIT-II: Phylum Porifera and Ctenophora

General characteristics and classification up to classes; Canal system in sponges; General characteristics and evolutionary significance; Evolution of Parazoa and Metazoa.

UNIT-III: Phylum Cnidaria

General characteristics and classification up to classes; Metagenesis in *Obelia*; Polymorphism in Cnidaria; Corals and coral reefs.

UNIT-IV: Phylum Platyhelminthes

General characteristics and classification up to classes; Life cycle, pathogenicity and prophylaxis of *Faciola hepatica* and *Taenia solium*; Parasitic adaptations.

UNIT-V: Phylum Nematelminthes

General characteristics and classification up to classes; Life cycle, pathogenicity and prophylaxis of *Ascaris lumbricoides* and *Wuchereria Bancrofti*; Parasitic adaptations.

Note: Classification to be followed from “ Barnes RD (1982) Invertebrate Zoology; 5th Edition.”

PRACTICAL

Kingdom Protista

1. Morphology of *Paramecium*, Binary fission and Conjugation in *Paramecium*.
2. Life stages of *Plasmodium vivax*, *Trypanosoma gambiense* and *Entamoeba histolytica* (Slides/Microphotographs).
3. Examination of pond water for protists.

Phylum Porifera

4. Study of *Sycon* (including T.S. and L.S.), *Hyalonema*, and *Euplectella*.
5. Temporary mounts of spicules, gemmules and sponging fibres.

Phylum Cnidaria

6. Study of *Obelia*, *Physalia*, *Millepora*, *Aurelia*, *Ephyra* larva, *Tubipora*, *Corallium*, *Alcyonium*, *Gorgonia* and *Metridium* (including T.S. and L.S.).

Phylum Ctenophora

7. Any one specimen/slide.

Phylum Platyhelminthes

8. Study of adult *Fasciola hepatica*, *Taenia solium* and their life stages (Slides/microphotographs).

Phylum Nematelminthes

9. Study of adult *Ascaris lumbricoides*, *Wuchereria bancrofti* and their life stages (Slides/microphotographs).

Note: Classification to be followed from “ Barnes RD (1982) Invertebrate Zoology; 5th Edition.”

Recommended Books:

1. Arora MP (2006) Non-Chordata-I. 1st edition. Himalaya Publishing House, New Delhi.
2. Arora MP (2008) Non-Chordata-II. 1st edition. Himalaya Publishing House, New Delhi.
3. Barnes RD (1982) Invertebrate Zoology. 6th Edition. Holt Saunders International Edition.
4. Barnes RSK, Calow P, Olive PJW, Golding DW & Spicer JI (2002) The Invertebrates: A New Synthesis. 3rd Edition. Blackwell Science, USA.
5. Barrington EJW (1979) Invertebrate Structure and Functions. 2nd Edition. ELBS and Nelson.
6. Boradale LA and Potts EA (1961) Invertebrates: A Manual for the use of Students. Asia Publishing Home.
7. Jordan EL and Verma PS (1963) Invertebrate Zoology. Revised Edition. S. Chand, New Delhi.
8. Mohanty PK (2000) Illustrated Dictionary of Biology. Kalyani Publishers, Ludhiana.

C:2-PERSPECTIVES IN ECOLOGY AND BIOSTATISTICS

(Credits:6, Theory-4, Practical-2) Lectures:

60 (Theory:40, Practical:20) Max.

Marks:100 (Theory:70, Practical:30)

UNIT-I: Introduction to Ecology and Ecosystem

Relevance of studying ecology; History of ecology; Laws of limiting factors; Detailed study of temperature and light as physical factors; Types of ecosystem; Food chain, Detritus and grazing food chains; Food web; Energy flow through the ecosystem; Ecological pyramids.

UNIT-II: Population

Unitary and modular populations; Unique and group attributes of population: Density, natality, mortality, life tables, fecundity tables, survivorship curves, age ratio, sex ratio, dispersal and dispersion; Exponential and logistic growth, equation and patterns, r and K strategies, Population regulation-density-dependent and independent factors; Population interactions, Gause's Principle with laboratory and field examples; Lotka-Volterra equation for competition and Predation, functional and numerical responses.

UNIT-III: Community

Community characteristics: dominance, diversity, species richness, abundance, stratification; Ecotone and edge effect; Ecosystem development (succession) with example and Theories pertaining to climax community; Nutrient and biogeochemical cycle, Nitrogen cycle and Sulphur cycle.

UNIT-IV: Conservation of Biodiversity

Types of biodiversity, its significance, loss of biodiversity; Conservation strategies (in situ and ex situ); Endangered species concept; Role of ZSI, WWF, IUCN; Wildlife (Protection) Act, 1972.

UNIT-V: Biostatistics

Concept, definition and scope of biostatistics, biological data, sampling techniques, measures of central tendency (mean, median and mode), measures of dispersion, hypothesis and testing of hypothesis

(chi square test, t test and Z test), correlation and regression analysis; Data analysis using EXCEL programme.

PRACTICAL

1. Study of life tables and plotting of survivorship curves of different types from the hypothetical/real data provided.
2. Determination of population density in a natural/hypothetical community by quadrat method and calculation of Shannon-Weiner diversity index for the same community.
3. Study of an aquatic ecosystem: fauna and flora Measurement of area, temperature, turbidity/penetration of light, determination of pH, and Dissolved Oxygen content (Winklers method), Chemical Oxygen Demand and free CO₂.
4. Report on a visit to National Park/Biodiversity Park/Wildlife sanctuary.
5. Determination of mean, median, mode and standard deviation of biological data.

Recommended Books

1. Colinvaux PA (1993) Ecology. II Edition. John Wiley and Sons, Inc., USA.
2. Dash MC (1993) Fundamentals of Ecology. McGraw Hill Book Company, New Delhi.
3. Joshi N and Joshi PC (2012) Ecology and Environment. 1st Edition. Himalaya Publishing House, New Delhi.
4. Odum EP (2008) Fundamentals of Ecology. Indian Edition. Brooks/Cole.
5. Ricklefs, R.E., (2000). Ecology. 5th Edition. Chiron Press.
6. Robert Leo Smith Ecology and field biology Harper and Row.
7. Singh JS, Gupta SR and Singh SP (2014) Ecology, Environmental Science and Conservation. S. Chand, New Delhi.
8. Chainy, GBN, Mishra G and Mohanty PK. Basic Biostatistics, Kalyani Publisher.

C:3-DIVERSITY AND EVOLUTION OF NON-CHORDATA (COELOMATE NONCHORDATES)

(Credits:6, Theory-4, Practical-2) Lectures:
60 (Theory:40, Practical:20) Max.
Marks:100 (Theory:70, Practical:30)

UNIT-I: Phylum Annelida

General characteristics and classification up to classes; Evolution of Coelom; Metamerism and Excretion in Annelida.

UNIT-II: Phylum Arthropoda

General characteristics and classification up to classes; Vision in Arthropoda; Respiration in Arthropoda; Moulting in insects, Metamorphosis in insects; Social life in insects (bees and termites) and Larval forms in Crustacea.

UNIT-III: Phylum Onychophora

General characteristics and evolutionary significance and affinities of Peripatus.

UNIT-IV: Phylum Mollusca

General characteristics and classification up to classes; Respiration in Mollusca; Torsion and detorsion in Gastropoda; Pearl formation in bivalves and Evolutionary significance of trochophore larva.

UNIT-V: Phylum Echinodermata

General characteristics and classification up to classes; Water-vascular system in Asterozoa; Larval forms in Echinodermata and Evolutionary significance (Affinities with Chordates).

Note: Classification to be followed from “ Barnes, R.D. (1982). Invertebrate Zoology, 5th Edition, Holt Saunders International Edition.”

PRACTICAL

Phylum Annelida

1. Study of Aphrodite, Nereis, Sabella, Terebella, Serpula, Chaetopterus, Pheretima and Hirudinaria.
2. T.S. through pharynx, gizzard, and typhlosolar intestine of earthworm.
3. T.S. through crop of leech.

Phylum Arthropoda

4. Study of Limulus, Palamnaeus, Palaemon, Daphnia, Balanus, Sacculina, Cancer, Eupagurus, Scolopendra, Julus, termite, louse, honeybee, silk moth, wasp and dragon fly. **Phylum Onychophora**
5. Any one specimen/slide.

Phylum Mollusca

6. Study of Chiton, Dentalium, Pila, Doris, Helix, Unio, Ostrea, Mytilus, Loligo, Sepia, Octopus and Nautilus and Cypraea (cowrie).

Phylum Echinodermata

7. Study of echinoderm larvae.
8. Study of Pentaceros, Asterias, Ophiura, Clypeaster, Echinus, Echinocardium, Cucumaria and Antedon.

Note: Classification to be followed from “ Barnes, R.D. (1982). Invertebrate Zoology, 5th Edition, Holt Saunders International Edition.”

Recommended books

1. Arora MP (2006) Non-Chordata-I. 1st edition. Himalaya Publishing House, New Delhi.
2. Arora MP (2008) Non-Chordata-II. 1st edition. Himalaya Publishing House, New Delhi.
3. Barnes RD (1982) Invertebrate Zoology. 6th Edition. Holt Saunders International Edition.
4. Barnes RSK, Calow P, Olive PJW, Golding DW & Spicer JI (2002) The Invertebrates: A New Synthesis. 3rd Edition. Blackwell Science, USA.
5. Barrington EJW (1979) Invertebrate Structure and Functions. 2nd Edition. ELBS and Nelson.
6. Boradale LA and Potts EA (1961) Invertebrates: A Manual for the use of Students. Asia Publishing Home.
7. Jordan EL and Verma PS (1963) Invertebrate Zoology. Revised Edition. S. Chand, New Delhi.
8. Mohanty PK (2000) Illustrated Dictionary of Biology. Kalyani Publishers, Ludhiana.

C:4-PHYSIOLOGY: LIFE SUSTAINING SYSTEMS

(Credits:6, Theory-4, Practical-2) Lectures:
60 (Theory:40, Practical:20) Max.
Marks:100 (Theory:70, Practical:30)

UNIT-I: Digestive System

Structural organization, histology and functions of gastrointestinal tract and its associated glands; Mechanical and chemical digestion of food; Absorptions of carbohydrates, lipids, proteins, water, minerals and vitamins; Role of gastrointestinal hormones on the secretion and control of enzymes of gastrointestinal tract.

UNIT-II: Respiratory System

Histology of trachea and lung; Mechanism of respiration, Pulmonary ventilation; Respiratory volume and capacity; Transport of oxygen in the blood; Oxygen- hemoglobin and myoglobin, dissociation curve and the factors influencing it; Carbon monoxide poisoning; Carbon dioxide transport in the blood; buffering action of blood and haemoglobin and Control of respiration.

UNIT-III: Excretory System

Structure of kidney and its histological details; Renal blood supply; Mechanism of urine formation and its regulation and Regulation of acid-base balance.

UNIT-IV: Blood

Components of blood and their functions; Structure and functions of haemoglobin; Haemopoiesis; Haemostasis, Coagulation of blood and Disorders of blood.

UNIT-V: Heart

Structure of heart; Coronary circulation; Structure of conducting and working of myocardial fibers; Origin and conduction of cardiac impulses functions of AV node; Cardiac cycle; Cardiac output and its regulation-Frank-Starling Law of the heart; Nervous and chemical regulation of heart rate; Blood pressure and its regulation and Electrocardiogram.

PRACTICAL

1. Enumeration of red blood cells using haemocytometer.
2. Estimation of haemoglobin using Sahli's haemoglobinometer.
3. Preparation of haemin and haemochromogen crystals.
4. Recording of blood pressure using a Sphygmomanometer.
5. Examination of sections of mammalian oesophagus, stomach, duodenum, ileum, rectum liver, trachea, lung and kidney.

Recommended Books

1. Arey LB (1974) Human Histology. 4th Edition. W.B. Saunders, USA.
2. Chatterjee CC (2008) Human Physiology. Vol. I and II. Medical Allied Agency, Kolkata.
3. Guyton AC and Hall JE (2006) Textbook of Medical Physiology. 9th Edition. W.B. Saunders Company, Philadelphia.
4. Tortora GJ and Derrickson B (2012) Principles of Anatomy & Physiology. 13th Edition John Wiley and sons, USA.
5. Victor PE (2008) diFiores Atlas of Histology with Functional Correlations. 12th Edition, Lippincott W. & Wilkins, USA.

C:5-DIVERSITY AND DISTRIBUTION OF CHORDATA

(Credits:6, Theory-4, Practical-2) Lectures:
60 (Theory:40, Practical:20) Max.
Marks:100 (Theory:70, Practical:30)

UNIT-I: Protochordata and Origin of Chordates

General characters of Hemichordata, Urochordata and Cephalochordata; Study of larval forms in protochordates; Retrogressive metamorphosis in Urochordata; Dipleurula concept and the Echinoderm theory of origin of chordates.

UNIT-II: Introduction to Vertebrata and Agnatha

Advanced features of vertebrates over Protochordata; General characters and classification of cyclostomes up to class; Structural peculiarities and affinities of Petromyzon and Myxine.

UNIT-III: Pisces and Amphibia

General characters of Chondrichthyes and Osteichthyes and classification up to order; Migration; Osmoregulation and Parental care in fishes; Scales in fishes; Origin of Tetrapoda (Evolution of terrestrial ectotherms); General characters and classification up to order and Parental care in Amphibians.

UNIT-IV: Reptilia and Aves

General characters and classification up to order; Skull in Reptilia; Affinities of Sphenodon; Poison apparatus and Biting mechanism in snakes; General characters and classification up to order; Principles and aerodynamics of flight, Flight adaptations; Archaeopteryx- a connecting link and Migration in birds.

UNIT-V: Mammals and Zoogeography

General characters and classification up to order; Affinities of Prototheria and Metatheria; Dentition in mammals; Adaptive radiation with reference to locomotory appendages; Zoogeographical realms; Theories pertaining to distribution of animals and Distribution of vertebrates in different realms.

PRACTICAL

Protochordata

1. Balanoglossus, Herdmania, Branchiostoma and Colonial Urochordata.
2. Sections of Balanoglossus through proboscis and branchiogenital regions.
3. Sections of Amphioxus through pharyngeal, intestinal and caudal regions.
4. Permanent slide of spicules of Herdmania.

Agnatha

5. Petromyzon and Myxine.

Fishes

6. Sphyrna, Pristis, Trygon, Torpedo, Chimaera, Notopterus, Mystus, Heteropneustes, Hippocampus, Exocoetus, Echeineis, Anguilla, Tetradon, Diodon, Anabas and Flat fish.

Amphibia

7. Ichthyophis/Ureotyphlus, Necturus, Duttaphrynus, Polypedates, Hyla, Alytes and Salamandra.

Reptiles

8. Chelone, Trionyx, Hemidactylus, Varanus, Uromastix, Chamaeleon, Draco, Ophiosaurus, Bungarus, Vipera, Naja, Hydrophis, Zamenis and Crocodylus.
9. Key for Identification of poisonous and non-poisonous snakes.

Aves

10. Study of six common birds from different orders.
11. Types of beaks and claws.
12. Types of feathers.

Mammalia

13. Sorex, Bat (Insectivorous and Frugivorous), Funambulus, Loris, Herpestes and Hemiechenis.

Recommended Books

1. Agarwal VK (2011) Zoology for degree students. S. Chand, New Delhi.
2. Arora MP (2006) Chordata-1. 1st Edition. Himalaya Publishing House, New Delhi.
3. Hall BK and Hallgrímsson B (2008) Strickberger's Evolution. 4th Edition. Jones and Bartlett Publishers Inc., USA.
4. Jordan EL and Verma PS (1963) Chordate Zoology. Revised Edition. S. Chand, New Delhi.
5. Young JZ (2004) The Life of Vertebrates. 3rd Edition. Oxford University Press, USA.

C:6-PHYSIOLOGY CONTROLLING AND COORDINATING SYSTEM

(Credits:6, Theory-4, Practical-2) Lectures:

60 (Theory:40, Practical:20) Max.

Marks:100 (Theory:70, Practical:30)

UNIT-I: Tissues and Glands, Bone and cartilage

Structure, location, function and classification of Epithelial tissue, Connective tissue, Muscular tissue, Nervous tissue; Types of glands and their functions; Structure and types of bones and cartilages; Ossification, bone growth and resorption.

UNIT-II: Nervous System

Structure of neuron, resting membrane potential; Origin of action potential and its propagation across the myelinated and unmyelinated nerve fibers; types of synapses, Synaptic transmission; Neuromuscular junction; Reflex action and its types, Reflex arc and Physiology of hearing and vision.

UNIT-III: Muscle

Histology of different types of muscle; Ultra structure of skeletal muscle; Molecular and chemical basis of muscle contraction; Characteristics of muscle twitch; Motor Unit, summation and tetanus.

UNIT-IV: Reproductive System

Histology of male and female reproductive systems; Puberty; Physiology of reproduction of male and female; Methods of contraception (depicted through flow chart).

UNIT-V: Endocrine System

Functional Histology of endocrine glands – pineal, pituitary, thyroid, parathyroid, thymus, pancreas, adrenals; Hormones secreted by them and their mechanism of action; Gonadal hormones; Classification of hormones; Regulation of their secretion; Mode of hormone action; Signal transduction pathways utilized by steroidal and non-steroidal hormones; Hypothalamus (neuroendocrine gland), principal nuclei involved in neuroendocrine control of anterior pituitary and endocrine system and Placental hormones.

PRACTICAL

1. Demonstration of the unconditioned reflex action (Deep tendon reflex such as knee jerk reflex).
2. Preparation of temporary mounts: Squamous epithelium, Striated muscle fibres and nerve cells.
3. Examination of sections of mammalian skin, Cartilage, Bone, Spinal cord, Nerve cell, Pituitary, Pancreas, Testis, Ovary, Adrenal, Thyroid and Parathyroid.

Recommended Books

1. Arey LB (1974) Human Histology. 4th Edition. W.B. Saunders, USA.

- Chatterjee CC (2008) Human Physiology. Vol. I and II. Medical Allied Agency, Kolkata.
- Guyton AC and Hall JE (2006) Textbook of Medical Physiology. 9th Edition. W.B. Saunders Company, Philadelphia.
- Tortora GJ and Derrickson B (2012) Principles of Anatomy & Physiology. 13th Edition John Wiley and sons, USA.
- Victor PE (2008) diFiore Atlas of Histology with Functional Correlations. 12th Edition, Lippincott W. and Wilkins, USA.

C:7-COMPARATIVE ANATOMY OF VERTEBRATES

(Credits:6, Theory-4, Practical-2) Lectures:

60 (Theory:40, Practical:20) Max.

Marks:100 (Theory:70, Practical:30)

UNIT-I: Integumentary System and Skeletal System

Structure, functions and derivatives of integument; Axial and appendicular skeletons; Jaw suspension in vertebrates.

UNIT-II: Digestive and Respiratory System

Alimentary canal and associated glands; Skin, gills, lungs and air sacs and Accessory respiratory organs in fishes.

UNIT-III: Circulatory System

General plan of circulation; Evolution of heart and aortic arches.

UNIT-IV: Urinogenital System

Succession of kidney; Evolution of urinogenital ducts and Types of mammalian uteri.

UNIT-V: Nervous System and Sense Organs

Comparative account of brain; Autonomic nervous system; Spinal Nerves; Spinal cord; Cranial nerves in Mammals; Classification of receptors; visual receptors, chemoreceptors and mechanoreceptors.

PRACTICAL

- Study of placoid, cycloid and ctenoid scales through permanent slides/photographs.
- Disarticulated skeleton of Frog, Varanus, Fowl and Rabbit.
- Carapace and plastron of turtle or tortoise.
- Mammalian skulls (One herbivorous and one carnivorous animal).

Recommended Books

- Hilderbrand M and Gaslow GE. Analysis of Vertebrate Structure. John Wiley and Sons., USA.
- Kardong KV (2005) Vertebrates Comparative Anatomy, Function and Evolution. 4th Edition. McGraw-Hill Higher Education, New York.
- Kent GC and Carr RK (2000) Comparative Anatomy of the Vertebrates. 9th Edition. The McGraw-Hill Companies, New York.
- Weichert CK and William Presch (1970) Elements of Chordate Anatomy. Tata McGraw Hill, New York.

C:8-BIOCHEMISTRY OF METABOLIC PROCESSES

(Credits:6, Theory-4, Practical-2) Lectures:
60 (Theory:40, Practical:20) Max.
Marks:100 (Theory:70, Practical:30)

UNIT-I: Biomolecules

Structures and properties of important mono-, di- and polysaccharides; Fatty acids, triglycerides and steroids; and amino acids and proteins.

UNIT-II: Carbohydrate Metabolism

Glycolysis; Citric acid cycle; pentose phosphate pathway; Gluconeogenesis; Shuttle systems (Malate-aspartate shuttle, Glycerol 3-phosphate shuttle); Glycogenolysis; Glycogenesis.

UNIT-III: Lipid Metabolism

β -oxidation of saturated fatty acids with even and odd number of carbon atoms; Biosynthesis of palmitic acid and Ketogenesis and its regulation.

UNIT-IV: Protein Metabolism

Catabolism of amino acids: Transamination, Deamination; Urea cycle; Fate of C-skeleton of Glucogenic and Ketogenic amino acids.

UNIT-V: Enzymes and Oxidative Phosphorylation

Kinetics and Mechanism of action of enzymes; Inhibition of enzyme action; Allosteric enzymes; Oxidative phosphorylation in mitochondria; Respiratory chain, ATP synthase, Inhibitors and Uncouplers.

PRACTICAL

1. Identification of unknown carbohydrates in given solutions (Starch, Sucrose, Lactose, Galactose, Glucose, Fructose).
2. Colour tests of functional groups in protein solutions.
3. Action of salivary amylase under optimum conditions.
4. Effect of pH on the action of salivary amylase.
5. Effect of temperature on the action of salivary amylase.
6. Estimation of total protein in given solutions by Lowrys method.

Recommended Books

1. Berg JM, Tymoczko JL and Stryer L (2007) Biochemistry. 6th Edition, W.H. Freeman and Co., New York.
2. Cox MM and Nelson DL (2008) Lehninger Principles of Biochemistry. 5th Edition. W.H. Freeman and Co., New York.
3. Devesena T (2014) Enzymology. 2nd Edition. Oxford University Press, UK.
4. Hames BD and Hooper NM (2000) Instant Notes in Biochemistry. 2nd Edition. BIOS Scientific Publishers Ltd., U.K.
5. Murray RK, Bender DA, Botham KM, Kennelly PJ, Rodwell VW and Well PA (2009) Harpers Illustrated Biochemistry. 28th Edition. International Edition. The McGraw-Hill Companies Inc., New York.

C:9-CELL BIOLOGY

(Credits:6, Theory-4, Practical-2) Lectures:
60 (Theory:40, Practical:20) Max.
Marks:100 (Theory:70, Practical:30)

UNIT-I: Cells and Plasma Membrane

Prokaryotic and Eukaryotic cells; Mycoplasma; Virus, Viroids, Virions and Prions; Various models

of plasma membrane; Transport across membranes; Cell junctions: Occluding junctions (Tight junctions), Anchoring junctions (desmosomes), Communicating junctions (gap junctions) and Plasmodesmata.

UNIT-II: Endomembrane System, Mitochondria and Peroxisomes

The Endoplasmic Reticulum; Golgi apparatus; Mechanism of vesicular transport; Lysosomes; Structure and function of mitochondria: Chemi-osmotic hypothesis; Semiautonomous nature of mitochondria; Endosymbiotic hypothesis and Peroxisomes.

UNIT-III: Cytoskeleton and Nucleus

Structure and functions of intermediate filament, microtubules and microfilaments; Ultra structure of nucleus; Nuclear envelope: Structure of nuclear pore complex; Chromosomal DNA and its packaging; Structure and function of Nucleolus.

UNIT-IV: Cell Cycle and Cell Signaling

Cell cycle, Regulation of cell cycle; Signaling molecules and their receptors.

UNIT-V: Apoptosis and Cancer

Extrinsic (Death Receptor) Pathway and Intrinsic (Mitochondrial) Pathway; Growth and development of tumors and Metastasis.

PRACTICAL

1. Gram's staining technique for visualization of prokaryotic cells.
2. Study various stages of mitosis from permanent slides.
3. Study various stages of meiosis from permanent slides.
4. Study the presence of Barr body in human female blood cells/cheek cells. (Preparation of permanent slides).
5. Cytochemical demonstration (Preparation of permanent slides).
 - (i) DNA by Feulgen reaction.
 - (ii) Mucopolysaccharides by PAS reaction.
 - (iii) Proteins by Mercurobromophenol blue.
 - (iv) DNA and RNA by Methyl Green Pyronin.

(In practical examination, 05 marks should be of permanent slide submission; one mark each for DNA, PAS, Proteins, MGP and Barr body slide.)

Recommended Books

1. Becker WM, Kleinsmith LJ, Hardin J and Bertoni G P (2009) The World of the Cell. 7th Edition. Pearson Benjamin Cummings Publishing, San Francisco.
2. Bruce Albert, Bray Dennis, Levis Julian, Raff Martin, Roberts Keith and Watson James (2008) Molecular Biology of the Cell. 5th Edition. Garland publishing Inc., New York.
3. Cooper GM and Hausman RE (2009) The Cell: A Molecular Approach. 5th Edition. ASM Press, Washington D.C.
4. De Robertis EDP and De Robertis EMF (2006) Cell and Molecular Biology. 8th Edition. Lippincott Williams and Wilkins, Philadelphia.
5. Karp G (2010) Cell and Molecular Biology: Concepts and Experiments. 6th Edition. John Wiley and Sons. Inc., USA.

C:10-PRINCIPLES OF GENETICS

(Credits:6, Theory-4, Practical-2) Lectures:
60 (Theory:40, Practical:20) Max.
Marks:100 (Theory:70, Practical:30)

UNIT-I: Mendelian Genetics and its Extension

Principles of inheritance; Incomplete dominance and co-dominance; Multiple alleles, Lethal alleles; Epistasis; Pleiotropy; Sex-linked inheritance.

UNIT-II: Linkage, Crossing Over and Chromosomal Mapping

Linkage and crossing over; Cytological basis of crossing over; Molecular mechanisms of crossing over; Recombination frequency as a measure of linkage intensity; Two factor and three factor crosses; Interference and coincidence and Somatic cell hybridization.

UNIT-III: Mutations

Gene mutations; Chromosomal mutations: Deletion, duplication, inversion, translocation; Aneuploidy and polyploidy; Induced versus spontaneous mutations; Backward and forward mutations; Suppressor mutations; Molecular basis of mutations in relation to UV light and chemical mutagens; Detection of mutations: CLB method, attached X method and DNA repair mechanisms.

UNIT-IV: Sex Determination and Quantitative Genetics

Chromosomal mechanisms of sex determination; Sex-linked, sex-influenced and sex limited characters; Polygenic inheritance and Transgressive variation.

UNIT-V: Extra-chromosomal Inheritance

Criteria for extra-chromosomal inheritance; Antibiotic resistance in Chlamydomonas; Mitochondrial mutations and Maternal effects.

PRACICAL

1. To study the Mendelian laws and gene interactions and their verification by Chi square analyses using seeds/beads/Drosophila.
2. Identification of various mutants of Drosophila.
3. To calculate allelic frequencies by Hardy-Weinberg Law.
4. Linkage maps based on data from crosses of Drosophila.
5. Study of human karyotype (normal and abnormal).
6. Pedigree analysis of some human inherited traits.
7. Preparation of polytene chromosomes from larva of Chironomous/Drosophila.
8. To study mutagenicity in Salmonella/E. coli by Ames test.

Recommended Books

1. Gardner EJ, Simmons MJ, Snustad DP (2008) Principles of Genetics. 8th Edition. Wiley India.
2. Griffiths AJF, Wessler SR, Lewontin RC and Carroll SB. Introduction to Genetic Analysis. 9th Edition. W. H. Freeman and Co., NewYork.
3. Klug WS, Cummings MR, Spencer CA and Palladino MA (2012) Concepts of Genetics. 10th Edition. Pearson Education, Inc., USA.
4. Russell PJ (2009) Genetics- A Molecular Approach. 3rd Edition. Benjamin Cummings, USA.
5. Snustad DP and Simmons MJ (2012) Principles of Genetics. 6th Edition. John Wiley and Sons Inc., USA.
6. Verma PS and AgarwalVK (2010) Genetics. 9th Edition. S. Chand, New Delhi.

C:11-DEVELOPMENTAL BIOLOGY

(Credits:6, Theory-4, Practical-2) Lectures:
60 (Theory:40, Practical:20) Max.
Marks:100 (Theory:70, Practical:30)

UNIT-I: Introduction

History and basic concepts: Epigenesis, preformation, Mosaic and regulative development; Discovery of induction; Cell-Cell interaction; Pattern formation; Differentiation and growth; Differential gene expression; Cytoplasmic determinants and asymmetric cell division.

UNIT-II: Early Embryonic Development

Gametogenesis (Spermatogenesis, Oogenesis); Types of eggs; Egg membranes; Fertilization: Changes in gametes, monospermy and polyspermy; Planes and patterns of cleavage; Early development of frog and chick up to gastrulation; Fate maps; Embryonic induction and organizers.

UNIT-III: Late Embryonic Development

Fate of germ layers; Extra-embryonic membranes in birds; Implantation of embryo in humans and Placenta (Structure, types and functions of placenta).

UNIT-IV: Post Embryonic Development

Metamorphosis: Changes, hormonal regulations in amphibians; Regeneration: Modes of regeneration (epimorphosis, morphallaxis and compensatory regeneration); Ageing: Concepts and models.

UNIT-V: Implications of Developmental Biology

Teratogenesis: Teratogenic agents and their effects on embryonic development; *in vitro* Fertilization; Stem cell culture and Amniocentesis.

PRACTICAL

1. Study of whole mounts and sections of developmental stages of frog through permanent slides: Cleavage stages, blastula, gastrula, neurula, tail-bud stage, tadpole (external and internal gill stages).
2. Study of whole mounts of developmental stages of chick through permanent slides: Primitive streak (13 and 18 hours), 21, 24, 28, 33, 36, 48, 72, and 96 hours of incubation (Hamilton and Hamburger stages).
3. Study of developmental stages (above mentioned) by raising chick embryo in the laboratory.
4. Study of the developmental stages and life cycle of *Drosophila* from stock culture.
5. Study of different types of placenta.
6. Project report on *Drosophila* culture/chick embryo development.

Recommended Books

1. Balinsky BI and Fabian BC (1981) An Introduction to Embryology. 5th Edition. International Thompson Computer Press.
2. Gilbert SF (2010) Developmental Biology. 9th Edition. Sinauer Associates, Inc., USA.
3. Kalthoff (2008) Analysis of Biological Development. 2nd Edition. McGraw-Hill, New York.
4. Wolpert L, Beddington R, Jessell T, Lawrence P, Meyerowitz E and Smith J (2002) Principles of Development. 1st Edition, Oxford University Press, New York.

C:12-MOLECULAR BIOLOGY

(Credits:6, Theory-4, Practical-2)

Lectures: 60 (Theory:40, Practical:20)

Max. Marks:100 (Theory:70, Practical:30)

UNIT-I: Nucleic Acids and DNA Replication

Salient features of DNA double helix; Watson and Crick model of DNA; DNA denaturation and renaturation; DNA topology - linking number and DNA topoisomerases; Cot curves; Structure of RNA, tRNA and DNA and RNA associated proteins; DNA Replication in prokaryotes and eukaryotes; Mechanism of DNA replication; Role of proteins and enzymes in replication; Licensing factors; Semiconservative, bidirectional and semi-discontinuous replication; RNA priming; Replication of circular and linear ds-DNA and replication of telomeres.

UNIT-II: Transcription

RNA polymerase and transcription Unit; Mechanism of transcription in prokaryotes and Eukaryotes; Synthesis of rRNA and mRNA; Transcription factors and regulation of transcription.

UNIT-III: Translation

Genetic code, Degeneracy of the genetic code and Wobble Hypothesis; Process of protein synthesis in prokaryotes: Ribosome structure and assembly in prokaryotes, fidelity of protein synthesis, aminoacyl tRNA synthetases and charging of tRNA; Proteins involved in initiation, elongation and termination of polypeptide chain; Inhibitors of protein synthesis; Difference between prokaryotic and eukaryotic translation.

UNIT-IV: Post Transcriptional Modifications and Processing of Eukaryotic RNA Structure of globin mRNA; Split genes: concept of introns and exons, splicing mechanism, alternative splicing, exon shuffling, and RNA editing.

UNIT-V: Gene Regulation and Regulatory RNAs

Transcription regulation in prokaryotes: Principles of transcriptional regulation with examples from lac operon and trp operon; Transcription regulation in eukaryotes: Activators, repressors, enhancers, silencers elements; Gene silencing, Genetic imprinting; Ribo-switches, RNA interference, miRNA and siRNA.

PRACTICAL

1. Study of DNA replication using Photographs or slides and special cases, e.g., Polyteny using permanent slides of polytene chromosomes.
2. Preparation of liquid culture medium (LB) and raise culture of *E. coli*.
3. Estimation of the growth kinetics of *E. coli* by turbidity method.
4. Preparation of solid culture medium (LB) and growth of *E. coli* by spreading and streaking.
5. Demonstration of antibiotic sensitivity/resistance of *E. coli* to antibiotic pressure and interpretation of results.
6. Quantitative estimation of salmon sperm/calf thymus DNA using colorimeter (Diphenylamine reagent) or spectrophotometer (A₂₆₀ measurement).
7. Quantitative estimation of RNA using Orcinol reaction.

Recommended Books

1. Becker WM, Kleinsmith LJ, Hardin J and Bertoni GP (2009) The World of the Cell. 7th Edition. Pearson Benjamin Cummings Publishing, San Francisco.
2. Bruce Alberts, Alexander Johnson, Julian Lewis, Martin Raff, Keith Roberts, Peter Walter (2008) Molecular Biology of the Cell, 4th Edition. Garland publishing Inc., New York.
3. Cooper GM and Hausman RE (2007) The Cell: A Molecular Approach. 4th Edition, ASM Press, USA.
4. De Robertis EDP and De Robertis EMF (2006) Cell and Molecular Biology. 8th Edition; Lippincott Williams and Wilkins, Philadelphia.

5. Karp G (2010) Cell and Molecular Biology: Concepts and Experiments. 6th Edition; John Wiley and Sons. Inc., USA.

C:13-IMMUNOLOGY

(Credits:6, Theory-4, Practical-2) Lectures:
60 (Theory:40, Practical:20) Max.
Marks:100 (Theory:70, Practical:30)

UNIT-I: Immune System and Immunity

Historical perspective of Immunology, Early theories of Immunology, Haematopoiesis, Cells and organs of the Immune system; Anatomical barriers, Inflammation, Cell and molecules involved in innate immunity, Adaptive immunity (Cell mediated and humoral), Passive: Artificial and natural Immunity, Active: Artificial and natural Immunity and Immune dysfunctions.

UNIT-II: Antigens

Antigenicity and immunogenicity, Immunogens, Adjuvants and haptens, Factors influencing immunogenicity, B and T -Cell epitopes.

UNIT-III: Immunoglobulins

Structure and functions of different classes of immunoglobulins, Antigen-antibody interactions, Immunoassays, Polyclonal sera, Monoclonal antibodies and Hybridoma technology.

UNIT-IV: Major Histocompatibility Complex and Complement System

Structure and functions of endogenous and exogenous pathway of antigen presentation; Components and pathways of complement activation.

UNIT-V: Cytokines, Hypersensitivity and Vaccines

Properties and functions of cytokines; Cytokine-based therapies; Gell and Coombs classification and Brief description of various types of hypersensitivities; Types of vaccines: Recombinant vaccines and DNA vaccines.

PARCTICAL

1. Demonstration of lymphoid organs.
2. Ouchterlony's double immuno-diffusion method.
3. Determination of ABO blood group.
4. Preparation of single cell suspension of splenocytes from chick spleen, cell counting and viability test.
5. ELISA/ dot Elisa (using kit).
6. Principles, experimental set up and applications of immuno-electrophoresis, RIA, F.

Recommended Books

1. Abbas KA and Lichtman HA (2003) Cellular and Molecular Immunology. 5th Edition. Saunders Publication, Philadelphia.
2. David M, Jonathan B, David RB and Ivan R (2006) Immunology. 7th Edition. Elsevier Publication, USA .
3. Kindt TJ, Goldsby RA, Osborne BA and Kuby J (2006) Immunology. 6th Edition. W.H. Freeman and Company, New York.

C:14-EVOLUTIONARY BIOLOGY

(Credits:6, Theory-4, Practical-2) Lectures:
60 (Theory:40, Practical:20) Max.
Marks:100 (Theory:70, Practical:30)

UNIT-I: History of Life, theories of Evolution and Extinction

Chemogeny, Biogeny, RNA World, Major Events in History of Life; Lamarckism; Darwinism; Neo-Darwinism; Background of extinction, Mass extinction (Causes, Names of five major extinctions, K-T extinction in detail) and Role of extinction in evolution.

UNIT-II: Evidences of Evolution

Fossils and its types; Dating of fossils, Phylogeny of horse and human; Molecular evidences (Globin gene families as an example) and Molecular clock concept.

UNIT-III: Processes of Evolutionary Change

Organic variations; Isolating mechanisms; Natural selection (Industrial melanism, Pesticide/Antibiotic resistance); Types of natural selection (Directional, Stabilizing, Disruptive), Sexual Selection and Artificial selection.

UNIT-IV: Principles of population genetics

Concept of gene pool, Gene frequencies equilibrium frequency (Hardy-Weinberg equilibrium), Shift in gene frequency without selection Genetic drift, Mutation pressure and Gene flow and Shifts in gene frequencies with selection.

UNIT-V: Species Concept and Evolution above species level

Biological concept of species (Advantages and Limitations); Sibling species, Polymorphic species, Polytypic species, Ring species; Modes of speciation (Allopatric, Sympatric); Macro-evolutionary Principles (Darwins Finches); Convergence, Divergence and Parallelism.

PRACTICAL

1. Study of fossil evidences from plaster cast models and pictures.
2. Study of homology and analogy from suitable specimens/ pictures.
3. Demonstration of changing allele frequencies with and without selection.
4. Construction of cladogram based on morphological characteristics.
5. Construction of phylogenetic tree with bioinformatics tools (Clustal X and Phylip).
6. Interpretation of phylogenetic trees.

Recommended Books

1. Barton NH, Briggs DEG, Eisen JA, Goldstein DB and Patel NH (2007) Evolution. Cold Spring Harbour Laboratory Press.
2. Campbell NA and Reece JB (2011) Biology. 9th Edition. Pearson Education Inc., NewYork.
3. Douglas JF (1997) Evolutionary Biology. Sinauer Associates,USA.
4. Hall BK and Hallgrimsson B (2008) Evolution. 4th Edition. Jones and Bartlett Publishers,USA.
5. Pevsner J (2009) Bioinformatics and Functional Genomics. 2nd Edition. Wiley-Blackwell, USA.
6. Ridley M (2004) Evolution. 3rd Edition. Blackwell Publishing, USA.

DISCIPLINE SPECIFIC ELECTIVE

DSE:1-ANIMAL BEHAVIOUR

(Credits:6, Theory-4, Practical-2) Lectures:
60 (Theory:40, Practical:20) Max.
Marks:100 (Theory:70, Practical:30)

UNIT-I: Introduction and Mechanisms of Behaviour

Origin and history of Ethology; Brief profiles of Karl von Frisch, Ivan Pavlov, Konrad Lorenz, Niko Tinbergen; Proximate and ultimate behavior; Objective of behaviour, Behaviour as a basis of evolution; Behaviour as a discipline of science; Innate behaviour, Instinct, Stimulus filtering, Sign stimuli and Code breakers.

UNIT-II: Patterns of Behaviour

Reflexes: Types of reflexes, reflex path, characteristics of reflexes (latency, after discharge, summation, fatigue, inhibition) and its comparison with complex behavior.

Orientation: Primary and secondary orientation; kinesis-orthokinesis, klinokinesis; taxistropotaxis and klinotaxis and menotaxis (light compass orientation) and mnemotaxis.

Learning: Associative learning, classical and operant conditioning, Habituation and Imprinting.

UNIT-III: Social Behaviour

Insects society; Honey bee: Society organization, polyethism, foraging, round dance, waggledance, Experiments to prove distance and direction component of dance, learning ability in honey bee, formation of new hive/queen; Reciprocal altruism, Hamiltons rule and inclusive fitness with suitable examples.

UNIT-IV: Sexual Behaviour

Asymmetry of sex, Sexual dimorphism, Mate choice, Intra-sexual selection (male rivalry), Inter-sexual selection (female choice), Infanticide, Consequences of mate choice for female fitness, Sexual conflict for male versus female parental care and Courtship behaviour in three spine stickleback.

UNIT-V: Biological Clocks

Circadian rhythm, Tidal rhythm, Lunar rhythm, Advantages of biological clocks, Jet lag and Entrainment.

PRACTICAL

1. To study different types of animal behaviour such as habituation, social life, courtship behaviour in insects, and parental care from short videos/movies and prepare a short report.
2. To study nests and nesting habits of the birds and social insects.
3. To study the behavioural responses of wood lice to dry condition.
4. To study behavioural responses of wood lice in response to humid condition.
5. To study geotaxis behaviour in earthworm.
6. To study the phototaxis behaviour in insect larvae.
7. Visit to Forest/ Wild life Sanctuary/Biodiversity Park/Zoological Park to study behavioural activities of animals and prepare a short report.

Recommended Books

1. David McF. Animal Behaviour. Pitman Publishing Limited, London, UK.
2. John A (2001) Animal Behaviour. 7th Edition. Sinauer Associate Inc., USA.
3. Manning A and Dawkins MS. An Introduction to Animal Behaviour. Cambridge University Press, USA.
4. Paul WS and John A (2013) Exploring Animal Behaviour. 6th Edition. Sinauer Associate Inc., Massachusetts, USA.

DSE:2-ECONOMIC ZOOLOGY

(Credits:6, Theory-4, Practical-2) Lectures:
60 (Theory:40, Practical:20) Max.
Marks:100 (Theory:70, Practical:30)

UNIT-I: Bee-keeping and Bee Economy (Apiculture)

Varieties of honey bees and Bee pasturage; Setting up an apiary: Langstroths/Newton's hive, bee veil, brood and storage chambers, iron frames and comb sheets, drone excluder, rearing equipments, handling of bees, artificial diet; Diseases of honey bee, American and European Foulbrood, and their management; Honey extraction techniques; Physicochemical analysis of honey; Other beneficial products from bee; Visit to an apiculture institute and honey processing Units.

UNIT-II: Silk and Silk Production (Sericulture)

Different types of silk and silkworms in India; Rearing of Bombyx mori, Rearing racks and trays, disinfectants, rearing appliances, black boxing, Chawki rearing, bed cleaning, mountages, harvesting of cocoons; Silkworm diseases: Pebrine, Flacherie, Grasserie, Muscardine and Aspergillosis, and their management; Silkworm pests and parasites: Uzi fly, Dermestid beetles and their management; Silk reeling techniques and Quality assessment of silk fibre.

UNIT-III: Aquaculture I

Brood stock management; Induced breeding of fish; Management of hatchery of fish; Management of nursery, rearing and stocking ponds; Preparation and maintenance of fish aquarium; Preparation of compound diets for fish; Role of water quality in aquaculture; Fish diseases: Bacterial, viral and parasitic; Preservation and processing of harvested fish; Fishery by-products.

UNIT-IV: Aquaculture II

Prawn farming; Culture of crab; Pearl culture and Culture of air breathing fishes.

UNIT-V: Dairy and Poultry Farming

Introduction; Indigenous and exotic breeds; Rearing, housing, feed and rationing; Commercial importance of dairy and poultry farming; Varietal improvement techniques; Diseases and their management; Dairy or poultry farm management and business plan; Visit to any dairy farm or Poultry farm.

* Submission of report on anyone field visits mentioned above.

PRACTICAL

1. Study of different types of bees (Queens, Drones and Worker bees).
2. Study of different types of silk moths.
3. Study of different types of pearls.
4. Study of different types of fish diseases.
5. Identification of different types of scales in fishes.
6. Study of different types of fins.
7. Study of different modified structures of fishes (Saw of sawfish, Hammer of hammer head fish, tail of sharks etc.)
8. Identification of various types of natural silks.

Recommended Books

1. Dhyani Singh Bisht, Apiculture, ICAR Publication.
2. Dunham RA (2004) Aquaculture and Fisheries Biotechnology Genetic Approaches. CABI publications, U.K.
3. Hafez ESE (1962) Reproduction in Farm Animals. Lea and Fabiger Publishers.
4. Knobil E and Neill JD (2006) The Physiology of Reproduction. Vol. 2. Elsevier Publishers, USA.
5. Prost PJ (1962) Apiculture. Oxford and IBH, New Delhi.

6. Singh S. Beekeeping in India, Indian council of Agricultural Research, New Delhi.
7. Srivastava CBL (1999) Fishery Science and Indian Fisheries. Kitab Mahal publications, India.

DSE:3-MICROBIOLOGY

(Credits:6, Theory-4, Practical-2) Lectures:
60 (Theory:40, Practical:20) Max.
Marks:100 (Theory:70, Practical:30)

UNIT-I:

History of Microbiology; Microbial World Characterization, Classification and identification of microbes.

UNIT-II:

Prokaryotes: General morphology and classification of bacteria, their characters and economic importance; Gram-positive and Gram-negative bacteria.

UNIT-III:

Eukaryotes: General morphology of Protista and Fungi classification and economic importance.

UNIT-IV:

Viruses: structure, genome, replication cycle; Epidemiology of infectious diseases with reference of human hosts Bacterial (Tuberculosis), Viral (Hepatitis), Protozoan (Amoebiasis) and Fungal (any one) disease.

UNIT-V:

Microbe interactions-Immune Responses-Antibiotics and other chemotherapeutic agents; Applied microbiology in the fields of food, agriculture, industry and environment.

PRATICAL

1. Cleaning of glasswares, sterilisation principle and methods - moist heat - dry heat and filtration methods.
2. Media preparation: Liquid media, Solid media, Agar slants, Agar plates. Basal, enriched, selective media preparation - quality control of media, growth supporting properties, sterility check of media.
3. Pure culture techniques: Streak plate, pour plate and decimal dilution.
4. Cultural characteristics of microorganisms: Growth on different media, growth characteristics and description and demonstration of pigment production.
5. Staining techniques: Smear preparation, simple staining, Grams staining, Acidfast staining and staining for meta chromatic granules.
6. Morphology of microorganisms.
7. Antibiotic sensitivity testing: Disc diffusion test - Quality control with standard strains.
8. Physiology characteristics: IMViC test, H₂S, Oxidase, catalase, urease test, Carbohydrate fermentation, Maintenance of pure culture, Paraffin method, Stab culture and maintenance of mold culture.

Recommended Books

1. Ahsan J and Sinha SP (2010) A Hand book on Economic Zoology. S Chand, NewDelhi.
2. Arora DR and Arora B (2001) Medical Parasitology.2nd Edition.CBS Publications and Distributers.
3. Atwal AS (1993) Agricultural Pests of India and South East Asia. Kalyani Publishers, Ludhiana.
4. Dubey RC and Maheshwari DK (2013) A Textbook of Microbiology. S. Chand, New Delhi.
5. Dunham RA (2004) Aquaculture and Fisheries Biotechnology Genetic Approaches. CABI publications.
6. Pelczar MJ, Chan ECS and Krieg NR (1993) Microbiology.5th Edition, Tata McGraw Hill Publishing Co.Ltd.

7. Pradhan, S (1983) Insect Pests of Crops. National Book Trust of India, New Delhi.
8. Shukla, G.S. and Upadhya, V.B. (2013) Economic Zoology. 5th Edition, Rastogi Publications, Meerut.

DSE:4-PROJECT WORK
(Credits:6, Max. Marks:100)

SKILL ENHANCEMENT COURSES(SEC)

SEC:1-COMMUNICATIVE ENGLISH & ENGLISH WRITING SKILL

(Compulsory)

(Credits: 02) Theory: 20 Classes (1hr duration)

SEC:2-PUBLIC HEALTH AND HYGIENE

(Credits:2)

Lectures:30, Max. Marks:50

UNIT-I:

Scope of Public health and Hygiene; nutrition and health; classification of foods; Nutritional deficiencies; Vitamin deficiencies.

UNIT-II:

Pollution: water pollution, air pollution, soil pollution, noise pollution, thermal pollution and radioactive pollution.

UNIT-III:

Environment and Health hazards; Environmental degradation and health hazards due to pollutants.

UNIT-IV:

Communicable diseases and their control measures such as Measles, Polio, Chikungunya, Rabies, Plague, Leprosy and AIDS.

UNIT-V:

Non-Communicable diseases and their preventive measures such as Hypertension, Coronary Heart diseases, Stroke, Diabetes, Obesity and Mental ill-health.

Recommended Books

1. Arora DR and Arora B (2001) Medical Parasitology.2nd Edition.CBS Publications and Distributers.
2. Dubey RC and Maheshwari DK (2013) A text book of Microbiology. S. Chand, New Delhi.
3. Pelczar MJ, Chan ECS and Krieg NR (1993) Microbiology.5th Edition. Tata McGraw Hill Publishing Co. Ltd.

GENERIC ELECTIVE PAPERS(GE)

Credits: 06 each)

GE-1: ANIMAL DIVERSITY (NON-CHORDATE), PHYSIOLOGY AND ENDOCRINOLOGY

(Credits:6, Theory-4, Practical-2) Lectures:
60 (Theory:40, Practical:20) Max.
Marks:100 (Theory:70, Practical:30)

General characteristics and classification up to classes and study of types mentioned

UNIT-I:

Protozoa: Paramecium with reference to structure and reproduction.

Porifera: Structure of Sycon and Canal system in sponges.

Cnidaria: Structure, reproduction and life cycle of Aurelia.

UNIT-II:

Platyhelminthes: Structure, reproduction and life cycle of Fasciola.

Nemathelminthes: Structure, reproduction and life cycle of Ascaris.

Annelida: Structure, digestion and excretion of Hirudinaria.

UNIT-III:

Arthropoda: External morphology, digestive and excretory system of Paleamon.

Mollusca: Morphology and respiration of Pila.

Echimodermata: Morphology and water vascular system of Asterias.

UNIT-IV: Mammalian Physiology

Digestion, Respiration, Transport of respiratory gases, Structure of heart and cardiac cycle, Composition and clotting of blood, Blood group, Structure of neuron and transmission of nerve impulse, Structure of skeletal muscle and muscle contraction.

UNIT-V: Endocrinology

Structure and function of Pituitary, Thyroid and Gonads.

Note: Classification to be followed from " Barnes RD (1982) Invertebrate Zoology. 5th Edition."

PRACTICAL

Experiment (Physiology) Estimation of haemoglobin concentration in man, Estimation of casein in milk, Estimation of lipid in any given sample.

Endocrinology slides as mentioned in syllabus Museum Specimens and slides Slides: Morphology of Paramecium, Binary fission and Conjugation in Paramecium. Section through Sycon, Spicules and Gemmules of sponge, Ephyra larva.

Museum specimens: Spongilla, Sycon, Gorgonia, Physallia, Porpita, Penatulla, Nereis, Aphrodite, Sacculina, Eupagurus, Chiton, Aplysia, Octopus, Starfish, sea-Urchin, sea Cucumber.

Recommended Books

1. Arora MP (2006) Non-Chordata-I. 1st edition. Himalaya Publishing House, New Delhi.
2. Arora MP (2008) Non-Chordata-II. 1st edition. Himalaya Publishing House, New Delhi.

3. Barnes RD (1982) Invertebrate Zoology. 6th Edition. Holt Saunders International Edition.
4. Barnes RSK, Calow P, Olive PJW, Golding DW & Spicer JI (2002) The Invertebrates: A New Synthesis. 3rd Edition. Blackwell Science, USA.
5. Barrington EJW (1979) Invertebrate Structure and Functions. 2nd Edition. ELBS and Nelson.
6. Boradale LA and Potts EA (1961) Invertebrates: A Manual for the use of Students. Asia Publishing Home.
7. Jordan EL and Verma PS (1963) Invertebrate Zoology. Revised Edition. S. Chand, New Delhi.
8. A text book of medical Physiology. Guyton and Hall.
9. Human physiology. Chatterjee.
10. Principle of Anatomy and Physiology. Tortora and Derrickson.
11. A book of Physiology and Functional Histology, A K berry.
12. Mohanty PK (2000) Illustrated Dictionary of Biology. Kalyani Publishers, Ludhiana.

GE-2: ANIMAL DIVERSITY (PROTOCHORDATA, CHORDATA), DEVELOPMENTAL BIOLOGY AND IMMUNOLOGY

(Credits:6, Theory-4, Practical-2) Lectures:
60 (Theory:40, Practical:20) Max.
Marks:100 (Theory:70, Practical:30)

UNIT-I: Protochordata and Origin of Chordates

General characters of Hemichordata, Urochordata and Cephalochordata; Structure, Digestive system, Respiratory and reproduction in Balanoglossus, Herdmania and Amphioxus.

UNIT-II: Pisces and Amphibia

General characters of Chondrichthyes and Osteichthyes and classification up to order; Digestive and reproductive system in Scoliodon General characters and classification of amphibian up to order, Circulatory and Nervous system (Brain and Cranial nerves).

UNIT-III: Reptilia, Aves and Mammals

Urogenital system of Calotes; Respiratory system of Pigeon and Flight adaptation in Birds; Digestive and Nervous System (Brain and Cranial nerves) of rabbit.

UNIT-IV: Developmental Biology

Gametogenesis, structure of gametes, Mechanism of fertilization, Types of Cleavage, Development of Amphioxus and frog up to formation of three germ layers.

UNIT-V: Immunology

Innate and acquired immunity, Antigens, structure and function of immunoglobulins, Antigen- Antibody interaction, Vaccines.

PRACTICAL

Immunology: Blood Grouping

Museum specimens: Balanoglossus, Herdmania, Amphioxus, Exocoetus, Hippocampus, Anabas, Ambystoma, Axolotl larva, Polypedates, Ichthyophis, Draco, Chelone, Trionyx, Hemidactylus, Varanus, Chamaeleon, Sea snake, Cobra, Viper, Krait, Pigeon, Crow, Bat, Rat.

Slides: Sections through Balanoglossus and Amphioxus; Tissue sections through Liver, Pancreas; Embryological slides of frog.

Bones: Amphibia and mammals.

Recommended Books

1. Agarwal VK (2011) Zoology for degree students. S. Chand, NewDelhi.
2. Arora MP (2006) Chordata-1. 1st Edition. Himalaya Publishing House, New Delhi.
3. Hall BK and Hallgrimsson B (2008) Strickbergers Evolution. 4th Edition. Jones and Bartlett Publishers Inc., USA.
4. Jordan EL and Verma PS (1963) Chordate Zoology. Revised Edition.S. Chand, New Delhi.
5. Young JZ (2004) The Life of Vertebrates. 3rd Edition. Oxford University Press, USA.
6. Kindt TJ, Goldsby RA, Osborne BA, Immunology.
7. Gilbert SF, Developmental Biology.

GE-3: FOOD, NUTRITION AND HEALTH

(Credits:6, Theory-4, Practical-2) Lectures:
60 (Theory:40, Practical:20) Max.
Marks:100 (Theory:70, Practical:30)

UNIT-I:

Food; Diet; Nutrient; Vitamins; Disorders due to deficiency of vitamins; Synthetic foods and drinks.

UNIT-II:

Functions of food; Components of food; Nutrients (Macro and micronutrients): their biochemical role and dietary sources; Food groups and the concept of a balanced diet; Causes of food spoilage; Food adulteration; Nutrition through the life cycle- Physiological considerations, nutrient needs and dietary pattern for various groups adults, pregnant and nursing mothers, infants, preschool and school children, adolescents and elderly.

UNIT-III:

Nutritional Biochemistry Carbohydrates, Lipids, Proteins - Definition, Classification, Structure and properties Significance of acid value, iodine value and saponification value of lipids; Essential and Non-essential amino acids; Enzymes- Definition, Classification, Properties; Coenzymes Vitamins- Fat-soluble and Water-soluble vitamins; their Structure and properties Minerals- Iron, calcium, phosphorus, iodine, selenium and zinc and their properties.

UNIT-IV:

Introduction to health- Definition and concept of health; Major nutritional deficiency Diseases: Protein Energy Malnutrition; Life style related diseases- hypertension, diabetes mellitus, and obesity- their causes and prevention through dietary or lifestyle modifications. Social health problems- smoking, alcoholism, drug dependence and Acquired Immuno Deficiency Syndrome (AIDS); Common ailments- cold, cough, fevers, diarrhoea, constipation: their causes and dietary treatment.

UNIT-V:

Food hygiene, Potable water- sources and methods of purification, Food and Water Borne Infections.

PRACTICAL

1. To detect adulteration in a) Ghee b) Sugars c) Tea leaves and d) Turmeric.
2. To determine absorbed oil content in fried foods.
3. Estimation of lactose in milk.
4. Ascorbic acid estimation in food by titrimetry.
5. Estimation of calcium in foods by titrimetry.

6. Preparation of temporary mounts of various stored grain pests.
7. Project- Undertake computer aided diet analysis and nutrition counselling for different age groups. OR Identify nutrient rich sources of foods, their seasonal availability and price; study of Nutrition labelling on selected foods.

Recommended Books

1. Bamji MS, Rao NP and Reddy V (2009) Text Book of Human Nutrition. Oxford & IBH Publishing Co. Pvt Ltd.
2. Jain P et al. (2007) Poshan vaswasthya ke mool siddhant (Hindi). 1st Ed. Academic Pratibha.
3. Lakra P and Singh MD (2008) Text book of Nutrition and Health. 1st Edition. Academic Excellence.
4. Manay MS, Shadaksharaswamy (1998) Food-Facts and Principles. New Age International (P) Ltd.
5. Mohanty PK (2000) Illustrated Dictionary of Biology. Kalyani Publishers, Ludhiana.
6. Mudambi SR and Rajagopal MV (2007) Fundamentals of Foods, Nutrition and Diet Therapy. 5th Edition. New Age International Publishers.
7. Srilakshmi B (2002) Nutrition Science. New Age International (P) Ltd.
8. Srilakshmi B (2007) Food Science. 4th Edition. New Age International (P) Ltd.
9. Swaminathan M (1986) Handbook of Foods and Nutrition. 5th Edition. BAPPCO.
10. Wardlaw GM, Hampl JS (2007) Perspectives in Nutrition. 7th Edition. McGraw Hill.

GE-4: BIOTECHNOLOGY: MICROBES TO ANIMALS

(Credits:6, Theory-4,
Practical-2) Lectures:
60 (Theory:40,
Practical:20) Max.
Marks:100 (Theory:70,
Practical:30)

UNIT-I: Introduction

Concept and scope of Biotechnology; Importance of biotechnology and Application of biotechnology.

UNIT-II: Techniques in Gene Manipulation

Restriction and modifying enzymes, Cloning vectors and Expression vectors, Transformation techniques, Identification of recombinants, Construction and screening of DNA libraries; Molecular analysis of DNA, RNA and proteins (i.e., Southern, Northern and Western blotting), DNA sequencing (Sanger's method and automation), Polymerase Chain Reaction, Microarrays, DNA fingerprinting and RAPD.

UNIT-III: Microbes in Biotechnology

Growth kinetics of microbes, Applications of microbes in industry (Concept of primary and secondary metabolites, Fermentation/Bioreactors, Downstream processing), Bioremediation and Biosensing.

UNIT-IV: Transgenic Animal

Production of transgenic animals: Retroviral method, DNA microinjection method, embryonic stem cell method, nuclear transplantation; Applications of transgenic animals; Knockout mice; Transgenic livestock and Transgenic fish.

UNIT-V: Biotechnology and Human Welfare

Animal cell technology: Concept of expressing cloned genes in mammalian cells, Recombinant DNA in health (Recombinant insulin and human growth hormone), Production of recombinant vaccines, Gene therapy: in vitro, in-vivo and ex-vivo. Ethical issues concerning: Transgenesis, Bio safety and Intellectual Property Rights.

PRACTICAL

1. Isolation of genomic DNA from E. coli and analyze it using agarose gel electrophoresis.
2. Isolation of plasmid DNA (pUC 18/19) and analyse it using agarose gel electrophoresis.
3. Transformation of E. coli (pUC 18/19) and calculation of transformation efficiency.
4. Restriction digestion of lambda (λ) DNA using EcoR1 and Hind III.
5. DNA ligation (lambda DNA EcoR1/Hind III digested).
6. Construction of restriction digestion maps from data provided.
7. Study of Southern blot hybridization and PCR; Analysis of DNA fingerprinting (Dry Lab).
8. Project on Animal Cell Culture.

Recommended Books

1. Beauchamp TI and Childress JF (2008) Principles of Biomedical Ethics.6th Edition. Oxford University Press, USA.
2. Brown TA (1998) Molecular Biology Labfax II: Gene Cloning and DNA Analysis. 2nd Edition. Academic Press, USA.
3. Glick BR and Pasternak JJ and Patten CL (2009) Molecular Biotechnology-Principles and Applications of Recombinant DNA. 4th Edition. ASM press, Washington, USA.
4. Griffiths AJF, Miller JH, Suzuki DT, Lewontin RC and Gelbart WM (2009) An Introduction to Genetic Analysis. 9th Edition. W.H. Freeman and Co., USA.
5. Snustad DP and Simmons MJ (2009) Principles of Genetics.5th Edition, John Wiley and Sons Inc., USA.
6. Watson JD, Myers RM, Caudy A and Witkowski JK (2007) Recombinant DNA-Genes and Genomes- A Short Course. 3rd Edition, Freeman and Co., USA.

	Skill Development
	Employability
	Entrepreneurship
	All the three
	Skill Development and Employability
	Skill Development and Entrepreneurship
	Employability and Entrepreneurship

SYLLABUS FOR B.COM HONS.						
B.Com. Hons. (CBCS) for the Academic Year 2017-18						
	Course Structure	Category	Marks			Credits
	Semester I		Theory	Practical /Internal	Total	
BCH-1.1	Environmental Science	AECC-1	80	20 (I)	100	4
BCH-1.2	Financial Accounting	Core -1	80	20 (I)	100	6
BCH-1.3	Business Law	Core -2	80	20 (I)	100	6
BCH-1.4	Micro Economics	GE-1	80	20 (I)	100	6
Total			320	80	400	22
	Semester-II					
BCH-2.1	English Communication	AECC-2	80	20 (I)	100	4
BCH-2.2	Corporate Accounting	Core -3	80	20 (I)	100	6
BCH-2.3	Corporate Laws	Core -4	80	20 (I)	100	6
BCH-2.4	Macro Economics	GE-2	80	20 (I)	100	6
Total			400	100	400	26
	Semester III					
BCH-3.1	Human Resource Management	Core-5	80	20 (I)	100	6
BCH-3.2	Income-tax Law and Practice	Core -6	80	20 (I)	100	6
BCH-3.3	Management Principles and Application	Core -7	80	20 (I)	100	6
BCH-3.4	Business Statistics	GE-3	80	20 (I)	100	6
BCH-3.5	E-Commerce(Compulsory)	SEC-2	80	20 (I)	100	4
Total			400	100	500	28
	Semester IV					
BCH-4.1	Cost and Management Accounting	Core -8	80	20 (I)	100	6
BCH-4.2	Business Mathematics	Core -9	80	20 (I)	100	6

BCH-4.3	Computer Applications in Business	Core -10	80	20 (I)	100	6
BCH-4.4	Indian Economy - Performance and Policies	GE-4	80	20 (I)	100	6
BCH-4.5	Entrepreneurship(Compulsory)	SEC-3	80	20 (I)	100	4
	Total		400	100	500	28

	Course Structure	Category	Theory	Practical / Internal	Total	Credits
	Semester V					
BCH-5.1	Principles of Marketing	Core -11	80	20 (I)	100	6
BCH-5.2	Fundamentals of Financial Management	Core -12	80	20 (I)	100	6
BCH-5.3	DSE-1 (Any one of the following)	DSE-1	80	20 (I)	100	6
	A. Accounting and Finance	Financial Markets , Institution and Services				
	B. Banking and Insurance	Indian Banking and Insurance System				
	C. Financial Markets	Indian Financial System				
BCH-5.4	DSE-2 (Any one of the following)	DSE-2	80	20 (I)	100	6
	A. Accounting and Finance	Financial Statement Analysis and Reporting				
	B. Banking and Insurance	Merchant Banking and Financial Services				
	C. Financial Markets	Financial Institutions and Services				
	Total		320	80	400	24
	Semester VI					
BCH-6.1	Auditing and Corporate Governance	Core -13	80	20 (I)	100	6
BCH-6.2	Indirect Tax Law	Core-14	80	20 (I)	100	6
BCH-6.3	DSE-3 (Any one of the following)	DSE-3	80	20 (I)	100	6
	A. Accounting and Finance	Corporate Tax Planning				
	B. Banking and Insurance	Fundamentals of Investment				
	C. Financial Markets	Financial Market Operations				
BCH-6.4	Business Research Methods and Project Work*	DSE-4	50	50(I)	100	6
	Total		290	110	400	24

Grand Total				2600 (Min)	148 (Min)
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B.Com. (Hons.): Semester - I
**Paper BCH-1.1: Environmental
Science**

Duration: 3 hrs.

Marks: 100 (80+20)

Lectures: 65

Objectives: To provide information on environmental science, its resources and Management.

Contents:

Unit - I

The Environment: The Atmosphere, Hydrosphere, Lithosphere, Biosphere, Ecology, Ecosystem, Biogeochemical Cycle (Carbon Cycle, Nitrogen Cycle).

Unit – II

Environment Pollution: Air Pollution, Water Pollution, Soil Pollution, Noise Pollution, Thermal Pollution, Radiation Pollution, Natural Disasters and their Management.

Unit – III

Population Ecology: Individuals, Species, Pollution, Community, Control Methods of Population, Urbanization and its effects on Society, Communicable Diseases and its Transmission, Non-Communicable Diseases.

Unit- IV

Environmental Movements in India: Grass root Environmental movements in India, Role of women, Environmental Movements in Odisha, State Pollution Control Board, Central Pollution Control Board.

Unit – V

Natural Resources: Conservation of Natural Resources, Management and Conservation of Wildlife, Soil Erosion and Conservation, Environmental Laws: Water Act, 1974, Air Act, 1981, The Wildlife (Protection) Act, 1972, Environment Protection, 1986.

Learning Outcomes: After completion of this paper, students would be able to analyze the ways in which the natural environment and the society impact the establishment and continuation of business. Along with that, they would also gain knowledge about the ways and means of managing the natural resources for the benefit of both i.e. the business and the society thereby creating a win-win situation.

BOOKS FOR REFERENCE:

- ✓ *Text Book of Environmental Studies, D.K.Asthana, DrMeeraAsthana, S.Chand*
- ✓ *Environmental Studies – Sanjay Ku. Batra / KanchanBatra/ H.K.Kaur / Parul Pant – Taxmann Pub.*
- ✓ *Principles of Environmental Studies–P. C. Manoharachary & P. J. Reddy B. S. Pub., 2004*
- ✓ *Introduction to an Environmental Science–Y. Anjaneyulu, B. S. Pub. 2004.*
- ✓ *Ecology–Subramanyam & Sambamurty, Narosa Pub. House, 2000.*
- ✓ *A Text Book in Environmental Science–V. Subramaniam, Narosa Pub. House, 2000*
- ✓ *Managing Industrial Pollution –S. C. Bhatia, Mac Millan, 2003.*
- ✓ *Man and Environment–Dash and Mishra, Mac Millan*
- ✓ *Environment and Society–Mishra and Dash, Mac Millan*
- ✓ *Text Book of Environmental Science–Panigrahi and Sahu, Sadgranth Mandir.*
- ✓ *Environment and Ecology, De and De, S.Chand*
- ✓ *Environmental Management, G.N.Pandey, Vikash Publishing*

B.Com. (Hons.): Semester - I **Paper BCH 1.2: Financial** **Accounting**

Duration: 3 hrs.

Marks: 100 (80+20)

Lectures: 65

Objectives: The objective of this paper is to help students to acquire conceptual knowledge of financial accounting and to impart skills for recording various kinds of business transactions.

Contents

Unit 1. (a) Theoretical Framework

- i. Accounting as the language of business and an information system, the users of financial accounting information and their needs. Qualitative characteristics of accounting information. Functions, advantages and limitations of accounting. Branches of accounting. Bases of accounting; cash basis and accrual basis.
- ii. The nature of financial accounting principles – Basic concepts and conventions: entity, money measurement, going concern, cost, realization, accruals, periodicity, consistency, prudence (conservatism), materiality and full disclosures and Accounting Equation.

(b) Accounting Process

From recording of business transactions to the preparation of trial balance including adjustments: journal, sub-division of journal, ledger accounts, trial balance

Unit 2. Business Income

- i. Measurement of business income-Net income: the accounting period, the continuity

doctrine and matching concept. Objectives of measurement and revenue recognition.

ii. Depreciation Accounting: The accounting concept of depreciation. Factors in the measurement of depreciation. Methods of computing depreciation: straight line method and

diminishing balance method; Disposal of depreciable assets-change of method. Salient features of Accounting Standard 6 (AS- 6) issued by ICAI

iii. Inventory Accounting: Meaning. Significance of inventory valuation. Inventory Record Systems: periodic and perpetual. Methods: FIFO, LIFO and Weighted Average. Salient features of Accounting Standard 2 (AS- 2) issued by ICAI

Unit 3. Final Accounts

Capital and revenue expenditures and receipts: general introduction only. Preparation of financial statements of Sole Trade and Partnership Business with adjustments

Unit 4. Hire Purchase and Installment Systems and Accounting for Branch & Department

- i. Concepts of operating and financial lease (theory only)
- ii. Departmental Accounting and Branch Accounting including foreign branch (Theory and Problem)

Unit 5. Accounting for Partnership Firm

Accounting of Admission of partner, Retirement and Death of partner and Dissolution of the Partnership Firm Including Insolvency of partners

Learning Outcomes: The course structure of this paper would equip the students to get in-depth knowledge of financial accounting along with its practical application thereby giving an opportunity to gain easy access to this competitive business world.

Suggested Readings:

1. Anthony, R.N. Hawkins, and Merchant, *Accounting: Text and Cases*. McGraw-Hill Education.
2. Bal Ranjan Kumar, *Financial Accounting* – S. Chand
3. Bansal.K.M - *Financial Accounting* – Taxman Publication
4. Deepak Sehgal, *Financial Accounting* – Vikash Publication
5. Horngren, *Introduction to Financial Accounting*, Pearson Education.
6. Monga, J.R. *Financial Accounting: Concepts and Applications*. Mayoor Paper Backs, New Delhi.
7. Shukla, M.C., T.S. Grewal and S.C.Gupta. *Advanced Accounts. Vol.-I*. S. Chand & Co., New Delhi.
8. Maheshwari, S.N. and. S. K. Maheshwari. *Financial Accounting*. Vikas Publishing House, New Delhi.
9. Sehgal, Ashok, and Deepak Sehgal. *Advanced Accounting. Part –I*.Taxmann Applied Services, New Delhi.
10. Bhushan Kumar Goyal and HN Tiwari, *Financial Accounting*, International Book House
11. Goldwin, Alderman and Sanyal, *Financial Accounting*, Cengage Learning.
12. Tulsian, P.C. *Financial Accounting*, **S. Chand**.
8. Jain, S.P. and K.L. Narang. *Financial Accounting*, Kalyani Publishers, New Delhi

9. Gupta, Nirmal. *Financial Accounting*, Sahitya Bhawan, Agra.

10. *Compendium of Statements and Standards of Accounting*. The Institute of Chartered Accountants of India, New Delhi

B.Com. (Hons.):
Semester - I Paper BCH
1.3: Business Law

Duration: 3 hrs.

Marks: 100 (80+20)

Lectures: 65

Objective: The objective of the course is to impart basic knowledge of the important business laws along with relevant case laws.

Contents:

Unit I: The Indian Contract Act, 1872: General Principle of Law of Contract

- a) Contract – meaning, characteristics and kinds
- b) Essentials of valid contract - Offer and acceptance, consideration, contractual capacity, free consent, legality of objects.
- c) Void agreements
- d) Discharge of contract – modes of discharge including breach and its remedies.
- e) Contingent contracts
- f) Quasi - contracts

Unit II: The Indian Contract Act, 1872: Specific Contracts

- a) Contract of Indemnity and Guarantee
- b) Contract of Bailment
- c) Contract of Agency

Unit III: The Sale of Goods Act, 1930

- a) Contract of sale, meaning and difference between sale and agreement to sell.
- b) Conditions and warranties
- c) Transfer of ownership in goods including sale by non-owners
- d) Performance of contract of sale
- e) Unpaid seller – meaning and rights of an unpaid seller against the goods and the buyer.

Unit IV: Partnership Laws

The Partnership Act, 1932

- a. Nature and Characteristics of Partnership
- b. Registration of Firms
- c. Types of Partners
- d. Rights and Duties of Partners
- e. Implied Authority of a Partner
- f. Incoming and outgoing Partners
- g. Mode of Dissolution of Partnership

Unit V: The Negotiable Instruments Act 1881

- a) Meaning and Characteristics of Negotiable Instruments : Promissory Note, Bill of Exchange, Cheque

- b) Holder and Holder in due Course, Privileges of Holder in Due Course.
- c) Negotiation: Types of Endorsements

- d) Crossing of Cheque
- e) Bouncing of Cheque

Learning Outcomes: The students would be able to deal with the legal aspect of different business situations.

Suggested Readings:

1. Arora Sushma – Business Law – Taxmann Publication
2. Kuchhal, M.C. and Vivek Kuchhal, *Business Law*, Vikas Publishing House, New Delhi.
3. Tulsian, P.C, Business Law, S.Chand
4. Gogna P.P.S, Business & Industrial Law, S.Chand
5. Singh, Avtar, *Business Law*, Eastern Book Company, Lucknow.
6. Maheshwari & Maheshwari, *Business Law*, National Publishing House, New Delhi.
7. Chadha, P. R., *Business Law* Galgotia Publishing Company, New Delhi.
8. Aggarwal S K, Business Law, Galgotia Publishers Company, New Delhi.
9. GoyalBhushan Kumar and Jain Kinneri, Business Laws, International Book House
10. Ravinder Kumar, Legal Aspects of Business, Cengage Learning

B.Com. (Hons.): Semester - I Paper BCH-1.4: Micro Economics

Duration: 3 hrs.

Marks: 100 (80+20)

Lectures: 65

Objective: Objective of the course is to acquaint the students with the concepts of micro-economics dealing with consumer behaviour. The course also makes the student understand the supply side of the market through the production and cost behaviour of firms.

Contents:

Unit I: Demand and Consumer Behaviour

Concepts of revenue: Marginal and Average: Revenue under conditions of Perfect and imperfect competition, Elasticity of demand: price, income and cross. Consumer Behaviour: Indifference curve analysis of consumer behavior; Consumer's equilibrium, Price elasticity and price consumption curve, income consumption curve and Engel curve, price change and income and substitution effects.

Unit II: Production and Cost

Production iso-quants, marginal rate of technical substitution, economic region of production, optimal combination of resources, the expansion path, returns to scale using iso-quants
Cost of Production: Social and private costs of production, long run and short run costs of production.

Unit III: Perfect Competition

Perfect competition: Assumptions, Equilibrium of the firm and the industry in the short and the long-run, including industry's long run supply curve. Measuring producer surplus under perfect competition

Unit IV: Monopoly

Monopoly: Monopoly short run and long run equilibrium. Shifts in demand curve and the absence of the supply curve. Measurement of monopoly power and the rule of thumb for pricing, Horizontal and vertical integration of firms

Unit V: Imperfect Competition

Monopolistic Competition and Oligopoly: Monopolistic competition price and output decision-equilibrium. Monopolistic Competition and economic efficiency Oligopoly and Interdependence

Learning Outcomes: The students would be able to apply tools of consumer behaviour and firm theory to business situations.

Suggested Readings:

1. Ahuja, H.L, Micro Economics, S.Chand
2. Dwivedi, D.N. Micro Economics, Vikash Publication
3. Mehta P.K, Singh M. – Micro Economics – Taxmann Publication
4. Pindyck, R.S., D. L. Rubinfeld and P. L. Mehta; *Microeconomics*, Pearson Education.
5. N. Gregory Mankiw, Principles of Micro Economics, Cengage Learning
6. Browning, E.K. and J.M. Browning; *Microeconomic Theory and Applications*, Kalyani Publishers, New Delhi.
7. Gould, J.P. and E.P. Lazear; *Microeconomic Theory*, All India Traveller Bookseller, New Delhi.
8. Lipsey, R.G. and K.A. Chrystal; *Economics*, Oxford University Press.
9. Maddala G.S. and E. Miller; *Microeconomics: Theory and Applications*, McGraw-Hill International.
10. Salvatore, D. *Schaum's Outline of Theory and Problems of Microeconomic Theory*, McGraw-Hill, International Edition.
11. Bilas, Richard A. *Microeconomic Theory: A Graphical Analysis*, McGraw-Hill Book Co. Kogakusha Co. Ltd.
12. Amit Sachdeva, *Micro Economics*, KusumLata Publishers.

B.Com. (Hons.): Semester - II

Paper BCH-2.1: English Communication

Skill Enhancement Compulsory Course for Commerce

Duration: 3hrs.

Marks: 100 (80+20)

Lectures: 65

Paper: 1

The purpose of this course is twofold: to train students in communication skills and to help develop in them a facility for communicative English.

Since language it is which binds society together and serves as a crucial medium of interaction as well as interchange of ideas and thoughts, it is important that students develop a capacity for clear and effective communication, spoken and written, at a relatively young age. The need has become even more urgent in an era of globalization and the increasing social and cultural diversity that comes with it.

English, being a global language par excellence, it is important that any course in communication is tied to an English proficiency programme. The present course will seek to create academic and social English competencies in speaking, listening, arguing, enunciation, reading, writing and interpreting, grammar and usage, vocabulary, syntax, and rhetorical patterns.

Students, at the end of the course, should be able to unlock the communicator in them by using English appropriately and with confidence for further studies or in professional spheres where English is the indispensable tool of communication.

Unit 1

[20]

Introduction

1. What is communication?

2. Types of communication

- Horizontal
- Vertical
- Interpersonal
- Grapevine

3. Uses of Communication

Prescribed Reading: Chapter 1 *Applying Communication Theory for Professional Life: A Practical Introduction* by Dainton and Zelle

<http://tsime.uz.ac.zw/claroline/backends/download.php?url=L0ludHJvX3RvX2NvbW11bmljYXRpb25fVGh1b3J5LnBkZg%3D%3D&cidReset=true&cidReq=MBA563>

Unit-2

[20]

Language of Communication

1. Verbal: spoken and written

2. Non-verbal

- Proxemics
- Kinesics
- Haptics
- Chronemics

- Paralinguistics

3. Barriers to communication

4. Communicative English

Unit-3

[20]

Reading Comprehension

- Locate and remember the most important points in the reading
- Interpret and evaluate events, ideas, and information
- Read “between the lines” to understand underlying meanings
- Connect information to what they already know

Unit 4

Writing

[20]

1. Expanding an Idea
2. Writing a Memo
3. Report Writing
4. Creative Writing
5. News Story
6. Setting in Creative Writing
7. Writing a Business Letter
8. Letters to the Editor
9. Précis Writing
10. CV & Resume Writing
11. Dialog writing
12. Covering Letter
13. Writing Formal Email
14. Elements of Story Writing
15. Note Making
16. Information Transfer
17. Interviewing for news papers

Unit-5

[20]

Language functions in listening and conversation

1. Discussion on a given topic in pairs
2. Speaking on a given topic individually
3. Group Discussion
4. Interview
5. Dialogue

(Practice to be given using speaking activities from the prescribed textbook)

Grammar and Usage

1. Simple and Compound Sentences
2. Complex Sentences
3. Noun Clause
4. Adjective Clause
5. Adverb Clause
6. The Conditionals in English
7. The Second Conditional
8. The Third Conditional
9. Words and their features
10. Phrasal Verbs
11. Collocation
12. Using Modals
13. Use of Passives
14. Use of Prepositions
15. Subject-verb Agreement
16. Sentence as a system
17. Common Errors in English Usage

Examination pattern

Each reading and writing question will invite a 200 word response.

Midterm test

[20 marks]

Unit 1 (preferably short questions on types and uses of

communication) Total

20 marks

Final Semester Examination

Unit 2	One long question with choice Two short notes with choice	01x 10 qns= 10 marks 02x 05 qns= 10 marks
Unit 3	Reading: 04 questions (2 prose and 2 poetry questions)	04 x 05 qns= 20 marks
Unit 4	Writing: 02 questions	02x 10 qns = 20 marks
Unit 5	Grammar & Usage	02x10 qns = 20 marks
Total		= 80 marks

Grammar questions must be set in contexts; not as isolated sentences as used for practice in the prescribed textbook.

Book Prescribed:

Vistas and Visions: An Anthology of Prose and Poetry. (Ed.) Kalyani Samantray, Himansu S.

Mohapatra, Jatindra K. Nayak, Gopa Ranjan Mishra, Arun Kumar Mohanty. OBS

Texts to be studied

Prose

- The Last Leaf
- Ecology and Society
- How Wealth Accumulates and Men Decay
- The Open Window

B.Com. (Hons.): Semester - II

Paper BCH-2.2: Corporate Accounting

Duration: 3 hrs.

Marks: 100(80+20)

Lectures: 65

Objectives: To help the students to acquire the conceptual knowledge of the corporate accounting and to learn the techniques of preparing the financial statements.

Contents:

Unit 1. Accounting for Share Capital & Debentures

Issue of shares, forfeiture and reissue of forfeited shares- concept & process of book building, Issue of rights and bonus shares; Buy back of shares, Redemption of preference shares. Issue and Redemption of Debentures

Unit 2 Final Accounts

Preparation of profit and loss account and balance sheet of corporate entities (excluding calculation of managerial remuneration) Disposal of company profits

Unit 3. Valuation of Goodwill and Valuation of Shares

Concepts and calculation - simple problem only

Unit 4 Amalgamation of Companies

Concepts and accounting treatment as per Accounting Standard: 14 (ICAI) (excluding intercompany holdings). Internal reconstruction: concepts and Accounting treatment excluding scheme of reconstruction

Unit 5 Liquidation of Company

Meaning of liquidation, modes of winding up, consequences of winding up, statement of affairs, liquidator's final statement of account, list 'B' contributories

Learning Outcomes: This paper can provide conceptual clarity about the techniques to prepare financial statements of companies along with accounting treatment of various situations viz. floating of shares, amalgamation and liquidation of companies.

Suggested Readings:

1. Monga, J.R. *Fundamentals of Corporate Accounting*. Mayur Paper Backs, New Delhi.
2. Tulsian, P.C, *Corporate Accounting*, S. Chand
3. Shukla, M.C., T.S. Grewal, and S.C. Gupta. *Advanced Accounts*. Vol.-II. S. Chand & Co., New Delhi.
4. Maheshwari, S.N. and S. K. Maheshwari. *Corporate Accounting*. Vikas Publishing House, New Delhi.
5. Sehgal, Ashok and Deepak Sehgal. *Corporate Accounting*. Taxman Publication, New Delhi.
6. Gupta, Nirmal. *Corporate Accounting*. Sahitya Bhawan, Agra.
7. Jain, S.P. and K.L. Narang. *Corporate Accounting*. Kalyani Publishers, New Delhi.
8. Compendium of Statements and Standards of Accounting. The Institute of Chartered Accountants of India, New Delhi.

9. Bhushan Kumar Goyal, *Fundamentals of Corporate Accounting*, International Book House

B.Com. (Hons.): Semester

- II Paper BCH-2.3:

Corporate Laws

Duration: 3 hrs.

Marks: 100 (80+20)

Lectures: 65

Objectives: *The objective of the course is to impart basic knowledge of the provisions of the Companies Act, 2013 and the Depositories Act, 1996. Case studies involving issues in corporate laws are required to be discussed.*

Contents:

UNIT I Introduction

Administration of Company Law [including National Company Law Tribunal (NCLT), National Company Law Appellate Tribunal (NCLAT), Special Courts]; Characteristics of a company; types of companies including one person company, small company, dormant company and producer company; association not for profit; formation of company, on-line filing of documents, promoters, their legal position. **(As per companies Act, 2013)**

UNIT II Documents

Memorandum of association, articles of association, GDR; book building; issue, allotment and forfeiture of share, transmission of shares, buyback and provisions regarding buyback; issue of bonus shares**(As per companies Act, 2013)**

UNIT III Management

Classification of directors, women directors, independent director, disqualifications, director identity number (DIN); appointment; Legal positions, powers and duties; removal of directors; managing director, meetings of shareholders and board; types of meeting, meeting through video conferencing, e-voting. Audit Committee, Nomination and Remuneration Committee, Stakeholders Relationship Committee, Corporate Social Responsibility Committee. **(As per companies Act, 2013)**

UNIT IV Dividends, Accounts, Audit–

Provisions relating to payment of Dividend, Provisions relating to Books of Account, Provisions relating to Audit, Auditors' Appointment, Rotation of Auditors, Auditors' Report.

Winding Up - Concept and modes of Winding Up.

Insider Trading, Whistle Blowing – Insider trading; meaning & legal provisions; Whistle blowing: Concept and Mechanism.

UNIT V Depositories Law:

The Depositories Act 1996 – Definitions; rights and obligations of depositories; participants issuers and beneficial owners; inquiry and inspections, penalty

Learning Outcomes: *Students would acquire knowledge about the legal framework and the ways and means to deal with the legal aspect of different situations of corporate sector.*

Suggested Readings:

1. Arora & Banshal, Corporate Law – Vikash Publication
2. Gogna, P.P.S – Company Law, S. Chand
3. MC Kuchhal *Corporate Laws*, Shri Mahaveer Book Depot. (Publishers).
4. GK Kapoor & Sanjay Dhamija, *Company Law*, Bharat Law House.
5. Reena Chadha and Sumant Chadha, *Corporate Laws*, Scholar Tech Press.
6. Gowar, LCB, *Principles of Modern company Law*, Stevens & Sons, London.
7. Ramaiya, *A Guide to Companies Act*, LexisNexis, Wadhwa and Butters worth.
8. *A Compendium of Companies Act 2013, along with Rules*, by Taxmann Publications.
9. Avtar Singh, *Introduction to company Law*, Eastern Book Company

B.Com. (Hons.): Semester - II Paper BCH-2.4: Macro Economics

Duration: 3 hrs.

Marks: 100(80+20)

Lectures: 65

Objectives: *The course aims at providing the student with knowledge of basic concepts of the macro economics. The modern tools of macro-economic analysis are discussed and the policy framework is elaborated, including the open economy.*

Contents:

Unit I

Introduction – concepts and variables of macro-economics, income, expenditure and the circular flow, components of expenditure. Static macro economic analysis short and the long run – determination of supply, determination of demand, and conditions of equilibrium

Unit II

Economy in the short run – IS–LM framework, fiscal and monetary policy, determination of aggregate demand, shifts in aggregate demand, aggregate supply in the short and long run, and aggregate demand- aggregate supply analysis.

Unit III

Inflation, causes of rising and falling inflation, inflation and interest rates, social costs of inflation. Unemployment – natural rate of unemployment, frictional and wait unemployment. The trade-off between inflation and unemployment

Unit IV

Open economy – flows of goods and capital, saving and investment in a small and a large open economy, exchange rates, Mundell – Fleming model with fixed and flexible prices in a small open economy with fixed and with flexible exchange rates, interest-rate differentials case of a large economy.

Unit V

Behavioral Foundations - Investment –determinants of business fixed investment, effect of tax, determinants of residential investment and inventory investment. Demand for Money – Portfolio and transactions theories of demand for real balances, interest and income elasticity of demand for real balances, Supply of money.

Learning Outcomes: Students would be able to apply the modern tools of macro-economic analysis so as to minimize the adverse impact of macro-economic factors on business.

Suggested Readings

1. Ahuja H.L – Macro Economics – S.Chand
2. Mankiw, N. Gregory. Principles *Macroeconomics*. Cengage Learning
3. Dornbusch, Rudiger, and Stanley. Fischer, *Macroeconomics*. McGraw-Hill.
4. Dornbusch, Rudiger., Stanley. Fischer and Richard Startz, *Macroeconomics*. Irwin/McGraw-Hill.
5. Deepashree, *Macro Economics*, Scholar Tech. New Delhi.
6. Barro, Robert, J. *Macroeconomics*, MIT Press, Cambridge MA.
7. Burda, Michael, and Wyplosz. *Macroeconomics A European Text*. Oxford University Press, Oxford.
8. Vaish – Macro Economics – Vikash Publication
9. Salvatore, Dominick. *International Economics*. John Wiley & Sons Singapore.
8. Branson, William H. *Macroeconomic Theory and Policy*. HarperCollins India Pvt. Ltd.

B.Com. (Hons.): Semester - II

Paper BCH-2.5: Computerized Accounting

Duration: 3 hrs.

Marks: 100(80+20)

Lectures: 65

Objectives: To help the students to understand accounting as an information system for the generation of accounting information and preparation of accounting reports.

Contents:

Unit I – Introduction to Computer and Accounting Information System

Introduction to Computer (Elements, Capabilities, Limitations of Computer System), Introduction to Operating software, utility software and application software, Introduction to Accounting Information System (AIS) as a part of MIS

Unit II Overview of Computerized Accounting System

Introduction: Application in Accounting; Features of Computerized Accounting System, Structure

of CAS, Software Packages: Generic, Specific; Tailored.

Unit III Accounting Application of Electronic Spreadsheet

Concept of electronic Spread-sheet, Features offered by electronic spread-sheet; Application in generating accounting information – Bank reconciliation statement; asset accounting; loan, repayment of loan schedule, ratio analysis, Data representation – graphs, charts and diagrams.

Unit IV Using Computerized Accounting System

Computerised Accounting Systems: Computerized Accounts by using any popular accounting software: Creating a Company; Configure and Features settings; Creating Accounting Ledgers and Groups; Creating Stock Items and Groups; Vouchers Entry; Generating Reports - Cash Book, Ledger Accounts, Trial Balance, Profit and Loss Account, Balance Sheet, Funds Flow Statement, Cash Flow Statement Selecting and shutting a Company; Backup and Restore data of a Company

Unit V Database Management System (DBMS)

Concept and features of DBMS; DBMS in Business Application; Generating Accounting Information – Payroll.

Learning Outcome: After reading this subject the students will be able to define a computerized accounting system; distinguish between a manual and computerized accounting system; highlight the advantages and limitations of computerized accounting system and state the sourcing of a computerized accounting system.

Suggested Readings

1. Nanda Dhameja, Financial Accounting for Managerial Competitiveness – S.Chand
2. Maheswari S.N. - Introduction to Accounting – Vikash Publication

B.Com. (Hons.): Semester - III

Paper BCH-3.1: Human Resource Management

Duration: 3 hrs.

Marks: 100(80+20)

Lectures: 65

Objective: The objective of the course is to acquaint students with the techniques and principles to manage human resource of an organization.

Contents:

Unit I:

Human Resource Management: Concept and Functions, Role, Status and competencies of HR Manager, HR Policies, Evolution of HRM. Emerging Challenges of Human Resource Management;

workforce diversity, empowerment, Downsizing; VRS; Human Resource Information System;

Unit II

Acquisition of Human Resource: Human Resource Planning- Quantitative and Qualitative dimensions; job analysis – job description and job specification; Recruitment – Concept and sources; Selection – Concept and process; test and interview; placement induction.

Unit III

Training and Development; Concept and Importance; Identifying Training and Development Needs; Designing Training Programmes; Role Specific and Competency Based Training; Evaluating Training Effectiveness; Training Process Outsourcing; Management Development; Career Development.

Unit IV

Performance appraisal; nature and objectives; Modern Techniques of performance appraisal; potential appraisal and employee counseling; job changes - transfers and promotions. Compensation: concept and policies; job evaluation; methods of wage payments and incentive plans; fringe benefits; performance linked compensation.

Unit V

Maintenance: employee health and safety; employee welfare; social security; Employer Employee relations- an overview. Grievance handling and redressal Industrial Disputes causes and settlement machinery.

Learning Outcomes: This paper can enhance the capability of the students to manage the most important assets of organization i.e. human beings which is much needed to ensure growth of that organization.

Suggested Readings:

1. Bohlander and Snell, Principles of *Human Resource Management*, Cengage Learning
2. Chhabra, T.N. *Essentials of Human Resource Management*. Sun India Publication New Delhi.
3. DeCenzo, D.A. and S.P. Robbins, "*Personnel/Human Resource Management*", Prentice Hall of India, New Delhi.
4. Khanka S.S. *Human Resource Management*. S Chand.
5. Rao V.S.P - *Human Resource Management*. Vikash Publication
6. SanghiSeema, *Human Resource Management* – Vikash Publication
7. Ivancevich, John M. *Human Resource Management*. McGraw Hill.
8. Wreather and Davis. *Human Resource Management*. Pearson Education.
9. Robert L. Mathis and John H. Jackson. *Human Resource Management*. Cengage Learning.

B.Com. (Hons.): Semester - III

Paper BCH-3.2: Income Tax Law and Practice

Duration: 3 hrs.

Marks: 100(80+20)

Lectures: 65

Objective: To provide basic knowledge and equip students with the application of principles and provisions of Income Tax Act 1961.

Contents:

Unit I

Basic concept: Income, agricultural income, person, assessee, assessment year, previous year, gross total income, total income, Maximum marginal rate of tax. Permanent Account Number (PAN), Residential status; Scope of total income on the basis of residential Status Exempted income under section 10

Unit II Computation of income under different heads

- Salaries
- Income from house property

Unit III Computation of income under different heads

- Profits and gains of business or profession
- Capital gains
- Income from other sources

Unit IV Total income and tax computation

Income of other persons included in assessee's total income- Aggregation of income and set-off and carry forward of losses Deductions from gross total income, Rebates and reliefs

- Computation of total income of individuals and firms
- Tax liability of an individual and firm
- Five leading cases of Supreme Court

Unit V Preparation of return of income:

- Manually On-line filing of Returns of Income & TDS.
- Provision & Procedures of Compulsory On-Line filing of returns for specified assesses.

Learning Outcomes: This paper would provide the understanding of various provisions of Income Tax Act as well as equip the students to make practical applications of the provisions for taxation purpose.

Suggested readings:

1. Singhania, Vinod K. and Monica Singhania. *Students' Guide to Income Tax, University Edition*. Taxmann Publications Pvt. Ltd., New Delhi.
2. Ahuja, Girish and Ravi Gupta. *Systematic Approach to Income Tax*. Bharat Law House, Delhi.
3. Pagare, Dinkar. *Law and Practice of Income Tax*. Sultan Chand and Sons, New Delhi.
4. Lal, B.B. *Income Tax Law and Practice*. Konark Publications, New Delhi.

Journals

1. *Income Tax Reports*. Company Law Institute of India Pvt. Ltd., Chennai.
2. *Taxman*. Taxman Allied Services Pvt. Ltd., New Delhi.
3. *Current Tax Reporter*. Current Tax Reporter, Jodhpur.

Software

1. Dr. Vinod Kumar Singhania, *e-filing of Income Tax Returns and Computation of Tax*, Taxmann Publication Pvt. Ltd, New Delhi. Latest version
2. Excel Utility available at incometaxindiaefiling.gov.in

B.Com. (Hons.): Semester - III

Paper BCH-3.3: Management Principles & Applications

Duration: 3 hrs.

Marks: 100(80+20)

Lectures: 65

Objective: The objective of the course is to provide the student with an understanding of basic management concepts, principles and practices.

Unit 1: Introduction

Concept: Need for Study, Managerial Functions – An overview; Co-ordination: Essence of Managership, Evolution of the Management Thought, Classical Approach – Taylor, Fayol, Neo-Classical and Human Relations Approaches – Mayo, Hawthorne Experiments, Behavioural Approach, Systems Approach, Contingency Approach – Lawrence & Lorsch, MBO - Peter F. Drucker

Unit 2: Planning

- a. Types of Plan – An overview to highlight the differences b. Strategic planning – Concept, process, Importance and limitations c. Environmental Analysis and diagnosis (Internal and external environment) –Definition, Importance and Techniques (SWOT/TOWS/WOTS- UP, BCG Matrix, Competitor Analysis), Business environment; Concept and Components d. Decision-making – concept, importance

Unit 3: Organising

Concept and process of organising – An overview, Span of management, Different types of authority (line, staff and functional), Decentralisation, Delegation of authority Formal and Informal Structure; Principles of Organising; Network Organisation Structure

Unit 4: Staffing and Leading

a. *Staffing*: Concept of staffing, staffing process b. *Motivation*: Concept, Importance, extrinsic and intrinsic motivation; Major Motivation theories - Maslow's Need-Hierarchy Theory; Herzberg's Two-factor Theory, Vroom's Expectation Theory. c. *Leadership*: Concept, Importance, Major theories of Leadership (Likert's scale theory, Blake and Mouten's Managerial Grid theory) d. *Communication*: Concept, purpose, process; Oral and written communication; Formal and informal communication networks, Barriers to communication, Overcoming barriers to communication.

Unit 5: Control

a. *Control*: Concept, Process, Limitations, Principles of Effective Control, Major Techniques of control - Ratio Analysis, ROI, Budgetary Control, EVA, PERT/CPM.
b. Emerging issues in Management

Learning Outcomes: Students would be able to make use of different management principles in the course of decision making in different forms of business organizations.

Suggested Readings:

1. Chandan J.S – *Management Concepts of Strategy* – Vikash Publication
2. Pillai RSN – *Principles & Practice of Management* – S. Chand
3. Harold Koontz and Heinz Weihrich, *Essentials of Management: An International and Leadership Perspective*, McGraw Hill Education.
4. Stephen P Robbins and Madhushree Nanda Agrawal, *Fundamentals of Management: Essential Concepts and Applications*, Pearson Education.
5. George Terry, *Principles of Management*, Richard D. Irwin
6. Newman, Summer, and Gilbert, *Management*, PHI
7. James H. Donnelly, *Fundamentals of Management*, Pearson Education.
8. B.P. Singh and A.K.Singh, *Essentials of Management*, Excel Books
9. Griffin, *Management Principles and Application*, Cengage Learning
10. Robert Kreitner, *Management Theory and Application*, Cengage Learning
11. TN Chhabra, *Management Concepts and Practice*, DhanpatRai & Co. (Pvt. Ltd.), New Delhi
12. Peter F Drucker, *Practice of Management*, Mercury Books, London
13. Gupta R.N - *Principles & Practice of Management* – S. Chand

B.Com. (Hons.): Semester - III Paper 3.4: Business Statistics

Duration: 3 hrs.

Marks: 100 (80+20)

Lectures: 65

Objective: *The objective of this course is to familiarize students with the basic statistical tools used for managerial decision-making.*

Contents:

Unit 1 Statistical Data and Descriptive Statistics

Nature and Classification of data: univariate, bivariate and multivariate data; time-series and cross-sectional data

Measures of Central Tendency

a) Mathematical averages including arithmetic mean, geometric mean and harmonic mean.

Properties and applications.

b) Positional Averages

Mode and Median (and other partition values including quartiles, deciles, and percentiles)

(including graphic determination)

Unit 2

Measures of Variation: absolute and relative. Range, quartile deviation, mean deviation, standard deviation, and their coefficients, Properties of standard deviation/variance Skewness: Meaning, Measurement using Karl Pearson and Bowley's measures; Concept of Kurtosis

Probability and Probability Distributions

Theory of Probability: Approaches to the calculation of probability, Calculation of event probabilities. Addition and multiplication laws of probability (Proof not required) Conditional probability and Bayes' Theorem (Proof not required)

Unit 3 Simple Correlation and Regression Analysis

Correlation Analysis: Meaning of Correlation: simple, multiple and partial; linear and non-linear, Correlation and Causation, Scatter diagram, Pearson's co-efficient of correlation; calculation and properties (proofs not required). Correlation and Probable error; Rank Correlation

Regression Analysis: Principle of least squares and regression lines, Regression equations and estimation; Properties of regression coefficients; Relationship between Correlation and Regression coefficients; Standard Error of Estimate

Unit 4 Index Numbers

Meaning and uses of index numbers: Construction of index numbers: fixed and chain base: univariate and composite. Aggregative and average of relatives – simple and weighted

Tests of adequacy of index numbers, Base shifting, splicing and deflating. Problems in the construction of index numbers

Construction of consumer price indices, important share price indices

Unit 5 Time Series Analysis

Components of time series, Additive and multiplicative models Trend analysis, Fitting of trend line using principle of least squares – linear, second degree parabola and exponential. Conversion of annual linear trend equation to quarterly/monthly basis and vice-versa; Moving averages Seasonal variations- Calculation of Seasonal Indices using Simple averages, Ratio-to-trend, and Ratio-to-moving averages methods. Uses of Seasonal Indices

Learning Outcomes: Students would be armed with the knowledge of using different statistical tools very much required in the decision making process in any business as well as business research.

Suggested Readings:

1. Sharma J K, Fundamentals of Business Statistics – Vikash Publication
2. Levin, Richard, David S. Rubin, Rastogi, and Siddiqui. *Statistics for Management*. 7th Edition. Pearson Education.
3. Berenson and Levine. *Basic Business Statistics: Concepts and Applications*. Pearson Education.
4. Siegel Andrew F. *Practical Business Statistics*. McGraw Hill.
5. Hazarika P. Business Statistics – S. Chand
6. Vohra N. D., *Business Statistics*, McGraw Hill.
7. Spiegel M.D. *Theory and Problems of Statistics*. Schaum's Outlines Series. McGraw Hill Publishing Co.
8. Gupta, S.P., and Archana Gupta. *Statistical Methods*. Sultan Chand and Sons, New Delhi.
9. Gupta, S.C. *Fundamentals of Statistics*. Himalaya Publishing House.
10. Arora – Business Statistics – S.Chand

B.Com. (Hons.): Semester - III Paper 3.5: E- Commerce

Duration: 3 hrs.

Marks: 100 (80+20)

Lectures: 65

Objectives: To enable the student to become familiar with the mechanism for conducting business transactions through electronic means.

Contents

Unit-1

Unit I: Introduction: Meaning, nature, concepts, advantages and reasons for transacting online, categories of E-Commerce, Supply Chain Management, Customer Relations Management

Unit 2:

Planning Online-Business: Nature and dynamics of the internet, pure online vs. brick and click business; assessing requirement for an online business designing, developing and deploying the system, one to one enterprise.

Unit 3 Technology for Online-Business:

Internet, IT Infrastructure, Middle ware contents: Text and Integrating E-business applications.

Unit 4: Mechanism of making payment through internet:

Online-payment mechanism; Electronic Payment systems; payment Gateways; Visitors to website; tools for promoting websites; Plastic Money: Debit Card, Credit Card;

Unit 5: Applications in E-Commerce:

E-commerce applications in manufacturing, Wholesale, retail and service sector.

Security and Legal Aspects of E-Commerce:

Threats in E-Commerce, Security of Clients and Service-Provider; Cyber Law - Information Technology Act 2000: An overview of major provisions

Learning Outcomes: This paper would enhance the technical skills of the students to get into the business ventures using electronic means thereby providing the opportunity to gain access to a larger customer base.

Suggested Readings:

1. Pandey U.S – E.Commerce& Mobile Commerce Technology – S. Chand

B.Com. (Hons.): Semester – IV

Paper BCH- 4.1: COST AND MANAGEMENT ACCOUNTING

Duration: 3 hrs.

Marks: 100 (80 + 20)

Lectures: 65

Objective: To acquaint the students with basic concepts used in cost accounting, various methods involved in cost ascertainment.

CONTENTS:

Unit 1: Introduction

Meaning, objectives and advantages of cost accounting; Difference between cost accounting and financial accounting; Cost concepts and classifications; Elements of cost

Materials: Material/inventory control- concept and techniques, Accounting and control of purchases, storage and issue of materials. Methods of pricing of materials issues – FIFO, LIFO and Average

Unit 2: Labour and Overhead

Labour: Accounting and Control of labour cost. Time keeping and time booking. Concept and treatment of idle time, over time, labour turnover and fringe benefits. Methods of wage payment and the Incentive schemes- Halsey, Rowan, Taylor's Differential piece wage.

Overhead: Classification, allocation, apportionment and absorption of overhead. Under- and over-absorption

Unit 3: Methods of Costing

Methods of Costing: Unit costing, Job costing, Contract Costing, Process costing (excluding process losses, valuation of work in progress, joint and by-products)

Unit 4: Budgeting and Standard Costing

Budgeting and budgetary control: Concept of budget and budgetary control, objectives, merits, and limitations, Budget administration, Functional budgets, Fixed and flexible budgets, Zero base budget

Standard costing and variance analysis: Meaning of standard cost and standard costing: advantages, limitations and applications, Variance analysis – material, labour and overhead

Unit 5: Marginal Costing

Absorption versus variable costing: Distinctive features and income determination. Cost-Volume-Profit Analysis: Break-even analysis-algebraic and graphic methods. Contribution, Margin of safety and Angle of incidence

Learning Outcome: After the completion of this paper, the students will be able to have confidence in managing cost issues and also to keep a check on cost control and taking managerial decisions.

Suggested Reading:

1. Horngreen, Charles T., George Foster and Srikant M. Dattar. *Cost Accounting: A Managerial Emphasis*. Prentice Hall of India Ltd., New Delhi.
2. Horngreen, Charles T., Gary L. Sundem. *Introduction to Management Accounting*. Prentice Hall.
3. Jain, S.P. and K.L. Narang. *Cost Accounting: Principles and Methods*. Kalyani Publishers, Jalandhar.
4. Lal, Jawahar. *Cost Accounting*. Tata McGraw Hill Publishing Co., New Delhi.
5. Nigam, B.M. Lall and I.C. Jain. *Cost Accounting: Principles and Practice*. Prentice Hall of India, New Delhi.
6. Arora, M.N. *Cost Accounting – Principles and Practice*. Vikas Publishing House, New Delhi.
7. Maheshwari, S.N. and S.N. Mittal. *Cost Accounting: Theory and Problems*. Shri Mahabir Book Depot, New Delhi.
8. Singh, S. K. and Gupta Lovleen. *Management Accounting – Theory and Practice*. Pinnacle Publishing House.
9. Ustry, Milton E. and Lawrence H. Hammer. *Cost Accounting: Planning and Control*. South Western Publishing Co.

10. Barfield, Jesset T., Cecily A. Raibarn and Michael R. Kinney. *Cost Accounting: Traditions and Innovations*. Thomson Learning.

11. Lucey, T. Costing. ELST, London.
12. Garrison H., Ray and Eric W. Noreen. *Managerial Accounting*. McGraw Hill.
13. Drury, Colin. *Management and Cost Accounting*. Cengage Learning.
14. Lal, Jawahar. *Advanced Management Accounting Text and Cases*. S. Chand & Co., New Delhi.
15. Khan, M.Y. and P.K. Jain. *Management Accounting*. Tata McGraw Hill, Publishing Co., New Delhi.
16. Hansen, *Managerial Accounting*, Cengage Learning

B.Com. (Hons.): Semester - IV

Paper BCH-4.2: BUSINESS MATHEMATICS

Duration: 3 hrs.

Marks: 100 (80 + 20)

(Lectures: 65)

Objective: The objective of this course is to familiarize the students with the basic mathematical tools with emphasis on applications to business and economic situations.

Contents:

Unit 1. Matrices and Determinant

Algebra of matrices, Inverse of a matrix, Matrix Operation – Business Application Solution of system of linear equations (having unique solution and involving not more than three variables) using matrix inversion Method and Cremer's Rule.

Unit 2. Calculus I

Mathematical functions and their types- linear, quadratic, polynomial, exponential, logarithmic and logistic function. Concepts of limit, and continuity of a function, Concept and rules of differentiation, Maxima and Minima involving second order

Unit 3. Calculus II

Integration: Standard forms, Methods of integration – by substitution, by parts and by use of partial fractions, definite integration, finding areas in simple cases

Unit 4. Mathematics of Finance

Compounding and discounting of a sum using different types of rates. Types of annuities, like ordinary, due, deferred, continuous, perpetual, and their future and present values using different types of rates of interest, Depreciation of Assets. (*General annuities to be excluded*)

Unit 5. Linear Programming

Formulation of linear programming problems (LPP): Graphical solution to LPPs. Cases of unique and multiple optimal solutions, Unbounded solutions and infeasibility, and redundant constraints, Solution to LPPs using Simplex method – maximization and minimization cases.

Learning Outcome: After reading this subject the students will be able to understand basic concepts in the areas of business calculus and financial mathematics and to connect acquired knowledge with practical problems in economic practice.

Suggested Readings:

1. Arora P.N. Business Mathematics – S.Chand
2. Anthony, M. and N. Biggs. *Mathematics for Economics and Finance*. Cambridge University Press.
3. Arora S.R & Gupta K. – Business Mathematics – Taxmann Publication
4. Ayres, Frank Jr. *Theory and Problems of Mathematics of Finance*. Schaum's Outlines Series. McGraw Hill Publishing Co.
5. Budnick, P. *Applied Mathematics*. McGraw Hill Publishing Co.
6. Dowling, E.T. *Mathematics for Economics*, Schaum's Outlines Series. McGraw Hill Publishing Co.
7. Mizrahi and John Sullivan. *Mathematics for Business and Social Sciences*. Wiley and Sons.
8. Zamirudeen & Bhambri – Business Statistics – Vikash Publication
9. Wikes, F.M. *Mathematics for Business, Finance and Economics*. Thomson Learning.
10. Prasad, Bindra and P.K. Mittal. *Fundamentals of Business Mathematics*. Har-Anand Publications.
11. Thukral, J.K. *Mathematics for Business Studies*. Mayur Publications.
12. Vohra, N.D. *Quantitative Techniques in Management*. Tata McGraw Hill Publishing Company.
13. Soni, R.S. *Business Mathematics*. Pitambar Publishing House.
14. Singh J. K. *Business Mathematics*. Himalaya Publishing House
15. Hazarika P. Business Mathematics – S.Chand

B.Com. (Hons.): Semester - IV

Paper – BCH 4.3: COMPUTER APPLICATIONS IN BUSINESS

Duration: 3 hrs.
65)

Marks: 100(80+20)

(Lectures:

Objectives: To provide computer skills and knowledge for commerce students and to enhance the student understands of usefulness of information technology tools for business operations.

Contents:

Unit 1. Word Processing

Introduction to word Processing, Word processing concepts, Use of Templates, Working with word document: (Opening an existing document/creating a new document, Saving, Selecting text, Editing text, Finding and replacing text, Closing, Formatting, Checking and correcting spellings)Bullets and numbering, Tabs, Paragraph Formatting, Indent, Page Formatting, Header and footer, Mail Merge including linking with Access Database, Tables: Formatting the table, Inserting filling and formatting a table Creating Documents in the areas: Mail Merge including linking with Access Database, Handling Tables, Inserting Pictures and Video

Unit 2. Preparing Presentations:

Basics of presentations: Slides, Fonts, Drawing, Editing; Inserting: Tables, Images, texts, Symbols, Media; Design; Transition; Animation; and Slideshow

Unit 3. Spreadsheet and its Business Applications

Spreadsheet concepts, Creating a work book, Saving a work book, Editing a workbook, Inserting, deleting work sheets, Entering data in a cell, Formula Copying, Moving data from selected cells, Handling operators in formula, Rearranging Worksheet, Project involving multiple spreadsheets, Organizing Charts and graphs, Printing worksheet, Generally used Spread sheet functions: Mathematical, Statistical, Financial, Logical, Date and Time, Lookup and reference, Text functions.

Unit 4. Creating spreadsheet in the following areas:

Loan & Lease statement ;Ratio Analysis ;Payroll statements ;Capital Budgeting ;Depreciation Accounting; Graphical representation of data; Frequency distribution and its statistical parameters Correlation and Regression

Unit 5. Database Management System

Creating Data Tables, Editing a Database using Forms, Performing queries, Generating Reports Creating DBMS in the areas of Accounting, Employees, Suppliers and Customer

Learning Outcome: The completion of this paper will enhance students' computer abilities and skills to compete with the present technology driven business market.

NOTE:

- There shall be a practical examination of 100 Marks (Practical-80 Marks, Viva-10 Marks and Work Book- 10 Marks) and duration of Examination shall be 3 Hrs.
- Teaching arrangement need to be made in the computer Lab
- There shall be four lectures per class and 4 Practical Lab periods per batch to be thought in computer Lab.

Suggested Readings:

1. Saxena& Chopra – Computer Application in Management – Vikash Publication
2. Nagpal – Computer Fundamental – S.Chand

B.Com. (Hons.): Semester - IV

Paper BCH 4.4: INDIAN ECONOMY – PERFORMANCE AND POLICIES

Duration: 3 hrs.

Marks: 100(80+20)

Lectures: 65

Objective: This course seeks to enable the student to grasp the major economic problems in India and their solution.

Contents:

Unit 1: Basic Issues in Economic Development:

Concept and Measure of Development and Underdevelopment; Human Development

Unit 2: Basic Features of the Indian Economy at Independence:

Composition of national income and occupational structure, the agrarian scene and industrial structure

Unit 3: Policy Regimes:

- a) The evolution of planning and import substituting industrialization, (b) Economic reform and liberalization

Unit 4: Growth, Development and Structural Change:

- a) The experience of Growth, Development and Structural Change in different phases of growth and policy regimes across sectors and regions.
- b) The Institutional Framework: Patterns of assets ownership in agriculture and industry; Policies for restructuring agrarian relations and for regulating concentration of economic power;
- c) Changes in policy perspectives on the role of institutional framework after 1991.
- d) Growth and Distribution; Unemployment and Poverty; Human Development; Environmental concerns.
- e) Demographic Constraints: Interaction between population change and economic development.

Unit 5: Sectoral Trends and Issues:

- a) Agriculture: Agrarian growth and performance in different phases of policy regimes i.e. pre green revolution and the two phases of green revolution; Factors influencing productivity and growth; the role of technology and institutions; price policy, the public distribution system and food security.
- b) Industry and Services: Phases of Industrializations – the rate and pattern of industrial growth across alternative policy regimes; Public sector – its role, performance and reforms; The small scale sector; Role of Foreign capital.
- c) The Financial Sector: Structure, Performance and Reforms. Foreign Trade and balance of Payments: Structural Changes and Performance of India's Foreign Trade and Balance of Payments; Trade Policy Debate; Export policies and performance; Macro Economic Stabilization and Structural Adjustment; India and the WTO.

Learning Outcome: After the completion of this paper, the student will able to identify the key performance indicators and policies of the present economic environment of the country.

Readings:

1. Gaurav Dutt and KPM Sundarum, *Indian Economy*, S. Chand & Company.
2. Gopalji, Suman & Anisha Bakhri – *Indian Economy*, Vikash Publication
3. Mishra and Puri, *Indian Economics*, Himalaya Publishing House
4. Deepashree, "*Indian Economy, Performance and Polices*", Scholar Tech. New Delhi
5. Bettelheim. Charles *India Independent*. Chapters 1, 2 and 3.
6. Bhagwati, J. and Desai, P. *India: Planning for industrialization*, OUP, Ch 2.
7. Patnaik, Prabhat. *Some Indian Debates on Planning*. T. J. Byres (ed.). *The Indian Economy: Major Debates since Independence*, OUP.
8. Ahluwalia, MontekS. *State-level Performance under Economic Reforms in India* in A. O. Krueger. (ed.). *Economic Policy Reforms and the Indian Economy*, The University of Chicago Press.

9. Nagaraj, R. *Indian Economy since 1980: Vitrious Growth or Polarisation?* Economic and Political Weekly. pp. 2831-39.
10. Ray, S. K. *Land Systems and its Reforms In India. Sections II & III*, Indian Journal of Agricultural Economics. Vol. 51. Nos. 1 & 2.
11. Visaria, Pravin. *Demographic Aspects of Development: The Indian Experience*. Indian Journal of Social Sciences. Vol. 6. No. 3.
12. Dreze, Jean and Amartya Sen. *Economic Development and Social Opportunity*. Ch. 2. OUP.
13. Vaidyanathan, A. *India's Agricultural Development Policy*. Economic and Political Weekly.
14. Sawant, S. D. and C. V. Achuthan. *Agricultural Growth across Crops and Regions: Emerging Trends and Patterns*. Economic and Political Weekly. Vol. 30 A2-A13.
15. Krishnaji, N. *Agricultural Price Policy: A Survey with Reference to Indian Foodgrain Economy*. Economic and Political Weekly. Vol. 25. No. 26.
16. Chaudhuri, Sudip. *Debates on Industrialisation*. in T.J. Byres (ed.). *The Indian Economy: Major Debates since Independence*, OUP.
17. Chandra, Nirmal K. *Growth of Foreign Capital and its Importance in Indian Manufacturing*. Economic and Political Weekly. Vol. 26. No. 11.
18. Khanna, Sushil. *Financial Reforms and Industrial Sector in India*. Economic and Political Weekly. Vol. 34. No. 45.
19. Vaidyanathan, A. *Poverty and Development Policy*. Economic and Political Weekly.
20. Deaton, A and Jean Dreze. *Poverty and Inequality in India*. Economic and Political Weekly.
21. Planning Commission, *Task Force on Employment Opportunities*. Ch 1 and 2
22. Uma Kapila (ed), "*Indian Economy since Independence*", Relevant articles.
23. Rangarajan, C. and N. Jadhav. *Issues in Financial Sector Reform*. BimalJalan. (ed). *The Indian Economy*. Oxford University Press, New Delhi.
24. Chakravarty, Sukhamoy. *Development Planning – The Indian Experience*. Oxford University Press, Delhi.

B.Com. (Hons.): Semester - IV

Paper BCH 4.5: Entrepreneurship

Duration: 3 hrs.

Marks: 100 (80+20)

Lectures: 65

Objective: The purpose of the paper is to orient the learner toward entrepreneurship as a career option and creative thinking and behavior for effectiveness at work and in life.

Contents:

Unit 1

Meaning, elements, determinants and importance of entrepreneurship and creative behavior
 Entrepreneurship and creative response to the society' problems and at work, Dimensions of entrepreneurship: intra-preneurship, techno-preneurship, cultural entrepreneurship, international entrepreneurship, net-preneurship, eco-preneurship, and social entrepreneurship.

Unit 2

Entrepreneurship and Micro, Small and Medium Enterprises:

Concept of business groups and role of business houses and family business in India, The contemporary role models in Indian business: their values, business philosophy and behavioral orientations. Conflict in family business and its resolution

Unit 3

Public and private system of stimulation, support and sustainability of entrepreneurship, Requirement, availability and access to finance, marketing assistance, technology, and industrial accommodation, Role of industries/entrepreneur's associations and self-help groups. The concept, role and functions of business incubators, angel investors, venture capital and private equity fund.

Unit 4

Sources of business ideas and tests of feasibility:

Significance of writing the business plan/ project proposal, Contents of business plan/ project proposal. Designing business processes, location, layout, operation, planning & control; preparation of project report (various aspects of the project report such as size of investment, nature of product, market potential may be covered). Project submission/ presentation and appraisal thereof by external agencies, such as financial/non-financial institutions

Unit 5

Mobilizing resources for start-up, Accommodation and utilities, Preliminary contracts with the vendors, suppliers, bankers, principal customers; Contract management: Basic start-up problems.

Learning outcome: After the completion of this paper, student will have the entrepreneurial temper with conceptual input and practical insight as how to be an entrepreneur.

Suggested Readings:

1. SS Khanka, Entrepreneurial Development, S. Chand & Co, Delhi.
2. Kuratko and Rao, *Entrepreneurship: A South Asian Perspective*, Cengage Learning.
3. Rao, V.S.P – Business Entrepreneurship & Management – Vikash Publication
4. Desai, Vasant. *Dynamics of Entrepreneurial Development and Management*. Mumbai, Himalaya Publishing House.
5. Dollinger, Mare J. *Entrepreneurship: Strategies and Resources*. Illinois, Irwin.
6. Holt, David H. *Entrepreneurship: New Venture Creation*. Prentice-Hall of India, New Delhi.
7. Jain, Arun Kumar. *Competitive Excellence: Critical Success Factors*. New Delhi: Viva Books Limited. ISBN-81-7649-272-8.
6. Panda, ShibaCharan. *Entrepreneurship Development*. New Delhi, Anmol Publications. (Latest Editions)
7. Plsek, Paul E. *Creativity, Innovation and Quality*. (Eastern Economic Edition), New Delhi: Prentice-Hall of India. ISBN-81-203-1690-8.
8. SIDBI Reports on Small Scale Industries Sector.
9. Singh, Nagendra P. *Emerging Trends in Entrepreneurship Development*. New Delhi: ASEED.

B.Com. (Hons.): Semester - IV

Paper BCH 4.6: Personal Selling and Salesmanship (Optional-II)

Duration: 3 hrs.

Marks: 100 (80+20)

Lectures: 65

Objective: The purpose of this course is to familiarize the students with the fundamentals of personal selling and the selling process. They will be able to understand selling as a career and what it takes to be a successful salesman

Unit 1:

Introduction to Personal Selling: Nature and importance of personal selling, myths of selling, Difference between Personal Selling, Salesmanship and Sales Management, Characteristics of a good salesman, types of selling situations, types of salespersons, Career opportunities in selling, Measures for making selling an attractive career.

Unit- II

Buying Motives: Concept of motivation, Maslow's theory of need hierarchy; Dynamic nature of motivation; Buying motives and their uses in personal selling

Unit- III

Selling Process: Prospecting and qualifying; Pre-approach; Approach; Presentation

Unit- IV

and demonstration; handling of objections; Closing the sale; Post sales activities.

Sales Reports: reports and documents; sales manual, Order Book, Cash Memo; Tour Diary, Daily and Periodical Reports; Ethical aspects of Selling.

Unit V

Advertising: Meaning, Importance and Features, Modes of advertisements and their respective merits and demerits.

Learning outcome: After the completion of this paper, the students will able to identify an understand the psychology of selling and different factors that shape the buying behaviour of customers.

Suggested Readings:

1. Davar R.S – Salesmanship and Publicity – Vikash Publication
2. Sahu P.K & Rout K.C – Salesmanship & Sales Management – S.Chand
3. *Spiro, Stanton, and Rich, Management of the Sales force*, McGraw Hill.
4. Rusell, F. A. Beach and Richard H. Buskirk, *Selling: Principles and Practices*, McGraw Hill
5. Futrell, Charles, *Sales Management: Behaviour, Practices and Cases*, The Dryden Press.
6. Still, Richard R., Edward W. Cundiff and Norman A. P. Govoni, *Sales Management: Decision*
7. *Strategies and Cases*, Prentice Hall of India Ltd., New Delhi,
8. Johnson, Kurtz and Schueing, *Sales Management*, McGraw Hill
9. KapoorNeeru, *Advertising and personal Selling*, Pinnacle, New Delhi.

B.Com. (Hons.): Semester – V

Paper BCH 5.1: PRINCIPLES OF MARKETING

Duration: 3 hrs.

Marks: 100(80+20)

Lectures: 65

Objective: The objective of this course is to provide basic knowledge of concepts, principles, tools and techniques of marketing.

Contents:

Unit-1

Introduction: Nature, scope and importance marketing; Evolution of marketing concepts; Marketing mix, Marketing environment.

Consumer Behavior – An Overview: Consumer buying process; Factors influencing consumer buying decisions.

Unit-2

Market Selection: Market segmentation – concept, importance and bases; Target market selection; Positioning concept, importance and bases; Product differentiation vs. market segmentation;

Product: Meaning and importance. Product classifications; Concept of product mix; Branding, packaging and labeling; Product-Support; Product life-cycle; New Product Development

Unit-3

Pricing: Significance, Factors affecting price of a product; Pricing Policies and strategies;

Promotion: Nature and importance of promotion; Communication process; Types of promotion: advertising, personal selling, public relations & sales promotion, and their distinctive characteristics; Promotion mix and factors affecting promotion mix decisions.

Unit-4

Distribution: Channels of distribution - meaning and importance; Types of distribution channels; Wholesaling and retailing; Factors affecting choice of distribution channel; Physical Distribution.

Retailing: Types of retailing – store based and non-store based retailing, chain stores, specialty stores, supermarkets, retail vending machines, mail order houses, retail cooperatives; Management of retailing operations: an overview; Retailing in India: changing scenario.

Unit-5

Rural marketing: Growing Importance; Distinguishing characteristics of rural markets; Understanding rural consumers and rural markets; Marketing mix planning for rural markets.

Recent developments in marketing: Social marketing, on line marketing, direct marketing, services marketing, green marketing,

Learning outcome: After the completion of this paper, the students will be able to identify marketing components and fit them in the value chain along with the various marketing strategies.

Suggested Readings:

1. Kotler, Philip, Gary Armstrong, Prafulla Agnihotri and Ahsan UIHaque. *Principles of Marketing*. 13th edition. Pearson Education.
2. Mahajan & Mahajan – Principles of Marketing – Vikash Publication.
3. Michael, J. Etzel, Bruce J. Walker, William J. Stanton and Ajay Pandit. *Marketing Concepts and Cases*. (Special Indian Edition).
4. Rudani R.B – *Basics of Marketing Management* – S. Chand
5. McCarthy, E. Jerome., and William D. Perreault. *Basic Marketing*. Richard D. Irwin.
6. Lamb, Charles W., Joseph F. Hair, Dheeraj Sharma and Carl McDaniel. *Marketing: A South Asian Perspective*. Cengage Learning.
7. Pride, William M., and D.C. Ferrell. *Marketing: Planning, Implementation & Control*. Cengage Learning.
8. Majaro, Simon. *The Essence of Marketing*. Prentice Hall, New Delhi.
9. Zikmund William G. and Michael D'Amico. *Marketing; Creating and Keeping Customers in an E-Commerce World*. Thomson Learning.
10. Chhabra, T.N., and S. K. Grover. *Marketing Management*. Fourth Edition. Dhanpat Rai & Company.
11. The Consumer Protection Act 1986.
12. Iacobucci and Kapoor, *Marketing Management: A South Asian Perspective*. Cengage Learning.
13. Arun Kumar – Marketing management – Vikash Publication

B.Com. (Hons.): Semester – V

Paper BCH 5.2: FUNDAMENTALS OF FINANCIAL MANAGEMENT

Duration: 3 hrs.

Marks: 100(80+20)

Lectures: 65

Objective: To familiarize the students with the principles and practices of financial management.

Contents:

Unit-1

Introduction to Financial Management: Scope and objective, Time value of money, Risk and return, Valuation of securities – Bonds and Equities

Unit-2

Long Term Investment Decisions: The Capital Budgeting Process, Cash flow Estimation, Payback Period Method, Accounting Rate of Return, Net Present Value (NPV), Net Terminal Value, Internal Rate of Return (IRR), Profitability Index

Unit-3

Financing Decisions: Sources of long-term financing, Estimation of components of cost of capital. Methods for Calculating cost of equity capital, Cost of Retained Earnings, Cost of Debt and Cost of

Preference Capital, Weighted Average cost of capital (WACC) and Marginal cost of capital. Capital structure –Theories of Capital Structure (Net Income, Net Operating Income, MM Hypothesis, Traditional Approach). Operating and financial leverage, Determinants of capital

structure

Unit-4

Dividend Decisions: Theories for Relevance and irrelevance of dividend decision for corporate valuation. Cash and stock dividends, Dividend policies in practice

Unit-5

Working Capital Decisions: Concepts of working capital, the risk-return trade off, sources of short-term finance, working capital estimation, cash management, receivables management, Inventory management and payables management

Learning Outcome: After the completion of this paper, students will be able to understand finance in a better way along with giving them insight to practical management of long and short finance for real business houses.

Suggested Readings

1. Bhalla V.K – Financial Management – S.Chand
2. Horne, J.C. Van and Wackowich. *Fundamentals of Financial Management*. 9thed. New Delhi Prentice Hall of India.
3. Johnson, R.W. *Financial Management*. Boston Allyn and Bacon.
4. Joy, O.M. *Introduction to Financial Management*. Homewood: Irwin.
5. Khan and Jain. *Financial Management text and problems*. 2nd ed. Tata McGraw Hill New Delhi.
6. Pandey, I.M. *Financial Management*. Vikas Publications.
7. Chandra, P. *Financial Management- Theory and Practice*. (Tata McGraw Hill).
8. Rustagi, R.P. *Fundamentals of Financial Management*. Taxmann Publication Pvt. Ltd.
8. Singh, J.K. *Financial Management- text and Problems*. 2nd Ed. DhanpatRai and Company, Delhi.
9. Singh, Surender and Kaur, Rajeev. *Fundamentals of Financial Management*. Book Bank International.
10. Brigham and Houston, *Fundamentals of Financial Management*, 13th Ed., Cengage Learning

B.Com. (Hons.): Semester – V

Paper BCH-DSE 5.3(A): Financial Markets, Institutions and Services

Duration: 3 hrs.

Marks: 100(80+20)

Lectures:

65

Objective: To provide the student a basic knowledge of financial markets and institutions and to familiarize them with major financial services in India.

Contents

Unit-1

An Introduction to Financial System, its Components – financial markets and institutions, financial intermediation, Flow of funds matrix, financial system and economic development, an overview of Indian financial system

Unit-2

Financial Markets: Money market – functions, organization and instruments. Role of central bank in money market; Indian money market – An overview

Capital Markets – functions, organization and instruments. Indian debt market; Indian equity market – primary and secondary markets; Role of stock exchanges in India

Unit-3

Financial Institutions: Commercial banking – introduction, its role in project finance and working capital finance, Development Financial institutions (DFIs) – An overview and role in Indian economy, Life and non-life insurance companies in India; Mutual Funds – Introduction and their role in capital market development. Non-banking financial companies (NBFCs)

Unit-4

Overview of financial services industry: Merchant banking – pre and post issue management, underwriting. Regulatory framework relating to merchant banking in India

Unit-5

Leasing and Hire–purchase: Consumer and housing finance; Venture capital; Factoring services, bank guarantees and letter of credit; Credit rating; Counseling.

Learning Outcome: After the completion of this paper, the student will acquire financial literacy skill particularly by giving information about the financial system, markets, services and regulatory bodies in India.

Suggested Readings:

1. Bhole, L.M. *Financial Markets and Institutions*. Tata McGraw-Hill Publishing Company.
2. Pandian P. – *Financial Service and Markets*. Vikas Publishing House.
3. Dhanekar. *Pricing of Securities*. New Delhi: Bharat Publishing House.
4. Nibasaiya Sapna – *Indian Financial System* – S.Chand
5. Prasanna, Chandra. *Financial Management: Theory and Practice*. Tata McGraw Hill \ Publishing Company Ltd., New Delhi.
6. Simha, S.L.N. *Development Banking in India*. Madras: Institute of Financial Management and Research
7. Khan and Jain. *Financial Services*. 2nd ed. Tata McGraw Hill
8. Singh, J.K. *Venture Capital Financing in India*. Dhanpat Rai and Company, New Delhi.
9. Annual Reports of Major Financial Institutions in India

B.Com. (Hons.): Semester – V

Paper BCH-DSE 5.3 (B): BANKING AND INSURANCE SYSTEM

Duration: 3 hrs.

Marks: 100(80+20)

Lectures: 65

Objectives: To enable the students to acquire knowledge about basics of banking and insurance.

Unit-1

Concept of Bank and Banking: Historical Evolution of Banking: Origin and Development of Banking - Structure of Banking in India – Banks and Economic Development – Functions of Commercial banks (conventional and innovative functions) – Central Bank – RBI – functions – Emerging trends in Banking.

Unit-2

Types of Customers and Account holders: Procedure and practice in opening and operating the accounts of customers - individuals including minors - joint account holders - Partnership firms - joint stock companies - executors and trustees - clubs and associations

Unit-3

Introduction to insurance: Purpose and need of insurance, insurance as a social security tool - insurance and economic development - Principles of insurance - various kinds of insurance - life, marine, fire, medical, general insurance - features.

Unit-4

Life Insurance - Law relating to life Insurance; General Principles of Life Insurance Contract; Proposal and policy; assignment and nomination; title and claims; General Insurance - Law relating to general insurance; different types of general insurance; general insurance Vs life insurance – Insurance business in India.

Unit-5

Fundamentals of Agency Law: Definition of an agent; Agents regulations; Insurance intermediaries; Agents' compensation. Procedure for Becoming an Agent: Pre-requisite for obtaining a license; Duration of license; Cancellation of license; Revocation or suspension/termination of agent appointment; Code of conduct; Unfair practices. Functions of the Agent: Proposal form and other forms for grant of cover; Financial and medical underwriting; Material information; Nomination and assignment; Procedure regarding settlement of policy claims.

Learning Outcome: After the completion of this paper, the student will acquired practical knowledge of working mechanism of banking and insurance industries in India.

Reference Books:

1. Mishra S. *Banking Law and Practice – S Chand*
2. Sheldon H.P :*Practice and Law of Banking.*
3. Bedi. H.L :*Theory and Practice of Banking.*
4. Maheshwari. S.N. :*Banking Law and Practice.*
5. Shekar. K.C :*Banking Theory Law and Practice.*
6. Pannandikar&Mithami': *Banking in India.*
7. Radhaswamy&Vasudevan: *Text Book of Banking.*
8. Indian Institute of Bankers (Pub) *Commercial Banking Vol-I/Vol-II (part I&II) Vol- III.*
9. Varshaney: *Banking Law and Practice.*
10. Dr. P. Periasamy: *Principles and Practice of Insurance*
11. Himalaya Publishing House, Delhi.
12. Inderjit Singh, RakeshKatyal& Sanjay Arora: *Insurance Principles and Practices*
13. Kalyani Publishers, Chennai.
14. M.N. Mishra: *Insurance Principles and Practice, S. Chand & Company Ltd, Delhi.*
15. G. Krishnaswamy : *Principles & Practice of Life Insurance*
16. Kothari &Bahl : *Principles and Practices of Insurance.*
17. Prasad – *Banking Insurance – Vikash Publication*

B.Com. (Hons.): Semester – V

Paper 5.3BCH-DSE 5.3 (C): INDIAN FINANCIAL SYSTEM

Duration: 3 hrs.

Marks: 100(80+20)

Lectures: 65

Objectives: *To enable the students to understand the basic knowledge about the structure, organization and working of financial system in India.*

Unit-1

Financial System: Meaning and Significance-Functions of the financial system -Financial Assets- Financial markets- Classification-Financial instruments-weakness of Indian Financial System.

Unit-2

Money market: Definition-Features-Objectives-Features of a developed money market-Importance of Money market-Composition of Money market-Operations and Participants-Money market Instruments-features of Indian money market-Recent developments.

Unit-3

Primary, Secondary and Capital Markets: New issue market-meaning-functions-methods floating new issue - intermediaries in the new issue market-merchants bankers and their functions -Recent trends in new issue market - Stock Exchanges-Functions-Structure of stock exchanges-BSE-NSE- listing of securities-Advantages of listing-methods of trading in stock exchanges-on line trading-stock indices

Unit-4

Financial Institutions: commercial banks- development financial institutions- Nonbanking financial corporation's-Mutual Funds, insurance companies – Objectives and functions (only a brief outline).

Unit-5

Regulatory Institutions: RBI – Role and Functions. The Securities and Exchange Board of India-objectives-function-powers-SEBI guidelines for primary and secondary market

Learning Outcome: After completion of this paper, the student will be able to understand the structure and role of financial system, financial intermediaries and regulators in the Indian economy.

Reference Books:

1. Kohn, Meir: *Financial Institutions and Markets*, Tata McGraw Hill.
2. Bhole L.M: *Financial Institutions and Markets*, Tata McGraw Hill.

3. Desai, Vasantha: *The Indian Financial System*, Himalaya Publishing House.
4. Machiraju.R.H: *Indian Financial System*, Vikas Publishing House.

5. Khan M.Y: *Indian Financial System*, Tata McGraw Hill.
6. Varshney, P.N., & D K Mittal, D.K.: *Indian Financial System*, Sulthan Chand & Sons
7. Gordon E. &Natarajan K.: *Financial Markets & Services*, Himalaya Publishing House.
8. Pathak, V. Bharati: *Indian Financial System*, Pearson Education.

B.Com. (Hons.): Semester – V

Paper BCH-DSE 5.4 (A): FINANCIAL STATEMENT ANALYSIS & REPORTING

Duration: 3 hrs.

Marks: 100 (80+20)

Lectures: 65

Objectives: To enable the students to understand the basic knowledge about the financial statement analysis and reporting for economic decision making.

Unit-1

Introduction Concepts of financial statements – Nature of financial statements – Objectives of financial statements – Different types of financial statements: income statement, balance sheet, statement of retained earnings, fund flow statement, cash flow statement, schedules – Limitations of financial statements.

Unit-2

Analysis & Interpretation of Financial Statements: Traditional Approaches Vs. Modern Approaches to financial statement analysis – Classification of financial statement analysis: based on modus operandi and based on materials used – Techniques of financial statement analysis: Comparative Statements, Common-size Statements, Trend Ratios and Ratio Analysis – Problems encountered in financial statement analysis.

Unit-3

Ratio Analysis: Classification of ratios – Ratio formation – Ratio interpretation – Practical methods of ratio analysis: Time Series (intra firm) Analysis, Cross Sectional (inter firm) Analysis, Residual Analysis and Multivariate Analysis.

Unit-4

Multivariate Ratio Analysis: Concept, objectives, uses and limitations – Univariate analysis Vs. Multivariate ratio analysis – Application of statistical tools in financial statement analysis.

Unit-5

Corporate Reporting: Cash Flow statement Analysis (AS 3) and Statutory and Non Statutory Reports, Integrated Reporting

Learning Outcome: After the completion of this paper, the students will be able to prepare the end result of a business houses by preparation through financial statement analysis and reporting.

Suggested Readings:

1. Foster, G.: Financial Statement Analysis, Englewood Cliffs, NJ, Prentice Hall.
2. Sahaf M.A – Management Accounting – Principles & Practice – Vikash Publication
3. Foulke, R.A.: Practical Financial Statement Analysis, New York, McGraw-Hill.
4. Hendriksen, E.S.: Accounting Theory, New Delhi, Khosla Publishing House.
5. Kaveri, V.S.: Financial Ratios as Predictors of Borrowers' Health, New Delhi, Sultan Chand.
6. Lev, B.: Financial Statement Analysis – A New Approach, Englewood Cliffs, NJ, Prentice Hall.
7. Maheswari, S.N.: Management Accounting & Financial Control, New Delhi, Sultan Chand.
8. Myer, J.N.: Financial Statement Analysis, NJ, Prentice Hall. 8. Porwal, L.S.: Accounting Theory – An Introduction, New Delhi, Tata-McGraw-Hill

B.Com. (Hons.): Semester – V

Paper 5.4 (B): MERCHANT BANKING AND FINANCIAL SERVICES

Duration: 3 hrs.

Marks: 100 (80+20)

Lectures: 65

Objectives: *To enable the students to understand the basic knowledge about the financial services available in India.*

Unit-1

Merchant Banking: Nature and scope of Merchant Banking - Regulation of Merchant Banking Activity - overview of current Indian Merchant Banking scene - structure of Merchant Banking industry - primary Markets in India and Abroad - professional Ethics and code of conduct - current Development

Unit-2

Financial Services: Meaning and Definition, Role of Financial Services in a financial system. Leasing: Meaning and features. Introduction to equipment leasing: Types of Leases, Evolution of Indian Leasing Industry. Legal Aspects of Leasing: present Legislative Framework. Hire purchase: concept and characteristics of Hire purchase. Difference between hire purchase and leasing

Unit-3

Factoring: concept, nature and scope of Factoring - Forms of Factoring - Factoring vis-à-vis Bills Discounting - Factoring vis-à-vis credit Insurance Factoring vis-à-vis Forfeiting- Evaluation of a Factor - Evaluation of Factoring - Factoring in India current Developments.

Unit-4

Securitization / Mortgages: Meaning, nature and scope of securitization, securitization as a Funding Mechanism, securitization of Residential Real Estate - whole Loans - Mortgages - Graduated-payment. **Depository:** Meaning, Evolution, Merits and Demerits of Depository. **Process of Dematerialization and Dematerialization,** Brief description of NSDL and CDSL

Unit-5

Security Brokerage: Meaning of Brokerage, types of brokers. Difference between broker and jobber, SEBI Regulations relating to brokerage business in India.

Learning Outcome: After the completion of this course, the student will be able to understand the structure and function of mercantile banking and various financial services available in the present business world.

Suggested Readings:

1. M.Y.Khan, Financial Services, Tata McGraw-Hill, 11th Edition, 2008
2. Gopal C.R – Management Financial Service – S.Chand
3. NaliniPravaTripathy, Financial Services, PHI Learning, 2008
4. Machiraju, Indian Financial System, Vikas Publishing House, 2nd Edition, 2002.
5. J.C.Verma, A Manual of Merchant Banking, Bharath Publishing House, New Delhi.
6. Varshney P.N. & Mittal D.K., Indian Financial System, Sultan Chand & Sons, New Delhi.
7. Sasidharan, Financial Services and System, Tata Mcgraw Hill, New Delhi, 1st Edition, 2008.
8. Website of SEBI

B.Com. (Hons.): Semester – V

Paper 5.4 (C): FINANCIAL INSTITUTIONS AND SERVICES

Duration: 3 hrs.

Marks: 100 (80+20)

Lectures: 65

Objectives: *To enable the students to understand the financial institutions operating in India and services provided by them.*

Unit-1

Basic Theoretical Framework: The financial system and its technology; The factors affecting the stability of the financial system; Development finance vs. universal banking; Financial intermediaries and Financial Innovation; RBI-Central Banking.

Unit-2

Financial Institutions: A brief historical perspective. An update on the performance of IDBI, ICICI, IFCI and SFCs, LIC & GIC. The banking Institutions: Commercial banks - the public and the private sectors - structure and comparative performance. The problems of competition; interest rates, spreads, and NPAs. Bank capital - adequacy norms and capital market support.

Unit-3

Non-banking financial institutions: Evolution, control by RBI and SEBI. A perspective on future role, Unit Trust of India and Mutual Funds, Reserve bank of India Framework for/Regulation of Bank Credit . Commercial paper: Features and advantages, Framework of Indian CP Market, effective cost/interest yield.

Unit-4

Financial services: Asset/fund based Financial services - lease finance, consumer credit and hire purchase finance, factoring definition, functions, advantages, evaluation and forfeiting, bills discounting, housing finance, venture capital financing. Fee-based / Advisory services: Stock broking, credit rating.

Unit-5

Operations: Financial Assets/ Instruments Rights issues, issue of Debentures, issue of Equity shares - pre-issue activity, post-issue activities. The regulatory framework: SEBI and Regulation of Primary and Secondary Markets, Company Law provisions.

Learning Outcome: *After completion of this paper, the students will be able to understand the role and benefits of financial institution and services.*

Book References

1. M.Y.Khan, Financial Services, Tata McGraw-Hill, New Delhi, 2004.
2. Harsh V.Verma, Marketing of Services, Global Business Press, 2002
3. Sames L .Heskett, Managing In the Service Economy, Harvard Business School Press, Boston, 2001.
4. M.Y.Khan, Indian Financial System, 4/eTataMcGraw-Hill, New Delhi, 2004
5. Frank.J.Fabozzi& Franco Modigliani, Foundations of Financial Markets and Institutions, 3/e, Pearson Education Asia, 2002.
6. H.R Machiraju, Indian Financial Systems, Vikas Publishing House Pvt. Ltd.2002.
7. Meir Kohn, Financial Institutions and Markets, Tata McGraw-Hill, New Delhi, 2003.
8. Pathak: Indian Financial Systems Pearson Education
9. NibasaiyaSapna – Indian Financial System – S. Chand

B.Com. (Hons.): Semester - VI

Paper BCH 6.1: AUDITING AND CORPORATE GOVERNANCE

Duration: 3 hrs.

Marks: 100 (80+20)

Lectures: 65

Objective: *To provide knowledge of auditing principles, procedures and techniques in accordance with current legal requirements and professional standards and to give an overview of the principles of Corporate Governance and Corporate Social Responsibility*

Unit-1

Auditing: Introduction, Meaning, Objects, Basic Principles and Techniques; Classification of Audit, Audit Planning, Internal Control – Internal Check and Internal Audit; Audit Procedure – Vouching and verification of Assets & Liabilities

Unit-2

Audit of Limited Companies: Company Auditor- Qualifications and disqualifications, Appointment, Rotation, Removal, Remuneration, Rights and Duties Auditor's Report-Contents and Types. Liabilities of Statutory Auditors under the Companies Act 2013

Unit-3

Special Areas of Audit: Special features of Cost audit, Tax audit, and Management audit; Recent Trends in Auditing: Basic considerations of audit in EDP Environment; Standard on Auditing(SA); Relevant Case Studies/Problems;

Unit-4

Corporate Governance: Conceptual framework of Corporate Governance, Corporate Governance Reforms. Major Corporate Scandals in India and Abroad: Common Governance Problems Noticed in various Corporate Failures. Codes & Standards on Corporate Governance

Unit-5

Corporate Social Responsibility (CSR): Strategic Planning and Corporate Social Responsibility; Corporate Philanthropy, Meaning of CSR, CSR and CR, CSR and Corporate Sustainability, CSR and Business Ethics, CSR and Corporate Governance, Environmental Aspect of CSR, CSR provision under the Companies Act 2013, CSR Committees

Learning Outcome: At the end of the paper student will have detail knowledge about principles and techniques of audit in accordance with current legal requirement and as per the guidelines of different statutory authorities.

Suggested Readings:

1. Gupta, Kamal and Ashok Arora. *Fundamentals of Auditing*. Tata Mc-Graw Hill Publishing Co. Ltd., New Delhi.
2. Gadada Siddheswar T & Rachchh Gunvantrai – Introduction to Auditing – Vikash
3. Jha, Aruna. *Auditing*. Taxmann.
4. Tandon, B. N., S. Sudharsanam and S. Sundharabahu. *A Handbook of Practical Auditing*. S. Chand and Co. Ltd., New Delhi.
5. Ghatalia, S.V. *Practical Auditing*. Allied Publishers Private Ltd., New Delhi.
6. Singh, A. K. and Gupta Lovleen. *Auditing Theory and Practice*. Galgotia Publishing Company.
7. Alvin Arens and James Loebbecke, *Auditing: an Integrated Approach*
7. Ravinder Kumar and Virender Sharma, *Auditing Principles and Practice*, PHI Learning
Christine A Mallin, *Corporate Governance (Indian Edition)*, Oxford University Press, New Delhi.
8. Bob Tricker, *Corporate Governance-Principles, Policies, and Practice* (Indian Edition), Oxford University Press, New Delhi.
9. The Companies Act 2013 (Relevant Sections)
10. MC Kuchhal *Corporate Laws*, Shri Mahaveer Book Depot. (Publishers). (Relevant Chapters)
11. Relevant Publications of ICAI on *Auditing* (CARO).
12. Khanka – Business Ethics & Corporate Governance – Vikash Publication

B. Com.: Semester VI

Paper BCH 6.2: INDIRECT TAXES

Duration: 3 hrs.

Marks: 100 (80+20)

Lectures: 65

Objective: To provide basic knowledge and equip students with application of principles and provisions of Service Tax, VAT, Central Excise, and Customs Laws.

Contents:

Unit-1

Service tax – concepts and general principles, Charge of service tax and taxable services, Valuation of taxable services, Payment of service tax and filing of returns, Penalties, CENVAT Credit.

Unit-2

VAT – concepts and general principles, Calculation of VAT Liability including input Tax Credits, Small Dealers and Composition Scheme, VAT Procedures

Unit-3

Central Excise Law in brief – Goods, Excisable goods, Manufacture and Manufacturer, Valuation, CENVAT, Basic procedures, Export, SSI, Job Work

Unit-4

Basic concepts of customs law, Territorial waters, high seas, Types of custom duties – Basic, Countervailing & Anti- Dumping Duty, Safeguard Duty, Valuation, Customs Procedures, Import and Export Procedures, Baggage, Exemptions

Unit V

Emerging Issues in Indirect Taxes: Goods and Services Tax (GST) – Scope of GST, Modalities of GST

Learning outcome: After completion of this paper, the students will have an insight to the taxation on production and distribution of goods and provision of services along taxation mechanism of international trade.

Suggested Readings:

1. Singhania Vinod K. and Monica Singhania, *Students' Guide to Indirect Taxes*, Taxmann Publications Pvt. Ltd., Delhi.
2. V.S. Datey. *Indirect Tax Law and practice*, Taxmann Publications Pvt. Ltd., Delhi, Latest edition.
3. Sanjeev Kumar. *Systematic Approach to Indirect Taxes*, Latest edition.
4. S. S. Gupta. *Service Tax -How to meet your obligation* Taxmann Publications Pvt. Ltd., Delhi, Latest edition.

5. GrishAhuja& Dr. Ravi Gupta, Indirect Taxes, Flair Publication Pvt. Ltd.

B.Com. (Hons.): Semester - VI
Paper BCH-DSE 6.3 (A): CORPORATE TAX PLANNING

Duration: 3 hrs.

Marks: 100 (80+20)

Lectures: 65

Objective: To provide Basic knowledge of corporate tax planning and its impact on decision-making.

Contents:

Unit-1

Tax planning, tax management, tax evasion, tax avoidance, corporate tax in India, Types of companies, Residential status of companies and tax incidence, Tax liability and minimum alternate tax, Tax on distributed profits

Unit-2

Tax planning with reference to setting up of a new business; Locational aspect, nature of business, form of organization; Tax planning with reference to financial management decision; Capital structure, dividend including deemed dividend and bonus shares; Tax planning with reference to sale of scientific research assets

Unit-3

Tax planning with reference to specific management decisions; Make or buy; own or lease; repair or replace; Tax planning with reference to employees' remuneration; Tax planning with reference to receipt of insurance compensation; Tax planning with reference to distribution of assets at the time of liquidation.

Unit-4

Special provisions relating to non-residents; double taxation relief; Provisions regulating transfer pricing; Advance rulings; Advance pricing agreement

Unit-5

Tax planning with reference to business restructuring: - Amalgamation, Demerger, Slump sale, Conversion of sole proprietary concern/partnership firm into company, Conversion of company into LLP, Transfer of assets between holding and subsidiary companies.

Learning outcome: After learning the subject, the students will be able to understand the taxation of the corporate house.

Suggested Readings:

1. Singhania, Vinod K. and Monica Singhania. *Corporate Tax Planning*. Taxmann Publications Pvt. Ltd., New Delhi.
2. Ahuja, Girish. and Ravi Gupta. *Corporate Tax Planning and Management*. Bharat Law House, Delhi.

3. Acharya, Shuklendra and M.G. Gurha. *Tax Planning under Direct Taxes*. Modern Law Publication, Allahabad.
4. Mittal, D.P. *Law of Transfer Pricing*. Taxmann Publications Pvt. Ltd., New Delhi.
5. IAS – 12 and AS – 22.

B.Com. (Hons.): Semester - VI

Paper BCH-DSE 6.4: BUSINESS RESEARCH METHODS AND PROJECT WORK

Duration: 3 hrs.

Marks: 100(50+50)

Lectures: 65

Objective: *This course aims at providing the general understanding of business research and the methods of business research. The course will impart learning about how to collect, analyze, present and interpret data.*

Section A: Business Research Methods

50 Marks

Unit-1

Introduction: Meaning of research; Scope of Business Research; Purpose of Research –Exploration, Description, Explanation; Unit of Analysis – Individual, Organization, Groups, and Data Series; Conception, Construct, Attributes, Variables, and Hypotheses.

Unit-2

Research Process: An Overview; Problem Identification and Definition; Selection of Basic Research Methods- Field Study, Laboratory Study, Survey Method, Observational Method Existing Data Based Research, Longitudinal Studies, Panel Studies

Unit-3

Measurement: Definition; Designing and writing items; Uni-dimensional and Multi-dimensional scales; Measurement Scales- Nominal, Ordinal, Interval, Ratio; Ratings and Ranking Scale, Thurstone, Likert and Semantic Differential scaling, Paired Comparison; Sampling –Steps, Types, Sample Size Decision; Secondary data sources

Hypothesis Testing: Tests concerning means and proportions; ANOVA, Chi-square test and other Non-parametric tests; Testing the assumptions of Classical Normal Linear Regression.

Section B – Project Report

Marks

50

Unit-4

Report Preparation: Meaning, types and layout of research report; Steps in report writing; Citations, Bibliography and Annexure in report; JEL Classification

Note:

1. There shall be a written examination of 50% Marks on the basis of Unit I to III.
2. The student will write a project report under the supervision of a faculty member assigned by the college/institution based on field work. The Project Report carries 50% Marks and will be evaluated by University appointed examiners.

Learning Outcome: After completion of this paper, the students will be able to assess and apply a range of research method on a practical project.

Suggested Readings:

1. Chawla Deepak – Research Methodology – Vikash Publication
2. Upagade&Shende – Research Methodology – S.Chand

B.Com. (Hons.): Semester - VI
Paper 6.4 (B): FUNDAMENTALS OF INVESTMENT

Duration: 3 hrs.

Marks: 100 (80+20)

Lectures: 65

Objective: To familiarize the students with different investment alternatives, introduce them to the framework of their analysis and valuation and highlight the role of investor protection.

Contents

Unit-I:

The Investment Environment - The investment decision process, Types of Investments – Commodities, Real Estate and Financial Assets, the Indian securities market, the market participants and trading of securities, security market indices, sources of financial information, Concept of return and risk, Impact of Taxes and Inflation on return.

Unit-II:

Fixed Income Securities - Bond features, types of bonds, estimating bond yields, Bond Valuation types of bond risks, default risk and credit rating.

Unit-III:

Approaches to Equity Analysis: Introductions to Fundamental Analysis, Technical Analysis and Efficient Market Hypothesis, dividend capitalization models, and price-earnings multiple approach to equity valuation.

Unit-IV:

Portfolio Analysis and Financial Derivatives: (a) Portfolio and Diversification, Portfolio Risk and Return. (b) Mutual Funds. (c) Introduction to Financial Derivatives, Financial Derivatives Markets in India.

Unit-V:

Investor Protection – Role of SEBI and stock exchanges in investor protection; Investor grievances and their redressal system, insider trading, investors' awareness and activism.

Learning outcome: After completion of this paper, this paper will educate the students about various aspect of investment in detail along with understandability of stock market operation, focusing on need for common investor protection.

Suggested Readings

1. Bhalla – Fundamentals of Investment – S.Chand
2. Pandian P. – Security Analysis & Portfolio Management – Vikash Publication

3. Jones, C.P., *“Investments Analysis and Management”*, Wiley, 8thed.

4. Prasanna, Chandra., *“Investment Analysis and Portfolio Management”*, Tata McGraw Hill.
5. Rustogi, R.P., *Fundamentals of Investment*, Sultan Chand & Sons, New Delhi.
6. Vohra, N.D., and B.R. Bagri, *“Futures and Options”*, McGraw Hill Publishing
7. Mayo, *An Introduction to Investment*, Cengage Learning.

B.Com. (Hons.): Semester - VI
Paper 6.4 (C): FINANCIAL MARKET OPERATIONS

Duration: 3 hrs.

Marks: 100 (80+20)

Lectures: 65

Objective: This course aims at acquainting the students with the working of Financial Markets in India.

Unit-1

An overview of financial markets in India: Money Markets: Indian money markets composition and structure; (a) Acceptance houses, (b) Discount houses, and (c) Call money markets; Recent trends in India money markets.

Unit-2

Capital Market: Security market – (a) New issue market. (b) Secondary market: Functions and role of stock exchange: listing procedure and legal requirements: Public Issue – pricing and marketing: Stock exchanges – National Stock Exchange and over-the-counter exchanges.

Unit-3

Securities Contract and Regulations Act: Main provisions. Investors Protections: Grievances concerning stock exchange dealing and their removal: Grievances cells in stock exchanges: SEBI: Company Law Board: Press: Remedy through courts.

Unit-4

Functionaries on Stock Exchanges: Brokers, Sub brokers, market makers, jobbers, and NRIS.

Unit-4

Financial Services: Concept, functions, and types. Financial Services: Meaning and Definition, Role of Financial Services in a financial system. Leasing: Meaning and features. Introduction to equipment leasing: Types of Leases, Evolution of Indian Leasing Industry. Legal Aspects of Leasing: present Legislative Framework. Hire purchase: concept and characteristics of Hire purchase. Difference between hire purchase and leasing, SEBI guidelines: Credit rating

Learning Outcome: After completion of this paper, the student will be able to understand the nature and role of the main financial markets within the domestic and global environment.

Suggested Readings:

1. Chandler M. V. and Goldfeld S. M: Economics of Money and Banking: Harper and Row, New York.
2. Vaish M.C – Monetary Theory – Vikash Publication
3. Gupta Suraj B: Monetary Economics: S. Chand and Co., New Delhi
4. Gupta Suraj B: Monetary Planning in India: Oxford, Delhi.
5. Bhole I. M.: financial Markets and Instructional: Tata

**UTKAL UNIVERSITY COURSES OF STUDIES,
REGULATIONS & SYLLABUS FOR THE
MASTER OF ARTS IN
SOCIAL WORK
(2017 - 2018)**

**Nayagarh Autonomous College
Nayagarh**

**COLOUR SCHEME OF MAPPING THE SYLLABI FOR
ENTREPRENEURSHIP, EMPLOYABILITY AND SKILL
DEVELOPMENT**

	Skill Development
	Employability
	Entrepreneurship
	All the three
	Skill Development and Employability
	Skill Development and Entrepreneurship
	Employability and Entrepreneurship

**UTKAL UNIVERSITY REGULATION
For the
M.A. in SOCIAL WORK (MSW) EXAMINATIONS
(Semester Scheme)**

REGULATIONS

1. Introduction:

1.1. The two year post graduate degree course leading to the Master of Arts in Social Work (MSW) of Utkal University shall be spread over a period of two academic years. Each academic year comprises of two semesters namely the Odd and Even Semester.

1.2. A candidate for the Master of Social Work shall be required to pass the following

examinations.

- End Semester Examination – I
- End Semester Examination – II
- End Semester Examination – III
- End Semester Examination – IV
- Internal Assessment for Fieldwork in semesters I – IV
- External Examination for Fieldwork in semesters I – IV
- Internal Assessment for Dissertation in semester IV
- External Examination for Dissertation in semester IV

- 1.3. A candidate shall be eligible to appear for the oncoming semester courses subsequent to the first semester University examinations respectively irrespective of declaration of the results in the previous semester but.
- 1.4. Candidate who fails in the odd semester examinations shall be eligible to appear for the examination in which s/he has failed in the next odd semester and vice versa.
- 1.5. Students who have failed in a semester or are desirous to improve their performance will be allowed a single chance in the subsequent semester examination of the following year. Thus in no case the course completion will go beyond three years.

- 1.6. A candidate for the Master of Arts in Social Work Examination shall be required to enroll himself / herself under these conditions as a student in one of the colleges affiliated to this University.

2. Admission Criteria:

- 2.1. Any person who has passed the Under Graduate Degree in any subject with a minimum of 50% marks (General candidates) and 45% marks (SC/ST/OBC candidates) from an examination conducted by a recognized University is eligible to be admitted to the 1st Semester of this course. Students from SC/ST/OBC background have to apply with valid caste certificate.

3. Duration:

- 3.1 Odd semester shall be from July to December (I and III Semesters).
- 3.2 Even semester shall be from January to June (II and IV).
- 3.3 There shall be not less than 90 working days for each semester. This excludes the days for the conduct of University end semester examinations and other holidays.
- 3.4 A student would be required to complete the course within a maximum of three (Ref. 1.5 above) academic years from the date of admission.

4. Course:

Each course is well designed under lectures / tutorials / fieldwork / seminar / assignments / report writing so that it achieves the goals of effective teaching and learning needs of the students.

5. Contents in the Courses of Study:

- 5.1 The Master of Social Work programme of study consists of a number of contents. The term 'course' is applied to indicate a logical part of the subject matter of the programme and is invariably equivalent to the subject matter of a 'Paper' in the conventional sense. The following are the various categories of courses suggested for the Master of Social Work programme.
- 5.2 There are six Foundation papers.
- 5.3 Core compulsory papers comprise of twenty two courses. These are compulsory for all students.

- 5.4 There are eleven elective courses spread over two semesters III and IV. Out of the given electives student can choose any two of his or her interest for study in the respective semester.

6. Attendance:

Students must have 75% of attendance in each theory paper and 100% attendance in fieldwork and in related assignments. This is mandatory for appearing in the examination.

7. Examinations:

- 7.1 There shall be examinations at the end of each semester.
- 7.2 Examination for odd semesters shall be conducted in the month of November – December.
- 7.3 Examination for the even semesters shall be held in the month of May – June.
- 7.4 A candidate who does not pass the examination in any of the papers shall be permitted to appear in such failed papers in the subsequent examination to be held either in November – December or May – June as the case may be.

8. Pass Marks and Classification of Successful Candidates

- 8.1 Aggregate marks for passing the examination of the Degree of Master of Arts in Social Work (MSW) shall be the sum total of the aggregate of all the four semester Examinations taken together.
- 8.2.1 Divisions will be awarded on the basis of Utkal University Regulations for the M.A. Examination.
- 8.2.2 A candidate to be considered as Pass has to secure a minimum of 50% marks in the Field Work. Each of the field-work components namely Observation Visits, Concurrent Field Work in Community and Agency settings, Rural Camp and Block Placement has to be compulsorily completed to be considered as Pass.
- 8.3.a If a candidate is marked absent in a sitting(s) of an examination, such a candidate shall have to reappear in that paper (s) of the course in order to be considered as having completed the course.

.b If a candidate does not complete the requisite field-work days in a semester and does not appear for Field Work evaluation, Field Work Seminar and Viva Voce then he/she will be considered as not having completed the course and thereby ineligible to receive the M.A. degree.

8.3.b A candidate failing to secure a minimum of 30% in any Compulsory and a minimum of 50% in the Practical (Field Work - Ist, IInd & IIIrd & IVth) either in the First, Second, Third or Final examination of this University may be allowed to appear in those papers in not more than one chance (examination) immediately following that examination for which he/she was registered, in order to clear the back paper(s) on the payment of prescribed fees.

COURSE STRUCTURE UNDER THE SEMESTER SYSTEM – MSW

Semester – I

Paper	Course Code	Course Title	Credit	Total Instruction Hours	Marks
01	SWFC – 01	Foundations of Social Work: History, Philosophy, Ethics, and Theories in Social Work	4	60	100
02	SWFC – 02	Social Science Concepts I: social structure, social institutions and social change	4	60	100
03	SWFC – 03	Social Science Concepts II: Political Judicial and Economic System,	4	60	100
04	SWFC – 04	Social Science Concepts III: Poverty, Inequality and Social Exclusion	4	60	100
05	SWFC – 05	Social Science Concepts IV: Psychological Concepts, Human Behavior and Relationships	4	60	100
06	SWFC – 06	Orientation Visit Group Lab Concurrent Field Work	8	120	200
TOTAL			28	420	700

Semester – II

Paper	Course Code	Course Title	Credit	Total Instruction Hours	Marks
07	SWCP - 01	Working with Individuals	2	30	50
08	SWCP - 02	Working with Groups	2	30	50
09	SWCP - 03	Working with Communities	4	60	100
10	SWCP - 04	A Human Rights Approach to Social Work Practice	4	60	100
11	SWCP - 05	Social Welfare Administration	4	60	100
12	SWCP - 06	Social Work Research and Statistics	4	60	100
13	SWCP - 07	Concurrent Field Work + Rural Camp	8	120	200
TOTAL			28	420	700

Semester – III

Paper	Course Code	Course Title	Credit	Total Instruction Hours	Marks
14	SWCP - 08	Child Protection and Child Rights	4	60	100
15	SWCP - 09	Social Work with Women: Issues of gender and development	4	60	100
16	SWCP - 10	Ethnic Sensitive Social Work Practice in India	4	60	100
17	SWCP - 11	Rights of persons with Disabilities and their Rehabilitation.	4	60	100
18	SWCP - 12	Community Health and Social Workers	4	60	100
19	SWCP - 13	Social Management	4	60	100
20	SWCP - 14	Concurrent Field Work	8	140	200
21	SWEP – 01 SWEP – 02 SWEP – 03 SWEP - 04 SWEP - 05 SWEP - 06 (Any One)	School Social Work Working with Women Working with Alcoholics and Substance Abusers Correctional Social Work Counseling in Social Work Social Work with the Elderly	2	30	50
TOTAL			34	530	850

Semester – IV

Paper	Course Code	Course Title	Credit	Total Instruction Hours	Marks
22	SWCP - 15	Development Theories and Strategies: Issues Challenges and Responses	4	60	100
23	SWCP - 16	Social Work Practice in Rural Areas	4	60	100
24	SWCP - 17	Social Work Practice in Urban Areas: Migration, Unorganized Labour and Livelihoods	4	60	100
25	SWCP - 18	Social Policy, Planning and Implementation	4	60	100
26	SWCP - 19	Development Communication	4	60	100
27	SWCP - 20	Sustainable Agriculture	4	60	100
28	SWCP - 21	Dissertation: Research Project	4	70	100
29	SWCP - 22	Concurrent Field Work + Block Placement	2	340	100
30	SWEP - 07 SWEP - 08 SWEP - 09 SWEP – 10 SWEP – 11 (Any One)	Entrepreneurship Development NGO Management Project Management Disaster Management People Centred Advocacy.	2	30	50
TOTAL			34	740	850

Examination Question Paper Pattern:

There shall be three types of questions – Essay / Descriptive, Short Answer & Objective.

Distribution of Marks for courses carrying 100 Marks:

Five Essay type questions carrying 12 Marks each

(Out of a choice of seven) (Answer in 700 – 1000 Words) 5 x 12 Marks = 60
Marks

Four short type questions carrying 6 Marks each

(Out of a choice of six) (Answer in 150 – 200 Words) 4 x 6 Marks = 24
Marks

Eight objective type questions carrying 2 Marks each

(Out of a choice of ten) (Answer in one or two sentences) 8 x 2 Marks = 16
Marks

Social Work Practice (Fieldwork):

Fieldwork is an integral component of the course of Master of Social Work. A student shall have to undertake his/her fieldwork for 20 hours in every week in the semester. Students shall do the fieldwork under the guidance of a faculty supervisor. Fieldwork is mandatory for all students of social work.

Field Work Schedule:

Sl. No.	Semester	Field Practicum Component	Duration	Credits
1	SWFC - 06 MSW(I)	1. Observation Visit	10 Organizations	2
		2. Concurrent Fieldwork (Community Placement)	20 hrs/week (16 hrs in the field + 4 hrs report writing)	6
2	SWCP- 07	1. Concurrent Fieldwork (Community Placemen)	20 hrs/week (16 hrs in the field +	6

	MSW (II)		4hrs report writing).	
		2. Rural Camp	10 days	2
3	SWCP- 14 MSW (III)	1. Concurrent Fieldwork (Agency Placement)	20 hrs/week (16 hrs in the field + 4hrs report writing).	8
4	SWCP- 22 MSW (IV)	1. Concurrent Fieldwork (Agency Placement)	20 hrs/week (16hrs in the field + 4 hrs report writing).	2
		2. Block Placement	One Month before the end of the semester	2

Evaluation of Fieldwork: Regulation of Fieldwork:

At the end of each semester, the Chairman of the Board of studies shall call for the submission of the Field Work Attendance Record of the students, Field Work Report files of the students, the Fortnightly Reports on the students and the Self Evaluation Report of the students. This is to facilitate the external examiners to mark the performance.

Fieldwork carries 200 marks in Semester1, 2&3 and 100 marks in Semester 4. It is divided into internal and external.

The internal evaluation carries 50% marks and it shall be evaluated by the Faculty Supervisor on the basis of field-work records, practical fieldwork and reports.

The external carry 50% marks and it shall be evaluated by the external examiners on the basis of fieldwork seminar and practical knowledge gained by the student. The external examiner shall be any person authorized by the Chairman of the Board of studies for Social Work of Utkal University.

The minimum pass mark in the fieldwork shall be 50% in both the internal and the external examinations taken together in each semester. Both these marks together will comprise the university mark for field-work.

Field Work Assessment: [SL. No. 1 and 2 will be evaluated internally. Sl. No.3, 4 & 5 will be evaluated by an external examiner appointed by the Utkal University]

Sl. No.	Criteria for Assessment	Weightage In %
1	Field Work Reports	25%
2	Fortnightly Reports by Faculty	25%
3	Self-Evaluation Report by student	25%
4	Field Work Seminar	15%
5	Viva Voce	10%
	Total	100%

Evaluation of the Dissertation:

Students to practice Social Work Research Methodology shall submit a Dissertation in any area of their interest by working on a research project under the supervision of a faculty supervisor.

Total marks assigned for project work shall be 100. This total mark is distributed equally among internal and external evaluations. The internal marks of 50 and external marks of 50 shall be calculated in the basis of the Objective, Methodology, Analysis, Findings, Presentation and Viva-Voce. It is mandatory that it be the original work of the student.

HARD CASE RULE

The Hard Case Rule mentioned on the item No.5.2.4 (I,II,&III) in the correction ship No-1222 of Utkal University as amendments to the Regulation governing 2 Years Degree Course (Master of Arts, Science, Commerce Examinations) effective for the students admitted to such courses during the Academic 2002-2003 and 2003-2004,

shall be applicable to all the Compulsory and theory papers of Ist, IInd Year Examinations while computing the Final result of Master of Social Work Examinations. In case of any new regulation added to the Hard Case Rule by the University for 2 year Degree Course (Master of Arts, Science, Commerce Examinations) shall be applicable to the 2 years Degree Course of Master of Social Work.

REGULATION FOR FIELD-WORK

Introduction:

The student of the M.A in Social Work through field work practice is supposed to be committed to the people and social institutions in which they are placed. They are expected to serve individuals, families and communities through effective practice guided by qualified field-work supervisors (with MSW degrees) and by the social-work faculty in each college affiliated to this university.

Goals of Field Work:

1. To critically assess their own roles in field-work by conducting themselves ethically and professionally and by utilizing supervision & self-reflection.
2. To develop knowledge, skills and values required to engage in quality practice with individuals, families, groups, organizations and communities.
3. To demonstrate their ability to engage practically in problem solving as change agents in a variety of settings.
4. To demonstrate knowledge and ability to apply social theories and theories of human behavior and conceptual frameworks to assess, intervene and evaluate social work practice in the individuals, families and groups.
5. To recognize and understand various forms of discrimination and oppression as they apply to members of diverse groups and communities and advocate for social and economic justice for individuals, families, groups and communities.

Semester – I:

Observation Visits: 10 social work / welfare agencies have to be compulsorily visited. In each observation visit to an agency of community organization the student must be exposed to different field Situations. This observation visit will provide an opportunity to have an exposure and orientation to the services being offered by various Organisations/ Social institutions/ Agencies and open communities such as slums / rural settings as a response to community member's needs.

Understanding the Community: To understand the dynamics of the communities specifically the slum and the rural setting. This would imply comprehending the Socio-Cultural dynamics, economic and health status, being familiar with the problems of the communities, their causes, and observing how the people respond to such situations.

Semester – II:

Work with Individuals: Students shall be placed in slums or villages. They need to identify any issue affecting an individual and apply the principles and process of social case work. Similarly two separate case work should be done. The report should reflect learning derived from these two case work.

Work with Groups: Students shall be placed in slums or villages. They need to identify groups, study them well and carefully identify dysfunction if any in them and apply the principles and process of social group work.

Students may also start new groups such as Self Help Groups, children groups, Youth Clubs, integrated groups for person with disabilities, widows groups, senior citizens, adolescent girls group, study groups and etc. The purpose of this group formation is to learn group interaction, goal setting and group dynamics. The students should demonstrate principles and processes of group work. The reports should reflect on the learning derived out of it.

Community Organisation: Students shall be placed in a slum or village in a team of 4. Students shall be trained to demonstrate the skills and process of community organization. Each team shall identify a community issue along with the participation of the people and organize a programme that aims at resolving the community issue. The purpose of this fieldwork is to ensure students learning on community organization through demonstration and also for the students to learn to work in a team.

Rural Camp: All students shall compulsorily participate in a rural camp. This camp provides ample opportunity to learn about the community through experiences of living with them. It is to be a continuous 10 days camp and students and teachers are expected to stay in the rural area for all the 10 days continuously.

Semester – III:

Understanding Formation and Management of Social Welfare Agencies: Each student shall be linked with an agency promoting social welfare. These agencies may be either Governmental or Non-Governmental or Privately managed Corporate houses. Reports of students should reflect on their learning related to the above mentioned areas. Daily Report, Consolidated fieldwork report should be submitted by every student individually. Students will work under a Faculty Supervisor and Agency Supervisor.

- To provide an opportunity to work with social welfare agencies.
- To understand the agency as an organization, its structure, functions, activities sources of funding and management.

Semester – IV:

Students shall be directed to learn about the formation, legal formalities, taxation related formalities, project formulation, resources mobilization techniques, project management, Documentation, POSDCORB, Evaluation, Need Analysis, Problem Tree Analysis, Logical Frame Analysis and so on.

- To develop an understanding of the problem and opportunities in an organisational setting.
- To develop an understanding of the problems and opportunities of the organisation and the methods they adopt to respond to their environment.

Block Placement (On the Job Training): The students of Social Work will be assigned an agency. This agency setting should be located anywhere within or out of the State. Students will work in the agency and obtain on the job training experience. This training lasts for a continuous 25 days prior to the semester examination. It is compulsory for all.

Course Title: HISTORY, PHILOSOPHY, ETHICS AND THEORIES IN SOCIAL WORK

Course Code: SWFC – 01

Level: MSW (I)

Objectives:

- To understand the historical development of the philosophy of Social Work and its emergence as a profession.
- To understand the ethical and value base of Social Work.
- To bring clarity to the basic concepts of Social Work.
- To briefly introduce Social Theory relevant to Social Work practice.

Unit I: History and Evolution of Social Work Practice

History of Social Welfare in the West (UK and USA): The Elizabethan Poor Law (1601), Charity Organisation Society (1869) Settlement House Movement, The Poor Law Commission of (1905), Beveridge Report (1941); The development of Social Work as a profession; Development of the definition of Social Work; (From Charity to Human Rights and Social Justice); History of Social Work education in India: YMCA School of Social Work Lucknow, TISS Mumbai, Delhi School of Social Work

New Delhi; Voluntary Social Work in India.

Unit II: Philosophy of Social Work and Social Work Ethics

The Traditional religious doctrine of Charity; Scientific Naturalism; Liberalism; Scientific Charity; The ideological base of the Welfare state. (with specific reference to the Indian Constitution); Gandhian ideals in Social Work Practice in India; Ambedkar's ideals in Social Work Practice in India; Professional Code of Ethics: IFSW and IASSW code of Ethics; The meta-ethical dimension of Social Work Ethics; Ethical Dilemmas in specific contexts.

Unit III: Basic Concepts in Social Work

Social Work: Concepts, Definitions, Objectives & Functions, and Methods; Contributions of Social Sciences to Social Work; Traditional Social Work and

Radical Social Work; Social Service and Social Welfare Service; Social Welfare and Social Security; Social Reform and Social Justice ; Human Rights and Human Development; Social Inclusion & Empowerment; Social Change and Social Development; Social Action and Social Movements

Unit IV: Theories relevant to Social Work Practice

Social Welfare Theory: Emile Durkheim, Herbert Spencer and Max Weber; Social Justice Theory: Distributive and Retributive Justice, Rawls Theory of Justice, Nozick's Theory of Social Justice; Radical and Marxist perspective in Social Work: L. Althusser; Anti-discriminatory and Anti-oppressive Perspective; Communication Theory: J. Habermas, Erving Goffman; Critical Theory: J. Adorno; Structure Theory: Anthony Giddens & P. Bourdieu; The Ecological Perspective; The Generalist Perspective.

Reading List:

- Beilharz, Peter (Ed) (1991): Social Theory: A Guide to Central Thinkers.
- Elliot, Anthony (Ed) (2010): The Routledge Companion to Social Theory.
- Payne, Malcolm(1997), Modern Social Work Theory and Social Work Practice.
- Mulally, Robert P. (1993), structural Social Work: Ideology, Theory and Practice.
- Reamer, G.G.(2013), Social Work Values and Ethics.
- Hugman, Richard and Smith, David(Ed)(1995) Ethical Issues in Social Work.
- Tnattner, Walter I. (1998) From Poor law to Welfare State: A History of Social Welfare in America.
- Reisch, Michael (2002), The Road not Taken: A History of Radical Social Work in the United States.
- Zastow, C(2009) Introduction to Social Work and Social Welfare: Empowering People.
- Pierson, John(), Understanding Social Work: History and Context.
- Hering.S and Waaldijk (Eds); History of Social Work in Europe(1900-1960)
- Basanquet, Helen Dendy, Social Work in London, 1869-1912; A History of the Charity Organization Society.
- Queen, S.A, Social Work in the Light of History.

Course Title: SOCIAL SCIENCE CONCEPTS - I: SOCIAL STRUCTURE, SOCIAL INSTITUTIONS AND SOCIAL CHANGE

Course Code: SWFC – 02

Level: MSW (I)

Objectives:

- This introductory course seeks to familiarize the students with Sociology as a social science and the basic concepts necessary in understanding the social and cultural processes. It is organized in such a way that even students without previous exposure to sociology could acquire an interest in the subject and follow it. Understand the role of individual in the society and importance of various social Institutions and their impact. Get a scientific insight about the social structure, stratification and issues related to caste & class. Develop clarity about social issues and challenges in the social work field.

Unit – I: Basic Concepts

- Sociological Concepts: Society, Community, Association and Institution, social organisation.
- Social Group: Meaning, Types: Primary, Secondary, In-group - Out-group, formal and informal group, pressure group and reference group.
- Tradition: Little Tradition and Great Tradition, Parochialisation and Universalization.

Unit - II: Social structure and culture

- Concept of Social Structure and function.
- Social stratification: varna, caste, class, occupation, tribe and gender.
- Social Interaction and Social Processes: Associative and Dissociative Social Processes
- Culture: definition and types, norms & values, patterns of culture, culture and personality.

Unit - III: Social institutions and Socialisation

- Marriage and Family: Characteristics, types and functions, Rules of Marriage.

- Kinship: Meaning, Definition, Types, Functions.
- Social Process: Socialisation, Acculturation, Enculturation, Assimilation, Resocialisation, Anticipatory, Adult socialisation and agency of socialisation.
- Status and Role: Multiple Roles, Role Set, Status Set, Role Conflict.

Unit – IV: Social change and Mobility

- Concepts, processes and theories of social change,
- Meaning and nature of Social change,
- Factors of social change: Sanskritisation, Westernisation, Modernisation, Orthogenetic and Heterogenetic factors of social change; Social Mobility: Horizontal & Vertical,

Reading List:

- Abraham Francis, Contemporary Sociology, Oxford University Press, 2006.
- Ahuja Ram, Indian Social System, Rawat Publication, Jaipur, 1993
- Ahuja Ram, Social Problems in India, Rawat Publication, Jaipur, 1997
- Ahuja Ram, Society in India, Rawat Publication, New Delhi, 2010
- Kuppaswamy, Social Change in India, 1998
- Beteille, Andre, *Sociology: Essays on Approaches and Method*, New Delhi: OUP, 2002
- Bose, N.K. 1967, Culture and Society in India, Bombay: Asia Publishing House.
- Bottomore, T.B.: *Sociology: A Guide to Problems and Literature*, Blackie and Sons, Bombay, 1986.
- Desai, A.R. (Ed), *Rural Sociology in India*, Popular Praakashan, 2008
- Dube S C, *Indian Society*. New Delhi: NBT 1995
- Dube, S.C. 1995, *Indian Village* (London : Routledge)
- Dumont L, *Homo Hierarchicus : The Caste System and its Implications*, Chicago University Press, 1970
- Gupta Dipankar (ed). *Social Stratification*, New Delhi: Oxford University Press, 1991

- Jodhka, S.S. (ed), *Village Society*, New Delhu: Orient BlackSwan, 2012
- Karve, Irawati, 1961 : *Hindu Society : An Interpretation*(Poona : Deccan-College)
- Kothari, Rajni, *Caste in Indian Politics in Manoranjan Mohanty* (ed.) *Class, Caste, Gender: Readings in Indian Government and Politics*, New Delhi, Sage. 2004
- Maclver & Page, *Society, Introductory Analysis*, MacMillan, Delhi, 2001.
- Madan & Majumdar, *An Introduction to Social anthropology*, Mayur, 1999.
- Madan, Vandana. *Village in India*, India: OUP, 2003.
- Mandelbaum David,G, *Society in India*, Popular Prakashan, 2008
- Mukherjee Ramakrishna, *Sociology of Indian Sociology*, Allied Publishers, 1979
- Satish Deshpande, "*Contemporary India A Sociological View*", Viking Publishers, New Delhi, 2003.
- Singer Milton, B, *When a Great Tradition Modernises. An Anthrapological Approach to Indian Civilization*, Praeger Publishers, 1972
- Srinivas, M.N, *Caste and its New Avatar*, Penguin, 1996
- Srinivas, M.N. 1963: *Social Change in Modern India* (California, Berkeley: University of California Press).
- Srinivas, M.N. *Caste in Modern India and Other Essays*, Bombay Asia Publishing House, 1962
- Uberoi, Petricia, *Family Kinship and marriage in India*, OUP, 2005

Course Title: SOCIAL SCIENCE CONCEPTS II: POLITICAL JUDICIAL AND ECONOMIC SYSTEM

Course Code: SWFC - 03

Level: MSW (I)

Objectives:

1. To impart knowledge about the political institutions that regulate people's life and promote their interests.
2. To Understand the basic economic concepts, principles, theories & its application in social work profession.
3. To Understand and analyze economic problems on social work perspective.

Unit - I: System of Governance

- Indian Constitution: Objective(Preamble) Characteristic Features and Amendment Process, Fundamental Rights, Fundamental Duties and Directive Principles of State Policy.
- Indian Political System: Parliamentary Democracy, Federalism and Issue of State Autonomy, Coalition Government and Role of Bureaucracy in Administration.
- India- A Welfare State: Social Policy and Social Legislation, Increasing Partnership between Government Agencies and Private Voluntary Organization.
- Judiciary: Judicial Review, Judicial activism and P.I.L.

Unit – II: Social structure and Democratic Process

- Features of Indian Democracy: Multiparty System, Role of National Parties, Regional Parties and Pressure Groups.
- Grassroots Democracy: Panchayati Raj System and Empowerment
- Issues Concerning Religion, Language, Caste, Problem of Gender, Illiteracy and Reservation.
- Institutions: Bureaucracy, National Planning, Election and Participation.
- Socio-Political Movements: Peasant Movement, Trade Union Movement, Tribal Movement, Women's Movement, and Dalit Movement

Unit – III: Development Economic

- Development Economics: Meaning Nature and Significance, Contemporary Development, Problems: Poverty and Inequality.
Economic Systems: Capitalism, Socialism, Mixed Economy – Definitions, Features, Advantages and Disadvantages.
- Rural and Urban economy: Nature and structure of rural economy; rural financial structure-formal and informal; Regional Rural Banks Policy and Planning concerning development of rural area.
Urban economic growth: State and local policies; and urban poverty-policy responses.

Unit – IV: Indian Economy and Financial Institutions

- Indian economy: Nature and Characteristics
Inflation and Over population: Meaning, magnitude, causes and consequences;
Programmes for alleviation of poverty and unemployment.

- Economic Planning and Reforms: Rationale, Features and Objectives; Globalization, Privatization and Liberalization and their impact on Agriculture and Marginalized sections of India.
Meaning and concept of Free trade, Special Economic Zone and its impact on Indian social concerns.
- Financial Institutions: National and International Financial Institutions and their Role in Social Welfare- World Bank, International Monetary Fund (IMF), Reserve Bank of India (RBI), World Economic Forum, NABARD, Commercial Banks; Role of Non Bank Financial Institutions; and National and International Funding agency for social development.

Reading List:

- Kashyap Subhash(ed), 1993, Perspective on the Constitution, Shipra Publication, Delhi.
- Basu D. D., 1992, Introduction to the Constitution of India, Prentice Hall of India Pct. Ltd., New Delhi.
- Kaushik Sushila, 1993, Women and Panchayati Raj, Har Anand publication, New Delhi.
- Kulkarni P.D, Social Policy and Social Development in India.
- Reed Elaw, Social Welfare Administration.
- ND Kumble, Ashish, Deprived Castes and Their Struggle for quality, Publishing House, New Delhi.
- Murthy(ED),Planning for Change- Council for Social Development , Aspects of Social Development.
- Setty Krishna, K.R. Chaitanya, Fundamental Rights and Socio Economic Justice in the Constitution, Publishing House, Allahabad.
- Singh M.P. and Roy Himanshu, Indian Political System, Structures, Policies, Development, 1995, Jnanada Prakashan (P & D), New Delhi.
- Misra & Puri : Advanced economic theory
- Mitchell A Seligson & John T Passé Smith, Development & Underdevelopment- The political economy of global inequality
- Agarwal A.N., Indian economy- Problems of development & planning
- A Vaidyanathan : India's economic reforms & development
- Patel Surendra J: Indian economy towards the 21st century

- Lekhi R.K.: The Economics of Development and Planning
- Dhar P.K.: Indian Economy: Its Growing Dimensions
- Datt Rudra & KPM Sundharam: (2004), Indian Economics Theory: S, Chand & Co New Delhi.
- K.G Karmakar, Rural Credit And Self Help Groups: Microfinance Needs and Concepts in India: Sage publication.
- Thakur S.N., (1988): Economic theory of profile of Indian Economy: Deep & Deep Publication, New Delhi.

Course Title: SOCIAL SCIENCE CONCEPTS III: POVERTY, INEQUALITY AND SOCIAL EXCLUSION

Course Code: SWFC – 04

Level: MSW (I)

Objectives:

- To develop clarity and understanding on the various perspectives about the concept of poverty, Inequality and social exclusion.
- To discuss policy interventions that aim to reduce poverty, inequality and exclusion.

Unit – I: Understanding Poverty

- Concept of Poverty, Different types of poverty: relative, absolute, material and social; culture of poverty, theories of poverty; Deprivation.
- Poverty Measurement: Indicators of poverty, PQLI, HDI, Poverty lines.
- Anti-poverty programmes in India.

Unit – II: Understanding Inequality

- Equality, inequality, capability, post-industrial structuralism, norm of structural exclusion, inequality and globalization;
- Bases of inequality in India: religion, caste, ethnicity, gender, disability, merit, region, language, culture, migrants.
- Diversity & Inequality: Socio-cultural and geological analysis

Unit – III: Understanding Social Exclusion

- Definitions and Concepts, Evolution of the concept of Social Exclusion; Dimensions of Social Exclusion, Theories of Social Exclusion;
- Social Exclusion and the role of: Religion, Race, Caste, Ethnicity; Gender; and Disability.
- Relationship of Social Exclusion and Discrimination

UNIT – IV:

- Social policy response to combat Poverty. Inequality and Social Exclusion in India.
- The role of social work in addressing issues of poverty, inequality and social exclusion.

Reading List:

- Sen, Amartya 2000 Social Exclusion: Concept, Application and Scrutiny. Social Development Papers NO.1. Asian Development Bank.
- Sen, Amartya "Poverty as Capability Deprivation," chapter 4 in Development as Freedom, OUP, 2000.
- Sullivan, Elizabeth 2002 Social Exclusion, Social Identity and Social Capital: Reuniting the Global, the Local and the Personal. De Montfort University, UK.
- Silver, Hilary and S.M. Miller 2003 Social Exclusion: The European Approach to Social Disadvantage. Indicators.2.2: 1-17.
- Haan, Arjan de 2001 Social Exclusion: Enriching the Understanding of Deprivation. Institute of Development Studies and Poverty Research Unit, University of Sussex. Sussex. UK
- O'Brien, D, Joanna Wilkes, Arjan de Haan, Simon Maxwell Poverty and Social Exclusion in North and South. Institute of Development Studies and Poverty Research Unit, University of Sussex. Sussex. UK.
- Kabeer, Naila 2006 Social Exclusion and the MDGs. The Challenge of 'Durable Inequalities' in the Asian Context. Institute of Development Studies and Overseas Development Studies Institute.
- Beall, Jo 2002 Globalization and Social Exclusion in Cities: Framing the Debate with Lessons from Africa and Asia. Development Studies Institute, LSEP, London.
- Chebolu, Radha Mohan 2007 Corporate Quotas: The Myth Action'. Pravartak. 2:2: 159-165.
- Saith, Ruhi 2001 Social Exclusion: The Concept and Application to Developing Countries. QEH Working Paper Series -72.
- Lorry, G.C 2000 Social Exclusion and Ethnic Groups: The Challenge to Economics. Annual World Bank Conference on Development Economics 1999. The International Bank for Reconstruction and Development! The World Bank.

- Jenkins, Robert 2006 Social Exclusion of Scheduled Caste Children from Primary Education in India; UNICEF India. New Delhi.
- Sen, Amartya 1992 Inequality Re-examined, New Delhi Oxford University Press.
- Byrne, David 1999 Social Exclusion. Buckingham: Open University Press.

Course Title: SOCIAL SCIENCE CONCEPTS IV: PSYCHOLOGICAL CONCEPTS, HUMAN BEHAVIOUR AND RELATIONSHIPS

Course Code: SWFC – 05

Level: MSW (I)

Objectives:

- To understand the concept of human behavior
- To understand the basic concepts and factors of human behavior
- To understand the relevance of psychology in social work
- To understand the concept of personality and its application in social work education

UNIT – I: Nature and Scope of Psychology

Meaning and definition of psychology – Schools of psychology: Structural, Functional and Behaviourist, Importance of psychology in social work practice, Factors influencing Human Behaviour-Heredity, Environment and Self

UNIT – II: Human growth and development

Human growth and development: Meaning and principles; Social, Emotional, Cognitive and Physical Stages in Life Span approach from Conception to Old Age: characteristics, needs, tasks and problems at each stage.

UNIT – III: Personality

Meaning of personality, Theories of personality: Trait and Type theories; important concepts of the contributions of Freud, Jung, Adler, Maslow and Ericson: factors influencing personality Development Psychological Processes in Behaviour: Perception, Emotion, Motivation, Attitude; Processes of Adjustment: Concept and Factors; Coping Mechanism, Defence Mechanism

UNIT – IV: Theories of Human Development

Psychoanalytic theory: Psycho-sexual theory by Freud, Psycho-social theory by Erickson.

Behavioural theory: Classical conditioning by I P Pavlor, Operant.

Humanistic theory: Abraham Maslow and Carl Rogers, Alfred Adler. Cognitive theory: Jean Piaget's theory

Reading List:

Davidoff.L.L.: Introduction to Psychology, Aucklan; McGraw Hill Inc:1881

Morgan, C.T.& King, R.A:Introduction to psychology New York.

Weix;J.R& Schopler J: McGraw Hill;7th Ed.,1986.

Munn,N.A.:psychology-The fundamentals of human Behaviour;London;

Hurlock E. B: Developmental psychology, New Delhi, Tata Mcgraw Hill 5th Ed.1971

Rayner, Eric: Human Development, London; George Allen and Unwin, 1978.

Sareswathi T.S, Dutta R: Development psychology in India, Delhi; Sage publications, 1987.

Kuppusamy B: An Introduction to social Psychology; Bombay; Media Promoters and pub.Pvt.Ltd., 1980.

Coleman, J.C: Abnormal Psychology and Modern Life

Fair-weather George W.: Social Psychology Treating in Mental Illness, Sydney, Jhon Wiley and Sons

Course Title: WORKING WITH INDIVIDUALS

Course Code: SWCP – 01

Level: MSW (II)

Objectives:

- To develop theoretical knowledge and understanding about working with individuals
- To critically examine the application of social case work method in human

personality and development.

Unit - I: Basics of Case Work

Social Case Work: nature, assumptions, values and principles. Components of social case work: person, place, problem & process. History of social case work.

Unit – II: Client Worker Relationship

Need and importance of Relationship: nature and ways to establish. Psychoanalytical theory. Ego - functions and defense mechanisms. Concept of Human needs, stress, social role and adaptation

Unit – III: Process of Case Work

Process of social case work- study, assessment, goal formation, planning, treatment, evaluation, termination. Techniques of social case work: interviewing, support, encouragement, clarification, correcting perception, reality orientation; resource mobilization, home visit, interpretation, topical shift, logical reasoning, crisis intervention, burnout. Transference and Counter-Transference and its use in case work. Supportive techniques. Referral: its use in social case work. Recording: types and format.

Unit – IV: Models of Case Work

Models of social case Work practice: Problem solving, Psycho- social, Task oriented. Rational Emotive Therapy in social case work. Discussion on role of case worker from the records in school, family and marriage settings. Presentations and discussions on cases and practical questions.

Readings List:

Banarjee, G.R. TISS Series 23. Papers on Social Work: An Indian Perspective; Tata Institute of Social Sciences, Mumbai. TISS(Series 23).

Batra, Sushma & Marlin Taber, 1996. Social strains of Globalization in India, Mittal Publication, New Delhi.

Biestek, F.P. 1970. The Case Work Relationship: London: Unwin University Books, Impression.

Bogo, Mario, 2006-07. Social Work Practice: Concepts, Processes and Interviewing. Columbia University Press-2006. Indian Reprint by Rawat Publication : New Delhi,2007.

Friedlander, W.A. 1964. Concepts and Methods of Social "Work, New Delhi: Prentice Hall of India Pvt. Ltd.

Fisher, J, 1978. Effective Case Work Practice: An Effective Approach, New York McGraw Hill Book Co.

Florence, H., 1964. Case Work: A Psycho social therapy, Random House, New York.

Farard, M.L. & N.K. Hunnybun, 1962 The Case Work's use of relationship London, Tavistock. Pub.

Goldstein, H., 1970. Social Work Practice: A Unitary Approach, Carolina: Univ. of S. Carolina Press.

Grace, Methew, 1992. Introduction to School Case Work, Tata Institute of Social Sciences, Mumbai.

Hamilton, G., 1946. Principles of Social Case recording, New York: Columbia University Press.

Himilton, Gordon, 1959. Theory & Practice of Social Case Work, New York: Columbia University Press, VI Ed.

Husband. E.(ed) New Developments in Social Case Work Reading in Social Work, Vol. III, London: Georque Allen & unwin Ltd.

Mishra, P.D., 1985. Samajik Vijyaktik Sewa Karya (Hindi) Uttar Pradesh Hindi Sansthan, Lucknow.

Perlman, 1957 Social Case Work-A Problem solving Process, Chicago: The University of Chicago Press, V Impression.

Pathak, S.H. 1966. Records in Social Case Work, Delhi School of Social Work, Delhi.

Pinkus, Helen, 1971. Case Records for Teaching Purposes, Faculty as social Work, M.S. University, Baroda.

Roberts R.W. Nee, R.H. 1972 Theories of Social Case Work, the Uni. Of Chicago Press, Chicago, London.

Reid, W.K. & Anne W. Shyne, 1969 Brief and Extended Case Work: New York: Columbia Uni. Press.

Scott Briar and Henry Miller, 1971 Problems and issues in social Case Work: Columbia University Press, New York.

Timmis, N., 1964. Social Case Work: Principles and Practice, London; Rout ledge and Kegan Paul.

Timmis, N., 1972. Recording in Social Work, London, Rout ledge & Kegan Paul.

Terner, F (Ed) 1974. Social Work Treatment, New York: The Free Press.

Upadhyay, R.K. 1991. Samajik Vijyaktik Karya (Hindi) Haryana Sahitaya Academy, Chandigarh.

Upadhyay, R.K. 1993. Indian Philosophical Concepts in Clinical Social work, Kurukshetra Press, Kurukshetra.

Upadhyay, R.K. 2003. Social Case Work, Rawat publications, New Delhi, Jaipur.

Course Title: WORKING WITH GROUPS

Course Code: SWCP – 02

Level: MSW (II)

Objectives:

- To understand theoretical knowledge of social group work.
- To understand group work as an instrument of change/development in individual in groups.
- To understand the relevance of group work in different settings.

Unit – I: Social Group Work:

Definition, objectives and scope - Models of Social Group Work- Historical Development of Group Work, Principles of Group Work, Values, Significance, Limitation of social group work practice in India.

Social Groups and Development: Definition, Characteristics, Types of Groups and Functions of a Group - Basic Human Needs met by Groups at Different Stages of Group Development - Group Process : Bond, Acceptance, Isolation, Rejection, Sub- Group Formation, Withdrawal, Behaviour Contagion, Conflict and Control.

Unit – II: Approaches to the Practices of Group Work:

Group Therapy, Group Psychotherapy, Use of Home Visits and Collateral Contacts. Leadership: Concepts, Definition, Characteristics, Functions, Qualities of Leader, Types and Theories of Leadership, Training for Leadership - Sociometry and Sociogram - Group Work Supervision: Meaning, Purpose and Functions. Skills of social group worker.

Unit – III: Group Work Programme Planning:

Meaning and Definition of Programme, Principles and Process of Programme Planning and the place of Agency in Programme Planning - Programme Laboratory: Values and Techniques (Games, Singing, Dancing, Dramatics, Street play, Puppetry, Group Discussions, Excursion, Psychodrama, Socio drama, Role play, and Brain Storming); Rural Camp: Planning, Organizing, Executing, Evaluating and Reporting.

Unit – IV: Group Work Recording:

Meaning, Purpose, Principles, types of group work recording; Steps and Criteria for Good Group Work. Application of Group Work Methods in Different Settings: Community Settings, Medical and Psychiatric Settings, De-Addiction Centres, Correctional Institutions, Schools, Industries, Physically Handicapped and Aged Homes.

Reading List:

Alissi, A.S.1990 Perspectives on Social Group Work Practice: A Book of Readings, New York, The Free Press.

Balgopal, P.R. and Vassil. Groups in social Work- An Ecological Perspective, New York, Macmillan Publishing Co. Inc.

Bhatt, P.M.1970 Records of Group Work Practice in India, faculty of Social Work, M.S. University, Baroda.

Brandler S & Roman CP 1999 Group work, Skills and Strategies for Effective Interventions, New York. The Haworth Press.

Brandler S & Roman CP 1991. Group work, Skills and Strategies for Effective Interventions, New York. The Haworth Press.

Garland, J.A.(Ed) 1992. Group Work Reaching Out: People, Places and Power, New York, The Haworth Press.

Garwin, C 1987. Contemporary Group Work, New York Prentice- Hall Inc.

Golpelwar, Banmala, 2007 social Group Work, Indian Institute of Youth welfare, Nagpur.

Kemp, C.G. 1970. Perspectives on the Group Process, Boston: Houghton Mifflin C.

Klein, A.F.1970. Social Work Through Group Process,: School of Social Welfare- Albany: State University of New York.

Konopka, G 1963. Social Group Work: A Helping Process, Englewood Cliff, NJ Prentice Hall, Inc.

Kurland, R & Salmon, R 1998. Teaching a Methods Course in Social Work with Groups Alexandria: Council on Social Work Education.

Middleman, R, R 1968. The Non- Verbal Methods in Working with Groups.

Northen, H 1969. Social Work with Groups, New York: Columbia University Press.

Pepell, C.P & Rothman B. Social Work with Groups, New York: The Haworth Press.

Sundel, M, Glasser, P sari, Individual change Through Small R., Vinter, 1985 Groups. The Free Press.

Samuel, T. Gladhing 1999. Group Work: A Counseling Specility, Simon& Schaster, NJ Printice Hall Inc.

Siddiqui H.Y.2005. Group Work, theories and Practice, Rawat Publication New Delhi.

Toseland RW 1998. An introduction to Group Work Prectice, New York Macmillan Publication Co.

Trecker, Harleigh B 1990. Social Group Work: Principles and Practice, New York: Association Press.

Wilson, G. Ryland, G 1949. Social Group Work Practice, Boston: Houghton Mifflin, Co

Course Title: WORKING WITH COMMUNITIES

Course Code: SWCP– 03

Level: MSW (II)

Objectives:

- To provide theoretical and conceptual understanding of community organization as a method in social work.
- To practice and critically examine the steps and process of community organization in various community setting.

Unit – I: Community and Community Organisation

Community: Concept, characteristics, types and functions. Understanding of community organisation practice: Definition, values, ethics and principles; Historical development of community organisation practice; Community organization as a method of social work intervention; Role and skills of Community Organizer

Unit – II: Models and Strategies of Community Organization

Models and Strategies of Community Organization - Locality Development Model - Social Planning Model - Social Action Model - Select methods of public interest mobilization, litigation, protests and demonstrations, Dealing with authorities, Public Relations, Planning, Monitoring and Evaluation - Roles in different models attributes and attitude.

Unit – III: Community Organization Practice in the Context of Various Settings

Health, Education, Residential institutions, Livelihood and work, Natural resource management, Sustainable development, Working with tribal and Dalit populations, in rural and urban communities, Displaced population and rehabilitation, Community organization in disaster preparedness and response, Peace building and national integration .

Unit – IV: Social Action

Social work and social action, History of social action in India, Radical or emancipatory social work; Rights based approach, Different forms of protest, various contributions to the theory of social action (Lees, Saul Alinsky, Paulo Friere, Mahatma Gandhi's (Sarvodaya and Siddique) Strategies for social action from various social movements.

Reading List:

- Gangrade, K. D. 1971. Community Organization in India, Mumbai; Parkashan, 1971.
- Karamer, R.M. & Spech, H. Reading in Community Organization Practice-Hall Inc. Englewood Cliffs, 1983.
- Murphy C. G.: Community Organization Practice, Boston; Houghton Mifflin Co. Ross, 1954
- Patil, S.H. Community Dominance & Political Modernization; Mittal Publication; New Delhi; 2002.
- Rashmi Dewas & R. Community Participation & Empowerment in Primary Education; Mittal Publication New Delhi; 2003.
- Sengupta, P.K.; Community Organization Process in India, Kiran Publishers, 1976.
- Selgen, S. Empowerment & Social Development Issues in Community Participation; Mittal Publication: New Delhi; 2005.
- Speech, H & Karmer: R.M; 1969 Reading in Community; Englewood Cliffs: Prentice Hall.
- Surya Rao: Under Development with community initiative retrospect & prospect: mittal Publication: New Delhi, 2000.

- Zastrow Charles: 1978. Introduction to social Welfare Institution Social Problems, services & Current Issues (Social work Community Practices Part-3 Chapter-10) Ontario: The Dorsey Press.
- Butcher H. 2007: Critical community Practice.
- Kothari M 2006: Development and Social Action, Rawat Publication, New Delhi.
- Grundy M : Community Work, Rawat Publication, New Delhi,
- Siddiqui. H.V., Social Action in India.

Course Title: A HUMAN RIGHTS APPROACH TO SOCIAL WORK PRACTICE

Course Code: SWCP – 04

Level: MSW (II)

Objectives:

- To understand Human Rights and engage in critical self-reflection and correction for professional development.
- To recognize the extent to which a culture's structures and values may oppress, marginalize, exclude and enhance power and privilege.
- To engage in processes that advance social and economic justice.
- To critically analyse how the intersection of Human Rights Values with Social Work influences practice

UNIT I: Introduction to Human Rights

- Historical evolution and normative framework of the Universal Human Rights System: The UN Charter, Universal Declaration of Human Rights, the ICCPR and ICESCR.
- The generations of Rights
- UN vs National perspectives: Issues of cultural relativism: Rights and Duties, Rights of Indigenous Peoples and Rights of the Scheduled Tribes, Racial discrimination and Caste based discrimination, Right to Self-determination.

UNIT II: Human Rights in the Indian Constitution: Interpretation and Application

- The Preamble, the Fundamental Rights and the Directive Principles of State Policy;
- Special provisions for vulnerable groups: Scheduled Castes, Scheduled Tribes, Women, Religious, cultural and linguistic minorities.

- Role of the Judiciary in responding to Human Rights issues in India: The case of Niyamgiri, Reservations to OBCs, Women's issues, etc
- Role of the National Commissions on: Human Rights, Women, Scheduled Castes, Scheduled Tribes, Minorities, Backward Classes.
- Role of Human Rights NGOs.

UNIT III: Monitoring Human Rights

- Who monitors human Rights?: Social Work Professionals, Medical Professionals, the Police, Lawyers and Judges;
- How to monitor? : prisons, trials, hospitals, cemeteries, vulnerable groups;
- How to investigate? : practical steps on gathering evidence;
- How to report? : How to write a report, How to take a statement, How to collate evidence;
- Commissions of Enquiry; the NHRC
- International and National Reporting and Complaints Procedure.

UNIT IV: Human Rights in Social Work Practice

- The elements of the Human Rights approach and its value to Social Work: Respecting principles of Equality and non-Discrimination; incorporating the Gender perspective.
- The Right to Development: Application to International Agencies and NGOs; ensuring participation of service users; accountability of service providers and empowerment of all stakeholders.
- Applying Human Rights approach to Advocacy in the context of Social Work: Legislation; funds to respond to identified social needs; follow-up; public campaigns; networking.

Reading List:

- Youth for Human Rights (2010). What are human rights?
<http://www.youthforhumanrights.org/what-are-human-rights.html>
- Ife, J. (2001). Local and global practice: Relocating social work as a human rights profession in the new global order. *European Journal of Social Work*, 4(1), 5-15.

- United Nations. (1948). The Universal Declaration of Human Rights. Retrieved from <http://www.un.org/en/documents/udhr/>
- United Nations. (1994). Human rights and social work: A manual for schools of social work
 - and the social work profession. Geneva: United Nations Centre for Human Rights.
- Ife, J. (2012). Human Rights and Social Work: Towards Rights based Practice, CUP: London.
- Reichert, E. (2011). Social Work and human Rights: A Foundation for policy and practice, Columbia University Press.
- Lundy, Colleen (2011). Social Work, Social Justice and Human Rights: A Structural Approach to Practice. University of Toronto Press.
- Mullaly, Bob. () Challenging Oppression and Confronting Privilege, OUP.
- Wronka, Joseph. M. () Human Rights and Social Justice: Social Action and Service for the Helping and Health Professions, Sage publications.
- Hokenstad, Healy, M. and Segal, Uma A (2013). Learning to Teach, Teaching to Learn.

Course Title: SOCIAL WELFARE ADMINISTRATION

Course Code: SWCP – 05

Level: MSW (II)

Objectives:

- To have conceptual clarity about social welfare Administration.
- To understand the principles, structure and functioning of the social welfare Administration system in India.
- To understand the role of voluntary agencies/NGOs in social welfare administration.

Unit – I: Concept: Administration

- Evolution, Meaning Nature, Bureaucratic Human Relations, Philosophy of Social

Welfare Administration, Distinction between Welfare Administration and Public Administration.

- Structure of Social Welfare Administration in India: Departmental Administration in the Government of India; Ministry of Social Justice and Empowerment; Ministry of Women & child Development; Ministry of Rural Development; etc.

Unit – II: Principles and Techniques

- Planning: meaning and process.
- Organizing: Meaning, types of organizational structure, Delegation and Decentralization, Personnel Policy of the organization.
- Staffing: Recruitment and selection process, Terms and conditions of service Probation, confirmation, promotion, Human Relations in Social Welfare Agencies,
- Budgeting: Formulation, controlling mechanism, Problems of budgeting in welfare agencies.
- Commitment of Personnel.

Unit – III: Voluntary Agencies/NGOs

- Voluntary agencies/NGOs in Social Welfare: mandate, role and functioning.
- Administrative structure of voluntary Agencies/NGOs: General Body, Board of Management / Executive Committee, Directors, Secretary Policy formulation, Fund raising, public relations, challenges.
- Voluntary Organizations in the Welfare Section: Helpage India, Child Relief and you, Spastic Society of Northern India, etc.

Unit – IV: Institutions of Social Welfare

- Structure & functions of Central Social Welfare Board.
- State Social Welfare Advisory Board.
- Rehabilitation Council of India
- National Commission for Scheduled Tribes, National Commission for Scheduled Castes, National Commission for Minorities, etc.
- National Institute of Social Defense.

- National Institute of Public Cooperation & Child Development (NIPCCED) etc.
- Welfare Schemes of the various departments of the government of Odisha and the Department for SC,ST, OBC and Minorities Development.

Reading List:

- Choudhry Paul, Social Welfare Administration
- Sharma Urmila & Sharma S K: Public Administration, Atlantic Publishers and Distributors New Delhi.
- Arora Ramesh K. and Goyal rajni, 1995, Indian Public Administration Institutions and Issues: Viswa Prakashan, New Delhi.
- Ramachandran Padma, 1996, Public Administration in India: National Book Trust New Delhi.

Course Title: SOCIAL WORK RESEARCH AND STATISTICS

Course Code: SWCP-06

Level: MSW (II)

Objectives:

- To develop understanding about the components involved in the social work research methodology.
- To improve the ability to link between practice, research, theory and their role in enriching one another.
- To make students understand the importance of statistical tools and techniques and help them to arrive at better research conclusion.

Methods of Social Work Research

Unit-I

Social Work Research: Meaning and Objective. Ethical, Political and cultural context of Social Work research. Social Work research fields: professional practices research, contextual research, system research, trend research, community based participatory research. Qualitative vs. Quantitative research. Research process:

Feasibility issues influencing the research process. Research problems, questions, variables and hypotheses: Conceptualisation and operationalization. Critiquing knowledge bases and reviewing the literature.

Unit-II

Research Design: Matching design to purpose. Designs for evaluating policies, programs & practices: Single Subject Design, Case studies, Survey design, Experimental and Quasi experimental design. Finding research subjects: Sampling: Probability and non probability sampling. Sources of data and data collection techniques: Observation, Interview, Questionnaire, Focus Group Discussion, Brain storming, Delphi method and Projective techniques. Writing research abstract and research report: components of research report.

Methods of Data Analysis

Unit-III

Qualitative Analysis: Thematic analysis, Content analysis, Triangulation, *Phenomenology, and Hermeneutical Analysis*. Quantitative Analysis: Choosing and Understanding Statistical Tests: Levels of Measurement, Descriptive Statistics- Measures of Central Tendency: Mean Median and Mode, Measures of Dispersion: Standard deviation and variances.

Unit-IV

Inferential Statistics and Hypothesis Testing: Correlation and regression analysis, hypothesis testing and test of significance. Bi-variate Statistics: t-tests, ANOVA and Chi Square. Introduction to SPSS for analyzing quantified data. Critical Reflections in Data Analysis: looking for anomalies, discussing findings, analyzing limitations and biases of the study and considering future directions for research.

Reading List:

Anderson, J. Durston H. S & Pooram (1992) Thesis and Assignment Writing; Wiley Eastern Ltd, New Delhi.

Baper, L.T. (1998) Doing Social Research, McGraw Hill, Singapore.

Bryman, Alan & Duncan Cramer (1990) Qualitative data analysis for Social Scientists, Rutledge, London.

Denzin, K Norman & Lincoln, S Yuonna., (1998), Collecting and Interpreting Qualitative Materials, Sage publications, New Delhi.

Denzin, K Norman & Lincoln, S Yuonna.(2000), Hand book of qualitative research, Sage publications, Thousand Oaks.

Gupta, S. P (1992) Elementary Statistical methods sultan chand & sons, New Delhi.

Goode & Hatt (1981) Methods in Social Research, McGraw Hill, New Delhi.

Laldas, D.K (2000) Practice of Social Research, Rawat, Jaipur.

Nachmias & Nachmias (1981) Research methods in the Social Sciences; St. Martin"s press, New York.

Richard, G., et al, (2003) Scaling Procedure –issues and applications, Sage, Thousand Oaks.

Rubin & Bobbie (1993) Research Methods for Social Work, Brooks/Cole publishing Company, California.

Fundamentals of Research Methodology and Statistics by Y. K Singh , New Age International

C.R.Kothari, Research Methodology.

Mukarji Nath Ravindra, Social Research and Statistics, Vivek Prakashan, Delhi.

Kapoor B.K. & Gupta, S.C., Fundamental of Statistics, S. Chand Publication, New Delhi.

Ramchandran, P. Social Work Research And Statistics, Bombay : Allied Publishers

Gupta, S.P, Statistical Methods, Sultan Chand & Sons

Swain A.K.P.C, A First Course in Statistics With Applications, Kalyani Publishers

Patri, D., Statistical Methods, Kalyani Publishers

Bhatnagar, O.P. Reserach Methods And Measurements In Behavioral And Social Sciences, New Delhi, Agri Cole Publishing Academy

Dwivedi R.S. Research Methods in Behavioral Sciences. Delhi, Macmillan

D'cruz, Jones, Social Work Research

Ahuja Ram, Research Methods

SPSS for Social Scientists By Robert L. Miller, Ciaran Action, Deirdie A. Fullerton And John Maltby.

The SPSS Book: A Student Guide To The Statistical Package For The Social Sciences By Matthew J Zagumny

SPSS For Windows Step-By-Step: A Simple Guide And Reference By Paul Mallery And Darren George

Discovering Statistics Using SPSS by Andy Field

Drake, Brett, and Melissa Jonson-Reid. 2007. *Social work research methods: From conceptualization to dissemination*. Boston: Allyn and Bacon.

Grinnell, Richard M., and Yvonne A. Unrau, eds. 2007. *Social work research and evaluation: Quantitative and qualitative approaches*. 8th ed. New York: Oxford Univ. Press.

Rubin, Allen, and Earl R. Babbie. 2007. *Essential research methods for social work*. Belmont, CA: Thomson Brooks Cole.

Rubin, Allen, and Earl R. Babbie. *Research Methods for Social Work*. 6th ed. Belmont, CA: Thomson Brooks Cole, 2008.

Light, R. J., and D. B. Pillemer. 1984. *Summing up: The science of reviewing research*. Cambridge, MA: Harvard Univ. Press.

Course Title: CHILD PROTECTION AND CHILD RIGHTS

Course Code: SWCP – 08

Level: MSW (III)

Objectives:

- To understand the situation of children in India
- To understand the national & international efforts for child welfare
- To know the child related laws.
- To know the programmes & services for child welfare
- To understand & acquire the skills for working with children

Unit – I: Child Rights

Concept of Child Welfare and Child Rights; Demographic profile of the child in India, UN convention on the Rights of the Child, National Policy for Children(1974), National Policy on Education(1986), National Nutrition Policy (1993), National Charter for Children (2004), National Plan of Action for Children (2005) Changing trends in child welfare and protection services.

Unit - II: Problems of the Child and the response of Social Work

Social Work with: Street children, destitute, delinquent, abandoned, orphaned, child with disabilities, sexually abused child, child labour, child trafficking, children affected by natural calamity, HIV/AIDS affected and infected children, child prostitute, children in

poverty, the girl child, truant children, runaway children.

Health Problems: Causes of infant mortality and morbidity; Common childhood diseases; Development delay; Child Nutrition; Nutritional problems: PEM, Micro-nutrient deficiencies disorders, Mineral and vitamin deficiencies, Nutritional guidelines on infant and young child feeding.

Unit – III: Legal Provisions for child protection

The Constitution of India: Articles 14,15,15 (3),19 910 9a0, 21,21 (a),23,24,39(e),39(f); The Indian Penal Code, 1860: Feticide (Section 315 and 316), Infanticide (section 315), Abatement of Suicide (section 305), Exposure and Abandonment (section 317), kidnapping and Abduction (section 360 to 369),Procurement of Minor Girls (section 366-A), Selling of girls for Prostitution (section 372,373), Rape (Section 376), Unnatural sex(section 377); The Pre-natal diagnostic Techniques (Regulation and Prevention of Misuse) Act, 1994; The Juvenile Justice (Care and Protection of Children) Act, 2000; The Immoral Traffic (Prevention) Act, 1956; Child Labour (Prohibition and Regulation) Act, 1986; The Prohibition of child Marriage Act, 2006; The Commission for the Protection of child Rights Act, 2005; Protection of Children Against Sexual Offences Act,2012.

Unit - IV: Social work practice with children

Child guidance clinics; School social work; Child counselling; Life skills training; Child help lines; Adoption services; International and national NGOs working with children: UNICEF, CARE, CRY, SOS-Children's Villages.

Reading List:

- Banerjee, B. G. (1987) Child Development and Socialisation, New Delhi : Deep & Deep Publication
- Baroocha, Pramila Pandit (1999) Hand book on Child, New Delhi : Concept Publishing Com.
- Bhalla, M. M. (1985) Studies in Child Care, Delhi : Published by NIPCCD
- Bhangana. Vinita (2005) Adoption in India.
- Chaturvedi, T. N. (1979) Administration for Child Welfare, Admin, New Delhi : Indian Institute of Pub.
- Choudhari, D. Paul (1980) Child Welfare / Development, Delhi : Atma Ram & Sons.
- Deshpabhu, Rashmi (2001) Child Development & Nutrition Management, Jaipur : Book Enclave
- Ghathia, Joseph (1999) Child Prostitution in India, New Delhi : Concept Publishing Company
- Hugh, Jolly (1981) Diseases of Children, Oxford, London, Edinburgh : The English Language book society and Blackwell Scientific Publications

- Hurlock, Elizabeth B. (1968) Child Development, New Delhi : Tata McGraw Hill Pub; Com; Ltd.
- Rani, Asha (1986) Children in Different situations in India- A Review, TISSS.
- UNICEF, State of Worlds Children Annual Report
- Venkatesan S.(2004) Children with Developmental Disabilities.

Course TITLE: SOCIAL WORK WITH WOMEN: ISSUES OF GENDER AND DEVELOPMENT

Course Code: SWCP – 09

Level: MSW (III)

Objectives

- Develop an ability among students to analyze the position of women in rural and tribal society and the role of the social worker thereof.
- To develop an understanding of problems specific to women.
- To be introduced to legislative protection of women.
- To understand the concept of gender in various areas of social work practice.

UNIT-I: Construction of Gender

- Socio-Cultural Concepts: Gender, Sex, Patriarchy, Masculinity and Feminism.
- Women and Society: Status of Women in Indian society (Urban, Rural, Tribal and Dalits):
- Role of Women in Socio- Economic life: Family, Marriage, Religion, Caste, Tribe, Economy, Health and Education, Environment , Women and Media

UNIT-II: Issues and Challenges of Women in India and Odisha

- Problems of Women: Dowry, Domestic Violence, Crime against Women, Immoral Trafficking, Prostitution etc.
- Maternal Health Issues: Maternal Morbidity, Maternal Mortality, Infant Mortality, Female foeticide, Women's reproductive health and rights; and Changing concepts of Motherhood: Surrogate motherhood; Family Planning: Objectives and methods.
- Community based mental health programmes with a focus on mental health needs of women.

UNIT-III: State and Women

- Social Legislation for Women : Property Rights Act under the Hindu Succession Act,1956(Sect 6,14,15,16), Property Rights of Muslim Law, Dowry Prohibition Act,1961, Family Courts 1984, The Pre-conception and Pre-natal Diagnostic Techniques(Prohibition of Sex Selection) Act 1994, The

Protection of Women from Domestic Violence Act,2005, The Indecent Representation of Women(Prohibition)Act, 1986

- Social Policies regarding Women: National Health Policy, National Education Policies,
- Provisions, Schemes and Programmes for women empowerment.

UNIT-IV: Women's Development and Social Work

- Concept of engendering Social Work and the role of the Social Worker.
- Applications of Social Work methods for Women empowerment and Development.
- Political Empowerment of Women: Participation of Women in National Movements; Women in National and Regional politics, Panchayati Raj Institutions and Urban Local bodies.

Reading List:

- Brook E and Davis, Ann (1985) Women, The family and Social Work, London.
- Samanta, R.K (2005) Empowering Rural Women and Issues, Opportunities and Approaches, B.R world of books
- Saxena,S(2005) Crimes against Women and Protective laws, Deep and Deep Publications, Pvt.Ltd. New-Delhi
- Paul chowdhry, D Women welfare and Development(A Source Book) Inter-India Publication, New-Delhi 1991
- Agarwal Sushila, Status of Women, Print well Publisher, New-delhi.
- Bodra Gomati, Empowerment of Tribal Women
- Baig, Tara Ali Women In India, Ministry of information and Broadcasting, Govt. Of India Publication Division, New Delhi
- Agrawal Bina, Gender And Legal Rights in Landed Property in India, Kali for Women.
- Bhargava V. Durvar, Mental Health from a Gender Perspective, Sage publication.
- Gore,M.S: Urbanisation & family Change, popular Prakashan, Bombay, 1986.
- Agarwal, R.K. Hindu Law-central Law Agency, Allahabad.
- Adhikari, A.K and Pramanik: Gender inequality and Women's empowerment, Abhijeet Publication,2006
- Sikligar, P.C:Empowerment of Tribal Women, Jaipur Mangal Deep Publications,2006.

Course Title: ETHNIC SENSITIVE SOCIAL WORK PRACTICE IN INDIA

Course Code: SWCP - 10

Level: MSW (III)

Objectives:

- To tune Social Work Practice to the values and dispositions related to the social background of the client and the behavior of the larger social system, to work towards social justice and human liberation.

UNIT – I: What is Ethnic Sensitive Practice (ESP) in Social Work?

- Definition, conceptual formulation and perspectives on ethnic sensitive practice.
- Assumptions and principles for ethnic-sensitive practice.
- The layers of understanding in ethnic sensitive practice.
- Ethnic sensitive practice with displaced populations, migrants, families, communities, students, etc.

UNIT – II: The Ethnic Scenario in India

- The Schedule Tribes (ST), particularly vulnerable tribal groups (PVTGs) and Denotified Tribes: Demographic profile, their education, health, employment and economic status.
- The Scheduled Castes (SC) and other Backward Castes (OBC): Demographic profile, their education, health, employment and economic status.
- An analysis of the caste system, and the practice of untouchability.
- Ethnic based discrimination in India with respect to public services, government schemes and employment programmes etc.
- An analysis of industrialization, urbanization, liberalization, privatization, globalization, development projects and their impact on STs and SCs land alienation, loss of forest rights, displacement, socio-cultural loss, poverty and impoverishment, indebtedness, psychological issues.

UNIT – III: Constitutional Safeguards Legal Provisions and Policies

- The Preamble, The Directive principles of state policy ensuring social safeguards: Articles 17,23,24,25,(2)(b); Economic safeguards: Articles 46, 23, 24, 244, 275(I), fifth schedule, sixth schedule; Education and cultural safeguards: Articles 15 (4), 29 (i), 350 A; Political safeguards: Articles 164 (I), 330, 332, 334, 371 A, 371 B, 371 C, 371 C, 371 F, 371 G, 371 H. Service Safeguards; Article 16 (4), 16(4a), 335, 320 (4); To ensure these safeguards Articles 338 and 338A provide for two statutory commissions: The National commission for Scheduled Castes and the National Commission for Scheduled Tribes.
- Protective Legislations: The Protection of Civil Rights (PCR) Act 1955; The Scheduled Castes and Scheduled Tribes (Prevention of Atrocities): POA Act, 1989; The Orissa Scheduled Areas Transfer of immovable property (by ST) Regulation (1956); The Orissa Land Reforms Act (1960)
- Schemes of the Ministry of social justice and empowerment; Scheduled Caste Sub Plan (SCSP) and Schedule Tribe Sub Plan (STSP) introduced since the sixth Five Year Plan.

UNIT – IV: Strategies for Social Workers to Work for Social Justice and Rights

- Identifying the sources and dynamics of injustice, discrimination and oppression.
- Adopting the layers of understanding in ESP in all fields of social work practice.
- Adopting 'radical' change oriented methods such as: advocating human rights, affirming core social work values, affirming politics of social justice and human liberation, facilitating critical consciousness, participatory-democratic egalitarian social movements.

Reading List:

- Denove.W and Schlesinger E.G, (1999) Ethnic-Sensitive Social Work Practice.
- Yil. David. G, (1998), Confronting Injustice and Oppression.
- Thorat S.K. (2009) Dalits in India: Search for a Common Destiny.
- Thorat S.K. and Newman Kathernic S., (2010) Blocked by Caste: Economic Discrimination and Social Exclusion in Modern India.
- Constitution of India

- Website of Ministry of Social Justice and Empowerment, Government of India.
- Munshi. Indra, (2007) Adivasi Life Stories: Contexts, Constraints, Choices, Rawat Publication.
- Jain, P.C. 1991. Social Movements among Tribals, New Delhi: Rawat Publications.
- Singh K.S. (ed.). Tribal Movements in India, Vol. I & II;
- Singh, J.P. & Vyas. M.N. Tribal Development: Past Efforts and New Challenges.
- Alinsky Saul, Rules for Radicals. Vintage Books Edition, 1972
- VirginiusXaxa (2003), "Tribes in India," The Oxford India Companion to Sociology and Social Anthropology, (Ed) Veena Das, New Delhi: Oxford University Press,
- Baviskar, Amita. 1997. "Tribal Politics and the Discourses of Environmentalism," Contributions to Indian Sociology, Volume 31, Number 2.
- Abbi, Anvita. 2102. Chapter 13, "Declining Adivasi Knowledge Systems and Killing of Linguistic Diversity," Social Exclusion and Adverse Inclusion: Development and Deprivation of Adivasis In India, (Editors) Dev Nathan and VirginiusXaxa, Oxford University Press, 2012.
- Jean Dreze, Meera Samson and Satyajit Singh. 1997. Chapter 2, "Resettlement Politics and Tribal Interests," Dam and the Nation: Displacement and Resettlement in the Narmada Valley. New Delhi: Oxford University Press.
- Dev, Nathan. 2012. Chapter 17, "Displacement and Reconstruction of Livelihoods," and Chapter 18, "Community Representatives" Views on Development Processes," Social Exclusion and Adverse Inclusion: Development and Deprivation of Adivasis in India, (Editors) Dev Nathan and VirginiusXaxa, Oxford University Press, 2012.
- Xaxa, Virginius. 2008 "Protective Discrimination: Why the Scheduled Tribes Lag Behind the Scheduled Castes," State, Society and Tribes, New Delhi: Pearson Education.

Course Title: RIGHTS OF PERSONS WITH DISABILITIES AND THEIR REHABILITATION

Course Code: SWCP – 11

Level: MSW (III)

Objectives:

- To facilitate basic understanding about person living with disability
- To disseminate information about the variety of policies and programmes targeting to include persons with disabilities.
- To develop understanding on the possible rehabilitation measures.
- To develop insight into the workable models of interventions for inclusion of persons with disabilities.

UNIT – I: Understanding Disability

- Definition, types, magnitude and causes of disabilities.
- Approaches towards disability; medical, psychological, economic-vocational, socio-political, human rights and capabilities.
- Examining the impact of disability on the quality of life of persons with disabilities in the context of their family, society and environment.
- Issues related to their daily living, education, sexuality, integration, employment, interpersonal relationships, marriage and the need for social work intervention.

UNIT – II: Role of the Social Worker in the Rehabilitation and Inclusion of the Disabled

- Assessment treatment and rehabilitation of persons with disabilities through a multi-disciplinary team including the social worker.
- Inclusion of persons with disabilities in schools and educational institutions.
- Skill development and vocational rehabilitation of persons with disabilities.
- Equality of opportunity and treatment in employment and occupation of persons with disabilities.

UNIT – III: International Initiatives and National Legislations and Policies for the Empowerment of persons with disabilities

- UN Initiatives: UN convention on the rights of persons with disabilities 2006; Un standard rules on the equalization of opportunities for persons with disabilities (1993); and Darter Framework for Action.
- ILO Initiatives for enhancing support to vulnerable groups including the disabled: Global employment agenda(2003); Declaration on social justice for fair globalization 92008); Global jobs pact (2009); ILO code of practice on managing disability in the workplace (2002)
- National Legislations: Rehabilitation Council of India Act, 1992; Persons with disabilities (equal opportunities, Protection of rights and full participation Act, 1995; National Trust for Welfare of Persons with Autism, Cerebral Palsy, Mental Retardation and Multiple Disability Act, 1999; The Rights of Persons with Disabilities Bill, 2011.
- National Policies:
 - National Policy for Persons with Disabilities (2006): Physical rehabilitation, Educational rehabilitation and Economic rehabilitation.
 - Guidelines for: Issue of disability certificates; evaluation of various disabilities and procedure for certification; space standards for barrier free built environment for disabled and elderly persons.
 - Identified posts for persons with disabilities -2007.

UNIT – IV: Role of Social Work

- Intervention strategies at individual level: counselling, building support groups, assertiveness training;
- Intervention strategies at family level: Parent counselling, parent training and family crisis intervention.
- Intervention strategies at community level: Community education, community based rehabilitation
- Intervention strategies at policy making level: Advocacy in legislative and policy making bodies; research and influencing public opinion.

Reading List:

- Ministry of Social Justice and Empowerment;
<http://www.socialjusticenic.in/policies/acts3.php>

- Bhumali.Anil,(2009) Rights of disabled women and children in India, serials publications, New Delhi.
- Hans. Asha and patri.A (2003) Women Disability and Identity sage, New Delhi
- Mukhrjee, Manjumohan(2006) Problems of Disabled People, Associated Publishes, India.
- Kanna. G.N. (2001), Disability Studies in India-Retrospect's and prospects Gyan Publishing house, New Delhi.
- Buckup, s. (2009), The Piece of exclusion; The economic consequences of excluding people with disabilities from the world of work. Employment sector working paper No. 43 (genevalLO)
- O'Reilly, A. (2007) The right to decent work of persons with disabilities (geneva ILO)
- Davis, Lennard. J. (1999) The Disability Studies Reader, Routage, NY
- Shapiro, Joseph P. (1993) No Pity: People with Disabilities Forging a New civil Rights Movements.

Course Title: COMMUNITY HEALTH AND SOCIAL WORKERS

Course Code: SWCP – 12

Level: MSW (III)

Objectives:

- To understand the basic concepts related to Health and its importance.
- Identify and understand the changing health needs of ever-changing community and organize relevant effective interventions for amelioration of health problem.
- To develop students' appreciation and a commitment to healthy and socially just ways of living.
- To develop student's knowledge and understanding about ways of enhancing personal and community health and wellbeing.

UNIT – I: Concepts of Health & Nutrition

- Definition & type (Physical & Mental) of health and its dimensions; appreciation of health as relative concept; determinants of health, changing concepts of health.
- Characteristics of agent, host and environmental factors in health and disease.
- Health situation in India and Odisha-especially the demography, mortality and morbidity profile and the existing health facilities in health services.
- Mental Health- concept, community based mental health programmes.
- Nutrition- definition, concept, balance diet nutritive values and food items.
- Genetically Engineered and modified foods.

- Nutritional Assessment and monitoring.

UNIT – II Epidemiology

- Epidemiology: definition, concepts and its role in health and disease, public health-concept & importance
- Definition of the terms used in describing disease, transmission and control.
- Epidemiology of specific diseases: Communicable and non-communicable diseases, symptoms causes and prevention of disease caused by virus: measles, chickenpox, polio, & leprosy, disease caused by bacteria: diphtheria, typhoid, tuberculosis, plague, dengue, hepatitis. disease caused by parasites: Malaria, scabies, intestinal worms. Preventive & Social Medicine: concept, meaning, programmes for controlling communicable diseases.

UNIT – III Environmental Health

- Awareness of the concept of safe and wholesome water.
- Awareness of the requirements of a sanitary source of water.
- Understanding the methods of purification of water on small scale with stress on chlorination of water.
- Disposal of solid waste, liquid waste, both in the context of urban and rural conditions in the country.
- Problems in the disposal of refuse, sullage and sewage.
- Role of social worker in environmental health.

UNIT – IV Community Health and Role of Social Work

- Primary Health Care Services: organizations & functions
- Medical Social Work: meaning nature & scope
- Health Care in Rural and Urban areas of Odisha:
- Role & Functions of Social Worker in hospital setting and community health: individual, family and community level; communication tools and techniques.

Reading List:

- Park J. E. and Park K.: Textbook of Preventive and social Medicine Banarasi Das Bharat Publishers, Jabalpur.
- Bedi, Yash Pal (1979) Social Preventive Medicine, Atma Ram and Sons; New Delhi.
- VHAI – State of India's Health.
- Shah. Ghanshyam (1997) Public Health and Urban Development, Sage; New Delhi.

- Werne. David (1994) where there is no Doctor, VHAJ.
- Sinha. A.K, (ed) (1997) Human Health and Environment, Vol. I & II, APH Publishers: New Delhi.
- John Webb (2002) Medical Social Work: The Reference Book, Trafferd Publishing.
- Gehlert, Sarah and Browne. Teri (Ed) (2011) Handbook of Health Social Work Wiley Publication.

Course Title: SOCIAL MANAGEMENT

Course Code: SWCP – 13

Level: MSW (III)

Objectives:

- To understand the eco system of communities and their market landscape to help community based organizations engage with a market based economy.
- To help build the capability needs of communities towards self reliance through sustainable community enterprises.
- To help gain fundamental principles of Management.

Unit I: Understanding the community and deciphering the market

- The village social structure: relationship between social groups, communication patterns, processes of exclusion and inclusion, culture and Social value base.
- Identifying community resources: social capital, natural resources, common- property resources, education, health & employment status.
- Institutions in the community: Social institutions, formal community based institutions for eg: clubs, SHGs, village Council, etc; PRI; Administrative Structure from Block to District level; Educational Institutions; Health and Medical Institutions
- The local market economy: Money Lenders, Small & Large traders, entrepreneurs, corporations and companies; key factors of Local Market Economy: Market Boundaries; Market Values; Market Values Chains.
- Need Assessment and mapping of village resources, producers and institutions study of the community.

Unit II: Operations and Marketing Management

- Operations Management in the context of community based enterprises- organizations: product design, process selection and design, capacity decisions, location and layout decisions, sowing, transformation and storage, quality of inputs and finished products, material handling and logistics.
- Farm, Forest and Livestock resources and their conversion to products: process & risks involved. Tools for process mapping and mapping a supply chain.
- Agricultural Products: Types and issues, value addition, pricing and distribution; Agricultural Product Buyers: Retail and Wholesaler, Consumers, Customers and key buyer characteristics.
- Key aspects of sales, marketing and planning; Negotiation and selling techniques.

Unit III: Accounting and Finance

- Accounting: Need, Meaning and objectives; role of an accountant; uses of accounting information; Origin and analysis of business transactions; accounting equation.
- Financial Statements: Balance sheet, Income statement; Recording business transactions: Double entry system, the T-accounts, principles and conventions of accounting, journal entries.
- Books of accounts: Cash book, ledger, sales register, etc; posting of transactions in books
- Trial balance: closing and balancing of accounts; locating and correcting errors; preparation of balance.
- Bank transactions and bank reconciliation: need for reconciliation, causes of difference in passbook and cash book balance, procedure for bank reconciliation statement.
- Distribution of profit: determination of distributable surplus; basis of distribution.

Unit IV: Planning and Budgeting

- Levels of Planning: Village level, cluster level community enterprise / organization level
- Planning for distribution of responsibilities among community based leaders / coordinators / facilitators.
- Planning for Product basket, their local value addition for greater shelf-life and for sale in local markets.
- Planning for marketing.
- Developing proposals considering resources, cost and time budget.
- Planning for Resource Generation: Internal resource generation and from external institutions Government Departments, Banks, Public and Private, NGOs and INGOs
- Planning for improving technical capabilities.

- Planning for allied services like Health, Education, etc.

Reading List:

- Implementing Community Enterprise system for Sustainability of Agricultural Communities: A Manual, Nayak, Amar KJR (2012)
- A Proposal for Holistic Development at a GP Level for Long Term sustainability of Small and Marginal Farmers/Producers in the GP. Amar KJR Nayak (2011)
- Ongoing Programmes & Schemes of the State Government and the Central Government, Rabindra Kumar Gouda (2012)

Course Title: SOCIAL WORK IN SCHOOLS

Course Code: SWEP – 01

Level: MSW III

Objectives:

- To understand the Rights of the Child in the context of schools.
- To acquire necessary understanding and skills to work with children in schools.

UNIT I: Conceptual framework for Social Work Practice in Schools

- Conceptual Perspectives: Social Learning Theory, General Systems Theory, Ecological Perspective
- Models of intervention: Traditional Clinical Model, The School Change model, The Community School Model, Social Interaction Model, School-Community- Pupil Relations Model

UNIT II: Context of Social Work Practice in Schools: Legislations and Policies

- UN Rights of the Child, Commission for Protection of Child Rights Act, 2005
- Constitution of India, Article 21 A, National Policy on Education (1986), National Curriculum Framework for School Education (2000), Right to Education Act (2009)
- Constitutional provisions for the education of SC, ST and religious, cultural and

linguistic minorities, policies and programmes of the Government.

- Inclusive Education policies in the V Year Plans, Integrated Education for Disabled Children (IEDC), District primary Education Programme (DPEP), Sarva Shiksha Abhijan (SSA)

UNIT III: Social Justice Issues in School

- Dealing with stereotype, bias and discrimination;
- Intervention for the vulnerable populations i.e., Challenged children, SC, ST and minority;
- Dealing with the 'Achievement gap' i.e, difference in performance between students of vulnerable and privileged backgrounds.

UNIT IV: The Role of the Social Worker

- Services to students: Dealing with social or behavioural problems (Depression, Truancy, Aggression, Trauma, Substance Abuse, Sexual Activity), poor attendance, drop-out, poor performance, offences against children.
- Services to teachers: Teacher support groups, teacher training, teaching stress;
- Services to families: Providing parent support, consultation, parenting skill classes, family programming; organizing financial support for vulnerable families;
- Services to the community: Community outreach, community involvement, village Education Councils.

Reading List:

- Allen- Meares, P., Washington, R. O., & Welsh, B. L. (1996). Social Work Services in schools. 2nd ed. Boston: Allyn & Bacon.
- Dupper. David, (2003). School Social Work: Skills and Intervention for Effective Practice, John Wiley and Sons, NJ.
- Bye. Lynn and Alvarez. Michelle (2006). School Social Work: Theory to Practice, Cengage Learning.
- Germaine. Carel B and Bloom Martin (2008). Human Behaviour in the Social Environment: An Ecological View. Columbia University Press, New York.
- Greene. Roberta R,(2010) Human Behavior Theory and Social Work Practice (Modern Applications of Social Work), Transaction Publishers, New Brunswick, New Jersey.
- Journal of School Social Work(JSSW), Chennai, India.

- NCPCR, Protection of Children against Corporal Punishment in Schools and Institutions,
- http://www.ncpcr.gov.in/Reports/Protection_of_Children_against_Corporal_Punishment_in_Schools_and_Institutions_December_2008.pdf
- NCERT (2000). *Assessment of Needs for Inclusive Education: Report of the First Regional Workshop for SAARC Countries*. New Delhi: NCERT
- Mohapatra, C. S. (2004). *Disability Management in India: Challenges & Commitments*. New Delhi: National Institute for the Mentally Handicapped (NIMH) and the Indian Institute of Public Administration.
- Mishra, A. (2000). "India: Special Education", in C.R. Reynolds, and F.E. Janzen (eds), *Encyclopedia of Special Education: A Reference for the Education of the Handicapped and other Exceptional Children and Adults*, 2e. USA: John Wiley and Sons
- Ministry of Social Justice and Empowerment of India. *Annual Report* (latest), New Delhi: GOI
- Ministry of Human Resources Development (MHRD). *Annual Report* (latest). New Delhi: GOI
- Ministry of Human Resources Development (2000). *Sarva Shiksha Abhiyan : Framework for Implementation*, Department of Elementary Education & Literacy, New Delhi; GOI
- Five Year Plans: <http://www.planningcommission.nic.in/plans/planrel/fiveYr/7th/vol2/7v2ch10.html>.
- Department of Education (1986). *National Policy on Education*, 1986. New Delhi: MHRD, GOI
- Department of Education (2000). *Sarva Shiksha Abhiyan: A Programme for Universal Elementary Education*. New Delhi: MHRD, GOI.

Course Title: WORKING WITH WOMEN

Course Code: SWEP – 02

Level: MSW III

Objectives

- Develop an ability among students to analyze the position of women in rural and tribal society
- Acquire understanding on problems relating to women

- Develop in them a critical understanding about the schemes related to women

Unit-1

Status of women in rural and tribal community - in the context of family

marriage, religion and economy. Sexual division of labor its impact on health, education, illiteracy, adjustment, malnutrition, early marriages.

Unit-2

Problems relating to women – dowry, domestic violence, crimes against women, female feticide, child prostitution, exploitation and abuse of domestic female lab our.

Unit-3

Women in local self government with special reference to women in decision making. Impact of 73 amendment, development schemes and women's situations, case studies of DRDA, ICDS, SHGs.

Unit -4

Role of media in projecting the images of women, women in the media- print media, radio, films, television, and advertisement and publicity, Media and self employed women

Reading List:

- Paul chowdhry, D. Women welfare and development (A source book) ; Inter-India Publication, New Delhi -1991
- Sushila Agarwal , Status Of Women Printwell publishers, Jaipur, 1988
- Pandit, S.K. Women in Society, Rawat Publications, New Delhi 1998
- Brook E and Davis, Ann (1985) Women, The family and Social Work, London.
- Samanta, R.K (2005) Empowering Rural Women and Issues, Opportunities and Approaches, B.R world of books
- Saxena, S(2005) Crimes against Women and Protective laws, Deep and Deep Publications, Pvt.Ltd. New-Delhi
- Paul chowdhry, D Women welafarae and Development(A Source Book) Inter-India Publication, New-Delhi 1991
- Agarwal Sushila, Status of Women, Print well Publisher, New-delhi.
- Bodra Gomati, Empowerment of Tribal Women
- Baig, Tara Ali Women In India, Ministry of information and Broadcasting, Govt. Of India Publication Division, New Delhi
- Agrawal Bina, Gender And Legal Rights in Landed Property in India, Kali for

Women.

- Bhargava V. Durvar, Mental Health from a Gender Perspective, Sage publication.
- Gore, M.S: Urbanisation & family Change, popular Prakashan, Bombay, 1986.
- Agarwal, R.K. Hindu Law-central Law Agency, Allahabad.
- Adhikari, A.K and Pramanik: Gender inequality and Women's empowerment, Abhijeet Publication, 2006
- Sikligar, P.C: Empowerment of Tribal Women, Jaipur Mangal Deep Publications, 2006.

Course Title: Working with Alcoholics and Substance Abusers

Course Code: SWEP – 03

Level: MSW (III)

Objectives:

- To facilitate basic understanding about substance abuse
- To disseminate information about addiction to alcohol.
- To develop understanding about the role of social worker in rehabilitation.
- To develop insight into the role of counseling among alcoholics and substance abusers.

UNIT – I: Basics on Substance Abuse

- Substance abuse and dependence: Meaning, Definition, nature and extent of the problem in India and Odisha.
- Types of Addictive Substances: Natural, Synthetic, Narcotics, Stimulants and depressants.
- Symptoms, short term and long term impact of substance abuse.

UNIT – II: Addiction to Alcohol

- Alcohol dependence and Alcoholism: Causes, symptoms, long-term and short-term effects.
- Impact of Alcoholism on Individual, Community and Family.
- Concept of social drinking, alcoholic and relapse.

- Phases of alcohol addiction.
- Social and economic implications of addiction.
- Alcoholism among Youth-causes and remedies.

UNIT – III: Role of Social Workers in rehabilitation

- Role of Social Worker in Preventive, curative and Rehabilitative services for substance abusers.
- Multidisciplinary Approach services for substance abusers.
- Legislation Provisions and Government programmes to control drug abuse in India.

UNIT – IV: Role of counseling

- Concepts of counselling and its association with addiction; approaches to counseling: Psychoanalytical, client centred therapy. Indigenous approaches of help and self help: Yoga, Meditation, Attitude and Values, Counselling as an treatment method for substance abusers.

Reading List:

- Chopra, R.N. and Chopra, F.C., 1965: Drug Addiction with Special Reference to India, New Delhi Council of Scientific and Industrial Research.
- National Institute of Social Defence, Govt. of India, 1992: Drug Abuse.
- Single, Eric. Et. Al, 2003: International Guidelines for Estimating the Costs of Substance Abuse and Addiction.
- Delaney and Eisen Berg, 1973: The counseling Process.
- Singh, Chandra Paul, 2000 Alcohol and Drug Dependence Among Industrial Worker, Delhi Shipra Publications.
- Kaur, Ravneet and Gulati, J.k., 2007: Drug Abuse: Trends and issues, International Marketing Conference on Marketing & Society, IIMK.
- Ahuja, R, College Youth and Drug Abuse: A Sociological Study of Nature and Incidence of Drug Abuse among College and University Students, University of Rjasthan Jaipur

- Gupta, R. Punjab a drugged State, Meditrack.
- Chopra, L.C. and R.N., Chopra 1957,; The use of Cannabis Drugs in Inda. Bulletin on narcotics (United Nations Publication)
- Mohan, D.A.K. Pravakar and P.N. Sharma: Prevalence and pattern of drug abuse among Delhi University students, Indian Journal of Medical Research.
- Ropar, C 2006: Social Use, abuse and addiction-site of the author University of Tekas, Austin.
- Horgan C. Substance abuse: The Nation's number one health Problem, Princeton NJ; The Robert Wood Johnson Foundation.

Course Title: CORRECTIONAL SOCIAL WORK

Course Code: SWEP – 04

Level: MSW (III)

Objectives:

- To understand crime and delinquency as a social problem.
- To study and understand the basic elements of correctional methods and approaches.
- To gain knowledge of legal provisions.
- To study and identify the practices of non-institutional services.
- To acquire skills of correctional social work and understand the role of professional social workers in correctional institutions.

Unit- 1: Crime in the context of Social problem

- Crime: Concept, Theories of Causation, Classification of crime and approaches to deal with crime and criminals.
- Crime in India and Odisha: crime against women, crime against children, Atrocities against Scheduled Castes and Scheduled tribes; Emerging patterns and trends.
- Juvenile Delinquency: Concept, Demography, Theories of causation and approaches to delinquency prevention.

Unit- 2: Criminology and Criminal Justice System

- Concept of criminology; Social, Psychological and Legal approaches
- Courts and correctional administration. Hierarchy of courts functions and powers. Lok Adalats, Lokayukta, Legal Aid, Functions of Law Commission. Analysis of the Criminal Justice System: Police, Judiciary, Prisons and Correctional Services.

Unit -3: Correctional Administration and Services

- Institutional services: Prison, observation homes, special homes, beggar homes, rescue homes, short-stay homes, protective homes, half-way homes, de-addiction centers.
- Community based corrections and non-institutional services: Early diversion and de-institutionalization, probation and parole, adoption, foster care, child guidance centers, family counselling, crisis intervention, after-care rehabilitation and reintegration of offenders; community po.

Unit- 4: Correctional Social Work

- Definition, history, philosophy: Retribution, Restitution, General Deterrence, Special Deterrence Incapitation, Just Desserts ,objectives, methods and approaches of contemporary correctional social work: Probation and Parole, Alternative to Capital Punishment.
- Correctional Social Work in India; role of professional social workers in correctional institution, crime prevention and rehabilitation of offenders: supervision, surveillance and counselling; skills unique to correctional social work; limitations of correctional social work.

Reading List:

- Gupta, M.C. & K. Chockalingam, J. Guha Roy (2001) Child Victims of Crime: Problems and Perspectives. New Delhi, Gyan Publishing house.
- Ahuja Ram. (1996) Youth and Crime. Jaipur, Rawat Publications.
- Tripathy, P. C. (2000) Crime against Working Women, APH Publishing Co., New Delhi.
- Dabir, Neela & Nigudjar, Mohua. (2005) Children in Conflict with Law. Mumbai, TISS.
- Coleman, Clive. (2000) Introducing Criminology, Willan Publication, UK

- Ahuja, Ram. (2000) Criminology, Rawat Publication, New Delhi
- Siegal, Larry J. (2000) Criminology, Wadsworth Thomson Learning, New Delhi
- Schmalleger, Frank. (1999) Criminology Today: An Integrative Introduction 2nd edition, Prentice Hall, New Delhi
- Alan Vand, K. Criminal Justice System – Readings
- Mehraj-ud-din, Mir, (1984) Crime and Criminal Justice System in India, Deep & Deep Publications, New Delhi
- Choudhuri, Mrinmaya. (1995) Languishing for Justice: Being a Critical Survey of Criminal Justice System, Datt Sons, Nagpur
- Chakrabarti, N. K. [Ed.] (1997) Administration of Criminal Justice (Vol.1.). New Delhi. Deep and Deep Publications.
- Robert M Carter, Daniel Glaser, Leslie T Wilkins, (1985) Correctional Institutions, Harper & Row Publishers Inc.
- Siddique, A. (1983) Criminology, Lucknow, Eastern Book Co.
- Smykla, J. Community based Corrections.
- Bartollas Clemens, (1985) Correctional Treatment: Theory and Practice, Prentice hall, New Jersey
- Panakal, J. J & Gokhale, S. D. (1989) Crime and Corrections in India, Mumbai, TISS

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Course Title: COUNSELLING IN SOCIAL WORK

Course Code: SWEP – 05

Level: MSW (III)

Objectives:

- To develop a holistic understanding of counseling as a tool for help
- To acquire knowledge of various approaches, their theoretical under-pinning for goals, values, process and techniques
- To develop skills of application to real life situations
- To develop ability to recognize and synthesize attitudes and values the enhance investment of self in the counselor's role

- To develop ability to use the tools/scales in various settings

Unit – I:

Introduction to Counseling: Meaning, Definition, Need and importance of counseling and professional counseling. Basic principles of Counseling: Participation, Individualization, Confidentiality, communication, acceptance, self confidence, self awareness and other principles governing the counseling relationship. Components of effective counseling: Personality of the counselor's skills – Role and functions of the counselors in schools, industries, family, hospital and rehabilitation institution

Unit – II:

Types of counseling – Individual and group Counseling, Family Counseling, Marital Counseling, Student Counseling and Industrial Counseling, E-Counseling: concept, conditions and importance of E-counseling; Techniques of group counseling, strategies and structure – barriers to effective counseling sessions; Counseling evaluation.

Unit – III:

Theories of counseling: Psychoanalytic, Adlerian, Client centered, Behavioural, Rational emotive, Reality, Gestalt, Transactional analysis and eclectic Theories.

Unit – IV:

Counseling process, Interview and its significance in counseling – Use of observation in counseling and understanding of emotions in counseling. Transference and counter transference. The following standardized tests must be practiced in counseling settings. Personality, intelligence, interpersonal relations, stress, anger, self esteem, anxiety, assertiveness, depression, adjustment, mental health and family intensive. Counseling in different settings: HIV/AIDS counseling, Alcohol and Substance dependence counseling and Trauma counseling.

Reading List:

- Burnett. J. : Counseling with young people
- Fred Machinery : Counseling for personal Adjustment
- Shestroi Everlett, Brammer M. Lawrence : The dynamics of counseling process.
- Tpbbert, E.L. Introduction to counseling

- Colin Fertham, Controversis in psycho therapy and counseling, Sage publications, New Delhi, 1999.
- Kathryn Geldard & David Geldard, Counseling Children, A practical Introduction, Sage publication, New Delhi, 1997.
- Fullmer, D.W. & Bernard H.W: Counseling content and process
- Harms E & Schreiber : Handbook of counseling Techniques
- Kennedt. E : On becoming a counselor – A basic Guides for non-professional counselors, Macmillan, New Delhi.
- Development theories of E.B. Harlock and Robert kegan Psychological theory(Eric Erickson, Need Hierarchy (Maslow's) Cognitive theory (Jean Piaget)

Course Title: SOCIAL WORK WITH THE ELDERLY

Course Code: SWEP – 06

Level: MSW (III)

Objectives:

- To study the basic characteristics about the elderly population
- To understand the development tasks associated with the elderly population.
- To know the various services provided at institution dealing with the elderly.
- To link social work methods in promoting welfare among the elderly.

UNIT – I: Basics about elderly

Gerontology – Definition and scope. Status of Elders in India & Odisha:- Demographic, social, cultural and economic aspects. Needs and problems of elders. Role of elders in family. Issues of Elderly in health, occupation, income retirement planning, property rights, gender issues and family supports. Constitutional guaranteed rights and policy on older persons.

UNIT – II: Developmental tasks

Developmental tasks in elderly: Issues in health care, changes in family structure, coping with aging process, challenges due to changing physiological, economic, safety, status

in the family and other issues, Healthy aging, quality of life, coping with demise of the life partner, bereavement, resolving one's death, and any other.

UNIT – III: Developmental services for the elderly

Institutional care settings for elderly: General hospitals, geriatric wards, home based care, homes for the aged, nursing homes, Day care centres, hobby centres, elder helpline, facilities for homeless elderly. Constitutional guaranteed rights and National policies on older persons. Role of National and International agencies providing developmental services to elders.

UNIT – IV: Social Work Interventions for the elderly

- Role of Social Worker in providing the legal and governmental welfare services to elders.
- Social Work intervention through Social Case Work, Social Group Work, Community Organisation and Social Welfare administration.

Reading List:

- Bali . P. Arun, 2001 Care of the Elderly in India. Shimla, Indian Institute of Advanced Studies.
- Chatterjee, S.C., Patna, Discourses on aging and Dying. New Delhi, and K.P., Charian, V. 2008., Sage Publications
- Dandekar, Kumudini. 1996 The Elderly In India, New Delhi, Sage Publications.
- Desai, Murli and Raju, Gerontological Social Work in India – Some Siva (Ed.) 2000. issues and Perspectives. Delhi, BR Publishing House,.
- Dey, A. B (Ed.) 2003 Ageing in India: Situation Analysis and Planning for the Future. New Delhi / WHO and AIIMS.
- Emmatty, Leena. M. 2008 An insight into Dementia Care in India. New Delhi, Sage Publications.
- Hurlock, Elizabeth. 1981 Developmental Psychology. 5th Edition. New Delhi, Tata McGraw Hill Publications.
- Khan M.Z. 1989 Voluntary Welfare Services for the Aged, Dept. of Social Work, New Delhi, Jamia Milia Islamia.

- Rajan, Irudaya.S., India's Elderly, New Delhi, Sage Publications. 1999.

JOURNALS.

- Indian Journal of Gerontology, C-207, Manu Marg, Tilak Nagar, Jaipur.
- R & D Journal of Helpage India . C-14, Qutab Institutional Area, New Delhi.

Course Title: DEVELOPMENT THEORIES AND STRATEGIES: ISSUES CHALLENGES AND RESPONSES

Course Code: SWCP –15

Level: MSW (IV)

Objectives:

- To be acquainted with the development discourse.
- To gain a critical understanding of the theories, models and approaches to development.
- The role of the state and the response of non-state actors to development.

Unit – I: What is Development?

- The concepts of: development, growth, human development, social development and sustainable development.
- Core values of development; Measuring development: per capita income, PQLI, choice and access, HDI, seer's criteria.
- Development and colonialism: continuity and divergence; persistence of global inequalities and dominance.

Unit - II: Theories and Models of Development

- Modernization Theory;
- Dependency Theory;
- Neoliberalism;
- Developmental State;
- Post Development

Unit - III: Theories and Approaches to Development

- Human Development;
- Capabilities Approach;

- Women, Gender and Development: WID, WAD, GAD.
- Participatory Development;
- Good Governance;
- Institutional Turn

Unit - IV: The Role of NGOs and Civil Societies and Social Movements in Development

- The failure of state-market-international aid institutions.
- NGO's and new-liberalism; Relationship of NGOs with INGOs; NGOs and the State; NGOs and the gap between theory and praxis.
- The role of Civil society in development and its relationship with the state in the Indian Context.
- The challenge of social movement to development in India.
- The Social worker as scholar- activist-practitioner.

Reading List:

- Cohen, Michael and Robert Shenton. 1995. "The Invention of Development." Pp. 27-43 in Jonathan Crush(ed), Power of Development. London and New York: Routledge.
- Esteva, Gustavo. 1991. "Development." Pp. 1-23 in Wolfgang Sachs (ed), The Development Dictionary. London: Zed Books
- Rist, Gilbert. 2002. "Definitions of Development." Pp. 8-24 in The History of Development: From Western Origins to Global Faith. London and New York: Zed Books.
- Seers, Dudley. 1972. "What are we trying to Measure?" Journal of Development Studies 8(3):21-36
- Myrdal, Gunnar. 1974. "What is Development?" Journal of Economic Issues 8(4):729-736.
- Wallerstein, I. 1984. "The Development of the Concept of Development." Sociological Theory 2:102-116
- Kothari, Uma. 2005. "From colonial administration to development studies: a post-colonial critique of the history of development studies," Pp. 47-66 in Uma Kothari (ed), A Radical History of Development Studies: Individuals, Institutions and

Ideologies. London: Zed Books

- Cooke, Bill. 2003. "A new continuity with colonial administration: participation in development management." *Third World Quarterly* 24(1):47-61
- Deutsch, Karl. 1961. "Social Mobilization and Political Development." *The American Political Science Review* 55(3):493-514.
- Lerner, Daniel. 1958. *The Passing of Traditional Society: Modernizing the Middle East*. New York: The Free Press.
- Levy, Marion. 1965. "Patterns (Structures) of Modernization and Political Development." *Annals of the American Academy of Political and Social Science* 358:29-40.
- Bernstein, Henry. 1971. "Modernization Theory and the Sociological Study of Development," *Journal of Development Studies* 7(2):141-60.
- Eisenstadt, S. N. 1974. "Studies of Modernization and Sociological Theory." *History and Theory* 13(3):225-252.
- Huntington, Samuel. 1971. "The Change to Change: Modernization, Development and Politics." *Comparative Politics* 3(3):283-322.
- Tipps, D. C. 1973. "Modernization Theory and the Comparative Study of Societies: A Critical Perspective." *Comparative Studies in Society and History* 15(2):199-226
- Amin, Samir. 1972. "Underdevelopment and dependence in Black Africa: Origins and Contemporary Forms," *Journal of Modern African Studies*. 10(4): 503-524.
- Cardoso, Fernando Enrique. 1972. "Dependency and development in Latin America." *New Left Review* 74(July/August):83-95.
- Frank, Andre Gunder. 1969. "The development of underdevelopment" *Monthly Review* 18(4):17-31.
- Chilcote, Ronald H. 1974. "Dependency: A Critical Synthesis of the Literature." *Latin American Perspectives* 1(1):4-29.
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- Against the Grain." *African Studies Review*
- Evans, Peter. 2005. "The Challenges of the 'Institutional Turn': Interdisciplinary Opportunities in Development Theory." Pp. 90-116 in Victor Nee and Richard Swedberg (eds), *The Economic Sociology of Capitalist Institutions*.
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- Raka Ray, Mary Fainsod Katzenstein (ed) 2005. *Social Movements in India: Poverty, Power, and Politics*, Rowman and Littlefield Publishers Inc.
- Shah, Ghanshyam (2004) *Social Movements in India; A review of literature*, Sage, India.
- Srivastava, S.K. (1988) *Social Movements for Development*, South Asia Books
- Rajagopal (2007) *International Law from Below: Development, Social Movements and Third World Resistance*, CUP

Course Title: SOCIAL WORK PRACTICE IN RURAL AREAS

Course Code: SWCP – 16

Level: MSW (IV)

Objectives

- To understand the issues faced by social workers in rural areas.
- To understand the skills necessary to practice in rural settings.
- To be acquainted with government plans and programmes for rural development in Odisha.

Unit – I: Rural Community Characteristics

Resources: natural resource, human resource, economic resources; Demography; Social structure; power structure; Political structure; Structure of rural economy; Governance structure; Presence of industries and external agencies; Indigenous knowledge systems; Needs of Rural communities: poverty landlessness, indebtedness, unemployment, migration, ill health, illiteracy, social exclusion, discrimination,

agriculture, forests.

Challenges to Rural Communities: Urbanization; deteriorating agriculture; changing land use SEZ; corporatization of agriculture and marginalization of small land holders; issues arising out of globalization.

Unit - II: Rural Development

Concept: nature, scope and significance; Approaches to Rural Development: Rural reconstruction approach, community development approach, sectoral development approach, area-specific and target group-oriented approach, economic development with social justice approach: Integrated rural development approach.

Rural local self government: Origin and development of the Panchayati Raj system in India; Salient features of 73rd Constitutional Amendment; Issues of Panchayati Raj: reservation, financial management, participation of political parties; Panchayati Raj institutions in Odisha- structure and functions. Five Year Plans and Rural Development Programmes. Poverty alleviation programmes in rural areas- MGNREGA, NRLM etc. Role of NABARD in Rural Development.

Unit - III: The Tribal Development Issue

Concept of Tribes, Indigenous peoples and Aborigines; Situational Analysis of Scheduled Tribes in Odisha: land, food security, employment/livelihood, displacement, migration, human development indices.

Scheduled Areas: Issues and Governance; Overview from Panchsheel, Tribal Sub- Plan and Special Component Plan; Other Significant Acts regarding Forest Rights, Resettlement and Rehabilitation.

Unit - IV: Response of Social Work

Building sustainable communities: identifying strengths, weaknesses and threats; Generalist Model of Social Work Practice: work with individuals, families, systems, clusters at the communities level; Cultural Competency: understanding the value system, diversity, cultivating sensitivity, gaining trust and building relationships; Advocating Social Justice: working with the oppressed and marginalized, reducing stereotypes/discrimination based on gender, caste, ethnic background; Political advocacy: analysing policies and programmes, working for reform of polices, increasing access and better service delivery of public services.

Reading List:

- Dubey, S.C. 1995. India's Changing Villages;

- Ganguli, B.N. 1973. Gandhi's Social Philosophy. Delhi: Vikas Publishing House;
- Gore, M.S. 1993. The Social Context of Ideology: Ambedkar's Social & Political Thought. New Delhi: Sage
- Kumar, Girish 2006, Local Democracy in India: Interpreting Decentralization, Sage Publications;
- Prasad, B. 2003. Rural Development: Concept, Approach and Strategy
- Sainath, P. One Hundred years of Drought
- Pandey, A.K. 1997. Tribal Society in India, New Delhi. Manak Publishing Ltd
- Agrawal, A.N. 2001. Indian Economy; Nature, Problems and Progress, Vikas Biraj Prakash, New Delhi
- Chamber. Robert, 1983, Rural Development: Putting the last First, Harlow, Longman.
- Datt and Sundaram, 2002, Indian Economy, S.Chand and Co, New Delhi.
- Desai, A.R., 1995 Rural Sociology in India, ISAE, Bombay
- Dube, S.C., 1965 India's changing Villages, RKP, London
- Dubashi, P.R., 2000 Rural development Administration in India, Mumbai.
- Riley John. M, 1995. Stakeholders in Rural Development, Sage: New Delhi
- Sachinanda and Purendu, 2001, 2001, Fifty years of Rural Development in India, Firma KLM Pvt. Ltd, Kolkata.

Course Title: SOCIAL WORK PRACTICE IN URBAN AREAS: MIGRATION, UNORGANISED LABOUR AND LIVELIHOODS

Course Code: SWCP-17

Level: MSW (IV)

Objectives:

- Sensitize the students to the need and problems of urban communities;
- Develop a critical understanding among the students about the programmes of urban development

Unit - I:

Urban Communities - Features and characterization; Concept of Urban, Urbanism
Urbanization – concept, causes and factors responsible for Urbanization; Urbanization
in India – Historical development, Characteristics of clusters town, city, metropolis,
suburbs, Satellite town, etc, Classification of cities. Growth of Urban settlement.

Urbanization and its impact on socio – economic development. Urbanization and
structure of Caste. Concept of Slums Dwellers, Pavement Dwellers and Refugees, their
characteristics and Problems. Changing Face of Urban communities: Infrastructural
development, Growing heterogeneity, merging of fringe villages, the “global city” and
socio-cultural and economic implications. Issues, Implications and Challenges

Unit - II:

Urban Problems – Congestion and overcrowding, Housing and slums, Environment
pollution, lack of inadequate civic amenities, etc. - causes, magnitude, impact, etc.,
Measures for alleviating these problems.

Urban Development – Meaning, need, scope and Historical evolution; planning policy
and programmes viz; slum clearance and slum improvement, Housing and Urban
development corporation; Major urban development authorities in Odisha. Urban
Community Development Programmes.

Unit – III:

Urban Informal sector Organised and Unorganised labour: Unorganised labour issues:
Migrant workers, Debt Bondage and child labour, Wage Structure and Components of
Wages of the unorganised labour, International and national labour scenario - ILO, WTO,
Privatization and role of the State: Social Security Programmes for the unorganised
labour.

Concept of Migration and characteristic of Migrants, Impact of Migration, Pattern of
Migration to cities in India.

Unit - IV:

Concept and scope of livelihood, caste and traditional livelihoods; natural resource crisis
and its impact on the livelihood of people: ecological, socio-cultural and economic
dimensions; Gender, caste and age implications on livelihood. Urban poverty and
livelihood issues; Social Work with urban communities – recent developments and future

perspectives.

Reading List:

- Aziz Abdul: Urban Poor and Urban Informal Sector, Ashish Publishing House, New Delhi, 1984.
- Bharadwai, R.K: Urban Development in India, National Book Trust, New Delhi, 1962.
- Bose Ashish: Studies in India's Urbanization (1901 to 1971), Tata McGraw Hill, New Delhi, 1973.
- Cullingworth, J.B: Problems of Urban Society, Vol 1 The Social Framework of Planning, London – George Allen and Unwin Ltd, 1973.
- Desai A.R and Pillai, S.D.(Eds): Slums and Urbanization, Popular Prakashan, Bombay.
- Diddee, Jaymala and Rangaswamy, Vimla (Eds): Urbanization – Trends Perspectives and Challenges, Rawat Publications, Jaipur 1993.
- Gangrade, K.D.: Community Organization in India, Popular Prakashan, Bombay, 1971.

Course Title: SOCIAL POLICY, PLANNING AND IMPLEMENTATION

Course Code: SWCP -18

Level: MSW (IV)

Objectives:

- Gain knowledge of policy analysis and the policy formulation process.
- Acquire skills in critical analysis of social policies and development plans.
- Develop an understanding of social policy in the perspective of national goals as stated in the Constitution, particularly with reference to fundamental right; and the directive principles of state policy.
- Critically understand the concept, content and process of social development.
- Develop the capacity to identify linkages among social needs, problems development issues and policies.
- Locate strategies and skills necessary for social development and reinforce

values of social justice, gender justice and equality.

Unit - I: Social Policy and Constitution: Concept of social policy, sectoral policies and social services- Relationship between social policy and social development-Values underlying social policy and planning based on the Constitutional provisions(i.e. the Directive Principles of State Policy and Fundamental Rights) and the Human Rights- Different models of social policy and their applicability to the Indian situation.

Unit - II: Sectoral Social Policies in India: Evolution of social policy in India in a historical perspective- Different sectoral policies and their implementation, e.g. Policies concerning education, health, social welfare, women, children, welfare of backward classes, social security, housing, youth, population and family welfare, environment and ecology, urban and rural development, tribal development and poverty alleviation.

Unit - III: Social Planning: Concept of social planning- Scope of social planning- the popular restricted view as planning for social services and the wider view as inclusive of all sectoral planning to achieve the goals fo social development-Indian planning in a historical perspective- The constitutional position of planning in India. The legal status of the planning commission- Coordination between centre and state, need for decentralization- Pancyati Raj, people participation.

Unit - IV: Social Policy Implementation and Social Work:

- Role of social policy in the Indian Development process: land reforms, PDS, employment, education, reservations.
- The social policy implementing structure in India; the lack of an integrated approach or convergence of development schemes and programmes.
- Role of social workers in social policy implementation.
- Do social workers have a major impact on social policy Implementation?

Reading List:

- Bagci, A.K. 1982 Political Economy of Underdevelopment, Cambridge; Cambridge University Press.
- Bandyopadhyay, D.1997 “People’s Participation in Planning: Kerala Experiment”,

Economic and Political Weekly, Sept. 24, 2450-54.

- Bhanti, R. 1993 Social Policy and Development in Rajasthan, Udaipur: Himnashu Publication.
- Bujmer, M,et.al., 1989 The Goals of Social Policy, London: UnwinHyman.
- Chakraborty,S.1987 Development Planning- Indian Experience, Oxford: Claredon Press.
- Dandekar, V.M. 1994 “ Role of Economic Planning in India in the 1990s & Beyond”, Economic and Political Weekly, Vol.29,No.24,1457-1464.
- Desai, V.1988 Rural Development (Vol.I) Mumbai: Himalaya Publishing House.
- Dimitto, D.M. 1991 Social Welfare: Politics and Public Policy, New Jersey: Prentice-Hall.
- Ganapathy, R.S. and Others 1985 Public policy and Policy Analysis In India, Delhi: Sage Publications.
- Ghosh, A. 1992 Planning In India: The Challenge for the Nineties, New Delhi: Sage Publications.
- Government of India Five Year Plan Documents (latest), New Delhi.
- Gupta, S.P. 1993 “ Planning and Liberalization”, Economic and Political Weekly, Vol.28 No.43, Oct.23,2349-2355.
- Jacob, K.K. 1992 Social Development Perspectives Hebsur, R.K. (Ed.) Social Intervention For Justice, Bombay: TISS.
- Huttman, E.D. 1981 Introduction to Social Policy, New York: McGraw-Hill.
- International Labour Office. 1973 Multinational Enterprises and Social Policy, Geneva, ILO.
- Jones, K.Et.al.,1983 Issues in Social Policy, London: ROutledge & Kegan paul.
- Joshi, P.C. 1976 Land Reform in India Kahn, A.E. 1973 Social Policy and Social Services, New York: Random House.
- Kulkarni, P.D, 1979 Social Policy and Social Development in India, Madras: Association of Schools of Social Work in India.
- Kulkarni, P.D.1952 Social Policy in India, New York: McGraW- Hill Book

Company.

- Kulkarni, P.D. 1975 Social Policy in India, Bombay, Tata Institute of Social Sciences.
- Leonard, P. 1997 Postmodern Welfare: Reconstructing an Emancipatory Project, London: Sage.
- Lindblom, C.E. 1980 The Policy-making Process, New Jersey; Prentice-Hall.
- Livingstone, A. 1969 Social Policy in Developing Countries, London: Routledge & Kegan Paul.
- Madison, B. Q. 1980 The Meaning of Social Policy, London: Croom Helm.
- Macpherson, S. 1980 Social Policy in the Third World, London: Wheat-sheat Brooks.
- Macpherson, S. 1982 Social Policy in the Third World, New York: John Wiley and Sons.
- Mathur, K. Bjorkman Top Policy Makers in India, New Delhi: Concept Publishing Co.
- Meadows, D.H. 1972 The Limits to Growth, New York: University Books.
- Mishra, R. 1977 Society and Social Policy, London: Macmillan Ltd.
- Mukherjee, N. 1993 Participatory Rural Appraisal; Methodology and Applications, New Delhi: Concept Publishers.
- Mundle, S. 1993 participatory Rural Appraisal: Methodology and Applications, New Delhi: Concept Publishers.
- Milliard, M. and Spicker. 1998 Social Policy in a Changing Society, London: Routledge.
- Philips, D.R. and Health and Development, London: Routledge and Verhasselt Yola (Eds) 1994 Kegan Paul.
- Rao, D.B. (Ed.) 1998 World Summit for Social Development Rao, V. "Social Policy: The Means and Ends Question" Indian Journal of Public Administration, Vol.50 No.1 Jan.-March, 1994.
- Rao, V. and Mander, H. An Agenda for Caring: Intervention for the Marginalized, New Delhi: VHAJ.
- Rastogi, P.N. 1992 Policy Analysis and Problem-Solving for Social Systems, New

Delhi: Sage Publications.

- Roychaudhury, T. 1982 The Cambridge Economic History of India, Vol.I&II, New Delhi: Cambridge University.
- Roy, Sumit 1997 “Globalisation, Structural Change and Poverty”, Economic and Political Weekly, Aug. 16-23, 2117-2132.
- Sachs, W. 3997 Development Dictionary Singh, R.R. (Ed.) 1995 Whither Social Development? New Delhi: ASSWI.
- Singh, Y 1972 Modernization of Indian Tradition, Delhi: Thomas Press. Spicker, Paul 1998 Principles of Social Welfare: An Introduction to Thinking About the Welfare State, London:Routledge. The Probe Team. 1999 Public Report on Basic Education in India New Association with Centre for Delhi: Oxford University Press. Development Economics
- Upadhyay, S.B. 1992 Urban Planning, Jaipur: Printwell. UNDP Human Development Reports, Oxford University Press.
- Vyasulu, V. Vani, B.P. 1997 “Development and Deprivation in Karnataka”, Economic and Political Weekly, Nov. 15 2970-2974.
- Weimer. D.L. and Policy Analysis: Concepts and Practice, New Vining, A.R. 1994 Jersey: Prentice-Hall.
- World Bank World Development Reports (Annual), Oxford University Press.
- Yadav, C.S. (Ed) 1986) Urban Planning and Policies- Part A, New Delhi: Concept Publishing Co. Encyclopedia of Social Sciences Encyclopedia of Social Work.
- De Haan, Anjan (20130 “The Social Policies of Emerging Economics: Growth and Welfare in China and India” IPC-JG working Paper No.110. Brasilia, International Policy Centre for Inclusive Growth.

Recommended Journals/Periodicals

- Alternatives; Development and Change; Economic and Political Weekly.

Course Title: DEVELOPMENT COMMUNICATION

Course Code: SWCP - 19

Level: MSW (IV)

Objectives :

- To study the basic issues in Communication.
- To learn about various channels of Communication
- To understand the channels of mass communication reaching to rural audience.

Unit : I

Development: meaning, concept, process and models of development – theories – origin – approaches to development, problems and issues in development, characteristics of developing societies, development dichotomies, gap between developed and developing societies. Development issues on national and regional and local level.

Unit : II

Development communication : meaning – concept – definition – philosophy – process – theories – role of media in development communication – strategies in development communication – social cultural and economic barriers – case studies and experience – development communication policy – strategies and action plans – democratic decentralization.

Unit : III

Communication with Individual Group, Traditional Communication: Streets play, Puppetry show & Folk media, Rural communication messages Development support communication: population and family welfare – health- education and society – environment and development – problems faced in development support communication.

Unit : IV

Writing development messages for rural audience: specific requirements of media writing with special reference to rural press, radio and television. Problems of Rural

Journalism, Farm Journals, Rural Press, Press Conference, Radio rural Forum, Role of Community Radio in Rural Communication.

Reading List:

Fernandes, Walter : Development with People, Indian Social Institute, New Delhi, 1988.

Jayaweera N. & Amunugama S. : Rethinking Development Communication, AMIC, Singapore, 1988.

Kumar, Kevel J. : Communication and Development : Communication Research Trends, Vol. 9, No.3, 1988.

Hoogvelt Ankie : The Third World in Global Development, Macmillan, London, 1982.

Hornik, Robert C : Development Communication : Information Agriculture and Nutrition in Third World, Longman, London/NY , 1988.

Melkote Srinivas : Communication for Development in the Third World – Theory and Practice, Prentice – Hall, New Delhi, 1991.

Sondhi, Krishan : Communication, Growth and Public Policy Breakthrough, New Delhi, 1983.

Schramm, Wilbur : Mass Media and National Development, Stanford UP, Stanford, 1964.

Course Title: SUSTAINABLE AGRICULTURE

Course Code: SWCP - 20

Level: MSW (IV)

Objectives:

- To Understand the Indian Agricultural Policy and the Crisis in Agriculture.
- To be acquainted with sustainable agricultural practices.
- To effectively respond to the problem of food and nutritional security at the level of the farmer/community.

Unit-I: Principles & Policy for Sustainable Agriculture

Social Work in Rural-Agro ecological Communities;

History & Evolution of Agricultural Practices;

Principles of Sustainable Agriculture;

Policy & Practice of Sustainable Agriculture;

Principles of Industrial Agriculture;

Policy & Practice of Industrial Agriculture.

Unit-II: Soil Health & Water Management Soil Health:

On Farm Biomass;

Cattle Dung;

Earth Worm;

Soil Health Enhancement Techniques;

Organic Carbon Measurement.

Water Management:

In-situ water conservation;

Methods to reduce flow of rain water;

Mulching;

Moisture Management.

Unit-III: Seeds & Cropping Pattern Seeds:

Seed in the context of a micro-ecosystem;

Significance of Diversity in Seed;

Types of Seeds;

Politics of Seed Control;

Techniques of preserving seeds with Farming Communities.

Cropping Pattern:

Multiple cropping patterns & Soil Health;

Soil-climate & cropping patterns;

Cropping Patterns as enhancing photosynthesis process.

Unit-IV: Integration & Ecological Agriculture

Integration of Agriculture:

Interrelated Activities of Agriculture;

Stages of Integration;

Processes of Integration;

Programs available for Integration.

Ecological Agriculture:

Principles of Ecological Agriculture;

Transition from Integrated Agriculture to Ecological Agriculture.

Reading List:

Randhawa M.S, A History of Agriculture in India, Vol. I, II, III & IV, ICAR.

Asian Agri-History Foundation (1999), Krishi Parashara, ISRISAT.

Subramaniam. C (1995) Hand of Destiny: The Green Revolution (Vol.2) Bharatiya Vidya Bhavan.

Shina Vandana, The Violence of the Green Revolution.

Roy. B. C, Chattopadhyay, G.N, And Tirado.R; Subsidising Food Crisis.
www.greenpeaceindia.org.

Howard. Albert, An Agricultural Testament, Other India Press.

Howard. Albert & Wad. Yeshwant D, The Waste Products of Agriculture- Their utilization as humus.

Howard. Albert and Berry. Wendell (1945), Soil and Health,
<http://www.journeytoforever.org/>

Fukuoka. M. (2009) The One Straw Revolution, OIB

Fukuoka. M. (1996). The Road Back to Nature: Regaining the Paradise Lost, OIB.

Dabholkar. S. A. (2001) Plenty for All, OIB.

Save. Bhasker, The Great Agricultural Challenge, OIB.

Green Foundation, Janadharya Seed Savers.

Green Foundation, Seed to Food.

Alvares. Claude (2009), The Organic Farming Sourcebook, Other India Press.

Course Title: DISSERTATION**Course Code: SWCP - 21****Level: MSW (IV)****Dissertation**

The student has to prepare and submit a dissertation under the guidance of a faculty. The student should exhibit ability to review relevant literature formulate a research question, choose appropriate methodology, develop data collection tools, analyze and interpret data and prepare the research report. The length of the dissertation excluding contents and Bibliography should not exceed ten thousand words.

Evaluation Criteria

Sl. No.	Item		Weightage
1	Choice of Topic Review of relevant literature	Scope, Research Potential Comprehension, quality, quantity	10
2	Objective and Hypothesis/Question	Relevance, clarity, relation to topic Research Design/Methodology Appropriateness, selection of variables sample and description	20
3	Tools Used	Appropriateness, use	10
4	Data analysis and interpretation	Scheme, Application of Statistical techniques, use of tables and figures relating findings to objectives and literatures, discussion on findings	20
5	Summary	Synthesis of findings Implications	10
6	Report Presentation	Cauterization, chapter size, structuring of paragraphs vocabulary, clarity, coherence, Bibliography	10
7	Viva-voce	Ability to explain the research process & defend research work	20
Total			100

Course Title: ENTREPRENEURSHIP

Course SWEP - 07

Level: MSW (IV)

Objectives

- To familiarize Social Work students to entrepreneurship
- To give them basic skills and competencies to encourage entrepreneurship through their Social Work practices.

Unit – I : What is Entrepreneurship?

Entrepreneurship- conceptual issues; Entrepreneurship and Development: Entrepreneurship motivating factors, competencies, performance and reward. Status of entrepreneurs in India, problems and concerns of entrepreneurs

Unit – II : How to be an Entrepreneurship?

Opportunity scouting and idea generation: creativity and innovation; the process of setting up a small business: Preliminary screening and detailed study of the feasibility of the business idea: financing/non-financing support agencies; Schemes of assistance from government and non-governmental agencies, policies/programs and procedures and the available schemes

Unit-III : Management Roles of an Entrepreneur

Management roles and functions in a small business; Designing and re-designing business process, location, layout, operations, planning and control. Issues of quality, productivity and environment; Managing business growth; Issues in marketing sales and distribution. Consortium marketing; competitive bidding/tender marketing negotiating with principal customers. Marketing Assistance, Subsidies and other Fiscal and monetary Incentives. National state level and grass-root level financial and non-financial institutions in support of small business development.

Unit – IV : Accounting

Principles of double-entry book-keeping: Journal entries, cash-book, pass book, and Bank Reconciliation Statement ledger account trail balance and preparation of final accounts: Trading and Profit and Loss Account; Balance-sheet. Brief introduction to Single-Entry system of record keeping. Sources of risk/venture capital, fixed capital, working capital and a basic awareness of financial services such as leasing and factoring

Reading list:

Sivakama Sundari, S. Entrepreneurship Development of Rural Women (Vol.I) Asian and Pacific for Transfer of technology, New Delhi.

Heggade, O.D. Developing rural women entrepreneurship, Mohit publications, New Delhi

Santhawali, A.Y. Entrepreneurship Development – Publications, Jaipur.

Bhide, Amar V. The Origin and Evolution of New Business, Oxford University Press, New York, 2000

Dollinger M.J., 'Entrepreneurship strategies and Resources', 3rd edition, Pearson Education, New Delhi 2006

Desai, Vasant Dr. (2004) Management of small scale enterprises New Delhi: Himalaya Publishing Company

Taneja, Gupta, Entrepreneur Development New Venture Creation: 2nd edition Galgotia Publishing Company

Holt, David H., Entrepreneurship: Strategies and Resources, Illinois , Irwin, 1955.

Panda, Shiba Charan, Entrepreneurship Development, New Delhi, Anmol Publications

Patel, V.G., The Seven Business Crises and How to Beat Them, Tata-Mcgraw, New Delhi, 1995

SIDBI Report on Small Scale Industries Sector[latest edition]

Verma, J.C., and Gurpal Singh, Small Business and Industry-A Handbook for Entrepreneurs, Sage, New Delhi, 2002

Course Title: NGO MANAGEMENT**Course Code: SWEP – 08****Level: MSW (IV)****Objectives:**

- To understand the role of NGOs in society
- To gain clarity about the operating environment of NGOs
- To understand the issues involved in the internal management of NGOs

Unit I: Introduction to NGOs

Definitions, History, Roles in Society; Description of the NGO sector; Theoretical Perspectives on Organization and Management of NGOs.

Unit II: The legality of NGOs in India

Societies Registration Act, 1860, Indian Trust Act, 1882, Cooperative Societies Act, 1912, Company Act, 1956 (Some Relevant Part), FCRA: Foreign Contribution Regulatory Act, Income tax Act 1961, Income Tax Exemption: Under Sections 11 and 12, Rebate under Sections 80G and 35AC of Income Tax Act.

Unit – III: The operating environment of NGOs

Understanding the environment in which NGOs function: Economic, Political, Socio-Cultural and Ideological macro level forces that influence NGOs, Globalization and Foreign aid system. Principal Players and their Relationships: Governments, Markets, NGOs, Donors; Importance of partnerships.

Unit – IV: Internal Management of NGOs

Governance structure, Vision and Mission; Internal management needs of a NGO; strategies/plans for action; Managing Resources: Human and Financial; Measuring performance, participation, evaluation; Accountability to multiple stakeholders; Ethical issues faced by NGO managers; Scaling up and sustainability of NGOs; creating a learning environment

Reading List:

Lewis, David. 2007. The Management of Non-Governmental Development Organizations, second edition. New York: Routledge.

Edwards, M. and Fowler, A. (2003) The Earthscan Reader on NGO Management. London: Earthscan Publications, Ltd.

Salamon, L.M. 1994. The Rise of the Nonprofit Sector. Foreign Affairs 74 (3): pp. 109–122

Lewis, D. 2007. Advocacy and Service Delivery: Managing the Main NGO Activities in The Management of Non-governmental Development Organizations, Second Edition

Fowler, A. 1997. Understanding International Development in Striking a Balance: A Guide to Enhancing the Effectiveness of Non-governmental Organizations in International Development London: Earthscan Publications, Ltd.,

Course Title: PROJECT MANAGEMENT

Course Code: SWEP – 09

Level: MSW (IV)

Objectives:

- To understand the fundamentals of Project management and how to initiate, plan, execute and close a project.

Unit - I: Fundamentals of Project Management

What is a Project? Definition, meaning, principles and types; What is project management? meaning, coverage and scope; Who is the project manager?; Project phases and knowledge areas. Planning and its importance; who should be involved in planning?

Unit - II: Initiating Projects and Project Identification

How to get a project started; Setting a mandate, finding a project sponsor and creating a project team: team dynamics and running meetings.

Project Identification: Needs assessment: listening, interviewing, focus group discussions, community mapping; Capacity assessment: human, social, natural, physical, economic, cultural

Unit - III: Planning and Executing Projects

Work Breakdown Schedule (WBS), Project estimating and scheduling techniques-sequencing tasks, identifying the path of the project, considering resources; Risk planning methods; Cost planning; Communications plan; final project plan.

Team management; identifying and involving all stakeholders, user groups, interest groups, beneficiaries, decision makers; Primary and Secondary stakeholders; levels of participation;

Unit - IV: Closing a Project

Closing of a successful project; stakeholder acceptance; writing a final report; Techniques of identifying lessons learned and their analysis; acknowledging successes and failures; and identifying areas for further projects.

Reading List:

- Verzuh, Eric. The Fast Forward MBA in Project Management. Published by John Wiley and Sons, Inc.
- Project Management Body of Knowledge, 5th Edition. Published by Project Management Institute (PMI)
- Blackman, Rachel. 2003. Project Cycle Management. UK: Tearfund.
- Preskill, Hallie and Russ-Eft, Darlene. 2005. Building Evaluation Capacity. London: Sage Publications.
- Capezio, Peter. 2000. Powerful Planning Skills. Mumbai: Jaico Publishing House.
- Smith, Steve. 2002. Plan to Win. New Delhi: Kogan Page India Pvt. Ltd.
- Dale, Reidar. 2001. Evaluation Frameworks for Development Programmes and Projects. New Delhi: Sage Publications.
- Loehle, Craig. 2000. Thinking Strategically. New Delhi: Foundation Books.
- Padaki, Vijay. 1995. Development Intervention and Programme Evaluation. New Delhi: Sage Publications.

Course Title: CLIMATE CHANGE, DISASTER MANAGEMENT AND REHABILITATION

Course Code: SWEP –

10 Level: MSW (IV)

Objectives:

- To understand the challenges of Climate change
- To gain a comprehensive understanding of the Disaster Management Cycle.
- To get acquainted with Disaster Management Policies and Laws in India.

Unit I:

- **Climate Change:** Concept, nature and severity of climate change. Causes of climate change. Impact of climate change: globally in general and Odisha in particular. Greenhouse effect, climate change and disaster.
- **Disaster Management:** Definition, Types of disaster (natural and manmade disaster) mining disaster, tropical cyclone, storms, floods, lightning, forest fire, tsunami and earthquakes.

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Unit II:

- **Concepts associated with Climate Change and Disasters:** air pollution

and acid rain, ozone depletion, bio-diversity extinction, de-forestation and loss of biological diversity, land degradation, deserts and desertification, groundwater over exploitation, dryness and wildfires, population growth and explosion, habitat related problems.

- **Social Systems, Ecological Networks and Disasters:** a socio-political ecology of disasters, nature of human communities, community as an ecological network.

Unit III:

- **Disaster Management Cycle:** Disaster phase, Response phase, Recovery phase, Risk reduction phase, Preparedness phase.
- **The Process of Disaster Management:** mitigation, preparedness, response and recovery.
- **Majors Disasters in Odisha:** Flood, cyclone, drought, tsunami, etc
- **Disaster Management Programs and System in India:** Nation Disaster Management Act (2005), National Policy on Disaster Management (2009), Disaster Management in the Xth Five Year Plan onwards, different bodies National Disaster Management Agency (NDMA), State Disaster management Agency (SDMA), National Disaster Response Force (NDRF), National Institute of Disaster Management (NIDM), India Disaster Resource Network (IDRN). Community based disaster management and community based disaster management practices (case studies), The role of INGOs and NGOs.
- **Disaster Warning and Evacuation:** Factors influencing evacuation and some policy considerations, media and other sources of information, Phases of evacuation: Preparation, Decision

Unit IV:

- **Environmental Legislation and Regulations associated with Disaster Management:** Environment Policy of the Government of India: Five Year Plans, Environment Protection Act (1986), The Environment (Sitting for Industrial Projects) Rules (1999), The Indian Forest Act (1927 and Amendment 1984), The Indian Forest (Conservation) Act (1981), Coastal Regulation Zone Notification (1991).
- **Rehabilitation:** Need for rehabilitation, Government and Non-government programs for rehabilitation, role of NGOs for rehabilitation programmes, Critical review of programmes, Role of Social Work in minimizing the effects of disaster.

Reading List:

Anandha Kumar K.J and Ajinder Walia (2013) India Disaster Report, NIDM: New

Delhi.

Gupta. Anil K et, al (Ed) (2014). Training Module Mainstreaming Climate Change Adaptation and Disaster Risk Reduction into District Level Development Plans, NIDM : New Delhi.

Satendra and Kaushik. D (2013) Forest Fire Disaster Management NIDM: New Delhi.

Vogelbacher (2013) Flood Disaster Risk Management NIDM: New Delhi.

Kaushik. A.D. (2012) Flood Risk Mitigation and Management: A Training of Trainers Module, NIDM: New Delhi.

Course Title: People-Centered Advocacy

Course Code: SWEP – 11

Level: MSW (IV)

Objectives:

1. To acquire conceptual clarity and theoretical knowledge about linkages between state, civil society and market, governance and social policy processes
2. To acquire conceptual clarity about Social Advocacy as a method for bringing about social change to achieve equality and social justice goals enshrined in the Constitution using non-violent methods
3. To become aware of the democratic institutions, actors and the processes of democratic decision making
4. To acquire necessary skills for strategy planning to engage in Social Advocacy
5. To internalize values and attitudes necessary for working at micro, meso and macro levels and with diverse individuals and groups by following the Constitutional and democratic processes

Unit 1: Understanding People Centred Advocacy

- Politics in Social Advocacy and its role in democratic decision making
- Advocacy vis-à-vis Social Revolution and Social Action
- Relevance and importance of people centered advocacy and rights based approaches in India
- Power, politics and public arguments
- Personal and institutional benefits of Social Advocacy

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Unit 2: Role of Information, Networking and the Media in Advocacy

- Power of Information in People Centered Advocacy

- Identifying incidents, collecting information and framing issues
- Mobilizing support and importance of coalitions
- Role of organization and campaign strategies
- Building favorable public opinion and putting pressure on decision makers
- Understanding the politics of media and its role in consensus and conflict creation
- Developing material for the media and its diverse audience
- Exploring alternate media for pro-people advocacy

Unit 3: Advocacy with the Legislature and Executive

- Understanding channels between legislators and advocacy groups
- Knowing the actors within and outside legislative bodies
- Role of bureaucracy in policy making, operationalization and implementation.
- Finding policy hooks and political angles. Understanding phases of policy making
- Implications of transparency and accountability vis-à-vis elected representatives and the bureaucracy
- Practical tips and strategies for advocating with legislatures and the bureaucracy

Unit 4: Advocating with the Judiciary and with the reference to the International framework.

- Understanding central and state laws and function of various courts in India
- Role of Information and PILs in Judicial Advocacy
- Post 2015 agenda, post MDG frameworks
- Making post 2015 matter for socially excluded groups in India

Reading List

NCAS.resource material and documented case stories on People Centred Advocacy

Academic Year
2018-19

UTKAL UNIVERSITY








REGULATIONS & SYLLABUS UNDER GRADUATE PROGRAMME IN BACHELOR OF ARTS

(HONOURS & PASS)- CBCS PATTERN Effective for Admission Batch: 2018 - 2019
(Applicable to Autonomous Colleges)

SYLLABUS FOR B.A. (HONORS) ECONOMICS UNDER CHOICE BASED CREDIT SYSTEM OF UTKAL UNIVERSITY, BHUBANESWAR

Course Structure for B.A. (Honours) Economics

There are a total of fourteen economics core courses that students are required to take across six semesters. All the core courses are compulsory. In addition to core courses in economics, a student of B.A. (Honours) Economics will choose four Discipline Specific Elective

 Skill Development
 Employability
 Entrepreneurship
 All the three
 Skill Development and Employability
 Skill Development and Entrepreneurship
 Employability and Entrepreneurship

(DSE) Courses. The DSE Courses are offered in the fifth and sixth semesters and two such courses will be selected by a student from a set of courses specified for each of these semesters (Groups I and II in the attached table). It is recommended that each college should offer at least three DSE Courses in the fifth and sixth semesters to allow the students some minimal element of choice.

Contact Hours: Each course has 5 lectures and 1 tutorial (per group) per week. The size of a tutorial group is 8-10 students.

Note on Course Readings: The nature of several of the courses is such that only selected

readings can be specified in advance. Reading lists will be updated and topic-wise readings will be specified at regular intervals, ideally on an annual basis.

Course Structure for B.A. (Honours) Economics

Skill Enhancement Courses (SEC II)

1. Data Analysis and Computer Application
2. Financial Economics

Core Economics Course 1: INTRODUCTORY MICROECONOMICS

Course Description

This course is designed to expose the students to the basic principles of microeconomic theory. The emphasis will be on thinking like an economist and the course will illustrate how microeconomic concepts can be applied to analyze real-life situations.

Module 1: Exploring the subject matter of Economics

The Ten Principles of Economics: How people make decisions; Working of the economy as a whole; Thinking Like an Economist: The economist as Scientist – The scientific method: Observation, Theory and more observation; Role of assumptions; Economic Models; The economist as a policy advisor; Why economists disagree; Graphs in Economics

Module 2: Supply and Demand: How Markets Work, Markets and Welfare

The market forces of demand and supply – Markets and competition; The demand curve – Market vs individual demand curve; Shifts in demand curve; The supply curve – Market vs individual supply curve; Shifts in supply curve; Equilibrium between supply and demand and changes there in; Price elasticity of demand and its determinants; Computing price elasticity of demand; Income and cross elasticity of demand; The price elasticity of supply and its determinants; Computing price elasticity of supply; Consumer Surplus and Producer Surplus; Market efficiency and market failure.

Module 3: The Households

The Budget Constraint; Preferences – representing preferences with indifference curves; Properties of indifference curves; Two extreme examples of indifference curves; Optimisation – Equilibrium; Change in equilibrium due to changes in income, changes in price; Income and substitution effect; Derivation of demand curve; Three applications – Demand for giffen goods, wages and labour supply, Interest rate and household saving.

Module 4: The Firm and Market Structures

Cost concepts; Production and costs; The various measures of cost – Fixed and variable cost, average and marginal cost; Cost curves and their shapes; Costs in the short run and in the long run; Economies and diseconomies of scale. Firms in competitive markets – What is a competitive market; Profit maximisation and the competitive firm's supply curve; The marginal cost curve and the firm's supply decision; Firm's short-run decision to shut down; Firm's long-run decision to exit or enter a market; The supply curve in a competitive market – short run and long run; Monopoly - Why monopolies arise and public policy towards monopolies

Module 5: The Input Markets

The demand for labour – The production function and the marginal product of labour; Value of the marginal product of labour and demand for labour; Shifts in labour demand curve; The supply of labour – the trade-off between work and leisure; Shifts in the labour supply curve; Equilibrium in the labour market; Other factors of production: Land and capital; Linkages among factors of production.

Readings:

1. Principles of Economics, Gregory N Mankiw, 6e Cengage Learning India Private Limited,

New Delhi

2. William A McEachern and Simrit Kaur (2012): *Micro Econ: A South-Asian Perspective*, Cengage Learning India Private Limited, New Delhi.
3. Karl E. Case and Ray C. Fair (2007): *Principles of Economics*, 8th Edition, Pearson Education Inc.

Core Economics Course 2: MATHEMATICAL METHODS FOR ECONOMICS I

Course Description

This is the first of a compulsory two-course sequence. The objective of this sequence is to transmit the body of basic mathematics that enables the study of economic theory at the undergraduate level, specifically the courses on microeconomic theory, macroeconomic theory, statistics and econometrics set out in this syllabus. In this course, particular economic models are not the ends, but the means for illustrating the method of applying mathematical techniques to economic theory in general. The level of sophistication at which the material is to be taught is indicated by the contents of the prescribed textbook.

Module I: Preliminaries

Sets and set operations; relations; functions and their properties; Number systems

Module II: Functions of one real variable

Types of functions- constant, polynomial, rational, exponential, logarithmic; Graphs and graphs of functions; Limit and continuity of functions; Limit theorems

Module III: Derivative of a function

Rate of change and derivative; Derivative and slope of a curve; Continuity and differentiability of a function; Rules of differentiation for a function of one variable; Application- Relationship between total, average and marginal functions

Module IV: Functions of two or more independent variables

Partial differentiation techniques; Geometric interpretation of partial derivatives; Partial derivatives in Economics; Elasticity of a function – demand and cost elasticity, cross and partial elasticity

Module V: Matrices and Determinants

Matrices: concept, types, matrix algebra, transpose, inverse, rank; Determinants: concept, properties, solving problems using properties of determinants, solution to a system of equations - Cramer's rule and matrix inversion method.

Readings:

1. K. Sydsaeter and P. J. Hammond (2002): *Mathematics for Economic Analysis*. Pearson Educational Asia
2. A. C. Chiang and K. Wainwright (2005): *Fundamental Methods of Mathematical Economics*, McGraw Hill International Edition.
3. T. Yamane (2012): *Mathematics for Economists*, Prentice-Hall of India

Generic Elective I: Indian Economy

Course Description: This paper introduces the students to the essentials of Indian economy with an intention of understanding the basic feature of the Indian economy and its planning process. It also aids in developing an insight into the agricultural and industrial development of India. The students will understand the problems and policies relating to the agricultural and industrial sectors of India and current challenges of Indian economy.

Module I: Introduction to Indian Economy

Colonialism & British Rule: Exploitation and under-development in India; Basic features of India Economy; Indian Economy as a developing economy; Demographic trends in India - Size and growth of population, Occupational structure, Sex composition, Age structure and demographic dividend; Causes of population growth and population policy

Module II: Indian Agriculture

Role of agriculture in Indian Economy; Cause of low productivity, Green Revolution and Land Reforms, Agricultural Finance-Sources and Problems; Agricultural Marketing in India

Module III: Industrial Development in India

Role of Industrialisation in Indian Economy; Small Scale & Cottage Industries: Meaning, Role, Problems and Remedies; Industrial Policies of 1948, 1956, 1977 and 1991; Problems of Industrial Development in India; Industrial Sickness

Module IV: Service Sector in India

Growth & Contribution to GDP; Composition and relative importance of service sector; Factors determining growth of the sector; ICT and IT – Spread and Policy; Sustainability of services led growth

Module V: Current Challenges facing Indian Economy

Unemployment – Meaning; important employment Generation programmes, MGNREGS; Inequality in income distribution-Causes thereof; Government policy to check its growth

Basic Readings:

1. Kapila U. *Indian economy since Independence*. Academic Foundation, New Delhi
2. Misra, S. K. and Puri V. K. *Indian Economy — Its Development Experience*. Himalaya Publishing House, Mumbai
3. Dutt R. and Sundharam K. P. M. *Indian Economy*. S. Chand & Company Ltd., New Delhi.
4. Agarawala, A. N. *Indian Economy*, New Age Publications, New Delhi
5. Panagariya, Arvind (2008): *India: the Emerging Giant*, Oxford University Press, New York
6. Acharya, S. and Mohan, R. (Eds.) (2010): *India's Economy: Performance and Challenges*, Oxford University Press, New Delhi.
7. Ahluwalia, I. J. and Little, I. M. D. (Eds.) (1998): *India's Economic Reforms and Development: Essays for Manmohan Singh*, Oxford University Press, New Delhi.

Core Economics Course 3: INTRODUCTORY MACROECONOMICS

Course Description

This course aims to introduce the students to the basic concepts of Macroeconomics. Macroeconomics deals with the aggregate economy. This course discusses the preliminary concepts associated with the determination and measurement of aggregate macroeconomic variable like savings, investment, GDP, money, inflation, and the balance of payments.

Module I: Basic Concepts

Macro vs. Micro Economics; Why Study Macroeconomics? Limitations of Macroeconomics ; Stock and Flow variables, Equilibrium and Disequilibrium, Partial and General Equilibrium Statics – Comparative Statics and Dynamics ; National Income Concepts – GDP, GNP, NDP and NNP at market price and factor cost; Personal Income and Disposable personal Income; Real and Nominal GDP

Module II: Measurement of Macroeconomic Variables

Output, Income and Expenditure Approaches; Difficulties of Estimating National Income; National Income Identities in a simple 2- sector economy and with government and foreign trade sectors; Circular Flows of Income in 2, 3 and 4-sector economies; National Income and Economic Welfare ; Green Accounting.

Module III: Money

Evolution and Functions of Money, Quantity Theory of Money – Cash Transactions, Cash Balances and Keynesian Approaches, Value of Money and Index Number of Prices

Module IV: Inflation, Deflation, Depression and Stagflation

Inflation – Meaning, Causes, Costs and Anti-Inflationary Measures; Classical, Keynesian, Monetarist and Modern Theories of Inflation, Deflation- Meaning, Causes, Costs and Anti-Deflationary Measures, Depression and Stagflation; Inflation vs. Deflation

Module V: Determination of National Income

The Classical Approach - Say's Law, Theory of Determination of Income and Employment with and without saving and Investment; Basics of Aggregate Demand and Aggregate Supply and Consumption- Saving – Investment Functions, The Keynesian Approach – Basics of Aggregate Demand and Aggregate Supply and Consumption, Saving, Investment Functions; The Principle of Effective Demand; Income Determination in a Simple 2-Sector Model; Changes in Aggregate Demand and Income- The Simple Investment Multiplier; Income Determination in a 3-Sector Model with the Government Sector and Fiscal Multipliers

Readings:

1. N. Gregory Mankiw (2010): *Macroeconomics*, 7th edition, Cengage Learning India Private Limited, New Delhi
2. Richard T. Froyen (2005): *Macroeconomics*, 2nd Edition, Pearson Education Asia, New Delhi.
3. Errol D'Souza (2009): *Macroeconomics*, Pearson Education Asia, New Delhi.

Core Economics Course 4: MATHEMATICAL METHODS FOR ECONOMICS II

Course Description

This course is the second part of a compulsory two-course sequence. This part is to be taught in Semester II following the first part in Semester I. The objective of this sequence is to transmit the body of basic mathematics that enables the study of economic theory at the undergraduate level, specifically the courses on microeconomic theory, macroeconomic theory, statistics and econometrics set out in this Syllabus. In this course, particular economic models are not the ends, but the means for illustrating the method of applying mathematical techniques to economic theory in general. The level of sophistication at which the material is to be taught is indicated by the contents of the prescribed textbook.

Module I: Linear models:

Input- Output Model: Basic concepts and structure of Leontief's open and static Input-Output model; solution for equilibrium output in a three industry model; The closed model

Module II: Second and higher order derivatives:

Technique of higher order differentiation; Interpretation of second derivative; Second order derivative and curvature of a function; Concavity and convexity of functions; Points of inflection

Module III: Differentials and total derivatives:

Differentials and derivatives; Total differentials; Rules of differentials; Total derivatives; Derivatives of implicit functions

Module IV: Single and multivariable optimisation:

Optimum values and extreme values; Relative maximum and minimum; Necessary versus sufficient conditions - First and Second derivative tests; Economic applications thereof, First and second order condition for extremum of multivariable functions; Convex functions and convex sets

Module V: Optimisation with Equality Constraints:

Effects of a constraint; Finding stationary value – Lagrange-Multiplier method (Two variable single constraint case only): First and second order condition; The Bordered Hessian determinant.

Readings:

1. K. Sydsaeter and P. J. Hammond (2002): *Mathematics for Economic Analysis*. Pearson Educational Asia
2. A. C. Chiang and K. Wainwright (2005): *Fundamental Methods of Mathematical Economics*, McGraw Hill International Edition.
3. T. Yamane (2012): *Mathematics for Economists*, Prentice-Hall of India

Generic Elective II: Indian Economy II

Course Description: This paper is the part II of Indian economy deals with the external sector, financial markets in India, Indian Public Finances and Economic Reforms. This paper also troughs some light on current challenges of Indian Economy.

Module I: External Sector in India

Trends, Composition & Direction in exports from and imports of India; Problems of Balance of Payment: Causes of deficit in BoP & measures to correct it; Trade Policy- Export Promotion Vs Import Substitution; Foreign Trade Policy of India; WTO and India

Module II: Financial Markets in India

Commercial Banking in India- Nationalisation of Banks; Lead bank scheme and branch expansion; RBI - Functions, Monetary Policy; Development Banking- IFCI, IDBI, SIDBI and NABARD

Module III: Indian Public Finance

Public Expenditure-Growth and Composition, Causes of Growth of Public Expenditure in India: Tax Revenue of Central and State Governments; Concept of VAT; Deficit Financing in India- Revenue, Budget, Fiscal and Primary Deficits; Purpose and Effects of Deficit Financing; India's Fiscal Policy-Objectives

Module IV: Economic Reforms, Globalisation in India, Foreign Capital and MNCs

Genesis of Reforms, Macroeconomic Stabilisation, Structural Reforms, Appraisal
Globalisation and its impact on the Indian Economy; Foreign Capital-Need, Components; MNCs – Reasons for Growth and Appraisal

Module V: Current Challenges Facing Indian Economy

Inflation – Causes, Consequences and Anti-inflationary Policy; Poverty – Poverty line and Estimates, Major Poverty Alleviation Programmes; Environmental Degradation – Growth and Environment; Population Growth and Environment; Environment Policy

Basic Readings:

1. Kapila U. *Indian economy since Independence*. Academic Foundation, New Delhi
2. Misra, S. K. and Puri V. K. *Indian Economy — Its Development Experience*. Himalaya Publishing House, Mumbai
3. Dutt R. and Sundharam K. P. M. *Indian Economy*. S. Chand & Company Ltd., New Delhi.
4. Agarawala, A. N. *Indian Economy*, New Age Publications, New Delhi
5. Panagariya, Arvind (2008): **India: the Emerging Giant**, Oxford University Press, New York
6. Acharya, S. and Mohan, R. (Eds.) (2010): **India's Economy: Performance and Challenges**, Oxford University Press, New Delhi.
7. Ahluwalia, I. J. and Little, I. M. D. (Eds.) (1998): **India's Economic Reforms and Development: Essays for Manmohan Singh**, Oxford University Press, New Delhi.

Core Economics Course 5: MICROECONOMICS I

Course Description

The course is designed to provide a sound training in microeconomic theory to formally analyze the behaviour of individual agents. Since students are already familiar with the quantitative techniques in the previous semesters, mathematical tools are used to facilitate understanding of the basic concepts; this course looks at the behaviour of the consumer and the producer and also covers the behaviour of a competitive firm.

Module I: Consumer Theory I

The market – Constructing a model; Optimisation and equilibrium; The demand curve and the supply curve; Market Equilibrium; The budget constraint and budget set; Changes in budget line; Effect of taxes, subsidy and rationing on budget set; Consumer Preferences – Indifference curves; Case of perfect substitutes, complements, neutrals, satiation, discrete goods; The marginal rate of substitution; Utility – Cardinal utility; Constructing a utility function; Marginal utility and MRS; Optimal choice and consumer demand; Estimating Utility Functions; Implications of the MRS condition; Choosing taxes; Demand – Normal and inferior goods; Income Offer Curve and Engel Curve; Ordinary goods and Giffen goods; The Offer Curve and the demand Curve; The inverse demand function.

Module II: Consumer Theory II

Slutsky Equation – The Substitution and Income Effects; Sign of Substitution Effect; The Total Change in Demand; Rates of Change; The Law of Demand; Another Substitution Effect; Compensated Demand Curves; Consumer's Surplus – Demand for a discrete good; Constructing utility from demand; Other interpretations of consumer's surplus; Approximating continuous demand; Interpreting the change in consumer's surplus; Producer's surplus; Calculating gains and losses

Module III: Production Theory

Marginal Productivity, Isoquant Maps and the Rate of Technical Substitution, Production with One Variable Input (labour) and with Two-Variable Inputs, Returns to Scale, Four Simple Production Function (Linear, Fixed Proportions, Cobb-Duglas, CES), Technical Progress

Module IV: Cost Functions

Definition of Costs, Cost Functions and its Properties, Shift in Cost Curves, Cost in the Short-Run and Long-Run, Long-Run versus Short-Run Cost Curves, Production with Two Outputs – Economies of Scope

Module V: Profit Maximisation

The Nature and Behaviour of Firms, Profit Maximization, Marginal Revenue, Short-Run Supply by Price-Taking Firm, Profit Functions and its Properties

Readings:

1. C. Snyder and W. Nicholson (2012): Microeconomic Theory: Basic Principles and Extensions, 11th Edition, Cengage Learning, Delhi, India.
2. R. S. Pindyck, D. N. Rubinfeld and P. L. Meheta (2009): Microeconomics, 7th Edition, Pearson, New Delhi.

3. H. R. Varian (2010): *Intermediate Microeconomics: A Modern Approach*, 8th Edition, W.W. Norton and Company/Affiliated East-West Press (India). The workbook by Varian and Bergstrom may be used for problems

Core Economics Course 6: MACROECONOMICS I

Course Description

This course introduces the students to formal modelling of a macro-economy in terms of analytical tools. It discusses various alternative theories of output and employment determination in a closed economy in the short run as well as medium run, and the role of policy in this context. It also introduces the students to various theoretical issues related to an open economy.

Module I: Consumption Function

Consumption – Income Relationship, Propensities to Consume and the Fundamental Psychological Law of Consumption; Implications of Keynesian Consumption Function; Factors Influencing Consumption Function; Measures to Raise Consumption Function; Absolute, Relative, Permanent and Life – Cycle Hypotheses

Module II: Investment Function

Autonomous and Induced Investment, Residential Investment and Inventory Investment, Determinants of Business Fixed Investment, Decision to Invest and MEC, Accelerator and MEI Theories of Investment.

Module III: Demand for and Supply of Money

Demand for Money – Classical, Neoclassical and Keynesian Approaches, The Keynesian Liquidity Trap and its Implications, Supply of Money – Classical and Keynesian Approaches, The Theory of Money Supply Determination and Money Multiplier, Measures of Money Supply in India

Module IV: Aggregate Demand and Aggregate Supply

Derivation of Aggregate Demand and Aggregate Supply Curves in the IS-LM Framework; Nature and Shape of IS and LM curves; Interaction of IS and LM curves and Determination of Employment, Output, Prices and Investment; Changes in IS and LM curves and their Implications for Equilibrium

Module V: Inflation, Unemployment and Expectations, and Trade Cycles

Inflation – Unemployment Trade off and the Phillips Curve – Short run and Long run Analysis; Adaptive and Rational Expectations; The Policy Ineffectiveness Debate; Meaning and Characteristics of Trade Cycles; Hawtrey's Monetary Theory, Hayek's Over-investment Theory and Keynes' views on Trade Cycles

Readings:

1. N. Gregory Mankiw (2010): *Macroeconomics*, 7th edition, Cengage Learning India Private Limited, New Delhi
2. Richard T. Froyen (2005): *Macroeconomics*, 2nd Edition, Pearson Education Asia, New Delhi.

3. Errol D'Souza (2009): *Macroeconomics*, Pearson Education Asia, New Delhi.

Core Economics Course 7: STATISTICAL METHODS FOR ECONOMICS

Course Description

This is a course on statistical methods for economics. It begins with some basic concepts and terminology that are fundamental to statistical analysis and inference. It is followed by a study and measure of relationship between variables, which are the core of economic analysis. This is followed by a basic discussion on index numbers and time series. The paper finally develops the notion of probability, followed by probability distributions of discrete and continuous random variables and introduces the most frequently used theoretical distribution, the Normal distribution.

Module I: Data Collection and measures of central tendency and dispersion

Basic concepts: population and sample, parameter and statistic; Data Collection: primary and secondary data, methods of collection of primary data; Presentation of Data: frequency distribution; cumulative frequency; graphic and diagrammatic representation of data; Measures of Central Tendency: mean, median, mode, geometric mean, harmonic mean, their relative merits and demerits; Measures of Dispersion: absolute and relative - range, mean deviation, standard deviation, coefficient of variation, quartile deviation, their merits and demerits; Measures of skewness and kurtosis.

Module II: Correlation Analysis

Correlation: scatter diagram, sample correlation coefficient - Karl Pearson's correlation coefficient and its properties, probable error of correlation coefficient, Spearman's rank correlation coefficient, partial and multiple correlation.

Module III: Regression Analysis

Two variable linear regression analysis - estimation of regression lines (Least square method) and regression coefficients - their interpretation and properties, standard error of estimate

Module IV: Time Series and Index Number

Time Series: definition and components, measurement of trend- free hand method, methods of semi-average, moving average and method of least squares (equations of first and second degree only), measurement of seasonal component; Index Numbers: Concept, price relative, quantity relative and value relative; Laspeyer's and Fisher's index, family budget method, problems in construction and limitations of index numbers, test for ideal index number.

Module V: Probability theory

Probability: Basic concepts, addition and multiplication rules, conditional probability; Random variables and their probability distribution; Mathematical expectations; Theoretical Distribution: normal distribution - Properties and uses, problems using area under standard normal curve

Recommended books:

- 1 Jay L. Devore (2010): *Probability and Statistics for Engineering and the Sciences*, Cengage learning, 2010.

2. S. C. Gupta (): *Fundamentals of Statistics*, Himalaya Publishing House, Delhi
3. Murray R. Spiegel (): *Theory & Problems of Statistics*, Schaum's publishing Series.

Core Economics Course 8: MICROECONOMICS II

Course Description

This course is a sequel to Microeconomics I. The emphasis will be on giving conceptual clarity to the student coupled with the use of mathematical tools and reasoning. It covers Market, general equilibrium and welfare, imperfect markets and topics under information economics.

Module I: Firm Supply and Equilibrium

Market Environments; Pure competition ; Supply decision of a competitive firm and Exceptions; Inverse Supply Function; Profits and Producer's Surplus; Long Run Supply Curve of a Firm; Long Run Average Costs; Short Run and Long Run Industry Supply; Industry Equilibrium in Short and Long Run; Meaning of Zero Profits; Economic Rent.

Module II: General equilibrium, efficiency and welfare

The Edgeworth Box; Trade; Pareto Efficient Allocations; Existence of equilibrium and efficiency; The Welfare Theorems and their implications; The Firm; Production and the Welfare Theorems ; Production possibilities, comparative advantage and Pareto efficiency

Module III: Monopoly

Barriers to Entry, Profit Maximization and Output Choice, Monopoly and resource Allocation, Monopoly, Product Quality and Durability, Price Discrimination, Second Degree Price Discrimination through Price Schedules, Regulation of Monopoly, Dynamic Vies of Monopoly

Module IV: Oligopoly

Oligopoly – Choosing a strategy; Quantity leadership – Problems of the follower and the leader; Price leadership; Comparing quantity leadership and price leadership; Simultaneous Quantity Setting; Example of Cournot Equilibrium; Simultaneous Price Setting; Collusion

Module V: Game Theory

The Payoff Matrix of a Game; Nash Equilibrium; Mixed Strategies ;The Prisoner's Dilemma; Repeated Games; Enforcing a cartel; Sequential Games; A Game of entry deterrence.

Readings:

1. C. Snyder and W. Nicholson (2012): *Microeconomic Theory: Basic Principles and Extensions*, 11th Edition, Cengage Learning, Delhi, India.
2. R. S. Pindyck, D. N. Rubinfeld and P. L. Meheta (2009): *Microeconomics*, 7th Edition, Pearson, New Delhi.
3. H. R. Varian (2010): *Intermediate Microeconomics: A Modern Approach*, 8th Edition, W.W. Norton and Company/Affiliated East-West Press (India). The workbook by Varian and Bergstrom may be used for problems.

Core Economics Course 9: MACROECONOMICS II

Course Description

This course is a sequel to Macroeconomics I. In this course, the students are introduced to the long run dynamic issues like growth and technical progress. It also provides the micro-foundations to the various aggregative concepts used in the previous course.

Module I: Financial Markets and Reforms

Features of Financial Markets, Functions of Financial Markets, Banks and Financial Markets, Adverse Selection and Moral Hazard, Risk and Supply of Credit, The Determination of Banks Asset Portfolio, Financial Repression and Major Financial Sector Reforms in India, Lessons from the Global Financial Crisis and the Policy Response in India

Module II: Open Economy Macroeconomics

Balance of payments- Concept, Equilibrium and Disequilibrium, Measures to Correct Disequilibrium, Determination of Foreign Exchange Rate- the PPP Theory and its Implications, Fixed vs. Flexible Exchange Rates, The Short-run open economy Model, the basic Mundell-Fleming Model. International Financial Markets

Module III: Modelling Economic Growth

The Basic Harrod- Domar Model, Joan Robinson and the Golden Rule of Capital Accumulation, The Basic Solow Model, Theory of Endogenous Growth – the Rudimentary A-K Model

Module IV: Macroeconomic Policy

The Goals of Macroeconomic Policy and of Policy Makers, The Budget and Automatic Fiscal Stabilisers, The Doctrine of Balanced Budget and Keynesian Objections; Concepts of Budget, Revenue and Fiscal Deficits, Fiscal Policy: Objectives and Limits to Discretionary Policy, The Crowding –Out Hypothesis and the Crowding – in Controversy Meaning, Scope and Objectives of Monetary Policy, Instruments of Monetary Policy, the Transmission Mechanism of Monetary Policy, Rules vs. Discretion in Monetary Policy, Implications of Targeting the Interest Rate, Limits to Monetary Policy

Module V: Schools of Macroeconomic Thought and the Fundamentals of Macroeconomic Theory and Policy

Classics, Keynes, Monetarists, New Classicals and New Keynesians: (i) Keynes vs. the Classics – Aggregate Demand and Aggregate Supply, Underemployment Equilibrium and Wage Price Flexibility, (ii) Monetarists and Friedman's Reformulation of Quantity Theory, Fiscal and Monetary Policy: Monetarists vs. Keynesians, (iii) The New Classical View of Macroeconomics and the Keynesian Counter critique, (iv) The New Keynesian Economics with reference to the Basic Features of Real Business Cycle Models, the Sticky Price Model.

Readings:

1. N. Gregory Mankiw (2010): *Macroeconomics*, 7th edition, Cengage Learning India Private Limited, New Delhi
2. Richard T. Froyen (2005): *Macroeconomics*, 2nd Edition, Pearson Education Asia, New Delhi.
3. Errol D'Souza (2009): *Macroeconomics*, Pearson Education Asia, New Delhi.

Core Economics Course 10: Public Economics

Course Description

Public economics is the study of government policy from the points of view of economic efficiency and equity. The paper deals with the nature of government intervention and its implications for allocation, distribution and stabilization. Inherently, this study involves a formal analysis of government taxation and expenditures. The subject encompasses a host of topics including public goods, market failures and externalities.

Module I: Introduction to public finance

Public Finance: meaning and scope, distinction between public and private finance; public good versus private good; Principle of maximum social advantage; Market failure and role of government;

Module II: Public Expenditure

Meaning, classification, principles, cannons and effects, causes of growth of public expenditure, Wagner's law of increasing state activities, Peacock-Wiseman hypotheses

Module III: Public Revenue

Sources of Public Revenue; Taxation - meaning, cannons and classification of taxes, impact and incidence of taxes, division of tax burden, the benefit and ability to pay approaches, taxable capacity, effects of taxation, characteristics of a good tax system, major trends in tax revenue of central and state governments in India

Module III: Public Budget

Public Budget: kinds of budget, economic and functional classification of the budget; Balanced and unbalanced budget; Balanced budget multiplier; Budget as an instrument of economic policy.

Module V: Public Debt

Sources, effects, debt burden – Classical, Ricardian and other views, shifting - intergenerational equity, methods of debt redemption, debt management, tax versus debt;

Readings:

1. J. Hindriks and G. Myles (2006): *Intermediate Public Economics*, MIT Press.
2. R. A. Musgrave and P. B. Musgrave (1989): *Public Finance in Theory and Practices*. McGraw Hill
3. B. P. Herber (1975): *Modern Public Finance*.
4. B. Mishra (1978): *Public Finance*, Macmillan India limited.

Core Economics Course 11: INDIAN ECONOMY I

Course Description

Using appropriate analytical frameworks, this course reviews major trends in economic indicators and policy debates in India in the post-Independence period, with particular emphasis on paradigm shifts and turning points. Given the rapid changes taking place in India, the reading list will have to be updated annually.

Module I: Basic Characteristics of Indian Economy as a Developing Economy

Indian Economy in the Pre-British Period; The Structure and Organisation of Villages and Towns; Industries and Handicrafts in Pre-British India; Colonialism; Economic Consequences of British Rule; Decline of Handicrafts and Progressive Ruralisation; The Land System and Commercialisation of Agriculture; Industrial Transition; Colonial Exploitation and Impacts – Underdevelopment; Colonisation and Modernisation; State Policies and Economic Underdevelopment; The Current State of Indian Economy

Module II: Population and Human Development

Population Growth and Economic Development – size, growth and future of population; Causes of rapid population growth; Population and economic development; Population policy; Demographic issues – Sex and Age Composition of population; Demographic Dividend; Urbanisation and Migration; Human Resource Development – Indicators and importance of Human Resource Development; Education policy; Health and nutrition.

Module III: National Income in India – The Growth Story and Regional Disparities

Trends in national and per capita income; Changes in sectoral composition of national income; Regional disparities in Growth and Income; Savings and Investment and Economic Growth – The Linkage

Module IV: Economic Planning in India

Rationale, Features, Objectives, Strategies, Achievements and Assessment of Planning in India; Eleventh Five Year Plan – Objectives, Targets and Achievements; Twelfth Five Year Plan – Vision and Strategy; From Planning to NITI – Transforming India's Development Agenda.

Module V: Current Challenges

Poverty – Estimation and Trends, Poverty Alleviation Programs – MGNREGA, NRLM, SJSRY; Inequality – Measures and trends in India; Unemployment – Nature, Estimates, Trends, Causes and Employment Policy

Readings:

1. Indian Economy, VK Puri and SK Misra, Himalaya Publishing House, 31st Revised Edition
2. Indian Economy Datt and Sundharam, Gaurav Datt and Ashwani Mahajan, S Chand Publications, 7th Revised Edition
3. Indian Economy Since Independence, ed by Uma Kapila, Academic Foundation, Revised Nineteenth Edition 2008-09
4. The New Oxford Economics Companion to India, ed by K Basu and A Maertens, Oxford University Press, 2012
5. Economic Survey of India 2015-16, Ministry of Finance, GoI

6. NITI Ayog document- (Feb 8, 2015)

Core Economics Course 12: DEVELOPMENT ECONOMICS I

Course Description

This is the first part of a two-part course on economic development. The course begins with a discussion of alternative conceptions of development and their justification. It then proceeds to aggregate models of growth and cross-national comparisons of the growth experience that can help evaluate these models. The axiomatic basis for inequality measurement is used to develop measures of inequality and connections between growth and inequality are explored. The course ends by linking political institutions to growth and inequality by discussing the role of the state in economic development and the informational and incentive problems that affect state governance.

Module 1: Study of economic development:

Development Economics as a subject; economic growth and economic development; characteristics of underdeveloped countries – vicious cycle of poverty and cumulative causation; obstacles to economic development; measures of economic development – national and per capita income, basic needs approach, capabilities approach, three core values of development, PQLI, HDI, HPI, MDPI, GDI; capital formation and economic development

Module 2: Theories of Economic Growth and Development

Classical theory, Marxian theory; Schumpeterian theory; Rostow's stages of economic growth; Solow model and convergence with population growth and technical progress

Module 3: Poverty, Inequality and Development:

Concepts of poverty and inequality; Measuring poverty; Measuring Inequality – Lorenz curve and Kuznets' inverted U hypothesis; Growth, poverty and inequality; Economic characteristics of poverty groups (rural poverty, women and poverty, indigenous population and poverty); Policy options – some basic considerations

Module 4: Institutions and economic development:

Role of institutions in economic development; Characteristics of good institutions and quality of institutions; The pre-requisites of a sound institutional structure; Different measures of institutions – aggregate governance index, property rights and risk of expropriation; The role of democracy in economic development; Role of state; Role of markets and market failure; Institutional and cultural requirements for operation of effective private markets; Market facilitating conditions; Limitations of markets in LDCs; Corruption and economic development – tackling the problem of corruption

Module 5: Agriculture, Industry and Economic Development:

Role of agriculture; Transforming traditional agriculture; Barriers to agricultural development; Role of industrialization; Interdependence between agriculture and industries – A model of complementarities between agriculture and industry; terms of trade between agriculture and industry; functioning of markets in agrarian societies; interlinked agrarian markets

Readings:

1. Debraj Ray (2009): *Development Economics*, Oxford University Press.
2. Partha Dasgupta (2007): *Economics, A Very Short Introduction*, Oxford University Press.
3. Abhijit Banerjee, Roland Benabou and Dilip Mookerjee (2006): *Understanding Poverty*, Oxford University Press.
4. Amartya Sen (2000): *Development as Freedom*, OUP.
5. Daron Acemoglu and James Robinson (2006): *Economic Origins of Dictatorship and Democracy*, Cambridge University Press.
6. Robert Putnam (1994): *Making Democracy Work: Civic Traditions in Modern Italy*, Princeton University Press.
7. Todaro, Michael P and Stephen C Smith (2006): *Economic Development*, 8th Edition, Pearson
8. Thirlwall, A P (2011): *Economics of Development*, 9th Edition, Palgrave Macmillan

Core Economics Course 13: INDIAN ECONOMY II

Course Description

This course examines sector-specific policies and their impact in shaping trends in key economic indicators in India. It highlights major policy debates and evaluates the Indian empirical evidence. Given the rapid changes taking place in the country, the reading list will have to be updated annually.

Model I: Agricultural Development in India

Indian Agriculture: nature, importance, trends in agricultural production and productivity, factors determining production, land reforms, new agricultural strategies and green revolution, rural credit; Agricultural marketing and warehousing.

Module II: Industrial Development in India

Trends in industrial output and productivities; Industrial Policies of 1948, 1956, 1977 and 1991; Industrial Licensing Policies – MRTP Act, FERA and FEMA; Growth and problems of SSIs, Industrial sickness; Industrial finance; Industrial labour

Module III: Tertiary Sector and HRD

Tertiary Sector: growth and contribution of service sector to GDP of India, share of services in employment; Human development – concept, evolution, measurement; HRD: indication, importance, education in India, Indian educational policy; Health and Nutrition.

Module IV: External Sector

Foreign Trade: role, composition and direction of India's foreign trade, trends of export and import in India, export promotion versus import substitution; Balance of Payments of India; India's Trade Policies; Foreign Capital – FDI, Aid and MNCs.

Module IV: Indian Economy and Environment

Environmental Policies in India: The Environment (Protection) Act 1986, The Environment (Protection) Rules 1986, The National Forest Policy 1988, Policy statement for Abatement of Pollution 1992, National Conservation Strategy and Policy Statement on Environment and Development 1992, The National Environment Appellate Authority Act 1997, National Environmental Policy 2006; Global deal with Climate Change: Introduction, Intergovernmental Panel for Climate Change (IPCC), Impact of Climate Change on India, Global Response on Climate Change, Possible Role of India

Readings:

1. U. Kapila (2010): *Indian economy since Independence*. Academic Foundation, New Delhi
2. S. K. Misra and V. K. Puri (Latest Year): *Indian Economy — Its Development Experience*, Himalaya Publishing House, Mumbai
3. S. Chakraborty (): *Development Planning: The Indian Experience*. Clarendon Press.
4. R. Dutt and K. P. M, Sundharam (Latest Year): *Indian Economy*, S. Chand & Company Ltd., New Delhi.
5. A. Panagariya (2008): *India: the Emerging Giant*, Oxford University Press, New York
6. S. Acharya and R. Mohan (Eds.) (2010): *India's Economy: Performance and Challenges*, Oxford University Press, New Delhi.
7. I. J. Ahluwalia and I. M. D. Little (Eds.) (1998): *India's Economic Reforms and Development: Essays for Manmohan Singh*, Oxford University Press, New Delhi.

Core Economics Course 14: DEVELOPMENT ECONOMICS II**Course Description**

This is the second module of the economic development sequence. It begins with basic demographic concepts and their evolution during the process of development. The structure of markets and contracts is linked to the particular problems of enforcement experienced in poor countries. The governance of communities and organizations is studied and this is then linked to questions of sustainable growth. The course ends with reflections on the role of globalization and increased international dependence on the process of development.

Module 1: Population and Development

Demographic concepts : birth and death rates, age structure, fertility and its determinants, the Malthusian population trap and the microeconomic household theory of fertility; costs and benefits of population growth and the model of low level equilibrium trap; the seven negative consequences of population growth; the concept of optimum population; rural-urban migration – the Harris Todaro migration model and policy implications

Module 2: Dualism and economic development

Dualism – geographic, social and technological; the theory of cumulative causation; the regional inequalities in the context of economic development; the inverted U relationship; international inequality and the centre periphery thesis; dependency, exploitation and unequal exchange; the dualistic development thesis and its implications

Module 3: Environment and Development

Basic issues of environment and development – population, resources and the environment; poverty, economic growth, rural development, urban development and the environment; simple model of environment and economic activity; environmental degradation and externalities; common property resources, public goods and the free-rider problem; renewable and non-renewable resources; environmental values and their measurement; concept of sustainable development; basics of climate change

Module 4: Financing Economic Development

Saving, capital formation and economic development; rural financial intermediaries, micro credit and economic development; financial liberalisation, financial inclusion and economic

development; taxation, public borrowing and economic development; inflation, saving and growth – the Keynesian approach; foreign finance, investment and aid – controversies and opportunities; private foreign investment and private portfolio investment; growing role of non-governmental organisations

Module 5: Globalisation, international trade and economic development:

Trade and economic development; export led growth; trade liberalisation and growth of exports; terms of trade and economic growth – the Prebisch Singer Hypothesis; trade strategies for development – import substitution vs export promotion; international commodity agreements; trade vs aid.

Readings

1. Debraj Ray (2009): *Development Economics*, Oxford University Press.
2. Partha Dasgupta (2007): *Economics, A Very Short Introduction*, Oxford University Press.
3. Abhijit Banerjee, Roland Benabou and Dilip Mookerjee (2006): *Understanding Poverty*, Oxford University Press.
4. Thomas Schelling (1978): *Micromotives and Macrobehavior*, W. W. Norton.
5. Albert O. Hirschman (1970): *Exit, Voice and Loyalty: Responses to Decline in Firms, Organizations and States*, Harvard University Press.
6. Elinor Ostrom (1990): *Governing the Commons: The Evolution of Institutions for Collective Action*, Cambridge University Press.
7. Dani Rodrik (2011): *The Globalization Paradox: Why Global Markets, States and Democracy Can't Coexist*, Oxford University Press.
8. Michael D. Bordo, Alan M. Taylor and Jeffrey G. Williamson (ed.) (2003): *Globalization in Historical Perspective*, University of Chicago Press.
9. Todaro, Michael P and Stephen C Smith (2006): *Economic Development*, 8th Edition, Pearson
10. Thirlwall, A P (2011): *Economics of Development*, 9th Edition, Palgrave Macmillan

DSE Group I
DSEG 1.1: Economic History of India 1857-1947

Course Description

This course analyses key aspects of Indian economic development during the second half of British colonial rule. In doing so, it investigates the place of the Indian economy in the wider colonial context, and the mechanisms that linked economic development in India to the compulsions of colonial rule. This course links directly to the course on India's economic development after independence in 1947.

Module I: Introduction: Colonial India: Background and Introduction

Overview of colonial economy

Module II: Macro Trends

National Income; population; occupational structure

Module III: Agriculture

Agrarian structure and land relations; agricultural markets and institutions – credit, commerce and technology; trends in performance and productivity; famines

Module IV: Railways and Industry

Railways; the de-industrialisation debate; evolution of entrepreneurial and industrial structure; nature of industrialisation in the interwar period; constraints to industrial breakthrough; labor relations

Module V: Economy and State in the Imperial Context

The imperial priorities and the Indian economy; drain of wealth; international trade, capital flows and the colonial economy – changes and continuities; government and fiscal policy

Readings:

1. Lakshmi Subramanian, *"History of India 1707-1857"*, Orient Blackswan, 2010, Chapter 4.
2. Sumit Guha, 1991, Mortality decline in early 20th century India', *Indian Economic and Social History Review (IESHR)*, pp 371-74 and 385-87.
3. Tirthankar Roy, *The Economic History of India 1857-1947*, Oxford University Press, 3rd edition, 2011.
4. J. Krishnamurty, *Occupational Structure*, Dharma Kumar (editor), The Cambridge Economic History of India, Vol. II, (henceforth referred to as CEHI), 2005, Chapter 5.
5. Irfan Habib, *Indian Economy 1858-1914*, A People's History of India, Vol.28, Tulika, 2006.
6. Ira Klein, 1984, —When Rains Fail: Famine relief and mortality in British India||, *IESHR* 21.
7. Jean Dreze, *Famine Prevention in India in Dreze and Sen (eds.) Political Economy of Hunger*, WIDER Studies in Development Economics, 1990, pp.13-35
8. John Hurd, *Railways*, CEHI, Chapter 8, pp.737-761.
9. Rajat Ray (ed.), *Entrepreneurship and Industry in India*, 1994.
10. AK Bagchi, —Deindustrialization in India in the nineteenth century: Some theoretical implications, *Journal of Development Studies*, 1976.
11. MD Morris, *Emergence of an Industrial Labour Force in India*, OUP 1965, Chapter 11,

Summary and Conclusions.

12. K.N. Chaudhuri, *Foreign Trade and Balance of Payments*, CEHI, Chapter 10.
13. B.R. Tomlison, 1975, *India and the British Empire 1880-1935*, IESHR, Vol.XII.
14. Dharma Kumar, *The Fiscal System*, CEHI, Chapter 12.
15. Basudev Chatterjee, *Trade, Tariffs and Empire*, OUP 1992, Epilogue.

DSEG 1.2 INTRODUCTORY ECONOMETRICS

Course Description

This course provides a comprehensive introduction to basic econometric concepts and techniques. It covers statistical concepts of hypothesis testing, estimation and diagnostic testing of simple and multiple regression models. The course also covers the consequences of and tests for misspecification of regression models.

Module I: Introduction

Definition, Nature and scope of econometrics; Theoretical Probability Distributions: Normal distribution; chi-square, t- and F-distributions and their uses

Module II: Sampling

Basic concepts of sampling: Probability and non-probability sampling; Types of sampling. Theory of Estimation: Estimation of parameters; properties of estimators – small sample and asymptotic properties; point and interval estimation

Module III: Hypothesis Testing

Testing of hypotheses: defining statistical hypotheses; Simple and composite hypotheses; Null and alternative hypothesis; Type I and Type II errors, Critical region; Neyman-Pearson lemma; Power of a test.

Module IV: Linear Regression Analysis

Two variable linear regression model – Assumptions; Least square estimates, Variance and co- variance between Least square estimates; BLUE properties; Standard errors of estimates; Co- efficient of determination; Inference in a two variable linear regression model; ANOVA; Forecasting.

Module V: Violation of Classical Assumptions

Heteroscedasticity, multicollinearity and auto-correlation: Meaning, consequences, tests and remedies.

Reading List:

1. Johnston (1991), "Econometric Methods", Mc Graw Hill Book Co
2. Koutsoyiannis, A, (1992) "Introduction to Econometrics" OUP
3. Dougherty, C. (1992) "Introduction to Econometrics" OUP.
4. Kmenta, J (1997); "Elements of Econometrics", University of Michigan Press
5. Gujarati, D & Sangeetha (2007); "Basic Econometrics", Mc Graw Hill Book Co.

DSEG 1.3: Odisha Economy

Course Description

Using appropriate analytical frameworks, this course reviews major trends in economic indicators and policy debates in Odisha in pre- and post-Independence period, with particular emphasis on paradigm shifts and turning points. Given the rapid changes taking place in Odisha, the reading list will have to be updated annually.

Module I: Odisha Economy before 1947

Orissa's Economy in the Nineteenth Century: Benevolence or Exploitation, Forces of Nature, Animal Power, The Company Steps in, Public Works and Public Health, Education, Disintegration of Village Economy, New Social Environment, Changing Position of Social Classes, The Moneylenders, The Borrowers, Money-flows from Village to Metropolis, Pauperization of Peasantry, The Wage Earners, Demographic Changes, Profiting from Rural Adversity; Diarchy in 1919 and Separation of Provincial Finances from Central Government in 1937; Emergence of Federal Finance (Ref.: Das 1976a and 1976b, GoO 2016).

Module II: Macro Economy of Odisha

A macro glance of Odisha economy: aggregate income, broad sectoral decomposition, performance of districts, employment, child labour and bonded labour, employment programmes, consumption expenditure, cost of living; Odisha State public finances (Chapter 14 and 15 of Ref 1; & Chapter 2 and 9 of Ref 2)

Module III: Agriculture Sector Development in Odisha

Agriculture: land ownership and land tenure, agricultural wages and rural unemployment, production and productivity of major crops, agricultural inputs, agricultural policy; Animal Husbandry; Fisheries (Chapter 1 to 3 of Ref 1; & Chapter 3 of Ref 2)

Module IV: Industry, Infrastructure and Environment

Industry: Investment, industrial policy, and the growth of large industries, mining and quarrying; Construction; tertiary sector: tourism, transport and power; Water Resources, Forest Resources (Chapter 4 to 8 of Ref 1; & Chapter 4 & 5 of Ref 2)

Module V: Social Sector in Odisha

Poverty: income poverty and inequality; health sector: outcomes, infrastructure, finance, public health, NRHM; education: Literacy, Primary education, secondary education, higher education, SSA; human development (Chapter 9 to 13 of Ref 1; & Chapter 7 & 8 of Ref 2)

Reading List:

1. Nayak, P., Panda, S. C., Pattanaik, P. K. (2016): **The Economy of Odisha: A Profile**, Oxford University Press, New Delhi
2. GoO (2012): **Odisha Economic Survey 2015-16**, Planning and Convergence Department, Directorate of Economics and Statistics, Government of Odisha, Bhubaneswar
3. GoO (2004): *Human Development Report 2004 Orissa*, Planning and Coordination Department, Government of Odisha, Bhubaneswar
4. Mahapatro, S. B. (1980): Inter-Industry Wage Differentials in Orissa: An Empirical

- Analysis, *Indian Journal of Industrial Relations*, 15(4): 525-536.
5. Vyasulu, V. and Arun, A. V. (1997): Industrialisation in Orissa: Trends and Structure, *Economic and Political Weekly*, 32(22): M46-M53.
 6. Das, Binod S. (1976a): Orissa's Economy in the Nineteenth Century, *Social Scientist*, 4(11): 32-46.
 7. Das, Binod S. (1976b): Orissa's Economy in the Nineteenth Century: Part Two, *Social Scientist*, 4(12): 38-50.
 8. GoO (2016): Commemorative Volume on 80 Years Odisha Budget: Since 1936-37, CEFT-XIMB and Department of Finance, Government of Odisha
 9. Mohanti, K. K. and Padhi, S. (1995): Employment Situation of Tribal Population in Orissa: 1981 Census Data, *Economic and Political Weekly*, 30(29): 1879-1882.
 10. Nair, K. R. G. (1993): New Economic Policy and Development of Backward Regions: A Note on Orissa, *Economic and Political Weekly*, 28(19): 939-941.
 11. Mohanty, B. (1993): Orissa Famine of 1866: Demographic and Economic Consequences, *Economic and Political Weekly*, 28(1/2): 55-66.
 12. Haan, A. de and Dubey, A. (2005): Poverty, Disparities, or the Development of Underdevelopment in Orissa, *Economic and Political Weekly*, 40(22/23): 2321-2329.
 13. Samal, K. C. (1998): Poverty Alleviation after Post-Liberalisation: Study of a Tribal Block in Orissa, *Economic and Political Weekly*, 33(28): 1846-1851
 14. Nayak, P. and Chatterjee, B. (1986): Disguised Unemployment in Agriculture: A Case Study of Rural Orissa, *Indian Journal of Industrial Relations*, 21(3): 310-334.

DSEG 1.4: Research Methodology

Course Description

The course is to develop a research orientation among the students and to acquaint them with fundamentals of research methods. Specifically, the course aims at introducing them to the basic concepts used in research and to scientific social research methods and their approach. It includes discussions on sampling techniques, research designs and techniques of analysis.

Module I: Basics of Research

Introduction to Research: Meaning, Objectives, Motivation, Types, Approaches, Significance, Research Process, Criteria of Good Research; Qualities of a Good Researcher, Research as a Career

Module II: Research Problem

Defining the Research Problem: What is a Research Problem? Selecting the Problem, Necessity of Defining the Problem, Technique Involved in Defining a Problem; Research Design: Meaning, Need, Features of a Good Design, Important Concepts Relating to Research Design, Different Research Designs, Basic Principles of Experimental Designs

Module III: Measurement and Scaling Technique

Measurement in Research, Measurement Scales, Sources of Error in Measurement, Tests of Sound Measurement, Techniques of Measurement Tools, Scaling and Important Scaling Technique

Module IV: Problems in Research

Research Ethics: codes and ethics, permissions to research, responsibilities, confidentiality, feedback, participatory research; Research Proposal and literature review: research proposal, review of literature, levels of analysis, using the library and internet, abstracting, word processing, plagiarism

Module V: Actions in Research

English in report writing: words, sentences, paragraph, writing style; The Report: improving quality, sections, drawing conclusions, evaluation checklists, persistence; Common Citation Styles

Basic Readings

1. Kothari, C. R. (2004): **Research Methodology: Methods and Techniques**, New Age International Private Limited Publishers, New Delhi.
2. Guthrie, G. (2010): **Basic Research Methods**, Sage Publications India Private Limited, New Delhi.
3. Monippally, M. M. (2010): **Academic Writing: A Guide for Management Students and Researchers**, Response Books (Sage), New Delhi, Pp. 196-217

Additional Readings

1. Young, P. V. (1996): **Scientific Social Survey and Research**, PHI Learning Private Limited, New Delhi
2. Dooley, D. (2008): **Social Research Methods**, Prentice-Hall of India Private Limited, New Delhi

DSE Group II

DSEG 2.1: Environmental Economics

Course Description

This course introduces the students to the basics of environmental economics to understand the fundamentals of environmental concerns and develop insights into valuation of environment.

Module I: Economy and Environment

Nature and Scope of Environmental Economics- historical development, early economic paradigms, post- war economics and environmentalism; Environment and Economy interaction; Environment as a public good- National versus global public goods, Market failure, Externalities and the environment; The nexus involving environment, development and poverty.

Module II: The Economics of Pollution and Climate change

The optimal level of pollution, Pollution as externality, alternative definitions of pollution; The market Approach to optimal pollution, Property rights and market bargain theorems, Coase theorem; Taxation, Subsidies and optimal pollution; Pollution permit trading; Climate change – concept, causes, effects and management; Climate change and Agriculture

Module III: Valuation of Environmental damage

Methods and difficulties of environmental valuation, Economic value, Total economic value, Option value, Existence value; Direct and Indirect Valuation of Environmental Goods: The hedonic price approach, Contingent valuation, Travel cost approach; Willingness to pay vs. Willingness to accept.

Module IV: Environmental Pollution and Regulation in India

Causes and effects of water pollution, air pollution, noise pollution, soil pollution, Prevention and control of environmental degradation, Mechanism for environmental regulation in India- Environmental policy and legislations

Module V: Natural Resources and Sustainable Development

Environment and sustainable development, Concept and indicators of sustainable development, Resource scarcity, Renewable and exhaustible resources, Optimal use of renewable resources – fishery and forest, Tragedy of commons, People's Participation in the management of common property resources

Reading List:

1. Bhattacharya, R. N. (2002): Environmental Economics: An Indian Perspectives, OUP, New Delhi
2. Shankar, U. (Ed.) (2001): Environmental Economics, OUP, New Delhi.
3. Dayal, V. and Chopra, K. (2009): Handbook of Environmental Economics in India, OUP, New Delhi
4. Bromley, D.W (Ed)(1995); Handbook of Environmental Economics, Blackwell, London
5. Fisher, A.C(1981); Resource and Environmental Economics, Cambridge University Press
6. Helfand, G and P. Berck (2011); The Economics of the Environment, PHI Learning Private Limited, New Delhi
7. Hemple Lamont, C (1998); Environmental Economics – the Global Challenge First East West Press
8. Hussen, A.M (1999); Principles of Environmental Economics, Routledge, London
9. Kolstad, C.D (1999); Environmental Economics Oxford University Press, New Delhi
10. Pearce, D.W and R.K Turner (1948); Economics of Natural Resources and the Environment, Harvester Wheatsheaf
11. Perman R.M. and J. McGilvary (1996); Natural Resources and Environmental Economics, Longman, London
12. Tietenberg. T (1994); Environmental Economics Policy, Harper Collings, New York
13. The Economics of Climate Change: The Stern Review by Great Britain Treasury, Cambridge University Press

DSEG 2.2: International Economics

Course Description

This course introduces the students to international trade and finance to understand the theories of international trade and develop insights into trade policy and balance of payments. The course also develops insight into international financial system and the trade policy of India.

Module I: Importance of Trade and Trade Theories

Importance of the study of International Economics; Inter-regional and international trade; Need for a separate theory of international trade; Theories of Trade- absolute advantage, comparative advantage and opportunity cost; Heckscher-Ohlin theory of trade — its main features, assumptions and limitations

Module II: Trade and Economic Growth

Concepts of terms of trade and their importance; Doctrine reciprocal demand – Offer curve techniques; Gains from trade— their measurement and distribution; International Trade and Growth: Small and Open country cases; Tariffs and quotas – their impact in partial equilibrium analysis; Free trade and policy of tariffs in relation to economic growth with special reference to India

Module III: Exchange Rate

Concept and Types of Exchange Rate (bilateral vs trade-weighted exchange rate, cross exchange rate, spot, forward, futures), Demand for and Supply of foreign exchange, Exchange Rate Determination: Purchasing-Power Parity Theory, The Monetary Model of Exchange Rates, Asset or Portfolio Model of Exchange Rates. Fixed versus Flexible exchange rate

Module IV: Balance of Trade and Payments

Concepts and components of balance of trade and balance of payments; Equilibrium and disequilibrium in balance of payments; Consequences of disequilibrium in balance of payments; Various measures to correct deficit in BoPs; Foreign trade multiplier- Concept and implications; Present balance of payment position of India – Need for and rationale of trade reforms in India including partial and full convertibility of rupee; recent export and import policies in India

Module V: International Economic Institutions

Functions of IMF, World Bank, WTO and Asian Development Bank — Their achievements and failures; Their Role from the point of view of India; Forms of economic cooperation; Reforms for the emergence of international monetary system and trading blocs at the global level

Reading List:

1. Krugman Paul R. and Obstfeld Maurice. *International Economics*, Pearson Education
2. Salvatore Dominick. *International Economics*, Wile India.
3. Sodersten Bo and Reed J. *International Economics*, McMillan Publisher
4. Carbaugh Robert. *International Economics*, South-Western College Publication.
5. Gandolfo Giancarlo. *International Trade Theory and Policy*, Springer Publication
6. Gandolfo Giancarlo. *International Finance and Open-Economy Macro Economics*, Springer Publication
7. Copeland Laurence. *Exchange Rates and International Finance*, Addison Wesley, Publication.
8. Kanan, P. B. (1994): *The International Economy*, Cambridge University Press, London.
9. Kindleberger, C. P. (1973): *International Economics*, R.D. Irwin, Homewood.

DSEG 2.3: Economics of Agriculture

Course description

This course introduces the students to significance of agriculture in the Indian economy and helps to understand the role agriculture in economic development. It is designed to develop insights into changing agricultural practices in India and assess the significance of agriculture in the era of liberalisation.

Module I

Role of Agriculture in Economic Development, Economic growth – sectoral changes and agriculture, agriculture in rural development, farm and non-farm employment issues, inter-linkages between agriculture and industry; empirical evidence of inter-dependence between agriculture and industry

Module II

Traditional Agriculture: characteristics; Schultz's hypothesis – its criticisms; Mechanization of Indian Agriculture; Case for and against farm mechanization; Green revolution and trends of mechanization in India

Module III

Agricultural price policy for a developing economy – objectives and effectiveness of agricultural price policy, elements of agricultural price policy, features of an ideal agricultural price policy, agricultural price policy in India and public distribution system

Agricultural marketing – need and criteria for assessing efficiency, agricultural marketing system in India, development of a national agricultural marketing platform

Module IV

Risk and uncertainty in agriculture – difference between risk and uncertainty, types of uncertainty in agriculture, measures for mitigating risk and uncertainty in agriculture, new agricultural insurance scheme of India

Rural credit in India, importance and estimates, agencies for rural credit, review of progress of institutional finance in rural India since independence

Module V

Agriculture in Indian Planning, Globalization and Indian agriculture, Case for and against privatization of agriculture, WTO and India's trade in agricultural commodities

Reading List:

1. Ghatak, S and K. Ingerscent (1984), Agricultural and Economic Development, Select Books, New Delhi.
2. Rudra, A (1982), Indian Agricultural Economics: Myths and Realities, Allied Publishers, New Delhi.
3. Sony, R. N. (2006), Leading Issues in Agricultural Economics, Vishal Publishing, Jalandhar.
4. Tyagi, B. P. (1998), Agricultural Economics and Rural Development, J. P. Nath Publishing, Meerut.
5. Sadhu, A N and A Singh (2008), Fundamentals of Agricultural Economics, Himalaya Publishing House, Mumbai.
6. Lekhi, R K and Joginder Singh (2008), Agricultural Economics, Kalyani Publishers, Ludhiana.

SEC II: Data Analysis and Computer Application (Option I)

Course Description:

The purpose of this course is to introduce basic computer skills to students at UG level in non technical subjects. After completion of this course, the students are expected to acquire some basic knowledge about computers and to develop some basic skills in using computers for data storage, compilation, analysis and presentation.

Module I: Introduction to computer and Basic data types

Introduction to computer- Characteristics and Basic Applications of Computer, Components of Computer System, Central Processing Unit (CPU), VDU, Keyboard and Mouse, Other input/output Devices, Memory, concepts of Hardware and Software, Classifications of computers; Representation of data/Information concepts of data processing, Basic data types, Storage of data/Information as files, operating system and The User Interface (windows, Linux), Windows Setting- Control Panels, Accessories (windows)

Module II: Basic Word Processing

Introduction to Word Processing, Opening Word Processing Package, Opening and closing documents, Using a Document/Help Wizard, Text Creation and Manipulation, Formatting the Text, Handling Multiple Documents, Table Manipulation, Printing, saving documents in different formats

Module III: Spreadsheets and Basic Data Analysis

Spread Sheet, Elements of Electronics Spread Sheet, Application/usage of Electronic Spread Sheet, Manipulation of cells, Formulas and functions; Spread sheets for Small accountings- maintaining invoices/budgets, basic practical data analysis works (Maintaining daily and monthly sales reports)

Module IV: Basic Computer Communication and Internet

Basic of Computer networks- LAN and WAN, Internet, Service on Internet; WWW and Web Browsers, Web Browsing software, Surfing the Internet, Chatting on Internet, Email-Basic of electronic mail, Using Emails, Document handling in Email.

Module V: Basic Presentations

Basics- Difference between presentation and document, Using Power Point, Creation of Presentation, Preparation of Slides, Selection of type of Slides, Importing text from word documents, Providing aesthetics- Slide Designs, Slide Manipulation and Slide Show, Presentation of the Slides

Reading List:

1. C.S. French "Data Processing and Information Technology", BPB Publications 1998
2. P.K Sinha, Computer Fundamentals, BPB Publications, 1992
3. Guy Hart-Davis "The ABCs of Microsoft Office 97 Professional edition", BPB Publications, 1998
4. Karl Schwartz, "Microsoft Windows 98 Training Guide", 1998

Course Description

This course intends to explain the ideas on financial system in India. It will help the students to enhance their knowledge on concepts like financial institutions, instruments and markets, their functioning and usage in real world.

Module I: Financial system

The structure of the financial system- Functions of the financial sector-Indicators of financial development; Financial System and Economic Development; financial inclusion: concept and its evolution; policy initiatives on financial inclusion.

Module II: Interest rate policy

Theories of interest rate determination-Level of interest rates-Long period and short period rates- Administered interest rates; Deregulation of interest rates; financial sector reforms in India.

Module III: Money market

Money Market: features; objectives; features of a developed and under developed money market; importance of money market; composition of money market: organized and unorganized; money market institutions and instruments; features and problems of Indian money market.

Module IV: Capital Market

Capital market: composition; Primary and secondary market for securities. Functions of new issue and secondary market; organizations of stock exchanges in India; defects in Indian stock exchange; SEBI; its objectives and functions

Module V: Non-Banking Financial Companies

Non-Banking Financial Companies: Hire purchase Companies-Venture Capital Companies. Insurance Sector: objectives, functions, life insurance and general insurance; IRDA and its role and functions in financial markets.

Basic Reading List

1. M.Y.Khan-Indian Financial System, Tata McGraw Hill, New Delhi.
2. L.M.Bhole: Financial institutions and Market, Tata McGraw hill, New Delhi.
3. Gorden & Natrajan: Financial Market and institutions, Himalaya Publishing house.

SYLLABUS FOR B.A. (HONORS) EDUCATION UNDER CHOICE BASED CREDIT SYSTEM OF UTKAL UNIVERSITY, BHUBANESWAR

CORE - 1

BASICS IN EDUCATION

INTRODUCTION:

The Philosophical foundation is a unique educational charity whose aim is to bring philosophy to schools and the wider community. Through doing philosophy in the classroom the primary concern is to improve the educational practices and provide opportunities for the disadvantaged. Philosophical enquiry develops speaking and listening skills vital for literacy and emotional development, helps children who find it difficult to access other classes, and encourages critical and creative thinking essential in the 21st Century. And it will prepare students to apply knowledge, sensibility, skills and dispositions of philosophical inquiry, analysis, and interpretation to educational practices.

Course Objectives

- after completion of the paper, students shall be able to:
- explain the concept of education and its relationship with philosophy
- list areas of philosophy and narrate their educational implications.
- describe the contribution of Philosophy to the field of education.
- appreciate the contribution of various Indian Schools of Philosophy to the field of education.
- evaluate the impact of Western Philosophies on Indian Education.
- narrate the contribution of the Great Indian Thinkers.

Unit – 1 Bases of Education

- Meaning, Nature and purpose of Education
- Aims of Education: Education for individual development and education for social efficiency
- Functions of education

Unit – 2 Philosophical foundations of education

- Concept of Philosophy

- Inter dependence of philosophy and education
- Branches of philosophy and their educational implications –
Metaphysics, Epistemology and Axiology.

Unit – 3 Reflections of Indian schools of Philosophy on education

- Common characteristics of Indian Philosophy
- Sankhya and Vedanta as Philosophical systems
- Educational implications of Sankhya and Vedanta.

Unit – 4 - Western Schools of Philosophy and their educational implication.

- Idealism
- Naturalism
- Pragmatism

Unit – 5 Doctrines of Great Educators of East and West and their influence on the practices of school education with special reference to Aims and ideals of Education, Curriculum, method of teaching and the role of teacher.

- Gandhi
- Sri Aurobindo
- Rousseau
- Dewey

REFERENCES

- Agarwal, J.c. (2010), *Teacher and Education in a Developing society*, Delhi; Vikash Publishing house.
- Arulsarmy, S (2011), *Philosophical and sociological perspectives on Education*, New Delhi; Neelkamal Publications Pvt. Ltd.
- Bhatia K.K., (2011), *Philosophical and sociological foundations of Education*, New Delhi; Kalyani Publishers.
- Bigge, Morris, L. *Educational Philosophies for Teachers*. Columbus, USA: Charies
Boston, USA: Allyn & Bacon.
- Brubacher, John. S. *Modern Philosophies of Education*. New York, USA: McGraw
- Butler J. Donald, *Four Philosophies and their practices in Education and Religion*.

- Chauhe, S.P. & Chaube, A (2009), *Foundation of education* , New Delhi; Vikash, Publishing house Pvt. Ltd.
- Dash, B.N. (2011) *Foundation of Education*, New Delhi; Kalyani Publishers.
- E. Merrill Publishing Co.
- Gutek, Gerald L. (2009). *New Perspectives on Philosophy and Education*. New
- Hill Book Company Inc.
- Janeja, V.R. (2012) *Educational Thought and Practice*, New Delhi, Sterling Publishers, Private Limited.
- Jersey, USA: Pearson
- Kneller, George F. *Introduction to Philosophy of Education*. New York, USA: John
- Mishra, Bhawna (2004), *Education Evolution Development and Philosophy*, New Delhi; Akanhsa Publishing House.
- Mohanty, Jagannatha (1991), *Foundation of Education*, Cuttack – 2, Takshashila.
- Nayak, B.K *Text Book of Foundation of Education*. Cuttack, Odisha: Kitab Mhal.
- New York, USA: Harper & Row.
- Ozman, Howard A., & Craver, Samuel M., *Philosophical Foundations of Education*.
- Premnath, *Bases of Educations*. Delhi, India: S. Chand and Co.
- Publishers.
- Ross, James S., *Ground Work of Educational Theory*. London, U.K: Oxford
- Rusk, Robert R., *Philosophical Bases of Education*, London, U.K: Oxford University of London Press Ltd.
- Safaya, R.N. & Shaida, B.D. (2010), *Modern Theory and Principles of Education*, New Delhi : Dhanpatrai Publishing Company Pvt. Ltd.
- Saiyadain, K.G. *Education and social order*. Bombay: Asia Publishing House.
- Taneja, V. R. (2000). *Educational Thought and Practice*. New Delhi: Sterling University of London Press Ltd.
- Wiley and Sons, Inc.
- Wingo, G. Max. *Philosophies of Education*. New Delhi: Sterling Publishers.

C1 Practical

Book Review

Each Student is required to review a Book / Journal / Educational Article and Write a report.

CORE – 2

EDUCATION AND SOCIETY

INTRODUCTION

Education is a sub-system of the society. The aims of education are determined by the aims of the society. The relationships between the two concepts i.e., education and society are so strong that it is not possible to separate them because what happens to one affects the other. It is impossible to think purposefully about many contemporary problems and issues of education without thinking about the society. Educational institutions are micro-societies, which reflect the entire society. The education system in any given society prepares the child for future life and instils in him those skills that will enable him to live a useful life and contribute to the development of the society. Education as a social phenomenon does not take place in a vacuum or isolation; it takes place in the society. This paper will deal with the functioning of education vis-a-vis the society. Education as a sub-system of society and how other sub-systems affect education will be discussed. Various agencies which are involved towards promotion of education will be discussed at length. Special emphasis is placed on issues relating to equality of educational opportunity with specific reference to the Scheduled Castes/Tribes and women. Special attention is also given how education plays an important role towards social change, national integration and international understanding in a diverse social context.

Course Objectives

After completion of this paper, students shall be able to:

- justify education as a social process and explain its function.
- describe the aims of education from sociological perspective.
- list various agencies of education and their function.
- justify education as a sub-system of society and how other sub-systems affect education;
- appreciate the importance of education for social change.

Unit – 1 **Education and society**

- **Society : Meaning and characteristics**

- **Types of society : Agricultural, Industrial, rural and urban**

- **Interrelationship between education and society**

- Views of Indian thinkers on Education and Society :

Radhakrishnan and Sri Aurobindo on Education

- Views of Western Thinkers on Education and Society: Dewey and Illich

Unit – 2 **Education and culture**

- Meaning and concept of culture

- Characteristics and types of culture

- Cultural lag and acculturation

- Cultural dimensions of Education

- Inter relationship between education, custom and value system.

Unit – 3 **Education, Social process and Institution**

- Education and socialization

- Education and social change

- Education and social mobility

- Role of Education for the development of the marginalised

- Education and Affirmative action

Unit – 4 **Education and Globalisation**

- Education, Growth and Development

- Globalisation and liberalization

- Educational system in Europe

- Educational system in SAARC countries

- Education in Global context

Unit – 5 **Education and state**

- Concept of Democracy

- Education in totalitarian and welfare state

- Interrelationship of state and education

- Role of education in Nation building

- State Control of Education and Autonomy in Education.

REFERENCES

- Abraham, M.F. (2008). *Contemporary Sociology*. New Delhi: Oxford University Press.
- Anand, C.L. et.al. (Ed.) (1983). *Teacher and Education in Emerging in Indian Society*. New Delhi: NCERT.
- Dewey, John (1973). *The School and Society*. Chicago: University of

Chicago Press.

- Mathur, S.S. (1966). *A Sociological Approach to Indian Education*. Vinod PustakMandir, Agra.
- Nayak, B.K. *Text Book of Foundation of Education*. Cuttack: Kitab Mahal.
- NCERT (1983). *Teacher and Education in Emerging Indian Society*. New Delhi.
- Ottaway, A.K.C. (1966). *Education and Society*. London: Routledge and Kegan Paul.

C2 Practical

Field Study

Each student is required to visit a school observe the school functioning and prepare a report

CORE – 3

THE LEARNER AND LEARNING PROCESS

INTRODUCTION:

Educational Psychology plays a pivotal role in understanding Children's unique character in teaching learning process. No child is alike from physical, psychological, and social point of view. So a classroom teacher must understand unique characteristics of children and the factors affecting children's learning. This course will enable the learners to understand the Children's innate potentialities and apply educational psychology in teaching learning process.

Course Objectives:

After completion of this paper, students shall be able to:

- establish relationship between education and psychology.
- understand various methods used to study individual behaviour.
- explain the application of educational psychology in teaching learning process.
- understand individual difference from intelligence, creativity, and personality point of view
- explain the concept of learning and factors affecting learning.
- reflect the contribution of various learning theories in teaching learning process.
- Explain different category of people from different Personality type and the type of adjustment.

Unit - 1 **Educational Psychology**

- Relationship between education and psychology

- Meaning, Nature and scope of educational psychology

- Relevance of educational psychology for teacher

- Methods of studying learner behaviour :

Survey, observation case study and experimental

Unit – 2 **Developmental psychology**

• Concept

• Difference between growth and development

- Principles of development
- Areas of development : Physical, social, emotional and intellectual during childhood and adolescence
- Piagetian stages of cognitive development

Unit – 3

Intelligence, creativity and individual difference

- Meaning and nature of intelligence
- Theories: Uni-factor, two-factor, multiple factor, Gardner's theory of Multiple Intelligence.
- Measurement of intelligence : individual and group tests, verbal, non- verbal and performance test.
- Individual difference: concept, nature factors and Role of Education
- Creativity : Meaning, Nature and Stages of creative thinking
Assessing and nurturing creativity.

Unit – 4

Learning and motivation

- Learning : Meaning nature and factor
- Theories of learning with experiment and educational implications: Trial and error with focus on laws of learning classical conditioning, operant conditioning and insightful learning and constructivist approach to learning.
- Motivation: concept, types and technique of motivation.

Unit – 5

Personality and Mental Health

- Personality: Meaning and nature
- Assessment: Subjective, objective and projective techniques.
- Mental Health: Concept, factor affecting mental health and role of teacher.
- Mental Health of teachers
- Adjustment mechanism

REFERNECES

- Aggarwal J.C (2010) Essentials of Educational Psychology, New Delhi, Vikas Publishing House Pvt. Ltd.
- Sharma R.N. (2010) Educational Psychology, Delhi, Surjeet Publications.
- Mangal S.K. (2008) Essentials of Educational Psychology, New Delhi, Prentice Hall of India Private Limited.
- Kuppuswamy B (2013) Advanced Educational Psychology, New Delhi,

Sterling Publishers Private Limited.

- Mathur S.S. (1962) Educational Psychology, Agra, Vinod Pustak Mandir.
- Kulshreshtha S.P. (2013) Educational Psychology, Meerut, R. Lall Book Depot.
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- Pandey Ram Shakal (2006), Advanced Educational Psychology, Meerut, R. Lall Book Depot.
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- Chauhan, S.S.(1998). *Advanced Educational Psychology*. Vikash Publishing House, New Delhi.
- Choube, S. P. & Choube. (1996). Educational Psychology and Experiments. Himalay Publishing House New Delhi.
- Mangal S.K. (1997). *Advanced Educational Psychology*. Presentice Hall of India, New Delhi.
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- Dash, U.N & Mohanty, M.M (1990). Schooling and Cognition. Harper Collins Publisher, New York.
- Maslow, A.H. (1970). Motivation and Personality (2nd edition). New York: Harper & Row.

C3 Practical

Administration of Psychological Test

Each student is to administer a psychological test (Intelligence / creativity / personality test) and interpret the scores and prepare a report.

CORE – 4

PEDAGOGICAL SKILLS

INTRODUCTION

It is important to note that 'education' is not synonymous with 'school'. It has always been the case that a range of activities that are educational in nature can, indeed should, occur outside the school, even from the earliest age given the educative role of the parents. The Delors Commission Report on education for the 21st century proposed 'learning to live together' as one of the four pillars of education. It advocates learning to live together by developing an understanding of other people and an appreciation of interdependence – carrying out joint projects and learning to manage conflicts in a spirit of respect for the values of pluralism, mutual understanding and peace (UNESCO, 1996). The policy context in India and around the globe is moving towards recognition of the educational value of newer form of pedagogy in the 21st Century which will enable the children to develop critical reasoning power, justify their views, independent decision making power, expression of thoughts, and empathy to others' feelings. Recently NCERT (2005) and NCTE (2009) have changed their curriculum framework and accordingly revised their text books and teacher orientation process to empower the prospective teachers to cope up with emerging pedagogies and to promote higher order learning of the learners like, creative expression, authenticity, abstraction of ideas, and multiple thinking, etc. This paper is intended to give insight to the students on importance of pedagogy in education.

Course objectives

After completion of the course, the students shall be able to:

- explain the concept of pedagogy;
- differentiate pedagogy from other allied concepts;
- define different type of task of teaching
- establish relationship between teaching and learning;
- list out different approaches and methods of teaching;

Unit – 1 **Concept of teaching – learning**

- Meaning and definitions of teaching
- Characteristics and importance of teaching
- Meaning and definition of learning.

- Relationship between teaching and learning.

Unit – 2 Task of teaching

- Meaning and definition of teaching task
- Variables involved in a teaching task: Independent Dependent and intervening variable.
- Phases of teaching task : Pre-active, interactive and post – active phase.
- Level of teaching task: Memory Understanding and reflective level.
- Lesson plan design : The Herbartian steps, 5E Model ICON Design Model.

Unit – 3 Theories of teaching

- Meaning and Nature of Theory of teaching
- Types of Teaching Theories.
- Formal : Communication theory,
- Descriptive : Gagne’s hierarchical theory
- Normative: Theories of Mitra and Clarke

Unit – 4 Principles and Maxims of Teaching

- General principles teaching
- Psychological principles of teaching
- Maxims of teaching

Unit – 5 Approaches and Methods of Teaching

Inductive – Deductive, Analytic - synthetic,
Problem Solving and Project
method.

Shift in focus from teaching to learning –

constructivist approach Activity based and child centered

approach – concept and elements.

REFERENCES

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- Chauhan S.S. (1995) Innovation of Teaching Learning Process, Vikas

Publishing House, New Delhi.

- Kochar, S.K. (2011) Methods and Techniques of Teaching, Sterling Publisher Pvt. Ltd., New Delhi.
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- Pathak, R.P. & Chaudhary J (2012) Educational Technology, Pearson, New Delhi.
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- Sampath, K, Pannir Salvam. A., & Santhanam, S. (1981) introduction to Educational Technology, sterling publishers, New Delhi.
- Sharma, R.A. (1986) Technology of Teaching, International Publishing House, Meerut.

C-4 Practical

Preparation of Lesson

Plan

Each student is to required develop five lesson plans in his/her method subject, (which he / she has to opt in 3rd Semester). The plan will be developed following Herbatian approach / 5E Model / Icon Design Model.

CORE - 5

TECHNOLOGY AND INNOVATIONS IN EDUCATION

INTRODUCTION

Educational technology (ET) is the efficient organization of any learning system adapting or adopting methods, processes, and products to serve identified educational goals (NCERT, 2006). This involves systematic identification of the goals of education, recognition of the diversity of learners' needs, the contexts in which learning will take place, and the range of provisions needed for each of these. Our schools should move from a predetermined set of outcomes and skill sets to one that enables students to develop explanatory reasoning and other higher-order skills. Educational technology is a powerful tool towards developing such reasoning and skills. It should enable students to access sources of knowledge, interpret them and create knowledge rather than be passive users. It should enable the teachers to promote flexible models of curriculum transaction. It should encourage to use flexible curriculum content and flexible models of evaluation as well. Present paper will give an exposure to students to understand the meaning, nature and scope of educational technology. They will be sufficiently oriented about nuances of communication and their implications in educational context. They will understand the underlying principles of instructional design. Students will develop the ability to prepare lesson plans based on constructivist approach. They will be oriented about the need and importance distance education in India.

Course Objectives

On completion of this course, the students will be able to:

- understand the meaning, nature and scope of educational technology
- explain with examples various approaches to educational technology
- describe systems approach and its application in educational context
- explain the concepts, principles, modes, process and barriers of communication and their implications in educational context
- explain the instructional design and its underlying principles
- describe different models of teaching and their use in effective classroom teaching

Unit – 1 **Educational Technology**

Meaning, nature and scope

Approaches to Educational Technology : Hardware, software and
system approach

Types of Educational Technology

Importance of Educational Technology for the teacher and the student.

Unit – 2

Communication Process

Meaning and nature

Process, components and

types Barriers of

communication

Study of Classroom Communication through flander's interaction analysis.

Unit – 3

Innovations in Educational Technology

Programmed instruction : Concept Basic principles and

applications Microteaching : Concept assumptions, phases

and applications.

Simulated Teaching : concept, procedure and applications

Personalized system of instruction : Concept, objectives, strategies and
applications

Unit – 4

Teaching Models

Concept attainment

model Advance

organizer model

Synetics model

Inductive model

Memory model

(These teaching models are to be discussed with reference to focus, syntax, social system, support system and application)

Unit – 5 **Classroom instructional Aids**

Projected and non projected

Aids ICT – enabled devices

Organisation of school teaching learning

Materials (TLM) Centre: Objective

Procedure

Planning

Applicatio

n

Types of Materials to be procured for teaching different school subjects.

REFERENCES

- Garg, S., Puranik, C., Venkaiah, V., & Panda, S. (Eds) (2006). *Four Decades of Distance Education in India: Reflections on policy and practice*. New Delhi: Viva Books.
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 - Senapaty, H.K. and Pradhan, N. (2005). Designing Instruction for Constructivist Learning. *Staff and Educational Developmental International*. 9 (2&3), 93- 102
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 - Walia, J.S. *Essentials of Educational Technology*. Jalandhar: Ahim Paul Pub.

C5 Practical

Classroom Interaction Analysis

Each student is to observe one classroom interaction preferably in a school and prepare an observation matrix and write a report.

CORE - 6

PEDAGOGY OF SCHOOL SUBJECTS

(Each student is required to select any one of the following school subjects) **METHODS OF TEACHING ODIA**

Introduction

Mother-tongue plays a significant role in the education of a child. It has a great importance in the field of education. Therefore, mother tongue must be given an important and prominent place in the school curriculum. Method of teaching Odia will enable us to preserve and enrich our language and culture forever by developing Odia language skills among learners. The learners will also be equipped with the skills to prepare Odia lesson plans by using constructivist approach.

Learning Objectives and Expected Outcomes

On completion of the course the students shall be able to:

- describe the concept of Mother Tongue;
- explain the semantic peculiarity of Odia language
- justify the importance and objectives of teaching Mother Tongue (Odia) at Secondary Stage;
- describe various pedagogical approaches of language teaching.
- prepare subject specific lesson plan for improvement of language skills. plan and construct test to assess language skills and content areas.

Unit –1 Conceptual

Importance of mother tongue in the life and education of the child Aims and objectives of teaching mother tongue at school level.

Place of mother tongue in the school curriculum.

Unit – 2 Methods and approaches

Direct Method

Discussion Method

Discussion cum appreciation

method Inductive and deductive

method

Unit – 3 Techniques of Teaching

Teaching of prose and

poetry Teaching of

Grammar Teaching of

composition

Unit – 4 Teaching Learning Materials for teaching Odia

Teaching learning materials : Purpose, Types and

Use Language Text Book : Importance, Purpose

Language Laboratory characteristics application

Unit – 5 Development of Lesson Plan

Preparation of Lesson Plan : Herbartian approach

5E Model

Icon Design Model

REFERENCES:

Daswani, C. J. *Language Education in Multilingual India*. New/Delhi
(UNESCO)

http://en.wikipedia.org/wiki/Language_education

<http://modersmal.skolverket.se/engelska/index.php/mothe>

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Mother Tongue*. OUP.

METHOD OF TEACHING ENGLISH

INTRODUCTION

Language is always regarded as the means of communication. Among all the foreign languages English is worldwide accepted as the international language. It has been the window on the world through which we peep into the world to grasp international information on trade, education, health, politics etc. In this connection we need to strengthen our efficiency in English language to present ourselves in the market of education as a skilled person. Basically, in teaching and learning, English language deals with different modes of transaction, language skills. It enables a teacher to follow variety of methods of teaching of prose & poetry, grammar; and enables to prepare the lesson plan and scheme of lessons. As a student of education, one needs to learn role and anatomy of English language, methods of teaching and developing language skills, phonetics etc which are reflected in the course contents of this paper.

Learning Objectives and Expected Outcomes

On completion of course the students shall be able to:

- State the place of English language in India
- describe English as a second language in the multi lingual syllabus India
- List out different techniques of teaching
- Discuss different type of teaching learning materials in teaching English
- Prepare lesson plan in English

Unit – 1 Teaching / Learning English as a second language

- Importance of learning English as a second language
- Aims and objectives of teaching English
- Place of English in school curriculum

Unit – 2 Methods and approaches

- Translation and Direct methods
- Structural approach to teaching English
- Communicative approach to learning English

Unit – 3 Techniques of teaching

- Teaching prose and poetry
- Teaching grammar

- Teaching composition
- Unit – 4 Teaching learning materials for teaching English**
- Teaching aids : purpose types and use
 - The English test book and work book
 - The language laboratory
 - Application of ICT in teaching English
- Unit – 5 Developing a lesson plan for teaching English**
- Herbartian approach
 - 5 E Model
 - ICON Design Model

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METHODS OF TEACHING MATHEMATICS

INTRODUCTION

Mathematics is closely linked not only with the daily life of the human society but also with scientific and technological world. Therefore, teaching of mathematics has formed, since the advent of education in human history, one of the three 'R's of learning. To be effective in teaching and creating a constructive learning situation, the teacher should not only have the content knowledge of mathematics, but also the pedagogical knowledge and its values in daily life of the human being. The pedagogical knowledge of mathematics will help the learner to effectively transact the mathematical concept and apply the effective strategy to assess the learner.

Course Objectives

On completion of the course the students shall be able to:

- explain the nature and scope of mathematics
- identify different types of proof in mathematics and their application to solving mathematical problems
- relate the mathematical concepts with other school subjects
- achieve the mastery over the methods, strategy and approaches for transacting the contents of mathematics
- develop mathematics achievement test and acquire of the scoring procedure
- analyze learners learning difficulties and develop remedial strategies to meet needs of slow learners and to develop enrichment materials for the advanced learners

Unit – 1 Importance and values of teaching mathematics

- Aims and objectives of teaching mathematics
- Relationship of mathematics with other school subjects.

Unit – 2 Mathematics curriculum and its organization at school stage.

- Principles of curriculum construction in Mathematics
- Principles of Arranging / organizing curriculum
- Pedagogical analysis of content in School Mathematics

Unit – 3 Methods of teaching mathematics

- Analytic and synthetic methods

- Inductive and deductive methods
- Project method

Unit – 4 Teaching learning Materials in Mathematics

- Teaching aids in mathematics : Purpose, types and use.
- Mathematics text book and workbook.
- Application of ICT in teaching mathematics.

Unit – 5 Developing lesson plan for teaching mathematics.

- Herbartian approach
- 5 E Model
- ICON Design Model.

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METHOD OF TEACHING HISTORY

INTRODUCTION

History occupies an important place in the school curriculum. Through History students will aware about the past events and developments. History creates linkage between present and past. Through the subject our students will respect our culture, traditions and heritage. History shows path to future.

COURSE OBJECTIVES:

On completion of the course, students shall be able to:

- explain the meaning and scope of History
- relate History with other school subjects
- explain the different approaches to organization of contents in History
- achieve mastery over different methods and approached for curriculum transaction
- List out the different types of teaching learning materials in history and explain their importance.
- Prepare Lesson plan in History

Unit – 1 History: Meaning, nature, scope, and importance

- Aims and objectives of teaching History at school level.
- Relationship of History with other school subject.

Unit – 2 The History curriculum

- Approaches to organization of contents in history curriculum: chronological, concentric, topical, regressive.
- Selection of content of History : Local, national and global perspectives.
- The History curriculum at school level in Odisha.

Unit – 3 Methods of Teaching History

- Lecture, story telling, narration-cum-discussion, dramatization, source method.
- Development of sense of time and space.

Unit – 4 Teaching learning material (TLM) in history

- Purpose, types and use
- Time line.

- ICT-enabled teaching aids in History.

Unit – 5

Preparation of Lesson Plan in History

- Herbartian Approach
- 5E Model
- ICON design model

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METHOD OF TEACHING SCIENCE

Introduction

The paper is meant for the students joining Masters Level with B.S background. The paper intends to develop an insight among the students regarding science as a distinct

discipline with its characteristics and method of inquiry. The MA (Education) students pursuing science would focus both a s physical and biological science and acquaint themselves with different methods and models of teaching. The methods, models and materials would be discussed with reference to the content of course prescribed for H.S.C examination in science. The students, on completion of course, are expected to develop scientific thinking, adapt methods and materials to the needs of students and conduct assignments in line with constructivist perspective.

Learning Objectives and Expected Outcomes

On completion of the course the students shall be able to

- gain insight on the meaning nature, scope and objective of science education.
- appreciate science as a dynamic body of knowledge
- appreciate the fact that every child possesses curiosity about his natural surroundings
- identify and relate everyday experiences with learning science
- appreciate various approaches of teaching learning of science
- employ various techniques for learning science
- use different activities like demonstration ,laboratory experiences, observation, exploration for learning of science
- facilitate development of scientific attitudes in learner
- Construct appropriate assessment tools for evaluating science learning

Unit – 1 Conceptual

- Meaning, nature and scope of General Science
- Aims and objectives of teaching science at school level.
- Correlation of science with other school subjects.
- Importance of science in the school curriculum

- Unit – 2 Methods and approaches**
- Observation method
 - Demonstration-cum-Discussion method
 - Project method
 - Heuristic method
 - Laboratory method
- Unit – 3 Science curriculum**
- Principles of curriculum construction in science
 - Organisation of curriculum in science
 - Pedagogical analysis of contents in science
- Unit – 4 Teaching learning materials (TLM) for teaching science**
- Purpose, type and use
 - Application of ICT in teaching science
 - The science laboratory : Purpose, Importance and utility
- Unit – 5 Development of Lesson plan for teaching Science**
- Herbartian Approach
 - 5 E Model
 - ICON Design model

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METHOD OF TEACHING GEOGRAPHY

INTRODUCTION

Geography as a subject play a vital role in the school Curriculum for many people, Geography means knowing where places are and something of their characteristics is important for reading or the multiplication of tables for arithmetic, but Geography involves far more. Geography is the study of places on earth and their relationship with each other. Often the study of Geography begins with one's home community and expands as person gains greater experience. Thus Geography provides a conceptual link for children between home, school and the world beyond. Geographers study how people enteract with the environment and with each other from place to place and they classify the earth into regions. It helps us to be better citizen.

Course Objectives:

On completion of the course ,students shall be able to:

- explain the meaning and scope of Geography.
- relate Geography with other school subjects
- explain the different approaches of curriculum transaction in Geography.
- list out the different type of Teaching Learning Material (TLM) in Geography
- explain the principles of curriculum organization in Geography.
- Prepare lesson plan in teaching Geography.

Unit – 1 Conceptual

- Meaning, nature and scope of Geography
- Aims and objectives of teaching Geography at the school level.
- Correlation of Geography with other school subjects.
- Place of Geography in the school curriculum.

Unit – 2 Methods and approaches

- Direct observation and indirect observation
- Discussion method / Demonstration-cum-discussion method
- Project method
- Regional method
- Heuristic method

Unit – 3 Geography curriculum

- Principles of curriculum construction in Geography
- Organisation of curriculum in Geography
- Pedagogical Analysis of contents in Geography

Unit – 4 Teaching Learning Materials (TLM) for teaching

- Teaching Learning Materials : Purpose, type, & use
- Application of ICT in Teaching Geography
- Importance of Geography Room: Purpose, importance, utility
- Geography Text Book: Importance characteristics purpose and application.

Unit – 5 Development of Lesson Plan for teaching Geography

- Herbartian approach
- 5 E Model
- ICON Design Model

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C-6 Practical

School

Internship

Each student will deliver 5 (five) lesson in a school in his / her method subject opted in the 3rd Semester following Herbartian approach / 5E Model / Icon Design Model.

CORE – 7

STATISTICS IN EDUCATION

INTRODUCTION

The fundamental principles and techniques of statistics provide a firm foundation to all those who are pursuing courses in education, psychology and sociology. The role of statistics is essential for collection, analysis, grouping and interpreting the quantitative data. Research and innovations are very essential in the field of education for enrichment, progress and development of the knowledge society. A lot of surveys and research works are carried out in the field of education. Statistical methods help the researchers in carrying out these researches successfully. Therefore, the basic knowledge of statistical method is very vital for conducting any survey, research and project work. Students at undergraduate level must have to develop the basic knowledge of statistical methods used in education.

Course Objectives

After completion of this course students shall be able to:

- Describe the importance of statistics in field of education
- Convey the essential characteristics of a set of data by representing in tabular and graphical forms.
- Compute relevant measures of average and measures of variation
- Spell out the characteristics of normal probability of distribution
- Examine relationship between and among different types of variables of a research study

Unit – 1 **Concept of Statistics**

- Meaning, Definition and characteristics of statistics
- Kinds of statistics
- Types of Data
- Scales of Measurement
- Frequency Distribution

Unit – 2 **Graphical Representation of Data**

- Histogram
- Frequency Polygon
- Pie-Diagram

- Cumulative frequency graph
- Cumulative percentage curve / Ogive

Unit – 3

Measures of Central Tendency and Dispersion:

- Mean
- Median
- Mode
- Range
- Average Deviation
- Quartile Deviation
- Standard Deviation

Unit – 4

Measures of Correlation

- Concept of Correlation
- Linear and Non-linear correlation
- Rank difference method of correlation
- Product moment correlational method

Unit – 5

Inferential Statistics

- Normal Probability curve – Divergence from Normality
- Chi-square test
- t-test

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C-7 Practical

Statistical Analysis of Achievement Scores

Each student is required to collect the achievement scores of the students of a class at least 02(two) schools and make statistical analysis of the collected data and a report.

CORE – 8

CURRICULUM DEVELOPMENT & EDUCATIONAL GUIDANCE

INTRODUCTION

The organization of schooling and further education has long been associated with the idea of a curriculum. But what actually is curriculum, and how might it be conceptualized? We explore theory and practice of curriculum design and its relation to informal education. Curriculum theory and practice to some must sound like a dull but required course activity. Curriculum theory at its best is a challenging and exciting intellectual puzzle. It is a vibrant field full of contradictions, challenges, uncertainties and directions. Yet it is a critical field, the outcome of which does matter. When we teach, whether from preschool to high school; from children to adult, whether educating or training, what we do must make a difference. We cannot waste our audiences time with training that doesn't help, with educating that doesn't educate, or teaching that which may be irrelevant or even wrong. If a surgeon makes a mistake, his patient dies. If teachers, educators, professors, trainers make a mistake, we do not readily see the consequences, and indeed may never see the consequences. Ask yourself: Have you hurt anyone lately by giving misinformation? Did you really make a difference in your teaching, say yesterday? How do you know? Does the curriculum that you help design and deliver really do the job it is supposed to? This course deals with the theory and practice of curriculum design. Participants will want to ask "How do I do curriculum design?" "What are the theoretic underpinnings which inform the practical problems of making curriculum?" For this course, however, the underlying theoretical foundations which inform how and what one does will bias our discussions into particular directions. Students need Guidance in different ways and in various forms to solve their problem. Educational guidance is helpful for all categories of learner There are different services available to provide guidance to students . The present paper emphasizes the study of various concepts of guidance and counseling and its importance in teaching learning process.

Course Objectives:

On completion of this course, the students shall be able to:

- define and explain the concept of curriculum.
- list different types of curriculum with examples.
- suggest bases of curriculum such as, philosophical,

psychological and sociological.

- describe different considerations for curriculum planning;
- elucidate different process of curriculum development;
- explain the role of teacher in curriculum development.
- identify major issues and trends in curriculum;
- Explain National curricular Framework (2005)
- Explain different type of Guidance & Counselling
- List out different type of counseling services and the role of teacher in organizing those services

Unit – 1 Curriculum

- Meaning and importance
- Types of Curriculum: subject centered, learner centered, experience centered curriculum, Core curriculum, Local specific curriculum.
- Components of curriculum: Objectives, Content, Learning experience & Evaluation

Unit – 2 Bases of curriculum

- Philosophical, Sociological & Psychological bases of curriculum,
Principles of curriculum construction:
 - Principles of Activity centredness, Community centeredness
 - Integration, Relevance, Balance, Flexibility, Variety & Plurality, Forward looking, contextuality, ICT – enabled

Unit – 3 National Curricular Framework (NCF) 2005

- Guiding Principles
- Learning & knowledge
- Curricular areas, School Stages & Assessment

Unit – 4 Guidance and counseling

- Guidance: Meaning, Nature and scope
- Types of guidance : Educational, Vocational, & Personal
- Counseling : Meaning, nature & Scope
- Different types of counseling
- Techniques of counseling

Unit – 5 Organisation of Guidance services in school

- Placement service
- Occupational information service

- Pupil inventory service
- Follow up service
- Role of teacher in organizing guidance services in school

References

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C-8 Practical

Text Book

Review

Each student will review a school text book and write a detailed report.

CORE - 9

EDUCATIONAL ASSESSMENT & EVALUATION

INTRODUCTION

Assessment is considered to be one of the most crucial aspects of any teaching learning process, as it helps the teacher to record the growth of their students, planning for instructional strategy and most importantly helps to assess their own growth over the years. An effective method of assessment in the classroom helps to create conducive learning environment and a teacher must have to know different techniques of assessment which may improve students' learning. The key issues that involve in assessment are how to assess, when to assess, and what will be its implication on students learning. The paper outlines the above mentioned questions and different issues that involves in assessment.

Course Objectives

After completion of the course ,students shall be able to:

- describe the role of assessment in education.
- differentiate measurement, assessment and evaluation.
- establish the relationship among measurement, assessment and evaluation.
- explain different forms of assessment that aid student learning.
- use wide range of assessment tools and techniques and construct these appropriately.
- classify educational objectives in terms of specific behavioral form
- prepare a good achievement test on any school subject
- explain the characteristics of good measuring instruments.
- list out different type of assessment techniques

Unit – 1 **Assessment & Evaluation in Education**

- Understanding the meaning of Test, Measurement Evaluation and Assessment
- Scales of Measurement
- Types of measurement, Norm Referenced and Criterion Referenced
- Procedure of Evaluation: Placement, Formative, Diagnostic and Summative

- Concept of continuous and comprehensive evaluation (CCE).
- Unit – 2 Instructional Objectives**
- Taxonomy of Educational objectives with special reference to cognitive domain
 - Methods of stating instructional objectives: General instructional objectives and specific learning outcomes.
 - Relationship of Evaluation procedure with objectives.
 - Construction of objective based and objective type test items: Essay type, Objective type: principles of construction, Advantages and limitations.

Unit – 3 Techniques of Assessment

- Observation
- Interview
- Rating scale
- Checklist
- Project
- Concept Mapping

(Above techniques are to be discussed with reference to purpose, type, procedure of administration and application)

Unit – 4 Test construction

- Teacher made test vs. standardization
- General Principles of Test construction and standardization : Planning, Preparing, Tryingout & Evaluating.

Unit – 5 Characteristics of a Good Test

- Reliability - Concept and method
- Validity - Concept, type and methods of validation
- Objectivity - Concept, type and factors
- Usability - Concept and factors

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C-9 Practical

Construction of an achievement test

Each student will construct 50 objective based objective type test items along with a blue print

CORE – 10

INTRODUCTION TO EDUCATIONAL RESEARCH

INTRODUCTION

Research is a creative work undertaken systematically to increase the stock of knowledge, including knowledge of humanity, culture and society, and the use of this stock of knowledge to devise new applications. It is used to establish or confirm facts, reaffirm the results of previous work, solve new or existing problems, support theorems, or develop new theories. A research project may also be an expansion on past work in the field. The primary purposes of research are documentation, discovery, interpretation, or the research and development of methods and systems for the advancement of human knowledge. Approaches to research depend on epistemologies, which vary considerably both within and between humanities and sciences. In the present paper, students will be given an orientation about the nature, purpose, scope of research in education. A brief overview of different types of research in education will be given to the students. Students will be exposed to different methodology of research in education. Students can use appropriate tools and techniques for the collection of data and understand concept of sampling.

Course Objectives

On completion of this course the students shall be able to:

- Describe the nature, purpose, scope of research in education
- Identify types of research in education
- Explain the characteristic of qualitative, quantitative and mixed research
- Select and explain an appropriate method for a research study
- Select appropriate tools and techniques for the collection of data
- Describe the procedure of preparation of Research Report

Unit – 1 Introduction to Research

- Methods of Acquiring knowledge
- The Nature of science
- Meaning and characteristics of research
- Basic, Applied and action research
- The nature of educational research

Unit – 2 Types of studies in Educational Research

- Descriptive Research
- Experimental Research
- Qualitative Research
- Philosophical and Historical studies

Unit – 3 Research Design

- Identification of problem and formulation of Research question
- Hypothesis : Meaning and types
- Sampling : Concept and purpose
- Tools of data collection : Questionnaire, Rating scale, Attitude scale and checklist
- Techniques of data collection : Interview and observation

Unit – 4 Data Analysis and Interpretation

- Analysis of Quantitative Data (Descriptive statistical Measure)
- Analysis of Quantitative Data (inferential statistics based on parametric tests)
- Analysis of Quantitative Data (inferential statistics based on non-parametric tests)
- Analysis of Qualitative Data

Unit – 5 Research reports and application

- Writing proposal / synopsis
- Method of literature survey / Review
- Research Reports various components or structure
- Scheme of chapterization and Referencing

REFERENCES

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C-10 Practical

Preparation of Project

proposal

Each student will prepare a project proposal.

CORE – 11

HISTORY OF EDUCATION IN INDIA

INTRODUCTION

In heritage of Indian education, you need to know the key words, *Heritage* and *Education*. The Indian heritage witnesses the most fabulous contributions in the field of education. It is believed that in the ancient days, education was imparted orally by the sages and the scholars and the information was passed on from one generation to the other. The Gurukuls were the traditional Hindu residential schools of learning which were typically in the teacher's house or a monastery. At the Gurukuls, the teacher imparted knowledge on various aspects of the religion, the scriptures, the philosophy, the literature, the warfare, the statecraft, the medicine astrology and the history. As the students of Education, you all need to learn the system of education starting from the ancient India till the today's globalised knowledge society through the hierarchy of time. The paper will develop a sense of appreciation and pride about the Indian Cultural and Educational heritage.

Course objectives

On completion of this course ,students shall be able to:

- narrate the concept of education in the context of Indian heritage.
- describe education in ancient India, particularly, Vedic Education, panishadic Education, and the Buddhist Education.
- critically examine the education system in Medieval India
- elaborate the role of teacher, school and community in preservation of Indian heritage and achievement of national goals.
- Evaluate the education system during British period with special emphasison the commissions and committees.
- Elaborate the status of education during post-independence period with special emphasis on the commissions and committees.

Unit – 1 **Education in Ancient India**

- Education during Vedic & Upanishadic period
- Education during Buddhist period
- Ancient seats of learning: Nalanda, Taxila, & Varanasi
- Achievements of Ancient India in different fields of knowledge

and enlightenment.

Unit – 2 Education in Medieval India

- Islamic Education in India: Aims, structure, curriculum, methods and educational institutions.
- Hindu Education: Aims, structure, curriculum, methods and educational institution.
- Impact of the interaction between the two systems of education.
- Evaluation of state patronage for education during the period.

Unit – 3 Education during early British period (up to 1885)

- Educational endeavours during the early British period (up to 1835)
- Adam's Report
- Macalay's Minute and Bentinck's Resolution. 1835
- Wood's Despatch 1854
- Hunter Commission Report 1882

Unit – 4 Education during later British period (1885-1947)

- National Education Movement
- Curzon's Education Policy
- Calcutta University (Sadler) Commission report 1917
- Basic Education 1937

Unit – 5 Education in Independent India

- Report of the University Education Commission 1948
- Report of the Secondary Education Commission 1952.
- Report of the Indian Education Commission 1966
(Reports of the commissions to be studied with reference to Aims, structure & Curriculum)
- NPE 1986 and the Revised NPE 1992.
 - Essence & the Role of Education
 - National System of Education
 - Reorganisation of Education at different stages.
- Report of NKC with regard to school & higher education

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C-11 Practical

Case Study

Each student will make a case study of an educational institution and prepare report.

CORE – 12

COMPARATIVE EDUCATION

INTRODUCTION

This paper is an introduction to a systematic study of comparative education, the analytical survey of foreign educational systems. Comparative education is relatively a young sub field in the very old discipline of pedagogy. Educational reforms are so intimately connected with politics, with problems of race, nationality, language and religious and social ideals that it becomes rather imperative to have a glimpse over the evolution of educational development of nations. This course is an attempt to combine the two purposes : an academic insight and a general introduction into comparative education as a study of contemporary solutions to various countries. It is widely recognized that this intending students of education should have some knowledge of foreign educational systems and their comparative merits. This paper also aims at the analytical study of education in all countries with a view to perfecting national systems with modification and changes, which the circumstances and local conditions would demand.

Course objectives

On completion of this course ,students shall be able to:

- Explain the scope of comparative education
- List out the factors of comparative education
- Compare the structure,curriculum and evaluation system of India with that of China, Japan,U.K and U.S.A

Unit – 1 **Definition and scope of Comparative Education**

- First pioneers of comparative education.
- Other subsequent comparative studies
- Approaches: statistical, psychological and historical
- National traditions and the definition of a nation.

Unit – 2 **Theory and Methods of comparative Education**

- Purpose of comparative education
- Area studies : Description and interpretation
- Comparative studies : Juxtaposition and comparison

Unit – 3 **Factors**

- The Racial factor
- The Linguistic factor
- Geographic and economic factor
- Religious factor

Unit – 4 Systems of Education

(Characteristic, structure, curriculum and evaluation system)

- U.K.
- U.S.A.

Unit – 5 Systems of Education

(Characteristic, Structure, Curriculum & Evaluation system)

- China
- Japan

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Core-12 Practical

Term Paper

Each student is required to prepare a term paper on any topic of comparative education.

DISCIPLINE SPECIFIC ELECTIVE (DSE) – 1 ICT IN

EDUCATION

INTRODUCTION

Information and Communication Technology (ICT) now hold great potential for increasing the access to information as well as a means of promoting learning. ICT has tremendous potentiality in transforming classrooms into more engaging, collaborative and productive learning environments in which instructions can be customized to students' specific needs, interests and learning styles. It is also redefining the way educators teach as well as the way the students learn. The present paper is based on above assumptions. The paper will orient the learners about the need and importance of ICT in education. It will describe about the importance of open source software in education particularly, in developing country like, India. Students will be given an exposure about the various approaches and stages towards the use of ICT in education. Students are expected to develop reasonably good ICT skills in terms of use of various computer software and ICT tools.

Course Objectives

On completion of this course, the students shall be able to:

- explain the concept, nature and scope of ICT in education
- differentiate Web. 1.0 and Web 2.0
- describe the importance of open source software in education
- list and explain various approaches in adoption and use of ICT in education.
- list and explain various stages of ICT usages in general and pedagogical usages in particular in education.
- describe the needed teacher competencies for ICT usage in the classroom.
- ☐ demonstrate the use of various computer software such as Word-processing , Spreadsheets, and Presentation.

Unit – 1

Information & Communication Technology : Meaning and importance

- The ICT infrastructure : computers, telecommunication network, networking.
- Introduction to internet, the World Wide Web, e-mail, and social media.

- ICT potential for improving access, quality and inclusion in education

Unit – 2

E- learning : meaning and importance

E – learning methods and media :

Virtual learning environment

Virtual universities

Massive Open Online Course(MOOCs)

Webinars

Special internet forum / discussion

groups e-tutorials

Unit – 3

ICT Resources

- Open Educational Resources (OERs) purpose and importance
- e-Libraries, e-books, e-journals, Infflibnet
- Important website for education : NCERT, UGC, NCTE, MHRD, DHE, UNESCO, UNICEF, UIS (UNESCO Institute of Statistics) etc.
- Other learning resources: Encyclopedia, dictionaries, multimedia etc.

Unit – 4 ICT in class room

- Purpose and importance of ICT in class room
- ICT enabled curriculum : enhancing ICT use in the existing curriculum
- Full integration of ICT into curriculum
- Designing / Developing ICT integrated smart classrooms: hardware and software requirements, utilization procedures
- Developing multimedia and ICT based lessons.

Unit – 5

ICT for school improvement

- ICT for competency standards and professional development of teachers
- ICT for school administration
- ICT for student support services : admission libraries, guidance, maintenance of student records etc.
- ICT enabled assessment
- ICT for open and distance learning
- ICT for life long learning

REFERENCES

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DSE-1 Practical

Internet Search for Study Material

Each student is required to search internet, collect study materials related to any educational topic and write a report.

DISCIPLINE SPECIFIC ELECTIVE (DSE) – 2

SPECIAL EDUCATION

INTRODUCTION

Nature and nurture have a substantial role to play in growth and development of human beings. Nature and nurture apart, human organism is susceptible to damage through disease and injury. Disease, accident, genetic causes or any other reason, which inflicts the persons, causing loss or want of abilities, may not be equal in all cases. Accordingly the degree of abilities or lack of abilities varies. Deviations from average of physical and mental ability of human beings beyond limits resulting in substantial and appreciable difficulties in performing a function or in social adjustment process be perceived as disability. Some of the practitioners understand rehabilitation as a graded acquential individualized approach in which charity has given way to right so far as the empowerment of persons with disability is concerned. Education is the means to empower them. It has become a fundamental right of every child. The evolution of education of persons with disability has a history with the starting point in the 10th century in Europe and America. It has been realized that education of the persons with disability is very crucial for the development and independent living as far as possible. Education of the persons with disability has evolved as an essential responsibility of the government not only because of constitutional provisions but also with the UN mandates.

Course Objectives

On completion of this course, students shall be able to

- know about the concept, nature, objectives, types and historical perspective of special education
- explain the innovations and issues of special education
- elaborate the policies and programmes of special education
- able to identify different type of special category children
- understand various educational interventions meant for special children
- explain the role of resource teacher and special teacher

- Unit – 1** **Conceptual**
- Exceptional children : Concept and types
 - Inter relationship between impairment, disability and handicap.
 - Historical development of special education in India.
 - Issues and innovations in Education of Exceptional children:
Mainstreaming, Labeling and De-institutionalisation.
- Unit – 2** **Policies and programmes in the Education of special children**
- Indian Education Commission (1964-66)
 - National Policy on Education (1986)
 - Report of Rama Murty Committee (1991)
 - Programme of Action (1992)
 - UN Conventions in Human Rights (1994)
- Unit – 3** **Education of the gifted and creative children**
- Concept
 - Characteristics
 - Identification
 - Educational provisions
 - Role of Teacher
- Unit – 4** **Education of the Educable Mentally Retarded**
- Concept
 - Characteristics
 - Methods of identification
 - Educational Provision
 - Role of Teacher
- Unit – 5** **Education of Children with Learning Disability**
- Concept
 - Characteristics
 - Methods of identification
 - Role of Special / Resource Teacher

REFERENCES:

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DSE-2 Practical

Case study of Special

Child

Each student is required to conduct a case study of a special child and write a report.

CORE – 13

EDUCATIONAL PLANNING, ADMINISTRATION AND MANAGEMENT

INTRODUCTION

Management is a universal phenomenon. Knowledge of management is indispensable for successful accomplishment of goals of an organization. Knowledge of management is required to ensure efficiency and better output of an organization and its functioning. As we know education plays a significant role in the socioeconomic development of the country, proper management of educational institutions requires managerial skills among all the people entrusted with the responsibilities of education. The paper deals with various concepts, principles and functions of educational management. It emphasizes on educational planning, finance and school management and focuses on trends in educational management. The paper will develop an interest towards the educational management.

Course Objectives

On completion of the course the students shall be able to:

- explain the concept, nature and scope of educational management
- describe the functions of educational management and administration
- list down various types of educational administration
- elaborate the principles of educational management
- elaborate the steps in planning
- explain different types of administration
- elaborate functions of state level educational bodies
- describe the sources of financing in education

Unit – 1 Educational Planning

- Meaning, Nature, Objective and scope
- Approaches: Social Demand, Cost benefit analysis and Manpower requirement
- Steps in Educational Planning : Diagnosis of Educational Development, Plan formulation, Plan implementation,

Monitoring and Evaluation.

- School Development Plan : Concept and Process

Unit – 2 Educational Administration

- Concept, Objectives and scope of educational administration
- Types : Totalitarian and Democratic
- Basic Functions of Administration : Planning, Organizing, Directing and Controlling.

Unit – 3 Educational administration in the state

- Administration of Education in Odisha: Structure and Functions.
- Functions of state level educational bodies: SCERT, BSE & OPEPA

Unit – 4 Educational Management

- Meaning, Nature and Scope
- Types: Centralized vs Decentralised Authoritarian vs Democratic
- Functions of Educational Management

Unit – 5 Economics of Education

- Costs in Education: The current cost and capital cost of education
 - The Direct and Indirect cost of education.
 - The private cost, social cost and unit cost of education.
- Educational Expenditure as investment
- Financing of Education :
 - Agencies of financing Education
 - Financing of education by parents
 - Financing of education by Employers.

REFERENCES:

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C-13 Practical

Visit to Administrative Unit

A visit to educational administrative unit such as DHE, SCERT, RDE, CHSE, University OPEPA interaction with administrator(s) and preparation of a report.

CORE – 14

CONTEMPORARY CONCERNS IN INDIAN EDUCATION

INTRODUCTION:

To remain current, to widen understanding levels holistically, and to thoroughly prepare learner for the world in which they will ultimately live and work, they must continually examine current practices in search of better solutions and needed change. The intent of this course is to familiarize learner to historical roots of Universalisation of Elementary education and initiative so far taken by Govt. to materialize this reality. Further, paper generally discusses the effort of Govt. to extend the provision of free and compulsory education at secondary level and developing a sound approach to dealing with the rapid pace of reform and change from the teacher's perspective. Emphasis is placed on examining over various emerging issues, problems and strategies of current trends relating to Peace education, Human Rights education value education, environmental education, Life skills education

Course Objectives

On completion of the course the students shall be able to:

- explain the concept of universalization of elementary education
- describe universalization of elementary education and secondary education implementation strategies
- describe present position of secondary education
- Explain the challenges of secondary education
- explain present scenario of higher education and agencies for improvement
- explain the concept of value education, environmental education and Life skills education

Unit – 1

Elementary Education

- Universalisation of elementary education.
- Right of Children to Free and Compulsory Education (RCFCE) Act 2009.
- Quality concerns in Elementary education.
- Sarva Sikshya Abhiyan (SSA) & District Primary Education Project (DPEP)

Unit – 2 Secondary Education

- Present position of secondary education in India
- Challenges and problems of secondary education.
- Vocationalisation of secondary education
- Rashtriya Madhyamik Sikshya Abhiyan (RMSA)

Unit – 3 Higher Education

- Present position of Higher Education in India
- Challenges in higher education : expansion, quality & inclusiveness.
- RUSA

Unit – 4 Social Commitments in Education

- Gender issues in Indian education
- Equalisation of educational opportunity
- Constitutional provisions for education
- Education for national integration and international understanding.

Unit – 5 Emerging concerns

- Environmental Education
- Value education, Peace Education and Human Rights Education
- Adolescent Education
- Life skills ducation

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C-14 Practical

Educational Programme Review

Each student is required to collect the perception of students / teachers / community members about the relevance and implementation issues in respect of an educational initiative / programme and prepare a report.

DISCIPLINE SPECIFIC ELECTIVE (DSE) – 3

DISTANCE EDUCATION

INTRODUCTION:

Distance education was an educational mode supplementary, Complementary and alternative to conventional/traditional system of education depending on the situation it was practiced. Today it has evolved into an independent system of education, hanks to the growth of communication Technologies and cognitive sciences which are flexible enough to use the technologies for pedagogic purposes. It is an educational innovation to meet the ever increasing and diversified educational needs and demands of the society which are sequel to changing social, economic and other conditions on one hand and technological developments on the other. Distance education is innovative in the sense that it sets up its own norms, approaches and methodology which are different from the face-to-face system of education. It can be non-conformist and non-traditional in nature. It makes adequate provision to impart instruction to learners at a distance by incorporating a variety of means for didactic interaction between its students and the teaches and / or the institution. This paper is an attempt to provide the students of education honours some of the fundamental concepts under the purview of distance education.

Course Objectives

On completion of this course, students shall be able to

- explain the importance of Distance education in the present context
- describe the historical perspective of distance education
- elaborate the curricular process of Distance education
- understand various modes of student support services
- develop clear idea about different type of Distance education institutions

Unit – 1 Concept of Distance Education

- Aims and objectives of Distance Education
- Purposes and functions served by distance education.
- Theories of Distance Education
- Distance education in India : Historical perspective

Unit – 2 Curricular process in Distance Education

- Preparing and supplying study material

- ICT support for distance learning
- Personal contact programme in distance learning
- Assignments and projects in distance learning

Unit – 3 Development of distance learning material /self –

instructional material (SIM)

- Planning for self instructional material: Importance objectives and learning outcomes
- Preparation of the material
- Context, language and formal editing of self – instructional material
- Self –assessment for self – instructional material

Unit – 4 Distance learners

- Profit of distance learners
- Needs of distance learner
- Problems of distance learner
- Steps for facilitating distance learner
- Student support services

Unit – 5 Open and distance learning institutions:

- Open Universities and open schools : Meaning and Nature
- IGNOU and NIOS
- Other forms of distance education – correspondence courses, Radio TV education
- Virtual universities and Massive Open online courses.

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DSE-3 Practical

Preparation of Self instructional materials (SIM)

Each student is required to prepare a self instructional material (SIM) on any topic.

OR

Case study of Distance education study centre

Each student is required to conduct case study of distance education study centre (IGNOU, NIOS, SOU, etc.) and write a report.

Distribution of Marks

Record - 20 marks

Viva voce - 05 marks

Total = 25 marks

DSE – 4 PROJECT

Each student is required to prepare a project on educational problem / issue and submit a report. The project shall be evaluated by an external and internal examination.

GENERIC ELECTIVE (G.E.) – 1

VISION OF EDUCATION IN INDIA:

ISSUES AND CONCERNS

INTRODUCTION

Education is essentially a normative endeavour, hence is intentional. It intends, rather deliberately, to socialize children into a value frame or normative structure. That is why history reveals that every education system, at different historical periods, had been guided by certain value concerns. In contemporary times, the education system in India derives its values from the Constitution of India. While socializing children education has to negotiate within the frame of Constitutional values. Indian Constitution envisioned a humane society based on freedom, equality and justice, and this led to evolving many institutions to realize the vision. In this regard, education has been considered as an agency of social transformation and classroom as the shaper of the envisioned destiny. Since teachers ought to play crucial role in realizing the vision, they are to be informed the Constitutional vision so as to develop normative perspectives regarding education and thereby emerging concerns and issues. This normative perspective a teacher holds in turn guides his/her actions and acquires a meaning to action.

Education being an operational area, every citizen perceives several issues related to it through personal experience. The student-teachers need to understand the main issues that touch their functioning as also situate themselves in context. Such an understanding on at least a few issues and concerns will equip student teachers to be ready for dealing with other issues and concerns in the field. This is very relevant as it may not be possible to bring under scrutiny all issues and concerns.

Since, concerns and issues cannot and should not be 'informed' like 'ready to cook facts', the course is designed in such a fashion that prospective teachers would be encouraged to come to terms with concerns and issues that would emerge out of their reasoned engagement with contemporary educational reality in the light of professed humanistic values,

Course Objectives

On completion of the course the students shall be able to:

- explain normative vision of Indian Society

- explain the view points of Indian thinkers on Education
- elaborate the contemporary issues like universalisation of school education, RTE Act -2009 and Rastriya Madhyamika sikshya Abhiyan
- identify importance of common school system

Unit – 1 Normative vision of Indian Education

- Normative orientation of Indian Education: A historical enquiry.
- Constitutional provisions on education that reflect national ideas : Democracy, Equity, Liberty, Secularism and social justice
- India as an evolving nation state : Vision, nature and salient feature – Democratic and secular polity, federal structure : Implications for educational system .
- Aims and purposes of education drawn from the normative vision.

Unit – 2 Vision of Indian Education : Four Indian thinkers

- An overview of salient features of the “Philosophy and Practice” of education advocated by these thinkers.
 - Rabindranath Tagore : Liberationist pedagogy
 - M.K. Gandhi : Basic Education
 - Jiddu Krishnamurty : Education for Individual and social Transformation
 - Sir Aurobindo : integral Education

Unit – 3 Concern for Equality in Education: Concerns and Issues

- Universalisation of school education
 - (i) Issues of (a) Universal enrollment
 - (b) Universal Retention
 - (c) Universal success
 - (ii) Issues of quality and equity

Unit – 4 Concern for Equality in Education

- Equality of Educational opportunity
- Prevailing nature and forms of inequality including Dominant and Minor groups and the related issues.
- Inequality in schooling : Public-private schools, Rural-urban schools, single teachers schools and many other forms of inequalities in school systems and the process leading to

disparity.

- Idea of common school system

Unit – 5

Education and Development – an interface

- Education for National Development : Education Commission (1964-66)
- Emerging trends in the interface between:
 - Political process and education
 - Economic Development and Education
 - Social cultural – changes in Education

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GE-1 Practical

Term paper

Each student is required to prepare a term paper on the educational ideas of any Indian Thinkers or on any contemporary issues on Education.

GENERIC ELECTIVE (G.E.) - 2

ASSESSMENT AND EVALUATION TECHNIQUES

INTRODUCTION

Assessment is considered to be one of the most crucial aspects of any teaching learning process, as it helps the teacher to record the growth of their students, planning for instructional strategy and most importantly helps to assess their own growth over the years. An effective method of assessment in the classroom helps to create conducive learning environment and a teacher must have to know different techniques of assessment which may improve students' learning. The key issues that involve in assessment are how to assess, when to assess, and what will be its implication on students learning. The paper outlines the above mentioned questions and different issues that involves in assessment.

Course Objectives

After completion of the course the students shall be able to:

- describe the role of assessment in education.
- differentiate measurement, assessment and evaluation.
- establish the relationship among measurement, assessment and evaluation.
- explain different forms of assessment that aid student learning.
- use wide range of assessment tools and techniques and construct these appropriately.
- classify educational objectives in terms of specific behavioral form
- prepare a good achievement test on any school subject

Unit – 1 The Measurement, Evaluation and Assessment Process

- Educational Testing and Assessment : Context, Issues and Trends.
- The Role of Measurement, Evaluation and Assessment in Teaching.
- Instructional Goals and objectives : Foundation for Assessment.
- Types of Assessment: Placement, Formative, Diagnostic and Summative.

Unit – 2 Classroom tests and Assessment

- Planning classroom tests and assessment
- Constructing objective test items: simple forms and multiple choice forms.
- Constructing Essay type questions: Form and uses; suggestions for scoring essay questions.

Unit – 3 Alternative Techniques of Assessment

- Observational Technique: Observation schedule, Anecdotal Records, Rating scales, Checklists
- Self – reporting Techniques: Interview, portfolio, questionnaire and inventories.
- Peer – appraisal: “Guess who” technique, sociometric technique.

Unit – 4 Processing and Reporting in Assessment

- Processing qualitative evaluation data: Content Analysis
- Considerations for reporting the performance
- Scheme of reporting: criterion – reformed and non reformed interpretation.
- Combining mark or grades over different subjects and reporting results of assessment to different users.

Unit – 5 Contemporary Trends in Assessment

- Marks vs Grading system
- Credit system
- Concept of Continuous and Comprehensive Evaluation (CCE)
- ☐ Computers in student evaluation

REFERENCES

- Aggrawal, J.C. (1997). Essentials of Examination System, Evaluation, Tests and Measurement. New Delhi: Vikas Publishing House Pvt Ltd.
- Banks, S.R. (2005). Classroom Assessment: Issues and Practices. Boston: Allyn & Bacon.
- Blooms, B.S.(1956). Taxonomy of Educational Objectives. New York: Longman Green and Company

- Cooper, D. (2007). *Talk About Assessment, Strategy and Tools to Improve Learning*. Toronto: Thomson Nelson
- Earl, L.M. (2006). *Assessment as Learning: Using Classroom Assessment to Maximize Student Learning*. Thousand Oaks, California: Corwin Press
- Gronlund, N.E. (2003). *Assessment of student Achievement*. Boston: Allyn & Bacon.
- Kaplan, R.M. & Saccuzzo. D.P. (2000). *Psychological Testing, Principles, Applications & Issues*. California: Wordsworth.
- Linn, R.L. & Gronlund, N.E. (2000). *Measurement and Assessment in Teaching* London: Merrill Prentice Hall.

GE-2 Practical

Achievement Test Construction

Each student is required to construct 50 objective based objective type test items along with a blue print.

GENERIC ELECTIVE (G.E.) - 3

CONTEMPORARY PEDAGOGY

INTRODUCTION

It is important to note that 'education' is not synonymous with 'school'. It has always been the case that a range of activities that are educational in nature can, indeed should, occur outside the school, even from the earliest age given the educative role of the parents. The Delors Commission Report on education for the 21st century proposed 'learning to live together' as one of the four pillars of education. It advocates learning to live together by developing an understanding of other people and an appreciation of interdependence – carrying out joint projects and learning to manage conflicts in a spirit of respect for the values of pluralism, mutual understanding and peace (UNESCO, 1996). The policy context in India and around the globe is moving towards recognition of the educational value of newer forms of pedagogy in the 21st Century which will enable the children to develop critical reasoning power, justify their views, independent decision making power, expression of thoughts, and empathy to others' feelings. Recently NCERT (2005) and NCTE (2009) have changed their curriculum framework and accordingly revised their text books and teacher orientation process to empower the prospective teachers to cope up with emerging pedagogies and to promote higher order learning of the learners like, creative expression, authenticity, abstraction of ideas, and multiple thinking, etc. This paper is intended to give insight to the students on importance of pedagogy in education.

Course objectives

After completion of the course, the students shall be able to:

- explain the concept of pedagogy;
- differentiate pedagogy from other allied concepts;

Unit – 1 Meaning process and Aims of Education

- Concept of Teaching and learning
- Nature and characteristics of teaching
- Meaning and characteristics of learning

Unit – 2 The task of teaching

- Meaning and definition of teaching task
- Variables involved in teaching task
- Phases of teaching : Pre-active, interactive and post – active

- Levels of teaching : Memory, understanding and reflective

Lesson plan design : Herbartian steps, ICON Model and 5E Model

Unit – 3 Principles and maxims of teaching

- General principles of teaching
- Psychological principles of teaching
- Maxims of teaching

Unit – 4 Approaches and methods of teaching

- Inductive –Deductive
- Analytic and synthetic
- Problems solving and project method
- Shift in focus from teaching to learning – The constructivist approach.
- Activity based and child centered approach to teaching .

Unit – 5 Technology in teaching

- ICT tools and techniques facilitating teaching : www, internet applications in teaching and learning.
- Teaching Learning Material (TLM) : purpose, types and use
- Role of mass media in teaching learning.

GE-3 Practical

Preparation of Lesson

Plan

Each student is required to develop 05(Five) lesson plans on any school subject (Odia, English, History, Geography, Math, General Science) based on Herbartian approach / 5E Model / Icon design Model.

REFERENCES

- Aggarawal, J.C. (1995) Essential of Educational Technology, Vikas Publishing House New Delhi.
- Chauhan S.S. (1995) Innovation of Teaching Learning Process, Vikas Publishing House, New Delhi.
- Kochar, S.K. (2011) Methods and Techniques of Teaching, Sterling Publisher Pvt. Ltd., New Delhi.

- Mangal S.K. and Mangal, UMA (2010), Essentials of Educational Technology, New Delhi, Asok Ghosh PHI Learning Pvt. Ltd.
- Mangal, S.K. (1988) Fundamentals of Educational Technology, Educational Publishers Ludhiana.
- Nageswara Rao, S., Sreedhar, P & Bhaskar Rao (2007) Methods and Techniques of teaching, Sonali Publications, New Delhi
- Oliver, R.A. (1963) effective teaching, J.M. Dent & Sons, Toronto
- Pathak, R.P. & Chaudhary J (2012) Educational Technology, Pearson, New Delhi.
- Rayment, T (1946) Modern Education - - It's Aims and Methods, Longmans, Green Co. London.
- Ryburn, W.M. (1955) Principles of Teaching, Geoffrey Cembidge, OUP
- Sampath, K, Pannir Salvam. A., & Santhanam, S. (1981) introduction to Educational Technology, sterling publishers, New Delhi.
- Sharma, R.A. (1986) Technology of Teaching, International Publishing House, Meerut.

GENERIC ELECTIVE (G.E.) – 4

EARLY CHILDHOOD CARE AND EDUCATION

INTRODUCTION

This paper will help the students to develop a sensitivity towards the needs and rights of children and will provide an understanding of their development. Students will also acquire skills that will help them to interact with children. Besides orienting the students towards a vocation in childcare, this course will orient the students towards organizing services for children. These services are crèches / day care centres and pre- schools for children upto six years of age. Students will enlighten themselves regarding how the pre-school education prepares the child for schooling which lies ahead. Pre-schools in our country are called by various names: anganwadi, balwadi, nursery school, kindergarden and play center.

Course Objectives

On completion of this course, students shall be able to:

- understand the importance of early childhood stage as the formative stage of growth and development
- explain the basic principles of curriculum formulation and their respective growth
- list out the activities for the different type of developmental needs of early child
- elaborate the learning materials needed for their appropriate developmental stage.

Unit – 1 Introduction to childcare and development

- Basic concepts in child development : Scope, growth and development, stages of development, areas of development, significance of study of child development.
- Principles of growth and development.

Unit – 2 Curriculum for ECCE

- Basic principles of the curricular framework
- Areas: cognitive development, language

development, social and emotional development, exploring, the environment, habit formation.

Unit – 3 Activities for physical development, movement and mobility.

- Activities for cognitive development
- Activities for language development
- Activities for social and emotional development
- Activities for exploring the environment
- Creative and aesthetic activities.

Unit – 4 Learning materials for ECCE

- Principles of selection of materials
- Type of materials
- Specific materials for different activities
- Preparation of teacher made materials
- Concept of toy bank

Unit – 5 Statutory framework for ECCE

- Constitutional framework
- National ECCE Policy, 2013
- Rights of the children

REFERENCES:

- Aggarawal J.C. and Gupta S. (2013) Early Childhood care and Education New Delhi: Shipra Publications
- Kaul Veneta (2009) Early child hood Education Programme, New Delhi, NCERT
- Soni Romila, Kapoor Rajendra & Vashishitha Krushna Kanta (2008) Early childhood Education an Introduction, New Delhi, NCERT
- NCF Curriculum Framework-2005

GE-4 Practical Observation of ECCE Centre

Each student is required to observe an ECCE centre and prepare a report.

SYLLABUS FOR B.A. (HONORS) ENGLISH
UNDER CHOICE BASED CREDIT SYSTEM OF
UTKAL UNIVERSITY, BHUBANESWAR

CBCS UG SYLLABUS Sem 1

Core 1

British Poetry and Drama: 14th to 17th Centuries

The paper seeks to introduce the students to British poetry and drama from the 14th to the 17th centuries. It offers the students an exploration of certain seminal texts that set the course of British poetry and plays.

British Poetry and Drama: 14th to 17th Centuries

Unit 1

A historical overview:

The period is remarkable in many ways: 14th century poetry evokes an unmistakable sense of “modern” and the spirit of Renaissance is marked in the Elizabethan Drama. The Reformation brings about sweeping changes in religion and politics. A period of expansion of horizons: intellectual and geographical.

Unit 2

Chaucer: *The Wife of Bath’s Tale* or *Sir Gawain and the Green Knight* (Part 1, lines 1-490)

Unit 3

Thomas Campion: “Follow Thy Fair Sun, Unhappy Shadow”, Sir Philip Sidney: “Leave , O Love, which reachest but to dust”, Edmund Waller: “Go, lovely Rose”, Ben Jonson: “Song to Celia”, William Shakespeare: Sonnets: “Shall I compare thee to a summer’s day?”, “When to the seasons of sweet silent thought”,

“Let me not to the marriage of true minds.”

Unit 4

William Shakespeare: *Macbeth* or *Twelfth*

Night. Unit 5

Marlowe: *The Jew of Malta* or Thomas Dekker: *The Shoemaker’s Holiday*.

Suggested Readings:

Weller series: *Macbeth&Twelfth Night*

Chaudhury & Goswami: *A History of English Literature: Traversing Centuries.*

Orient Blackswan

Harold Bloom: *Shakespeare: The Invention of the Human*

Sanders, Andrews: *The Short Oxford History of English Literature.* Oxford: OUP

CBCS UG SYLLABUS Sem 1

Core 2

British Poetry and Drama: 17th and 18th Century

The objective of this paper is to acquaint students with the Jacobean and the 18th century British poetry and drama, the first a period of the acid satire and the comedy of humours; and the second a period of supreme satiric poetry and the comedy of manners.

Unit 1

A historical overview

17th C: Period of the English Revolution (1640–60); the Jacobean period; metaphysical poetry; cavalier poetry; comedy of humours; masques and beast fables

18th C: Puritanism; Restoration; Neoclassicism; Heroic poetry; Restoration comedy; Comedy of manners

Unit 2

John Milton: *Lycidas* Or *L'Allegro* and *Il Penseroso*:

John Donne: *A Nocturnall upon S. Lucie's Day, Love's Deity*; and Andrew Marvel: *To His Coy Mistress*; *The Garden*; *A Dialogue between the Soul and the Body*

Unit 3

Ben Jonson: *Volpone* or *The Alchemist*:

Unit 4

Pope: *Ode on Solitude*, *Summer*, *Sound and Sense*, *The Dying Christian to his Soul*; and Robert Burns: *A Red Red Rose*, *A Fond Kiss*, *A Winter Night*, *My Heart's in the Highlands* **Unit 5**

Dryden : *All for Love* Or Congreve: *The Old Bachelor*

Suggested readings:

1. *A History of English Literature: Traversing the Centuries* - Chowdhury & Goswami, Orient Blackswan
2. *Lycidas* - John Milton (Eds. Paul & Thomas), Orient Blackswan
3. *The Norton Anthology of English Literature, Vol. B: The Sixteenth Century & The Early Seventeenth Century*
4. *The Norton Anthology of English Literature: The Restoration and the Eighteenth Century*

Core 3

British Literature: 18th Century

The objective of the paper is to acquaint the students with two remarkable forms of literature: Essay and novel. The period is also known for its shift of emphasis from reason to emotion.

Unit -1 A historical overview:

Restoration, Glorious Revolution, Neo-classicism, Enlightenment.

Unit-2 Joseph Addison : On Giving Advice

Reflections in Westminster Abbey

Defence and Happiness of Married

Life

Richard Steele: Recollections

On Long-Winded People

Unit-3 Daniel Defoe: *Robinson Crusoe*

Unit-4 Oliver Goldsmith: A City Night-Piece

On National

Prejudices Man in

Black

Samuel Johnson: Expectations of Pleasure frustrated

Domestic Greatness Unattainable

Mischiefs of Good Company

The Decay of Friendship

Unit-5 Thomas Gray: Elegy written in a country churchyard

Suggested Readings:

1. *A History of English Literature: Traversing the Centuries* - Chowdhury & Goswami, Orient Blackswan
2. *The Norton Anthology of English Literature: The Restoration and the Eighteenth Century*

CBCS UG SYLLABUS Sem 2

Core 4

Indian Writing in English

Though a late developer, Indian writing in English has been the fastest growing branch of Indian literature. It has delivered a rich and vibrant body of writing spanning all genres. As a 'twice born' form of writing, it partakes of both the native and alien perspectives and has an inherent inclination to be postcolonial. This paper attempts to introduce the students to the field of Indian writing in English through some representative works.

Unit – 1

A historical overview of Indian writing in English the key points of which are East India Company's arrival in India, Macaulay's 1835 Minutes of Education, India's first war of independence and the establishment of colleges to promote Western education. The focus in the literary setting will include Dean Mohammed's travel writing, said to be the first work of Indian English writing, Toru Dutt and Henry Derezio in poetry and Bankim Chandra Chatterjee and Lal Behari Day in prose fiction.

Unit 2

Crystallization: R.K. Narayan, *The Bachelor of Arts* or Mulk Raj Anand, *Untouchable*

Unit 3

Flowering: R. Parthasarathy (ed) *Ten Twentieth Century Indian Poets*. The following poets and their poems are to be studied. Nissim Ezekiel, "Good Bye Party for Miss Puspa T.S", "Poet, Lover, Bird Watcher", Arun Kolatkar, "The Boat Ride", "Jejuri", Kamala Das, "My Grandmother's House", "A Hot Noon in Malabar", Jayanta Mahapatra, "Indian Summer", "Grass", A. K. Ramanujan, "Looking for a Cousin on a Swing", "Small Scale Reflections on a Great House"

Unit 4

Performing: Mahesh Dattani, *The Final Solution* Or Manjula Padmanabhan, *The Harvest*

Unit 5

Maturation: Amitav Ghosh, *Shadow Lines* Or Kiran Desai, *The Inheritance of Loss*

Suggested Readings:

1. Arvind Krishna Mehrotra, *An illustrated History of Indian Literature in English*. Hyderabad: Orient BlackSwan, 2003.
2. R. Parthasarathy, *Ten Twentieth-Century Indian Poets*. Delhi: Oxford University Press, 1975.
3. Vinay Dharwadkar, "The Historical Formation of Indian-English Literature" in Sheldon Pollock (ed.) *Literary Cultures in History*. New Delhi: Oxford University Press,

CBCS UG SYLLABUS Sem 3

Core 5

British Romantic Literature

The paper aims at acquainting the students with the Romantic period and some of its representative writers. At the same time one of the chief objectives of the paper is to give the students with a broad idea of the social as well as historical contexts that shaped this unique upheaval.

UNIT I: A Historical Overview:

The period otherwise known as The Romantic Revival may also be called as The Age of Revolution as it owes its origin to the Epoch making French Revolution of 1789. The emphasis on individual liberty and unbridled desire free from the shackles of classicism made this period unique, intriguing and controversial.

UNIT-II

Robert Burns: "To a Muse" and "The Cotter's Saturday Night"

William Blake: "The Holy Thursday" and "London"

UNIT-III

William Wordsworth: "Tintern Abbey" and "Ode on Intimations of

Immortality" Samuel Taylor Coleridge: "Kubla Khan" and "Road to Xanadu"

UNIT-IV

John Keats "Ode on a Grecian Urn" and "Ode on Melancholy"

P.B. Shelley: "Ode to the West Wind" and "To a Skylark"

UNIT-V:

William Wordsworth: Preface to *Lyrical Ballads* (2nd Edition)

OR

P.B. Shelley: "A Defence of Poetry"

Suggested Reading:

The Routledge History of Literature in English
History of English Literature: Traversing the Centuries – Chowdhury & Goswami
Romantic Imagination by C. M. Bowra
Pelican Guide to English Literature. Vol.5. Edited by Boris Ford

CBCS UG SYLLABUS Sem 3

Core 6

19th Century British Literature

The paper seeks to expose students to the literature produced in Britain in the 19th century. The focus is mainly on prose (fictional and non-fictional) and criticism. The 19th century embraces three distinct periods of the Regency, Victorian and late Victorian.

Unit 1

A Historical Overview

The 19th century British literature though mainly famous for the Romantic Movement, was also a witness to major socio-political developments like industrialization, technological advancements and large scale mobilization of people from the rural to the urban centers. Much of these prosaic activities/developments needed the medium of prose for its articulation. Politically known as the Victorian period 19th century also witnessed what is known as the culture and society debate.

Unit 2 : Essays

Charles Lamb: "Old China"

William Hazlitt: "On Going Journey"

Leigh Hunt: "A Few Thoughts on sleep"

R L Stevenson: "Walking Tours"

Unit 3: Novels

Mary Shelly: *Frankenstein* OR R.L .Stevenson: *Dr. Jekyll and Mr. Hyde*

Unit 4: Novel

Jane Austen: *Pride and Prejudice* OR Elizabeth Gaskell: *Mary Barton*

Unit 5 : Criticism

Mathew Arnold: *Culture and Anarchy* (Chapter 1)

OR

William Hazlitt: "Lectures Chiefly on the Dramatic Literature of the Age of Elizabeth" from *Lectures on English Poets*

Suggested Reading:

- Chapter 4, 5 from a *Short Introduction to English Literature* by Jonathan Bate
- *The English Novel* by Terry Eagleton
- *The Cultural Critics* by Leslie Johnson

CBCS UG SYLLABUS Sem 3

Core 7

American Literature

This paper seeks to give the students a sense of how the great American themes of self-reliance, individualism, sin and redemption and multiculturalism were shaped through its rich and varied Literature.

Unit – I : Genesis and evolution, and the defining myths of American Literature—city on a hill, the frontier spirit, the American Dream, manifest destiny, e pluribus unum

Unit – II: Harriet Jacobs *Incidents in the Life of a Slave Girl* OR “Economy” , “Where I lived, and What I Lived for”, “Reading” and “Pond in Winter” from H D Thoreau’s *Walden*

Unit – III: *The Pioneers* – James Fennimore Cooper OR *Billy Budd*—Herman Melville

Unit – IV: (Any four poets to be studied)

- Walt Whitman: “when I heard the learn’d astronomer” and “A noiseless patient spider”
- Emily Dickinson: “Success is counted sweetest” and “‘Faith’ is fine invention”
- Robert Frost: “The road not taken” and “Fire and Ice”
- Wallace Stevens: “Thirteen ways of looking at a blackbird” and “Disillusionment of ten o’ clock”
- Adrienne Rich: “For the record” and “A valediction forbidding mourning”
- Susan Howe: “From the midnight” and “That this”
- Rita Dove: “Teach us to number our days” and “Exit”

Unit – V *Desire under the Elms*– Eugene O’Neill OR *The Dutchman*—Amiri Baraka

Suggested Reading

- Lewisohn, Ludwig. *The Story of American Literature*. The Modern Library, N. Y.
- Horton, Rod & Herbert W.. Edwards. *Backgrounds of American Literary Thought* . 3rd edition.
- Stewart, Randall(ed). *Living Masterpieces Of American Literature* . Brown University
- Norton Anthology of American Literature. 8th edition.

Core 8

British Literature: Early 20th Century

British Literature: Early 20th Century

This paper aims to familiarize the students with the new literature of Britain in the early decades of the 20th century. The course will mainly focus on the modernist canon, founded on Ezra Pound's idea of 'make it new', but will cover war poetry, social poetry of the 1930s and literary criticism.

Unit 1 (A historical overview): Highlights will include developments in society and economy, leading to a crisis in western society known as the First World War and the resultant change in the ways of knowing and perceiving. Such triggers for the modern consciousness as Marx's concept of class struggle, Freud's theory of the unconscious, Bergson's *duree*, Nietzsche's will to power and Einstein's theory of relativity are to be discussed.

Unit 2 T.S. Eliot "The Love Song of J. Alfred Prufrock"

W.B. Yeats	"Sailing to Byzantium"
Ezra Pound	"In a Station of the Metro"
T.E. Hulme	"Autumn"
Hilda Doolittle	"The Mysteries Remain"

Unit 3 War Poetry : Wilfred Owen "Dulce Et

Decorumest" Siegfried Sassoon "Suicide in the

Trenches"

Social Poetry: W.H Auden "The Unknown Citizen"

Stephen Spender "An Elementary Classroom in a

Slum" Louis MacNeice "Prayer before

Birth"

Unit 4 Virginia Woolf: *Mrs. Dalloway* OR

James Joyce: Stories from *Dubliners* ("The Sisters", "Evelyn", "An Encounter", "Clay", "Two Gallants")

Unit 5 Literary Criticism: Henry James, "The Art of Fiction" or T.S. Eliot, "Tradition and Individual Talent"

Suggested Readings:

1. *Pelican Guide to English Literature: The Modern Age*(ed.) Boris Ford
2. Jonathan Bate, *English Literature: A Very short Introduction*, Oxford Paperback
3. Peter Faulkner, *Modernism*. London: Methuen
4. Peter Childs, *Modernism, New Accents*. Routledge

CBCS UG SYLLABUS Sem 4

Core 9

European Classical Literature

The objective of this paper is to introduce the students to European Classical literature, commonly considered to have begun in the 8th century BC in ancient Greece and continued until the decline of the Roman Empire in the 5th century AD. The paper seeks to acquaint the students with the origins of the European canon.

Unit-1 A historical overview:

Classical Antiquity: ancient Greece, the rise and decline of the Roman Empire

Geographical space: cultural history of the Greco-Roman world centered on the Mediterranean Sea

Unit-2 Epic poetry:

Homer *Odyssey* (Book I) **OR**

Virgil *Aeneid* (Book I)

Unit-3 Tragedy:

Sophocles *Oedipus the King* **OR**

Aeschylus *Prometheus Bound*

Unit-4 Comedy:

Aristophanes *Frogs* **OR** Plautus *Asinaria*

Unit-5 Criticism:

Plato *Republic*, (Book 10) **OR**

Aristotle *Poetics*, Chapter 6,7,8 **OR**

Horace *Ars Poetica* or *Essay on Poetic Theory***OR**

Longinus *On the Sublime*, Chapter 7, 39

Suggested Readings:

Auerbach, Erich. *Mimesis: The Representation of Reality in Western Literature*. USA: Princeton University Press. 2013.

Beye, Charles Rowan. *Ancient Greek Literature and Society*. Ithaca, New York: Cornell University Press. 1987

*All the texts are available for access on Project Gutenberg <https://www.gutenberg.org/>

CBCS UG SYLLABUS Sem 4

Core 10

Women's writing

The course aims to acquaint the students with the complex and multifaceted literature by women of the world, reflecting the diversity of women's experiences and their varied cultural moorings. It embraces different forms of literature: poetry, fiction, short fiction, and critical writings. In certain respects, it interlocks concerns of women's literary history, women's studies and feminist criticism.

Unit 1: In Defence of A Literature of Their Own

Mary Wollstonecraft: "Introduction" from "A Vindication of the Rights of Women"

OR

Sarala Devi: "Narira Dabi" (The Claim of the Woman) Trans. S.Mohanty, Chapters 13 & 17 from the collective novel *Basanti* (The first two in *Lost Tradition: Early Women's Writing from Orissa* and the third in *Indian Literature No.*)

Unit 2: Desiring Self: Fiction by Women from the Centre

Charlotte Bronte: *Jane Eyre* OR Emily Bronte: *Wuthering Heights*

Jean Rhys: *Wide Sargasso Sea* OR Dorris Lessing: *The Grass is Singing*

Unit 3: Desiring and Dissenting Self: Fiction by Women from the Periphery

Krupabai Sathianadhan: *Saguna or Kamala*

OR

Prativa Ray: *Yajnaseni*

Unit 4: Tongues of Flame: Poetry by Women from Across the World

***Any Four Poets to be read**

Kamala Das "An Introduction" & "The

Sunshine Cat" Shanta Acharya

"Homecoming", "Shringara"

Eunice de Souza "Women in Dutch Painting" & "Remember

Medusa?" Tishani Doshi "Ode to the Walking Woman"

& "What the Body Knows"

Maya Angelou "Phenomenal Woman" & "I Know Why the Caged

Bird Sings" Sylvia Plath "Mirror" & "Barren Woman"

Margaret Atwood "This is a Photograph of me" & "The

Landlady" **Unit 5: Discoursing at Par: Literary Criticism**

by Women Virginia Woolf: "Chapter 1" from *A Room of*

One's Own

OR

Simone de Beauvoir: "Introduction" from *The Second Sex*

Web Resources:

- Virginia Woolf, *A Room of One's Own*
<https://victorianpersistence.files.wordpress.com/2013/03/a-room-of-ones-own-virginia-woolf-1929.pdf>
- Mary Wollstonecraft, *A Vindication of the Rights of Women*:
Introduction <http://pinkmonkey.com/dl/library1/vindicat.pdf>
- Maya Angelou's Poems
http://www.poemhunter.com/i/ebooks/pdf/maya_angelou_2012_6.pdf
- Sylvia Plath's Collected Poems
https://monoskop.org/images/2/27/Plath_Sylvia_The_Collected_Poems_1981.pdf
- Margaret Atwood's Poems
<http://www.poemhunter.com/margaret-atwood/poems/>
- Eunice de Souza, "Remember Medusa?" & "Women in Dutch Painting"
<http://www.poetrynook.com/poem/remember-medusa> ,
<http://www.gallerie.net/issue14/poetry1.html>
- Tishani Doshi's Poems

http://www.poemhunter.com/i/ebooks/pdf/tishani_doshi_2012_6.pdf

- Simone de Beauvoir *The Second Sex*
<http://burawoy.berkeley.edu/Reader.102/Beauvoir.1.pdf>

Suggested Reading:

- Toril Moi, *Sexual Textual Criticism*
- Elaine Showalter, *A Literature of Their Own*
- Sandra Gilbert and Susan Gubar, *The Mad Woman in the Attic*
- Gill Plain and Susan Sellers, *A History of Feminist Literary Criticism*. Cambridge University Press. 2007. Essays to be read: Helen Carr, "A History of Women's Writing" and Mary Eagleton, "Literary Representations of Women"
https://mthoyibi.files.wordpress.com/2011/09/05-history-of-feminist-literary-criticism_gill-plain-and-sus.pdf

CBCS UG SYLLABUS Sem 5

Core 11

Modern European Drama

The aim of this paper is to introduce the students to the best of experimental and innovative dramatic literature of modern Europe.

Unit 1: Politics, social change and the stage; text and performance; European Drama: Realism and Beyond; Tragedy and Heroism in Modern European Drama; The Theatre of the Absurd

Unit 2: Henrik Ibsen: *Ghosts* OR August Strindberg: *Miss Julie*

Unit 3: Luigi Pirandello: *Six Characters in Search of an Author* OR Heiner Müller: *Hamletmachine*

Unit 4: Eugene Ionesco: *Chairs* OR Jean Genet: *The Maids*

Unit 5: Samuel Beckett: *Waiting for Godot* OR Bertolt Brecht: *The Good Woman of Szechuan*

Web Resources

- *Hamletmachine*: <http://theater.augent.be/file/13>
- Pirandello: <http://www.eldritchpress.org/lp/six.htm>
- Ionesco: <http://www.kkworld.com/kitablar/ejen-ionesko-kergedan-eng.pdf>
- Genet: <http://web.mit.edu/jscheib/Public/phf/themaids.pdf>
- Ibsen: <http://www.gutenberg.org/files/8121/8121-h/8121-h.htm>
- Strindberg: <https://archive.org/details/missjulieotherpl00striiala>

Suggested Reading:

1. Constantin Stanislavski, *An Actor Prepares*, Chap. 8, 'Faith and the Sense of Truth', tr. Elizabeth Reynolds Hapgood (Harmondsworth: Penguin, 1967) sections 1,2, 7,8,9, pp. 121-5, 137-46.
2. Bertolt Brecht, 'The Street Scene', 'Theatre for Pleasure or Theatre for Instruction', and 'Dramatic Theatre vs Epic Theatre', in *Brecht on Theatre: The Development of an Aesthetic*, ed. And tr. John Willet (London: Methuen, 1992) pp.68-76, 121-8.
3. George Steiner, 'On Modern Tragedy', in *The Death of Tragedy* (London: Faber, 1995) pp. 303- 24.
4. Raymond Williams, "Tragedy and Revolution" in *Modern Tragedy*, Rvsd Ed (London: Verso, 1979) pp. 61-84.
5. Jean Genet, Reflections on Theatre (London:Faber & Faber) Chapter 2: "The Strange World Urb..." pp. 63-74.

CBCS UG SYLLABUS Sem 5

Core 12

Indian Classical Literature

This paper aims at creating awareness among the students of the rich and diverse literary culture of ancient India.

Unit 1: Vedic Literature

1. *Samjnana Sukta* Rig Veda X.19
2. *Sivasankalpa Sukta* Yajur Veda XXX.I.6
3. *Purusha Sukta* Yajur Veda XV.XXXI. 1-16

References: The New Vedic Selection Vol 1, Telang and Chaubey, Bharatiya Vidya Prakashan, New Delhi

Unit 2: Selections from Epic Lit.

Vyasa 'The Dicing' and 'The Sequel to Dicing,' 'The Book of the Assembly Hall', 'The Temptation of Karna', Book V 'The Book of Effort', in *The Mahabharata*: tr. And ed. J.A.B. van Buitenen (Chicago: Brill, 1975) pp. 106-69 OR 'Ayodhya Kanda' (Book II), 1st Canto—The Ramayana of Valmiki. Gita Press Edition.

Unit 3: Sanskrit Drama

Kalidasa, *Abhijnanasakuntalam*, Act IV, tr. M.R Kale, Motilal Banarasi Dass, New Delhi OR Bhavabhuti's *Rama's Last Act (Uttararamacharita)* tr. Sheldon Pollock (New York: Clay Sanskrit Library, 2007)

Unit 4: Sanskrit Drama

Mrcchakatika by Sudraka, Act I, tr. M.M. Ramachandra Kale (New Delhi: Motilal Banarasi Dass, 1962)

Unit 5: Aesthetics and Maxims

- Bharata's *Natyasastra*, Chapter VI on Rasa theory References- English Translation by M.M. Ghosh, Asiatic Society, Kolkata, 1950
- *Sahitya Darpana* of Vishvanatha Kaviraja Chaps-I & II References- English Translation by P.V. Kane, Motilal Banarsi Dass, N Delhi
- Nitisataka of Bhartrhari 20 verses from the beginning References- The Satakatrava edited by D.D. Kosambi, Published in Anandashrama Series, 127, Poona, 1945. Also English Translation published from Ramakrishna Mission, Kolkata

Suggested Reading:

- Kalidasa. Critical Edition, Sahitya Akademi
- B.B Choubey, New Vedic Selection, Vol 1, Bharatiya Vidya Prakashan, New Delhi
- H.H.Wilson (Tr.)- *Rig Veda*
- Bharata, *Natyashastra*, tr. Manomohan Ghosh, vol.I, 2 nd edn (Calcutta: Granthalaya, 1967) chap. 6: 'Sentiments', pp. 100–18.
- J.A.B.Van Buitenen, 'Dharma and Moksa', in Roy W. Perrett, ed., *Indian Philosophy*, vol. V, *Theory of Value: A Collection of Readings* (New York: Garland, 2000) pp.33–40.
- Vinay Dharwadkar, 'Orientalism and the Study of Indian Literature', in *Orientalism and the Postcolonial Predicament: Perspectives on South Asia*, ed. Carol A. Breckenridge and Peter van der Veer (New Delhi: OUP, 1994) pp. 158–95
- *Universals of Poetics* by Haldhar Panda

CBCS UG SYLLABUS Sem 6

Core 13

Postcolonial Literature

This paper seeks to introduce the students to postcolonial literature—a body of literature that responds to the discourses of European colonialism and empire in Asia, Africa, Middle East, the Pacific and elsewhere. By focusing on representative texts situated in a variety of locations, the paper aims to provide the students with the opportunity to think through and understand the layered response – compliance, resistance, mimicry and subversion - that colonial power has provoked from the nations in their search for a literature of their own.

Unit 1: Concept

- Definition and characteristics: Resistant descriptions, appropriation of the colonizer's language, reworking colonial art forms & etc.
- Scope and Concerns: Reclaiming spaces and places, asserting cultural integrity, revising history

Prescribed Reading:

Achebe, Chinua "An image of Africa: Racism in Joseph Conrad's *Heart of Darkness*," *Research in*

Unit 2: Indian

Raja Rao: *Kanthapura* OR R K Narayan: *The English Teacher*

Unit 3: Caribbean and African

V S Naipaul: *The Mimic Men* OR Chinua Achebe: *No Longer at Ease*

Unit 4: South African

Nadine Gordimer: *July's People* OR J M Coetzee: *Life & Times of Michael K*

Unit 5: Criticism

Chinua Achebe: "English and the African Writer" and
Ngugi wa Thiong'o: "The Quest for Relevance" from *Decolonising the Mind: The Politics of Language in African Literature*

Web Resources

- Achebe, Chinua "An image of Africa: Racism in Joseph Conrad's Heart of Darkness," *Research in African Literatures, Vol. 9, No.1, Special Issue on Literary Criticism. (Spring, 1978), pp. 1-15.* <http://english.gradstudies.yorku.ca/files/2013/06/achebe-chinua.pdf>
- Achebe, Chinua: "English and the African Writer" <https://mrvenglish.wikispaces.com/file/view/English+and+the+African+Writer.pdf>
- Thiong'o, Ngugi Wa. "The Quest for Relevance" from *Decolonising the Mind: The Politics of Language in African Literature* https://www.humanities.uci.edu/critical/pdf/Wellek_Readings_Ngugi_Quest_for_Rellevance.pdf
- Ashcroft, Bill, Gareth Griffiths, Helen Tiffin. *Post-Colonial Studies: The Key Concepts*. New York: Routledge. 2007.

Suggested Reading:

- Ashcroft, Bill, Gareth Griffiths, Helen Tiffin. "Introduction", *The Empire Writes Back: Theory and Practice in Post-Colonial Literature*. London, New York: Routledge, 2nd edition, 2002.
- Bhabha, Homi K. *The Location of Culture*. Noida: Atlantic Books. 2012.
- Gandhi, Leela. *Postcolonial Theory: An Introduction*. OUP. 1998.
- Said, Edward. *Orientalism*. India: Penguin. 2001.
- Spivak, Gayatri Chakraborty. *Can the Subaltern Speak?*. UK: Macmillan.1998 <http://planetarities.web.unc.edu/files/2015/01/spivak-subaltern-speak.pdf>

Core 14

Popular Literature

This paper seeks to introduce the students to genres such as romance, detective fiction, campus fiction, fantasy/mythology, which have a “mass” appeal, and can help us gain a better understanding of the popular roots of literature.

Unit 1: Introduction to the concept

- What is popular literature?
- Debate between popular and high cultures ('high brow' v/s 'low brow')
- What is Genre fiction?
- Debate between genre fiction and literary

fiction

Essays for discussion:

- Lev Grossman: “Literary Revolution in the Supermarket Aisle: Genre Fiction is Disruptive Technology”
<http://entertainment.time.com/2012/05/23/genre-fiction-is-disruptive-technology/>
- Arthur Krystal: “Easy Writers: Guilty pleasures without guilt”
<http://www.newyorker.com/magazine/2012/05/28/easy-writers>
- Joshua Rothman: “A Better Way to Think About the Genre Debate”
<http://www.newyorker.com/books/joshua-rothman/better-way-think-genre-debate>

Stephen Marche: How Genre Fiction Became More Important than Literary Fiction”

<http://www.esquire.com/entertainment/books/a33599/genre-fiction-vs-literary-fiction/>Midterm:

Unit 2: Detective Fiction

Sherlock Holmes: *The Hound of the Baskervilles* OR Agatha Christie: *Murder on the Orient Express*

Unit 3: Romance

Shobha De: *Socialite Evenings* OR Nicholas Sparks: *The Notebook*

Unit 4: Campus Fiction

Chetan Bhagat: *Five Point Someone* OR David Lodge: *Small World: An Academic Romance*

Unit 5: Rewriting Mythology

Amish Tripathi: *The Immortals of Meluha* OR Anuja Chandramouli: *Arjuna: Saga of a Pandava Warrior-Prince*

Suggested Reading

- Leslie Fiedler, *What was Literature? Class, Culture and Mass Society*
- Leo Lowenthal, *Literature, Popular Culture and Society*
- *Popular Fiction: Essays in Literature and History* by Peter Humm, Paul Stigant, Peter Widdowson

CBCS UG SYLLABUS SEM 5

Discipline Specific Course

1. Literary Theory

Objective

The development of theory in the last half-century or more is a fact of critical importance in the academic study of literature. Far from being seen as a parasite on the text, theory has been seen as a discourse that provides the conceptual framework for literature. This paper aims to give the students a firm grounding in a major methodological aspect of literary studies known as theory.

Starred texts are to be taught. Questions with alternatives are also to be set from these

texts. Unit 1: Overview

- Crisis in literary criticism and the search for a method
- Rise of theory
- What does it mean to theorise?

Unit 2: New Criticism and Formalism: with an emphasis on the main critical concepts of NC such as paradox, irony, tension, intentional and affective fallacy, heresy of paraphrase and of Formalism such as ostranenie, literariness, foregrounding, dominant and deviant

- *Cleanth Brooks, "The Language of Paradox" Or W.K. Wimsatt Jr. and Monroe Beardsley, "The Intentional Fallacy"
- *Viktor Shklovsky, "Art as Device" Or Roman Jakobson, "Linguistics and Poetics"

Unit 3: Structuralism and Poststructuralism: with an emphasis on the main critical concepts of Structuralism such as binary opposition, synchrony and diachrony, syntagm and paradigm and of Poststructuralism such as collapse of the binary, difference, mise-en-abym, erasure

- *Gerard Genette, "Introduction" to *Narrative Discourse*
(https://archive.org/stream/NarrativeDiscourseAnEssayInMethod/NarrativeDiscourse-AnEssayInMethod_djvu.txt) Or Roland Barthes, "Face of Garbo" and "French Fries" (from *Mythologies*)
- Jacques Derrida, "On the Idea of the Supplement" (from *Of Grammatology*) Or Michel Foucault, "What is an Author?"
(<http://artsites.ucsc.edu/faculty/Gustafson/FILM%20162.W10/readings/foucault.author.pdf>) (Either of the two essays can be taught depending on availability)

Unit 4: Marxism and New Historicism: with an emphasis on main critical concepts of Marxism

such as base, superstructure, ideology, commodification, determination and of New Historicism
such as power, resistance, high-low dialectic

- *Louis Althusser, "Letters on Art" (from *Lenin and Philosophy and Other Essays*) Or Georg Lukacs, "On Reification" (from *History and Class Consciousness*)
- Raymond Williams, "In Memory of Lucien Goldmann" Or Stephen Greenblatt, "Learning to Curse" (Either of the two essays can be taught depending on availability)

Unit 5: Eco-criticism and Eco-feminism: with an emphasis on main critical concepts of Ecology as environment, balance, food chain and of Eco-feminism as body and its colonisation, patriarchy, woman as a creative principle in harmony with nature

- *Rachel Carson, "A Fable for Tomorrow" and "The Obligation to Endure" (from *Silent Spring* (http://library.uniteddiversity.coop/More_Books_and_Reports/Silent_Spring-Rachel_Carson-1962.pdf))
- *Mack-Canty, Colleen, "Third-Wave Feminism and the Need to Reweave the Nature/Culture Duality." *NWSA Journal* 16, no. 3 (2004): 154-179 (from [JSTOR Arts & Sciences VI](#))

Suggested Reading:

Terry Eagleton, *Literary Theory: An Introduction for Foreign Students*

David Robey and Anne Jefferson, *Modern Literary*

Theory Jonathan Culler, *Literary Theory: A Very Short*

Introduction Richard Barry, *Beginning Theory*

Tony Bennett, *Formalism and Marxism*

Terence Hawkes, *Structuralism and Semiotics*

Christopher Norris, *Deconstruction: Theory and*

Practice Veenser H. Aram (ed), *The New Historicism*

Reader

Greg Gerrard, *Eco-Criticism*

Discipline Specific Course

2: Reading World Literature

This paper proposes to introduce the students to the study of world literature through a representative selection of texts from around the world. The idea is to read beyond the classic European canon by including defining literary texts from other major regions/countries—except the United States of America—written in languages other than English, but made available to the readers in English translation.

Unit 1: Concept

- The idea of world literature: Scope and definition
- Uses of reading world literature

Unit 2: European

Albert Camus *The Outsider*

OR

Fyodor Dostoevsky *Notes from Underground*

Unit 3: Caribbean and African

V S Naipaul *In a Free State*

OR

Chimamanda Ngozi Adichie *Purple Hibiscus*

Unit 4: Canadian Short Fiction

Margaret Atwood *Stone Mattress* & *Pretend Blood*

OR

Alice Munro *The Bear Came Over the Mountain* & *Face*

Unit 5: Latin American Poetry

Pablo Neruda “Death Alone”, “Furies and Suffering”, “There’s no Forgetting”, “Memory”

OR

Octavio Paz “from San Ildefonso Nocturne”, “Between Going and Staying the Day
Wavers”, “Humayun’s Tomb”, “Motion”

Web Resources:

- The Complete Stories by Franz Kafka
http://www.vanderbilt.edu/olli/class-materials/Franz_Kafka.pdf
- What is world Literature? (Introduction) David Damrosch
<http://press.princeton.edu/chapters/i7545.html>
- Tagore’s comparative world literature
https://www.academia.edu/4630860/Rabindranath_Tagores_Comparative_World_Literature

- Dostoevsky's *Notes from Underground* <http://www.gutenberg.org/files/600/600-h/600-h.htm>
- Margaret Atwood's *Stone Mattress* <http://www.newyorker.com/magazine/2011/12/19/stone-mattress>
- Margaret Atwood's *Pretend Blood* <http://www.independent.co.uk/arts-entertainment/books/features/first-lives-club-pretend-blood-a-short-story-by-margaret-atwood-1779529.html>
- Alice Munro's short Stories <http://www.newyorker.com/magazine/2013/10/21/the-bear-came-over-the-mountain-2>, <http://www.newyorker.com/magazine/2008/09/08/face>
- Poems of Octavio Paz http://www.poetrysoup.com/famous/poems/best/octavio_paz

Suggested Reading:

- *Weltliteratur*: John Wolfgang von Goethe in *Essays on Art and Literature* Goethe : The Collected Works Vol.3
- Rabindranath Tagore "World Literature": *Selected Writings On Literature and Language*: Rabindranath Tagore Ed. Sisir Kumar Das and Sukanta Chaudhuri Damrosch
- Goethe's "World Literature Paradigm and Contemporary Cultural Globalization" by John Pizer "Something Will Happen to You Who Read": Adrienne Rich, Eavan Boland' by Victor Luftig .JSTOR iv. *Comparative Literature* University of Oregon.
- David Damrosch, *What is World Literature?* Princeton University Press
- "WLT and the Essay" *World Literature Today* Vol. 74, No. 3, 2000. JSTOR Irish University Review, Vol.23 Spring 1, Spring-Summer.

CBCS UG SYLLABUS SEM 6

Discipline Specific Course

3: Research Methodology

Research methodology is a discipline specific course pitched at a higher level than the generic academic preparatory courses. Research is at the core of every university course starting from the UG to the PhD level. This course is designed to develop the fundamentals of research from creating a questioning mechanism in the students' minds leading up to writing research papers and dissertations. Students learn the methodological issues imperative for conducting research and for research documentation. The course also aims to train students in the essentials of academic and research writing skills.

Unit 1 Research and the Initial Issues

- Research as systematic investigation
- Searching for and locating research questions; Finding the general background about research problem/question: review of existing literature and applicable theories

- Refining the research problem/question; formulating its rationale and objectives
- Writing a research synopsis

Unit 2 Literature review

- Selecting review areas based on the research objectives
- Primary, secondary and tertiary sources, and related theory/s (sources: library, databases, online sources, previous research, archives, media, social/psychological/political/educational contexts, and such others)
- Gathering, reading and analysing literature and related theory
- Writing the review with implications for the research question selected

Unit 3 Hypotheses and formulation of research design

- Formulating hypotheses based on research objectives
- Formulation of research design: qualitative, quantitative, combinatory; steps in research design Theory application
- Data collection tools: surveys, questionnaires, interviews, observation checklists, review checklists, comparison tools, text analysis tools
- Data analysis and interpretation

Unit 4 Results and documentation

- Preparing tables, charts, and graphs to present data; Collating the findings
- Testing hypotheses; Generalisation of results
- Writing a dissertation; MLA/APA citation: in-text and works cited pages
- Plagiarism and related problems

Unit 5 Practical (for Internal Assessment)

Students will write i. literature review of 1000 words on a research question and ii. a book review of 500 words.

Texts prescribed

- i. K Samantray, *Academic and Research Writing*. Orient Blackswan (2015)
- ii. Kothari & Garg, *Research Methodology*. New Age Publishers
- iii. Deepak Chawla & Neena Sondhi. *Research methodology: Concepts & Cases*. Vikas Publishing

Generic Elective

Academic Writing and Composition

This is a generic academic preparatory course designed to develop the students' writing skills from basic to academic and research purposes. The aim of this course is to prepare students to succeed in complex academic tasks in writing along with an improvement in vocabulary and syntax.

Unit 1 Instruments of writing I

- Vocabulary development: synonyms and antonyms; words used as different parts of speech; vocabulary typical to 'science' and 'commerce'
- Collocation; effective use of vocabulary in context

Unit 2 Instruments of writing II

- Syntax: word order; subject-predicate; subject-verb agreement; simple, complex, compound, compound-complex sentences; structure and uses of active and passive sentences
- Common errors in Indian writing

Unit 3 Academic writing I

- What is academic writing?
- The formal academic writing process: the 'what' and the 'how' of writing; use of cohesive and transitional devices in short and extended pieces of writing

Unit 4 Academic writing II

- Paragraph writing: topic sentence, appropriate paragraph development ; expository, descriptive, narrative and argumentative paragraphs
- Extended pieces of writing: process development using comparison-contrast, cause and effect, argumentation, and persuasion

Unit 5 Project writing: (writing projects)

- What's a Project: reading-based, field work-based project : how to pick a topic for the project; background reading
- Structure of a Project: Title, aim of the project (a short statement), other objectives if any, significance of the Project : why is the project being undertaken, sources/books to be consulted for the study, method: Is it quantitative (field work) or qualitative (text-related), analysis/interpretation, findings, conclusion

Texts prescribed

1. K Samantray, *Academic and Research Writing: A Course for Undergraduates*, Orient BlackSwan
2. Leo Jones (1998) *Cambridge Advanced English: Student's Book* New Delhi: CUP

CBCS UG SYLLABUS SEM 2-GE 2

Generic Elective

Modern Indian Literature

The paper aims at introducing students to the richness and diversity of modern Indian literature written in many languages and translated into English.

Unit-I Historical Overview

Background, definition of the subject and historical perspectives will be covered.

Unit-II The Modern Indian Novel

Fakir Mohan Senapati: *Six Acres and a Third* Or U. R. Ananthamurthy: *Sanskara*

Unit-III The Modern Indian Short Story

Selected stories by Fakir Mohan Senapati: "Rebati", Rabindra Nath Tagore: "Post Master" Premchand: "The Shroud", Ishmat Chughtai: "Lihaaf"

Unit-IV Modern Indian Life Writing

Excerpts from M.K. Gandhi's *Story of My Experiments with Truth* (First two chapters), Amrita Pritam's *The Revenue Stamp* (first two chapters), *Autobiography* by Rajendra Prasad (chapter six & seven)

Unit-V The Modern Indian Essay

- A. K. Ramanujan "Is there an Indian Way of Thinking? An Informal Essay" *Collected Essays*, OUP, 2013
- "Decolonising the Indian Mind" by Namwar Singh. Tr. Harish Trivedi *Indian Literature*, Vol. 35, No. 5 (151) (Sept.-Oct., 1992), pp. 145-156
- G. N. Devy's introduction to *After Amnesia*, pp. 1-5, *The G. N. Devy Reader*, Orient BlackSwan, 2009.

Suggested Readings:

1. Sisir Kumar Das, *History of Indian Literature 1910–1956, Triumph and Tragedy*, Sahitya Akademi, New Delhi, 2000
2. Amit Chaudhuri, *The Vintage Book of Modern Indian Literature*, 2004
3. M.K. Naik, *A History of Indian English Literature*, Sahitya Akademi, 2004

CBCS UG SYLLABUS SEM 3-GE 3

Generic Elective

Language, Literature and Culture

This is a broad-based course that aims to encourage students to be knowledgeable and inquiring into the nature of language, nature of literature and the role of culture in both. The course introduces students to how language is special for humans, and how literature and culture make human beings caring. There is a strong emphasis here on encouraging students to develop intercultural understanding, open-mindedness, and the attitudes necessary for them to respect and evaluate a range of points of view.

Unit 1 Language

- Nature of language
- Functions of language : transactional, informative, interactional

(use these terms under each category above: Instrumental language, Regulatory Language, Interactional Language, Personal Language, imaginative Language, Heuristic Language, Informative Language)

Unit 2 Language and Literature 1

- Literature and its language
- Literary terms, Figures of speech used in literature: simile, metaphor, metonymy, irony, paradox, synecdoche, oxymoron

Unit 3 Language and Literature 2

- Language used in poetry, fiction and non-fiction
- Text analysis

Unit 4 Language and culture 1

- Culture, its implications and interpretations
- Transmission of culture through language: Culture and society

Unit 5 Language and Culture 2

- Intercultural and cross-cultural communications
- Analysis and applications

Suggested Reading

- Kalyani Samantray, *Pragmatics* (E-Pathshala)
- Bibhudendra Narayan Patnaik & Kalyani Samantray, *Cross-Cultural and Intercultural Communications* ((E-Pathshala)
- Brown, G & Yule, G. *Discourse Analysis*. CUP
- **Scaglia, B (ed.)** *Language, Understood: Examining the Linguistics of Discourse Analysis and Studies*. Webster's Digital Service.
- **Culture and language**

- <http://www2.lib.nifs-k.ac.jp/HPBU/annals/an46/46-11.pdf>
- <http://barthimeous.blogspot.in/2011/03/relationship-between-culture-and.html>
- *Companion to Literary Forms* by Padmaja Ashok, Orient BlackSwan.2015
- *Literature and Language* (ed.) Loveleen Mohan, Randep Rana, Jaibir S. Hooda. Orient BlackSwan.

CBCS UG SYLLABUS SEM 4-GE 4

Generic Elective

Language and Linguistics

Unit 1:Language and Human Language

- Nature and features of Human language ; language and human communication; differences from other forms of communications
- Artificial intelligence and human language

Unit 2 :Linguistics and Language 1

- What is linguistics; development in the history of linguistic studies; contribution of linguistics to other areas of human inquiry
- Linguistics for jobs

Unit 3 :Linguistics and Language 2

- Phonetics and accuracy in pronunciation
- Fluency and contextual speaking

Unit 4 :Linguistics and Language 3

- Morphology and Nature of words
- Word formation processes

Unit 5: Linguistics and Language 4

- Nature of sentences and connected texts; syntax and discourse
- Language and meaning: semantics

Recommended reading

- i. *A Course in Linguistics*. Tarni Prasad. PHI
- ii. *Linguistics: A very short introduction*. P H

Mathews.OUP

Skill Enhancement Compulsory Course

2. SEC 1 (English Communication)
3. SEC 2
 - A. Soft Skills OR
 - B. Translation and Principles of Translation

SEC 1: Skill Enhancement Compulsory Course

for Arts Semester 1

Paper: 1 Marks: 100 Credits: 04

The purpose of this course is twofold: to train students in communication skills and to help develop in them a facility for communicative English.

Since language is which binds society together and serves as a crucial medium of interaction as well as interchange of ideas and thoughts, it is important that students develop a capacity for clear and effective communication, spoken and written, at a relatively young age. The need has become even more urgent in an era of globalization and the increasing social and cultural diversity that comes with it.

English, being a global language par excellence, it is important that any course in communication is tied to an English proficiency programme. The present course will seek to create academic and social English competencies in speaking, listening, arguing, enunciation, reading, writing and interpreting, grammar and usage, vocabulary, syntax, and rhetorical patterns.

Students, at the end of the course, should be able to unlock the communicator in them by using English appropriately and with confidence for further studies or in professional spheres where English is the indispensable tool of communication.

Unit-1:

[20]

Introduction

1. What is communication?
2. Types of communication
 - Horizontal
 - Vertical
 - Interpersonal
 - Grapevine

3. Uses of Communication

Prescribed Reading: Chapter 1 *Applying Communication Theory for Professional Life: A Practical Introduction* by Dainton and Zelle

http://tsime.uz.ac.zw/claroline/backends/download.php?url=L0ludHJvX3RvX2NvbW11bmljYXRpb25fVGhlb3J5L_nBkZg%3D%3D&cidReset=true&cidReq=MBA563

Unit-2: Language of Communication [20]

1. Verbal: spoken and written

2. Non-verbal

- Proxemics
- Kinesics
- Haptics
- Chronemics
- Paralinguistics

3. Barriers to communication

4. Communicative English

Unit-3: Reading Comprehension [20]

- Locate and remember the most important points in the reading
- Interpret and evaluate events, ideas, and information
- Read “between the lines” to understand underlying meanings
- Connect information to what they already know

Unit-4: Writing [20]

- Expanding an Idea
- Note Making
- Information Transfer
- Writing a Memo
- Writing Formal Email
- Writing a Business Letter
- Letters to the Editor
- CV & Resume Writing
- Covering Letter
- Report Writing
- News Story
- Interviewing for news papers

(The above-mentioned writing activities are covered in the prescribed textbook *Vistas and Visions*)

Unit 5: Language functions in listening and conversation [20]

- Discussion on a given topic in pairs
- Speaking on a given topic individually
- Group Discussion
- Interview
- Dialogue

(Practice to be given using the set pieces from the prescribed textbook *Vistas and Visions*)

Grammar and Usage

1. Phrasal Verbs
2. Collocation
3. Using Modals
4. Use of Prepositions
5. Common Errors in English Usage

(The above-mentioned grammar items are covered in the textbook *Vistas and Visions*)

Grammar questions must be set in contexts; not as isolated sentences as used for practice in the prescribed textbook.

Book Prescribed:

Vistas and Visions: An Anthology of Prose and Poetry. (Ed.) Kalyani Samantray, Himansu S. Mohapatra, Jatindra K. Nayak, Gopa Ranjan Mishra, Arun Kumar Mohanty. OBS

Texts to be

studied Prose

- Decoding Newspapers
- Pleasures of Ignorance
- Playing the English Gentleman
- Lifestyle English
- A Cup of Tea

Poetry

- Last Sonnet
- Sonnet 46 (Shakespeare)
- Pigeons
- Miracles

All grammar and writing activities in the textbook *Vistas and Visions*

Recommended Reading:

Fluency in English – Part II, OUP, 2006

Business English, Pearson, 2008

Communicative English. E. Suresh Kumar and P. Sreehari

Break Free: Unlock the Powerful Communicator in You. Rajesh, V. Rupa, 2015

Soft Skills Shalini Verma, 2009.

Language, Literature and Creativity, Orient BlackSwan, 2013

Skill Enhancement Compulsory Course for Science

Semester 1

Paper: 1 Marks: 100 Credits: 04

The purpose of this course is twofold: to train students in communication skills and to help develop in them a facility for communicative English.

Since language it is which binds society together and serves as a crucial medium of interaction as well as interchange of ideas and thoughts, it is important that students develop a capacity for clear and effective communication, spoken and written, at a relatively young age. The need has become even more urgent in an era of globalization and the increasing social and cultural diversity that comes with it.

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Students, at the end of the course, should be able to unlock the communicator in them by using English appropriately and with confidence for further studies or in professional spheres where English is the indispensable tool of communication.

Unit 1

[20]

Introduction

1. What is communication?
2. Types of communication
 - Horizontal
 - Vertical
 - Interpersonal
 - Grapevine
3. Uses of Communication

Prescribed Reading: Chapter 1 *Applying Communication Theory for Professional Life: A Practical Introduction* by Dainton and Zellely

<http://tsime.uz.ac.zw/claroline/backends/download.php?url=L0ludHJvX3RvX2NvbW11bmljYXR>

Unit-2

[20]

Language of Communication

1. Verbal: spoken and written
2. Non-verbal
 - Proxemics
 - Kinesics
 - Haptics
 - Chronemics
 - Paralinguistics
3. Barriers to communication
4. Communicative English

Unit-3

[20]

Reading Comprehension

- Locate and remember the most important points in the reading
- Interpret and evaluate events, ideas, and information
- Read “between the lines” to understand underlying meanings
- Connect information to what they already know

Unit 4

[20]

Writing

- Expanding an Idea
- Note Making
- Information Transfer
- Writing a Memo
- Writing Formal Email
- Writing a Business Letter
- Letters to the Editor
- CV & Resume Writing
- Covering Letter
- Report Writing
- News Story
- Interviewing for news papers

(The above-mentioned writing activities are covered in the prescribed textbook *Vistas and Visions*)

Unit 5: Language functions in listening and conversation

[20]

1. Discussion on a given topic in pairs
2. Speaking on a given topic individually

3. Group Discussion
4. Interview
5. Dialogue

(Practice to be given using the set pieces from the prescribed textbook *Vistas and Visions*)

Grammar and Usage

1. Phrasal Verbs
2. Collocation
3. Using Modals
4. Use of Prepositions
5. Common Errors in English Usage

(The above-mentioned grammar items are covered in the textbook *Vistas and Visions*)

Book Prescribed:

Vistas and Visions: An Anthology of Prose and Poetry. (Ed.) Kalyani Samantray, Himansu S. Mohapatra, Jatindra K. Nayak, Gopa Ranjan Mishra, Arun Kumar Mohanty. OBS

Texts to be

studied Prose

- The Gold Frame
- Lifestyle English
- Need for Excellence
- Ecology and Community
- My Lost Dollar

Poetry

- The Darkling Thrush
- The Felling of the Banyan Tree
- Another Woman
- Meeting Poets

All grammar and writing activities in the textbook *Vistas and Visions*

Recommended Reading:

Fluency in English – Part II, OUP, 2006

Business English, Pearson, 2008

Communicative English. E. Suresh Kumar and P. Sreehari

Break Free: Unlock the Powerful Communicator in You. Rajesh, V. Rupa, 2015

Soft Skills Shalini Verma, 2009.

Language, Literature and Creativity, Orient BlackSwan, 2013

Language through Literature. (forthcoming) ed. Gauri Mishra, Dr. Ranajan Kaul, Dr. Brati Biswas

SEC 1

Skill Enhancement Compulsory Course for

Commerce Semester 1

Paper: 1 Marks: 100 Credits: 04

The purpose of this course is twofold: to train students in communication skills and to help develop in them a facility for communicative English.

Since language is which binds society together and serves as a crucial medium of interaction as well as interchange of ideas and thoughts, it is important that students develop a capacity for clear and effective communication, spoken and written, at a relatively young age. The need has become even more urgent in an era of globalization and the increasing social and cultural diversity that comes with it.

English, being a global language par excellence, it is important that any course in communication is tied to an English proficiency programme. The present course will seek to create academic and social English competencies in speaking, listening, arguing, enunciation, reading, writing and interpreting, grammar and usage, vocabulary, syntax, and rhetorical patterns.

Students, at the end of the course, should be able to unlock the communicator in them by using English appropriately and with confidence for further studies or in professional spheres where English is the indispensable tool of communication.

Unit 1

[20]

Introduction

1. What is communication?
2. Types of communication
 - Horizontal
 - Vertical
 - Interpersonal
 - Grapevine
3. Uses of Communication

Prescribed Reading: Chapter 1 *Applying Communication Theory for Professional Life: A Practical Introduction*

by Dainton and Zelle

<http://tsime.uz.ac.zw/claroline/backends/download.php?url=L0ludHJvX3RvX2NvbW11bmljYXRpb25fv>

Unit 2 [20]

Language of Communication

1. Verbal: spoken and written
2. Non-verbal
 - Proxemics
 - Kinesics
 - Haptics
 - Chronemics
 - Paralinguistics
3. Barriers to communication
4. Communicative English

Unit--3

[20]

Reading Comprehension

- Locate and remember the most important points in the reading
- Interpret and evaluate events, ideas, and information
- Read “between the lines” to understand underlying meanings
- Connect information to what they already know

Unit 4

[20]

Writing

- Expanding an Idea
- Note Making
- Information Transfer
- Writing a Memo
- Writing Formal Email
- Writing a Business Letter
- Letters to the Editor
- CV & Resume Writing
- Covering Letter
- Report Writing
- News Story
- Interviewing for news papers

(The above-mentioned writing activities are covered in the prescribed textbook *Vistas and Visions*)

Unit 5: Language functions in listening and conversation

[20]

1. Discussion on a given topic in pairs

2. Speaking on a given topic individually
3. Group Discussion
4. Interview
5. Dialogue

(Practice to be given using set pieces from the prescribed textbook *Vistas and Visions*)

Grammar and Usage

1. Phrasal Verbs
2. Collocation
3. Using Modals
4. Use of Prepositions
5. Common Errors in English Usage

(The above-mentioned grammar items are covered in the textbook *Vistas and Visions*)

Grammar questions must be set in contexts; not as isolated sentences as used for practice in the prescribed textbook.

Book Prescribed:

Vistas and Visions: An Anthology of Prose and Poetry. (Ed.) Kalyani Samantray, Himansu S. Mohapatra, Jatindra K. Nayak, Gopa Ranjan Mishra, Arun Kumar Mohanty. OBS

Texts to be

studied Prose

The Last Leaf

- Need for Excellence
- How Wealth Accumulates and Men Decay
- Values in Life
- Lifestyle English

Poetry

- Hidden Flame
- One Day I wrote Her Name
- The Darkling Thrush
- Meeting Poets

All grammar and writing activities in the textbook *Vistas and Visions*

Recommended Reading:

Fluency in English – Part II, OUP, 2006

Business English, Pearson, 2008

Communicative English. E. Suresh Kumar and P. Sreehari

Break Free: Unlock the Powerful Communicator in You. Rajesh, V. Rupa, 2015

Soft Skills Shalini Verma, 2009.

Language, Literature and Creativity, Orient BlackSwan, 2013

Language through Literature. (forthcoming) ed. Gauri Mishra, Dr. Ranajan Kaul, Dr. Brati Biswas

Skill Enhancement Course Credits: 4

Marks: 100

1. Soft Skills

Soft skills are 'people skills' that include communication skills, work ethic, positive attitude, emotional intelligence and other personal attributes crucial for success in business or career. Soft skills can be learnt and practiced for personal fulfillment and progress in career. This course provides the soft skills required mainly for professional achievements, and in the process, many of the personal requirements of an individual can be compiled with.

Unit 1

Soft skills and why they are important

What are soft skills?

Soft skills in communication; soft skills and intercultural communication

Unit 2

Soft skills in preparing for a career 1

Competency in verbal and written communication skills: active listening, interactive speaking, reading different types of texts, writing for formal and business contexts

Unit 3

Soft skills in preparing for a career 2

1. Using the Microsoft Office: word, excel, powerpoint; working online and offline; telephone and face-to-face etiquette in professional communication
2. Cross-Cultural etiquette: cultural awareness, cultural sensitivity, cultural flexibility, cross-cultural communication

Unit 4

Soft skills in getting jobs

CV Writing, writing job applications; GD Skills and interview taking skills; getting another job

Unit 5

Soft skills on the job

Emotional Intelligence; time and stress management; team work and net-working; presentation skills;

making meeting work: preparing, executing, following up; negotiation skills and crisis management

Prescribed Reading:

- i. Kalyani Samantray, Soft Skills for your Career, OUP
- ii. Himansu S. Mohapatra, Model of the Middle (Pieces to read: “ Our Literature Their Literature”, “ Life style English”, “Writing it Right”, “ The Vinglish way to English”)

Suggested Reading:

- i. Jayashri Mohanraj, Skill Sutras
- ii. Marian K Woodab, How to Communicate under Pressure

CBCS UG SYLLABUS SEM 4-SEC 2

Skill Enhancement Course Credits: 2

Marks: 50

2. Translation and Principles of Translation

This paper seeks to make students aware of a fundamental process of human communication which involves movement between languages. Known by the familiar term of translation, this process of transfer of meaning and values across language borders is as inevitable as it is problematic and challenging. The paper would acquaint students with the ‘what’, ‘why’ and ‘how’ of translation, approaches and problems of translation, and it would also sensitize them to the various ways of reading a translation.

Unit 1

What is Translation? Carrying across of meaning from source language to target language

Why Translation? Translation as a bridge, self –other interaction

Unit 2

Approaches to translation

- Domestication: Readability in the target language
- Foreignisation: Faithfulness to the source language text

Unit 3

How to Translate:

- sense translation based on difference (metaphrase), word-to-word translation based on

equivalence (paraphrase), regulated transformation (imitation)

- adaptation

Unit 4

Problems of translation

- Cultural gap
- Untranslatability
- Translation as appropriation of indigenous languages by English

Unit 5

How to read a translation:

Cultural difference and how to locate it, presence of the foreign in terms of cultural contexts and language

Text to be studied: *Rebati*, in *Bride Price and Other Stories* by Fakir Mohan Senapati, Rupa Publications.

Suggested Reading:

Translation Studies by Susan Basnett

“Found in Translation” Hamid Dabashi http://opinionator.blogs.nytimes.com/2013/07/28/found-in-translation/?_r=0

“Cultural Translation” by Harish Trivedi, “Translation and Globalization” by Paul St-Pierre from *Translation: Reflection, Refraction, Transformation*. Ed. Paul St-Pierre, Prafulla C Kar

**SYLLABUS FOR B.A. (HONORS) HISTORY UNDER
CHOICE BASED CREDIT SYSTEM OF UTKAL UNIVERSITY,
BHUBANESWAR**

Semester I

C.C.I: HISTORY OF INDIA- I

Unit-I: Reconstructing Ancient Indian History

- [1] Early Indian notions of History
- [2] Sources of Historical Writings
- [3] Historical Geography (Identification of Ancient historic sites and their importance)

Unit-II: Pre-historic hunter-gatherers

- [1] Paleolithic culture- Upper, Middle and Lower; Tool making habit
- [2] Mesolithic culture-New developments in technology and economy; rock art.

Unit-III: The advent of food production

Neolithic and Chalcolithic cultures:

- [1] Regional and chronological distribution
- [2] Settlements and Food Production

Unit-IV: The Harappan civilization

- [1] Origins; settlement patterns and town planning
- [2] Agrarian base; craft productions and trade
- [3] Social and political organization; religious beliefs and practices
- [4] Causes of Decline

Unit-V: Cultures in transition

- [1] Origin of the Aryans
- [2] Early Vedic Age- Society, Polity, Religion and Philosophy
- [3] Later Vedic Age- Social Stratification (Varna and Gender), Polity, Religion, Literature and Philosophy

Reading List:

- R.S. Sharma, India's Ancient Past, New Delhi, OUP, 2007
R. S. Sharma, Material Culture and Social Formations in Ancient India, 1983.
R.S. Sharma, Looking for the Aryas, Delhi, Orient
Longman Publishers,1995
D. P. Agrawal, The Archaeology of India, 1985
Bridget & F. Raymond Allchin, The Rise of Civilization in India and Pakistan, 1983.
A. L. Basham, The Wonder that Was India, 1971.
D. K. Chakrabarti, The Archaeology of Ancient Indian Cities, 1997,
Paperback.
D. K. Chakrabarti, The Oxford Companion to Indian Archaeology, New Delhi, 2006.
H. C. Raychaudhuri, Political History of Ancient India, Rev. ed. With Commentary by
B. N. Mukherjee, 1996
K. A. N. Sastri, ed., History of South India, OUP, 1966.
Upinder Singh, A History of Ancient and Early Medieval India, 2008.
Romila Thapar, Early India from the Beginnings to 1300, London,
2002.
Irfan Habib, A People's History-Vol.1, PreHistory, 2001,
----Vol.-2, Indus Civilization: Including Other Copper Age Cultures and

the History of Language Change till 155 B.C., 2002
 Uma Chakravarti, The Social Dimensions of Early Buddhism. 1997.
 Rajan Gurukkal, Social Formations of Early South India, 2010.
 R. Champakalakshmi, Trade, Ideology and urbanization: South India 300 BC- AD 1300, 1996.
 Gregory L. Possehl, A Indus Civilization: The Contemporary Perspectives, New Delhi, Vistaar publications, 2002.

C.C.II: SOCIAL FORMATIONS AND CULTURAL PATTERNS OF THE ANCIENT WORLD

Unit-I: Evolution of humankind; Paleolithic and Mesolithic-cultures.

Unit-II: Neolithic Culture: Food production; beginnings of agriculture and animal husbandry

Unit-III: Bronze Age Civilizations: with reference to *any one* of the following: i) Egypt (Old

Kingdom); ii) Mesopotamia (Sumeria & Babylonia); iii) China (Shang); iv) Eastern Mediterranean (Minoan); economy, social stratification, state structure, religion.

Unit-IV: Nomadic groups in Central and West Asia; Advent of iron and its implications

Unit-V: Ancient Greece:

Agrarian economy, urbanization, trade and politics in Ancient Greece: Athens and Sparta; Greek Culture.

Reading List:

Burns and Ralph. World Civilizations.
 Cambridge History of Africa, Vol. I.
 I. Gordon Childe, What Happened in History.
 G. Clark, World Prehistory: A New Perspective.
 B. Fagan, People of the Earth.
 Amar Farooqui, Early Social Formations.
 M. I. Finley, The Ancient Economy.
 Jacquetta Hawkes, First Civilizations.
 G. Roux, Ancient Iraq.
 Bai Shaoyi, An Outline History of China.
 H. W. F. Saggs, The Greatness that was Babylon.
 B. Trigger, Ancient Egypt: A Social History.
 UNESCO Series: History of Mankind, Vols. I - III./ or New ed.
 History of Humanity.
 R. J. Wenke, Patterns in Prehistory.
 G. E. M. Ste Croix, Class Struggles in the Ancient Greek World.
 J. D. Bernal, Science in History, Vol. I.
 V. Gordon Childe, Social Evolution.
 Glyn Daniel, First Civilizations.
 A. Hauser, A Social History of Art, Vol. I.

A.E.C.C-I: Environmental Science

(to be prepared by University)

GE-I: For non-History students, Minor-1

Semester II

C.C.III: HISTORY OF INDIA-II

Unit-I: Economy and Society (circa 300 BCE to circa CE 300):

- [1] Expansion of agrarian economy
- [2] Urban growth; craft production: trade and trade routes
- [3] Social stratification: class, Varna, jati, untouchability; gender; marriage and property relations

Unit-II: Changing political formations (circa 300 BCE to circa CE 300):

- [1] The Mauryan Empire: Chandragupta Maurya and Asoka-Conquest and Administration;
- [2] Post-Mauryan Polities with special reference to the Kushanas and the Satavahanas- Kaniska I and Gautamiputra Satakarni

Unit-III: Towards early medieval India [circa CE fourth century to CE 750]:

- [1] Gupta Age: Agrarian expansion, land grants, graded Land rights and peasantry
- [2] The problem of urban decline: patterns of trade, currency, and urban Settlements.
- [3] Varna, proliferation of *jatis*: changing norms of marriage and property.
- [4] The nature of polities: the Gupta empire and its contemporaries: post- Gupta polities – Pallavas, Chalukyas

Unit-IV: Religion, philosophy and society (circa 300 BCE- CE 750):

- (1) Consolidation of the brahmanical tradition: dharma, *Varnashram*, *Purusharthas*, *Samskaras*.
- (2) Theistic cults (from circa second century BC): Mahayana; the Puranic tradition.
- (3) The beginnings of Tantricism

Unit-V: Cultural developments (circa 300 BCE- CE 750):

- [1] A brief survey of Sanskrit, Pali, Prakrit and Tamil literature. Scientific and technical treatises
- [2] Art and architecture; Mauryan, post-Mauryan, Gupta, post-Gupta

Reading List:

- B. D. Chattopadhyaya, *The Making of Early Medieval India*, 1994.
- D. P. Chattopadhyaya, *History of Science and Technology in Ancient India*, 1986.
- D. D. Kosambi, *An Introduction to the Study of Indian History*, 1975.
- S. K. Maity, *Economic Life in Northern India in the Gupta Period*, 1970.
- B. P. Sahu (ed), *Land System and Rural Society in Early India*, 1997.
- K. A. N. Sastri, *A History of South India*.
- R. S. Sharma, *Indian Feudalism*, 1980.
- R.S.Sharma, *Urban Decay in India, c.300-1000*, Delhi, Munshiram Manohar Lal, 1987
- Romila Thapar, *Asoka and the Decline of the Mauryas*, 1997.

Susan Huntington, *The Art of Ancient India: Buddhist, Hindu, and Jain*, New York, 1985.
N. N. Bhattacharya, *Ancient Indian Rituals and Their Social Contents*, 2nd ed., 1996.
J. C. Harle, *The Art and Architecture of the Indian Subcontinent*, 1987.
P. L. Gupta, *Coins*, 4th ed., 1996.
Kesavan Veluthat, *The Early Medieval in South India*, New Delhi, 2009
H. P. Ray *Winds of Change*, 1994.
Romila Thapar, *Early India: From the Origins to 1300*, 2002.

C.C. IV: SOCIAL FORMATIONS AND CULTURAL PATTERNS OF THE MEDIEVAL WORLD

Unit-I: Roman Republic: Polity and Empire in ancient Rome: Agrarian economy, urbanization, trade.

Unit-II: Religion and culture in ancient Rome; Crises of the Roman Empire- Rise and fall

of Julius Caesar

Unit-III: Economic developments in Europe from 7th to 14th centuries:

[1] Organization of production, towns and trade,

[2] Technological developments.

[3] Feudalism- Origin, growth and decline

Unit-IV: Religion and culture in medieval Europe: Medieval Church, Monastic Communities, and Papacy

Unit-V: Societies in Central Islamic Lands:

[1] The tribal background, *ummah*, Caliphate state; rise of Sultanates

[2] Religious developments: the origins of shariah, Sufism

[3] Urbanization and trade

Reading List:

Perry Anderson, *Passages from Antiquity to Feudalism*.

Marc Bloch, *Feudal Society*, 2 Vols.

Cambridge History of Islam, 2 Vols.

Georges Duby, *The Early Growth of the European Economy*.

Fontana, *Economic History of Europe*, Vol. I (relevant chapters).

P. K. Hitti, *History of the Arabs*.

P. Garnsey and Saller, *The Roman Empire*.

SUGGESTED READINGS

S. Ameer Ali, *The Spirit of Islam*.

J. Barrowclough, *The Medieval Papacy*.

Encyclopedia of Islam, 1st ed., 4 vols.

M. G. S. Hodgson, *The Venture of Islam*.

GE-II- (For non-History Students, Minor-2)

Semester III

C.C.V: HISTORY OF INDIA-III (c. 750 -1206)

Unit –I: Studying Early Medieval India:

[1] Historical geography

[2] Sources: texts, epigraphic and numismatic Data,

[3] Indian feudalism

[4] Rise of the Rajputs and the nature of the state

Unit-II: Political Structures:

[1] Evolution of political structures: Rashtrakutas, Palas, Pratiharas, and Cholas

[2] Legitimization of kingship; *Brahmanas* and temples; royal genealogies and rituals

[3] Arab conquest of Sindh: causes and impact

[4] Causes and consequences of early Turkish invasions: Mahmud of Ghazni; Shahab-ud-Din of Ghur

Unit-III: Agrarian Structure and Social Change:

[1] Agricultural expansion; crops

[2] Landlords and peasants

[3] Proliferation of castes; status of Untouchables

[4] Tribes as peasants and their place in the Varna Order

Unit-IV: Trade and Commerce:

[1] Inter-regional trade

[2] Maritime trade and forms of exchange [3] Process of urbanization

[4] Merchant guilds of South India

Unit-V: Religious and Cultural Developments:

[1] Bhakti, Tantrism, Puranic traditions; Condition of Buddhism and Jainism

[2] Islamic intellectual traditions: Al-Biruni; Al-Hujwiri

[3] Regional languages and literature

[4] Art and architecture: Evolution of regional styles: Kalingan and Dravidian style of Temple Architecture.

Reading List:

R.S. Sharma, Indian Feudalism (circa 300 - 1200). B.D. Chattopadhyaya, The Making of Early Medieval India. R.S. Sharma and K.M. Shrivastava, eds, Comprehensive History of India, Vol. IV (A & B).

Mohammad Habib and K.A. Nizami, eds, Comprehensive History of India, Vol. V, The Delhi Sultanate Hermann Kulke, ed., The State in India (AD 1000 - AD 1700).

Dissanayake, W. and K. M. Gokul Singh, Indian Popular Cinema, Trentham Book, London, 2004 John Storey, Cultural Theory and Popular Culture, London, 2001 Oberoi, Patricia, Freedom and Destiny: Gender, Family and Popular Culture in India, Delhi, 2009 Christopher Princy, Camera Indica: The Social Life of Indian Photographs, Chicago, 1998

Pankaj Rag, Dhuno ke Yatri, Rajkamal, New Delhi, 2006 (Hindi) Ramanujan, A.K. Folktales from India A Selection of Oral Tales from Twenty-two Languages (Only Introduction). Ramaswamy, V. 'Women and the 'Domestic' in Tamil Folk Songs' in Kumkum Sangari and Uma Chakravarti, eds., From Myths to Markets: Essays on Gender, Shimla, 1999

Singh, Lata (ed.), Theatre in Colonial India: Playhouse of Power, New Delhi, 2009

N. Karashima, South Indian History and Society (Studies from Inscriptions, AD 850 - 1800

Derryl N. Maclean, Religion and Society in Arab Sindh. Irfan Habib, Medieval India: The Study of a Civilization. Richard Davis Lives of Indian Images.

Romila Thapar, Somanatha: The Many Voices of a History. John S. Deyell, Living

Without Silver: The Monetary History of Early Medieval North India.
 Vijaya Ramaswamy, Walking Naked: Women, Society, and Spirituality in South India.
 Burton Stein, Peasant State and Society in Medieval South India.
 R. Champakalakshmi, Trade, Ideology and Urbanization: South India, 300 BC to 1300 AD.
 Al. Beruni's India, NBT edition. Ali Hujwiri, Kashful Mahjoob, tr. R. Nicholson.
 S C Mishra, Rise of Muslim Communities in Gujarat. J. Schwartzberg, Historical Atlas of South Asia.

C.C.VI: RISE OF THE MODERN WEST – I

Unit-I: Transition from feudalism to capitalism:

1. The problems of Transition: Economic Expansion, Industrial production, trade and commerce
2. Urban Development, Town life

Unit-II: Early colonial expansion:

1. Motives, voyages and explorations
2. The conquests of the Americas: Beginning of the era of colonization
3. Mining and plantation, The African slaves

Unit-III: Renaissance:

1. Its social roots, city-states of Italy
2. Spread of humanism in Europe
3. The Art of Renaissance- Architecture, Sculpture, Painting and Literature

Unit-IV: The Reformation

1. Origins, course and results
2. Spread of Reformation movements.
3. Emergence of European State system: Spain, France, England, Russia

Unit-V: Economic developments of the sixteenth century:

1. Shift of economic balance from the Mediterranean to the Atlantic.
2. Commercial Revolution- Causes and Nature
3. Growth of Industries and its impact

Reading List:

B. H. Slicher von Bath, The Agrarian History of Western Europe. AD.500 - 1850.
 Charles A. Nauert, Humanism and the Culture of the Renaissance (1996).
 D. H. Pennington, Seventeenth Century Europe.
 F. Rice, The Foundations of Early Modern Europe
 G. R. Elton, Reformation Europe, 1517 - 1559.
 Harry Miskimin, The Economy of Later Renaissance Europe: 1460 - 1600.
 J. Lynch, Spain under the Hapsburgs.
 James B. Collins, The State in Early Modern France, New Approaches to European History.
 L. W. Owie, Seventeenth Century Europe.
 M. P. Gilmore, The World of Humanism. 1453 - 1517.
 M. S. Anderson, Europe in the Eighteenth Century.
 Perry Anderson, The Lineages of the Absolutist State.
 Peter Kriedte, Peasants, Landlords and Merchant Capitalists. Peter Mathias, First Industrial Revolution.
 Stuart Andrews, Eighteenth Century Europe.
 The Cambridge Economic History of Europe. Vol. I - VI.
 The New Cambridge Modern History of Europe, Vols. I - VII.

C.C. VII: HISTORY OF INDIA IV (c.1206 - 1526)

Unit-I: Interpreting the Sources of Delhi Sultanate:

Survey of Sources: (a) Persian *Tarikh* Tradition, (b) Vernacular Histories; (c) Epigraphy

Unit-II: Sultanate Political Structures:

1. Consolidation of the Sultanate of Delhi: Balban, the Khaljis and the Tughluqs.
2. Theories of kingship: The ruling elites, Sufis, Ulema and the imperial monuments

Unit-III: Emergence of Regional Identities

1. Bahamanis, Vijayanagar, Gujarat and Odisha.
2. Regional Art, Architecture and Literature.

Unit-IV: Society and Economy:

1. Iqta and the Revenue-free Grants.
2. Agricultural production, Technology.
3. Market Regulations, Growth of Urban Centers.
4. Trade and Commerce, Indian Ocean (Maritime) Trade.

Unit-V: Religion, Society and Culture:

1. Sufi silsilas: Chishtis and Suhrawardis; doctrines and practices, Social roles
2. Bhakti movement and monotheistic traditions: Kabir, Nanak and Sri Chaitanya.
3. Social Impact of the Bhakti tradition: Rise of Liberal Thought, Ideology of Equality and Gender Relations

Reading List:

- K.A. Nizami, Religion and Politics in the Thirteenth Century.
S.A.A. Rizvi, A History of Sufism in India, Vol. I.
Satish Chandra, Medieval India, vol.I, Har Anand Publications, New Delhi.
Tapan Raychaudhuri and Irfan Habib, eds, Cambridge Economic History of India, Vol. I.
W.H. McLeod, Karine Schomer, et al, Eds, The Sants.
Burton Stein, New Cambridge History of India: Vijayanagara.
Pushpa Prasad, Sanskrit Inscriptions of the Delhi Sultanate.
Richard M. Eaton, ed., India's Islamic Traditions.
Sheldon Pollock, Languages of the Gods in the World of Men.
Vijaya Ramaswamy, Walking Naked: Women, Society, and Spirituality in South India.
K.C. Panigrahi, History of Orissa, Cuttack, Kitab Mahal, 2008

SEC.I: Understanding Heritage

This course will enable students to understand the different facets of heritage and their significance. It highlights the legal and institutional frameworks for heritage protection in India as also the challenges facing it. The implications of the rapidly changing interface between heritage and history will also be examined. The course will be strongly project-based and will require visits to sites and monuments. At least two Projects will be based on visits to Museums/Heritage Sites.

Unit-I: Defining Heritage

- [1] Meaning of 'antiquity'
- [2] Archaeological sites
- [3] Tangible heritage
- [4] Intangible heritage and art treasures

Unit-II: Evolution of Heritage -Legislation and the Institutional Framework:

[1] Conventions and Acts— national and international Heritage

[2] Heritage related government departments

[3] Museums, Regulatory Bodies

[4] Conservation Initiatives

Unit-III: Challenges facing Tangible and Intangible Heritage

[1] Development of Heritage Sites

[2] Antiquity smuggling.

[3] Conflicts (to be examined through specific case studies)

Unit-IV: Heritage and Travel:

[1] Viewing Heritage Sites

[2] The relationship between cultural heritage, landscape and travel, and recent trends

[3] Management of heritage sites

Unit-V: World Heritage Monuments:

[1] Tajmahal

[2] Red Fort

[3] Golden temple at Amritsar

[4] Sun temple at Konark

Reading List

David Lowenthal, *Possessed By The Past: The Heritage Crusade and The Spoils of History*, Cambridge, 2010

Layton, R. P. Stone and J. Thomas. *Destruction and Conservation of Cultural Property*. London: Rutledge, 2001

Lahiri, N. *Marshaling the Past - Ancient India and its Modern Histories*. Ranikhet: Permanent Black. 2012, Chapters 4 and 5.

S.S. Biswas, *Protecting the Cultural Heritage (National Legislations and International Conventions)*. New Delhi: INTACH, 1999.

Acts, Charters and Conventions are available on the UNESCO and ASI websites (www.unesco.org; www.asi.nic.in)

Agrawal, O.P., *Essentials of Conservation and Museology*, Delhi, 2006_ Chainani, S. 2007. *Heritage and Environment*. Mumbai: Urban Design Research Institute, 2007

GE-III- (For non-History Students, Minor-1)

Semester IV

C.C.VIII: RISE OF THE MODERN WEST – II

Unit- I: 17th century European crisis: economic, social and political dimensions

Unit-II: The English Revolution and European politics in the 18th century:

(1) Major issues-political and intellectual Currents

(2) Parliamentary monarchy

(3) Patterns of Absolutism in Europe

Unit-III: Rise of modern science

(1) Development of Science from Renaissance to the 17th century

(2) Impact of Modern science on European society

Unit-IV: Mercantilism, European economics and Preludes to the Industrial Revolution

(1) Origin and spread of Mercantilism

(2) Impact of Mercantilism on European economy

(3) Agricultural and Scientific Background to the Industrial Revolution

Unit-V: The American Revolution, 1776

- (1) Political currents
- (2) Socio-Economic Issues
- (3) Significance of the American Revolution

Reading List:

- T.S. Aston and C.H.E. Philpin (eds.), *The Brenner Debate*.
- H. Butterfield, *The Origins of Modern Science*.
- Carlo M. Cipolla, *Fontana Economic History of Europe, Vols. II and III*. Carlo M. Cipolla, *Before the Industrial Revolution, European Society and Economy, 1000 -1700*. 3rd ed. (1993)
- . D.C. Coleman (ed.), *Revisions in Mercantilism*.
- Ralph Davis, *The Rise of the Atlantic Economics*.
- Maurice Dobb, *Studies in the Development of Capitalism*.
- J.R. Hale, *Renaissance Europe*.
- R. Hall, *From Galileo to Newton*.
- Christopher Hill, *A Century of Revolutions*.
- Rodney Hilton, *Transition from Feudalism to Capitalism*.
- Stephen J. Lee, *Aspects of European History, 1494 - 1789*.
- G. Parker, *Europe in Crisis, 1598 - 1648*.
- G. Parker and L.M. Smith, *General Crisis of the Seventeenth Century*.
- J.H. Parry, *The Age of Reconnaissance*.
- Meenaxi Phukan, *Rise of the Modern West: Social and Economic History of Early Modern Europe*.
- V. Poliensky, *War and Society in Europe. 1618 -48*. Theodore K. Rabb, *The Struggle for Stability in Early Modern Europe*.
- V. Scammell, *The First Imperial Age: European Overseas Expansion, 1400-1715*.
- Jan de Vries, *Economy of Europe in an Age of Crisis 1600- 1750*.
- B. V. Rao, *World History, New Delhi: Sterling Publishers*
- M. S. Anderson, *Europe in the Eighteenth Century*.
- Perry Anderson, *The Lineages of the Absolutist State*
- Stuart Andrews, *Eighteenth Century Europe*.
- B. H. Slicher von Bath, *The Agrarian History of Western Europe. AD. 500 - 1850*.
- The Cambridge Economic History of Europe. Vol. I - VI*.
- James B. Collins, *The State in Early Modern France, New Approaches to European History*.
- G. R. Elton, *Reformation Europe, 1517-1559*.
- M. P. Gilmore, *The World of Humanism. 1453 -1517*. Peter Kriedte, *Peasants, Landlords and Merchant Capitalists*.
- J. Lynch, *Spain under the Hapsburgs*.
- Peter Mathias, *First Industrial revolution*.
- Harry Miskimin, *The Economy of Later Renaissance Europe: 1460 - 1600*.
- Charles A. Nauert, *Humanism and the Culture of the Renaissance (1996)*.

The New Cambridge Modern History of Europe, Vols. I - VII.

L. W. Owie, Seventeenth Century Europe.

D. H. Pennington, Seventeenth Century Europe.

F. Rice, The Foundations of Early Modern Europe

C.C. IX: HISTORY OF INDIA V (c. 1526 - 1750)

Unit-I: Sources and Historiography:

- (1) Persian literary culture, translations; (2) Vernacular literary Traditions; (3) Memoirs and Travelogues

Unit-II: Establishment of Mughal rule:

- (1) India on the eve of advent of the Mughals
- (2) Fire arms, military technology and warfare
- (3) Sher Shah: Administrative and Revenue reforms

Unit-III: Consolidation of Mughal rule:

- (1) Incorporation of Rajputs and other indigenous groups in Mughal Nobility
- (2) Evolution of administrative institutions: *zabti*, *mansab*, *jagir*, *madad-i-maash*
- (3) Beginning of the crisis: Agrarian and Jagir crises; Revolts
- (4) Emergence of the Marathas; Shivaji; expansion under the Peshwas

Unit-IV: Society and Economy:

- (1) Land rights and revenue system: Zamindars and peasants
- (2) Trade routes and patterns of internal commerce; overseas trade
- (3) Urban Centres, Craft and Technology

Unit-V: Cultural ideals:

- (1) Religious tolerance and *sulh-i-kul*; Sufi mystical and intellectual interventions
- (2) Mughal Art and Architecture
- (3) Mughal and Rajput Paintings: Themes and Perspectives

Reading List:

M. Athar Ali, The Mughal Nobility under Aurangzeb.

Muzaffar Alam and Sanjay Subramanian, eds, The Mughal State, 1526 - 1750.

J.F. Richards, The Mughal Empire.

Satish Chandra, Essays on Medieval Indian History.-----, Medieval India, vol.2, Har Anand Publications, New Delhi

Irfan Habib, Agrarian System of Mughal India, 1526-1707. S.A.A. Rizvi, Muslim Revivalist Movements in Northern India.

S. Arsatnam, Maritime India in the Seventeenth Century. Satish Chandra, Parties and Politics at the Mughal Court.

Andre Wink, Land and Sovereignty in India. Harbans Mukhia, The Mughals of India.

Iqbal Husain, Ruhela Cheiftancies in 18th Century India.

C.C. X: HISTORICAL THEORIES & METHODS

Unit-I: Meaning and Scope of History

1. Definition, Nature and Scope of History.
2. Object and Value of History.
3. History, Science and Morality.

Unit-II: Traditions of Historical Writing

1. Ancient Greek Traditions – Herodotus, Thucydides
2. Ancient Roman Traditions - Polybius, Tacitus
3. Medieval Understanding: Western – St. Augustine, Arabic – Ibn Khaldun.

Unit-III: History as Interdisciplinary Practice

1. History and Archaeology, History and Anthropology.
2. History and Psychology, History and Literature.
3. History and Political Science

Unit-IV: Modern Theories

1. Scientific History: Ranke, Croce, Comte
2. Karl Marx, RG Collingwood, Toynbee
3. Total History: Marc Bloch, Lucien Febver, Fernand Braudel

Unit-V: Historical Methods

1. Sources of History: Written, Oral. Visual & Archaeological.
2. Historical facts.
3. Historical Causation.
4. Historical Objectivity

Reading List:

Arthur Marwick, *New Nature of History: Knowledge Evidence, Language* (Chapter V: The Historian at work: Forget 'facts' Foreground Sources), Lyceum Books Incorporated, 2001.

-----, *The Nature of History* (Chapter IV: History, Science and Social Science), London: Macmillan, 1989.

B. Sheik Ali, *History: Its Theory and Method*, Macmillan, Reprinted, 1996.

E. H. Carr, *What is History?*, Penguin Books, Reprinted, 1983.

E. Sreedharan, *A Text Book of Historiography*, Orient Longman, Reprinted, 2004.

Irfan Habib, *Interpreting Indian History*, Northeastern Hill University Publications, Shillong, 1988.

Marc Bloch, *The Historian's Craft*, Vintage Book, New York, 1953.(Introduction and Chapter-I: History Men and Time)

Maurice Aymard and Harbans Mukhia (eds), *French Studies in History*, Vols- I & II, Orient Longman, 1989.

Romila Thapar, *Past and Prejudice*, NBT, New Delhi, 1975.

S. K. Bajaj, *History: It's Philosophy, Theory & Methodology*, Patiala, 1987.

SEC.II: Understanding Popular Culture

The paper examines some popular cultures expressed in different mediums like visual, oral and cultural. In the process of their evolution, these cultures eclectically draw from traditions, articulate anxieties, and even give rise to new traditions. The paper endeavours to equip students with understanding such phenomena historically, with special reference to India. It is imperative that the Students use electronic devices to view, record, and document the subject matter.

Unit-I: Introduction of Popular Culture

[1] Meaning and Definition of popular culture

[2] Understanding it historically

Unit-II: Visual expressions:

[1] Folk art,

[2] Calendar art

[3] Photography

Unit-III: Performance:

[1] Theatres

[2] Music

[3] Folk tales/songs/Suang, Yatra and Nautanki: Identifying themes, functionality

Unit-IV: The audio-visual: cinema and television:

[1] Indian cinema: Mapping the influence of the national struggle for independence (1930s and 40s)

[2] Idealized nationalism (1950s), disillusionment and the anti-establishment mood (1970s and 80s)

[3] Documentary films, Expressions of popular culture in television; the impact of the Internet and audio-visual media

Unit-V: Fairs, Festivals and Rituals:

[1] Disentangling mythological stories

[2] Patronage

[3] Regional variations

[4] Impact on Society

Reading List:

Dissanayake, W. and K. M. Gokul Singh, Indian Popular Cinema, Trentham Book, London, 2004

John Storey, Cultural Theory and Popular Culture, London, 2001.

Oberoi, Patricia, Freedom and Destiny: Gender, Family and Popular Culture in India, Delhi, 2009

Christopher Princy, Camera Indica: The Social Life of Indian Photographs, Chicago, 1998

Pankaj Rag, Dhuno ke Yatri, Rajkamal, New Delhi, 2006(Hindi)

Ramanujan, A.K. Folktales from India A Selection of Oral Tales from Twenty-two Languages (Only Introduction).

Ramaswamy, V. 'Women and the 'Domestic' in Tamil Folk Songs' in

KumkumSangari and Uma Chakravarti, eds., From Myths to Markets: Essays on Gender, Shimla, 1999
Singh, Lata (ed.), Theatre in Colonial India: Playhouse of Power, New Delhi, 2009

G.E. IV:(For non-History students, Minor-2)

Semester V

C.C.XI: History of Modern Europe- I (c. 1780-1939)

Unit-I: The French Revolution:

- [1] Crisis of Ancient Regime
- [2] Intellectual currents.
- [3] Social classes and emerging gender relations.

Unit-II: Revolution and its European repercussions:

- [1] Phases of the French Revolution 1789 - 99.
- [2] Art and Culture of French Revolution.
- [3] Napoleonic consolidation - reform and empire.

Unit-III: Restoration and Revolution: c. 1815 - 1848:

- [1] Forces of conservatism & restoration of old hierarchies.
- [2] Social, Political and intellectual currents.
- [3] Revolutionary and Radical movements, 1830 - 1848.

Unit-IV: Capitalist Industrialization and Socio-Economic Transformation (Late 18th century to AD 1914)

- [1] Process of capitalist development in industry and agriculture: case Studies of Britain, France, the German States and Russia.
- [2] Evolution and Differentiation of social classes: Bourgeoisie, Proletariat, land owning classes and peasantry.
- [3] Changing trends in demography and urban patterns.
- [4] Family, gender and process of industrialization.

Unit-V: Varieties of Nationalism and the Remaking of States in the 19th and 20th Centuries.

- [1] Intellectual currents, popular movements and the formation of National identities in Germany, Italy
- [2] Specificities of economic development, political and administrative Reorganization - Italy, Germany

Reading List:

C.M. Cipolla: Fontana Economic History of Europe, Volume III: The Industrial Revolution.

Norman Davies, Europe.

J. Evans: The Foundations of a Modern State in 19th Century Europe.

T.S. Hamerow: Restoration, Revolution and Reaction: Economics and Politics in

Germany [1815 - 1871]. E.J. Hobsbawm: The Age of Revolution.

Lynn Hunt: Politics, Culture and Class in the French Revolution.

James Joll, Europe Since 1870. George Lefebvre, Coming of the French Revolution.

George Lichtheim : A Short History of Socialism. Alec Nove: An Economic History of the

USSR.

Andrew Porter, European Imperialism, 18760-1914 (1994). Anthony Wood, History of Europe, 1815 û 1960 (1983).

Stuart Woolf: History of Italy, 1700-1860. G. Barrowclough, An Introduction to Contemporary History.

Fernand Braudel, History and the Social Science in M. Aymard and H. Mukhia Ed. French Studies in History, Vol. I (1989).

Maurice Dobb: Soviet Economic Development Since 1917. M. Perrot and G. Duby [eds.]: A History of Women in the West, Volumes 4 and 5.

H.J. Hanham; Nineteenth Century Constitution, 1815 - 1914. E.J. Hobsbawm, Nations and Nationalism.

Charles and Barbara Jelavich: Establishment of the Balkan National States, 1840 û 1920. James Joll, Origins of the First World War (1989).

Jaon B. Landes: Women and the Public Sphere in the Age of the French Revolution. Colin Lucas: The French Revolution and the Making of Modern Political Culture, Volume Nicholas Mansergh: The Irish Question, 1840 û 1921.

K.O. Morgan: Oxford Illustrated History of Britain, Volume 3 [1789 -1983].

R.P. Morgan: German Social Democracy and the First International.

N.V. Riasanovsky: A History of Russia.

J.M. Robert, Europe 1880 û 1985. J.J. Roth (ed.), World War I : A Turning Point in Modern History.

Albert Soboul: History of the French Revolution (in two volumes).

Lawrence Stone, History and the Social Sciences in the Twentieth Century The Past and the Present (1981).

Dorothy Thompson: Chartists: Popular Politics in the Industrial Revolution.

E.P. Thompson: Making of the English Working Class.

Michel Vovelle, fall of the French Monarchy (1984).

H. Seton Watson: The Russian Empire.

Raymond Williams: Culture and Society.

C.C.XII: HISTORY OF INDIA VII (c. 1750 - 1857)

Unit-I: India in the mid 18th Century; Society, Economy, Polity

Unit-II: Expansion and Consolidation of colonial Power:

[1] Foreign trade and early forms of exactions from Bengal.

[2] Dynamics of expansion, with special reference to Bengal, Mysore, Awadh, Punjab

Unit-III: Colonial State and Ideology:

[1] Arms of the colonial state: army, police, law

[2] Ideologies of the Raj and racial attitudes

[3] Education: indigenous and modern

Unit-IV: Economy and Society:

[1] Land revenue systems- Permanent, Ryotwari and Mahalwari

[2] Commercialization of Agriculture- Consequences

[3] Drain of Wealth-causes and consequences

[4] Growth of modern industry

Unit-V: Popular Resistance: Causes and Consequences

[1] Santhal uprising (1856-57), Indigo rebellion (1860)

[2] Pabna agrarian Leagues (1873), Deccan riots (1875)

[3] Movement of 1857-causes and consequences

Reading List:

- C. A. Bayly, Indian Society and the Making of the British Empire, New Cambridge History of India.
- Bipan Chandra, Rise and Growth of Economic Nationalism in India.
- Suhash Chakravarty, The Raj Syndrome: A Study in Imperial Perceptions, 1989.
- J.S. Grewal, The Sikhs of the Punjab, New Cambridge History of India Ranajit Guha, ed., A Subaltern Studies Reader.
- Dharma Kumar and Tapan Raychaudhuri, eds., The Cambridge Economic History of India, Vol. II.
- P.J. Marshall, Bengal: The British Bridgehead, New Cambridge History of India.
- R.C. Majumdar, ed., History and Culture of Indian People, Vols. IX and X. British Paramountcy and Indian Renaissance.
- David Arnold and Ramchandra Guha, eds, Nature, Culture and Imperialism.
- Amiya Bagchi, Private Investment in India.
- Bipan Chandra, K.N. Panikkar, Mridula Mukherjee, Sucheta Mahajan and Aditya Mukherjee, India's Struggles for Independence.
- A.R. Desai, Peasant Struggles in India.
- R.P. Dutt, India today.
- M.J. Fisher, ed., Politics of Annexation (Oxford in India Readings).
- Ranjit Guha, Elementary Aspects of Peasant Insurgency in Colonial India (1983).
- P.C. Joshi, Rebellion 1857: A Symposium.
- J.Krishnamurti, Women in Colonial India.
- Dadabhai Naroji, Poverty and Un-British Rule in India.
- Rajat K. Ray, ed., Entrepreneurship and Industry in India, 1800-1947, Oxford In India Readings.
- Eric Stokes, English Utilitarians and India Thomas
- R. Metcalf, The Ideologies of the Raj

D.S.E-I: HISTORY OF THE UNITED STATES OF AMERICA (c.1776-1945)

Unit-I: The Background:

- [1] The land and indigenous people: settlement and colonization by Europeans
- [2] Early colonial society and politics; indentured labour-White and Black

Unit-II: Making of the Republic:

- [1] Revolution, Sources of conflict: Revolutionary groups, Ideology:
- [2] The American War of Independence- Causes and consequences
- [3] Processes and Features of Constitution making

Unit-III: Evolution of American Democracy:

- [1] Federalists: Jeffersonianism: Jacksonianism, Rise of political parties-1840-1960; Judiciary-role of the Supreme Court
- [2] Limits of democracy: Blacks and women.

Unit-IV: Early Capitalism:

- [1] Beginnings of Industrialization.
- [2] Immigrants and changing composition of Labour; Early Labour Movements.

Unit-V: The Agrarian South and Civil War:

- [1] Plantation economy.
- [2] Slave Society and Culture: Slave resistance.
- [3] Rise of Republicanism, Emancipation and Lincoln

Reading List:

- Bernard Bailyn, The Great Republic.
Bernard Bailyn, The Ideological Origins of the American Revolution.
Charles Beard, An Economic Interpretation of the American Constitution.
Peter Carroll and David Noble, Free and Un-free: A New History of the United States.
David B. Davis, The Problem of Slavery in the Age of Revolution.
U. Faulkner, American Economic History.
Eric Foner, America's Black Past.
John Hope Franklin, From Slavery to Freedom.
Gerald N. Grobb and George A. Billias, Interpretations of American History: Patterns and Perspectives, 2 Vols.
David M. Potter, The Impending Crisis.
J. G. Randall and David Donald, The Civil War and Reconstruction.
Kenneth Stampp, The Peculiar Institution, Slavery in the Antebellum South.
Federick Jackson Turner, The Frontier in American History.
Lee Benson, The Concept of Jackson Democracy.
Ray A. Billington, Westward Expansion.
Paul Boyer, Harvard Sitkoff, Nancy Woloch, The Enduring Vision: A History of the American People, Vols. Land 2.
Thomas Cochran, The Inner Revolution.
A. O. Craven, The Growth of Southern Nationalism, 1848 - 1861.
Carl N. Degler, At Odds: Women and Family in America from the Revolution to the Present.
Lewis L. Gould (ed.), The Progressive Era.
John D. Hicks, The Federal Union: A History of USA Since 1865.
R.P. Kaushik, Significant Themes in American History.
Irving Kristol, Gordon Wood and others, America's Continuing Revolution.
Richard W. Leopold, The Growth of American Foreign Policy.
Perry Miller, From Colony to Province.

Gary Nash (ed.), Retracing the Past.

Henry Pelling, American Labor.

Edward Pessen, Jacksonian Panorama.

Charles Sellers, Henry May and Neil McMillen, A Synopsis of American History; 2 Vols.

Donald Shiham, The Making of American History: The Emergence of the Nation, Vols. II & I.

Dwijendra Tripathi and S.C. Tiwari, Themes and Perspectives in American History.

DSE.II: History and Culture of Odisha

Unit-I: Socio-political life of Early and Medieval Odisha:

[1] Kalinga War (261 B.C.) and its significance

[2] Mahameghavahan Kharavela: His time and achievements

[3] The Bhauma Karas and The Somavamsis

[4] The Gangas and The Suryavamsis

Unit-II: Religion, Art and Literature of Early and Medieval Odisha:

[1] Buddhism, Jainism and Sanatana Dharma in Odisha.

[2] Development of Art and Architecture: Buddhist Art, Temples and Jain Sculptures

[3] Evolution and Growth of Odia Language

[4] Development of Odia Literature-Sarala Mohabharata

[5] Panchasakhas, Sri Chaitanya and Bhakti Movement in Odisha

Unit-III: Political and Economic structure in Medieval Odisha:

[1] Mughal Administration

[2] Maratha Administration

[3] Impact on Odisha's Socio-Economic Condition

Unit-IV: Colonialism in Odisha:

[1] The Early British Administration: Its Socio-economic impact

[2] The Odia Identity Movement

[3] Freedom Struggle in Odisha

Unit-V: Socio-cultural Changes in Modern Odisha:

[1] Development of Modern Education

[2] Social Reform Movements in Odisha

Reading List:

- A. Easchman et al (eds) The Cult of Jagannath and Regional Tradition of Orissa, Manohar, New Delhi, 1978.
- A. K. Mishra, Intellectual Tradition of Orissa: 2006.
- A. K. Mishra, The Raj, Nationalists and Reforms, 2007.
- A.K. Mishra, Indian Culture, Science and Technology (with special emphasis on Odisha), 2011.
- B.K. Mallik; Paradigms of Dissent and Protest: Social Movements in Eastern India (1400-1700 AD Manohar, New Delhi, 2004.
- J. Dora, Sakta Monuments of Orissa, A Study of Art, Architecture and Iconography, New Delhi, 2010.
- K.C. Mishra, The Cult Jagarnath.
- M.N. Das (ed) Sidelights on History and Culture of Orissa, Vidyapuri
- A.C. Pradhan, A Study of History of Orissa, Bhubaneswar, Panchsheel
- K.C. Panigrahi, History of Orissa, Cuttack, Kitab Mahal, First edition, 1981
- Chittaranjan Das, A Glimpse into Oriya Literature, Orissa Sahitya Akademi, Bhubaneswar, 1962
- K.B. Tripathi, The Evolution of Oriya Language and Script, Utkal University, Bhubaneswar
- K.C. Panigrahi, Sarala Dasa, Sahitya Akademi, New Delhi, 1975 Khageswar
- Mahapatra, (ed), Charyagitika

Semester VI

C.C. XIII: HISTORY OF INDIA VIII (c. 1857 - 1950)

Unit-I: Cultural changes and Social and Religious Reform

Movements:

- [1] The advent of printing and its implications
- [2] Reform and Revival: Brahmo Samaj, Arya Samaj, Aligarh Movement
- [3] Emancipation of Women, Sanskritization and Anti-Caste Movements

Unit-II: Nationalism: Trends up to 1919:

- [1] Political ideology and organizations, formation of INC
- [2] Moderates and Extremists.
- [3] Swadeshi Movement
- [4] Revolutionary Movements

Unit-III: Gandhian nationalism after 1919: Ideas and Movements:

- [1] Mahatma Gandhi: Perspectives and Methods

[2] Non- Cooperation, Civil Disobedience, Quit India, and INA

[3] Princely India: States' Peoples' Movement

[4] Nationalism and Social Groups: Peasants, Tribals, Dalits and Women

Unit-IV: Communalism and Partition:

[1] Ideologies and practices, Hindu Mahasabha, Muslim League

[2] Partition and Independence

Unit-V: Emergence of a New State:

[1] Making of the Constitution

[2] Integration of Princely States

[3] Land Reforms and beginnings of Planning

Reading List:

Judith Brown, Gandhi's rise to Power, 1915-22.

Paul Brass, The Politics of India Since Independence, OUP, 1990.

Bipan Chandra, Nationalism and Colonialism in Modern India, 1979.

Bipan Chandra, Rise and Growth of Economic Nationalism in India.

Mohandas K. Gandhi, An Autobiography or The Story of My Experiments with Truth.

Ranjit Guha, ed., A Subaltern Studies Reader.

Peter Hardy, Muslims of British India.

Mushirul Hasan, ed., India's Partition, Oxford in India Readings.

D.A. Low, ed., Congress and the Raj.

John R. McLane, Indian Nationalism and the Early Congress.

Jawaharlal Nehru, An Autobiography.

Gyanendra Pandey, The Construction of Communalism in colonial north India.

Sumit Sarkar, Modern India, 1885-1947. Anil

Seal, Emergence of Indian Nationalism.

Ram Lakhan Shukla (ed.), Adhunik Bharat ka Itihas.

Eleanor Zelliott, From Untouchable to Dalit: Essays on the Ambedkar Movement.

Judith Brown, Gandhi: (et al) A Prisoner of Hope.

Bipan Chandra, Communalism in Modern India, 2nd ed., 1987. Bipan

Chandra, K.N. Panikkar, Mridula Mukherjee, Sucheta Mahajan and Aditya Mukherjee, India's, Struggles for Independence.

A.R. Desai, Social Background of Indian Nationalism.

A.R. Desai, Peasant Struggles in India.

Francine Frankel, India's Political Economy, 1947-77. Ranajit

Guha, and G.C. Spivak, eds. Select Subaltern Studies.

Charles Heimsath, Indian Nationalism and Hindu Social Reform.

F. Hutchins, Illusion of Permanence.

F. Hutchins, Spontaneous Revolution.

V.C. Joshi (ed.), Rammohan Roy and the process of Modernization in India.

J.Krishnamurti, Women in Colonial India

C.C. XIV: HISTORY OF MODERN EUROPE II (c. 1780 -1939)

Unit-I: Liberal Democracy, Working Class Movements and Socialism in the 19th and 20th Centuries:

[1] The struggle for parliamentary democracy and civil liberties in Britain.

[2] Forms of protest during early capitalism: food riots in France and England: Luddites and Chartism.

[3] Early Socialist Thought; Marxian Socialism

Unit-II: The Crisis of Feudalism in Russia and Experiments in Socialism:

[1] Emancipation of serfs.

[2] Revolutions of 1905; the Bolshevik Revolution of 1917.

[3] Programmes of Socialist Construction.

Unit-III: Imperialism, War and Crisis: c. 1880-1939:

[1] Theories and mechanisms of imperialism; Growth of Militarism; Power blocks and alliances: expansion of European empires –First World War(1914 – 1918)

[2] The post 1919 World Order: economic crises, the Great Depression and Recovery.

[3] Fascism and Nazism.

[4] Origins of the Second World War.

Unit-IV: Cultural Transformation since circa 1850:

[1] Changing contexts: [i] Notions of Culture [ii] Creation of a New public sphere and mass media

[2] Creation of new cultural forms: from Romanticism to Abstract Art.

[3] Culture and the making of ideologies: Constructions of Race, Class and Gender, ideologies of Empire.

Unit-V: Intellectual Developments since circa 1850:

Major intellectual trends:

[1] Mass education and extension of literacy.

[2] Institutionalization of disciplines: History, Sociology and Anthropology.

[3] Darwin and Freud.

Reading List:

Gerald Brennan: The Spanish Labyrinth: An Account of the Social and Political Background of the Civil War

C.M. Cipolla: Fontana Economic History of Europe, Volume II the Present (1981). I : The Industrial Revolution.

Norman Davies, Europe.

J. Evans: The Foundations of a Modern State in 19th Century Europe.

T.S. Hamerow: Restoration, Revolution and Reaction: Economics and Politics in Germany [1815 - 1871].

E.J. Hobsbawm : The Age of Revolution. Lynn Hunt: Politics, Culture and Class in the French Revolution.

James Joll, Europe Since 1870. David Landes: Prometheus Unbound. George Lefebvre, Coming of the French Revolution.

George Lichtheim: A Short History of Socialism. Peter Mathias, First Industrial Revolution.

Alec Nove: An Economic History of the USSR. Andrew Porter, European Imperialism, 18760 -1914 (1994).

Anthony Wood, History of Europe, 1815 û 1960 (1983). Stuart Woolf: History of Italy, 1700 û 1860.

G. Barrowclough, An Introduction to Contemporary History.

Fernand Braudel, History and the Social Science in M. Aymard and H. Mukhia eds. French Studies in History, Vol. I (1989).

Maurice Dobb: Soviet Economic Development Since 1917.

M. Perrot and G. Duby [eds.]: A History of Women in the West, Volumes 4 and 5.

H.J. Hanham; Nineteenth Century Constitution, 1815 û 1914.
 E.J. Hobsbawm, Nations and Nationalism.
 Charles and Barbara Jelavich: Establishment of the Balkan National States, 1840 û 1920.
 James Joll, Origins of the First World war (1989).
 Jaon B. Landes: Women and the Public Sphere in the Age of the French Revolution.
 David lowenthal, The Past is a Foreign Country.
 Colin Licas: The French Revolution and the Making of Modern Political Culture, Volume 2.
 Nicholas Mansergh: The Irish Question, 1840 - 1921. K.O. Morgan: Oxford Illustrated History of Britain, Volume 3 [1789 - 1983].
 R.P. Morgan: German Social Democracy and the First International. N.V. Riasanovsky: A History of Russia.
 J.M. Robert, Europe 1880 - 1985.
 J.J. Roth (ed.), World War I: A Turning Point in Modern History. Albert Soboul: History of the French Revolution (in two volumes).

D.S.E. III: HISTORY OF THE UNITED STATES OF AMERICA-II (c.1776- 1945)

Unit-I: Reconstructions: Political changes and Economic transformation:

- [1] Conservative and Radical phases.
- [2] The New South: Participants and Reactions, Carpetbaggers; Scalawags, Blacks, Ku Klux Klan.
- [3] Growth of Capitalism
- [4] Depression.

Unit-II: Resistance and Reform:

- [1] Agrarian crises and populism
- [2] Urban corruption and progressivism
- [3] Labour movements and Unionization.
- [4] New Deal.

Unit-III: U.S. Imperialism:

- [1] Spanish-American War
- [2] Expansion in the Far East and Latin America
- [3] World War I and Fourteen Points
- [4] Americans in World War II: Bombing of Hiroshima and Nagasaki

Unit-IV: Afro-American Movements:

Black Movements: Booker T. Washington, W.E.B. Dubois; NAACP and Marcus Garvey.

Unit-V: Socio-Cultural, Religious and Intellectual Movements:

- [1] Abolitionists, Women's rights movement and Suffrage
- [2] Religious movements: Early Revivalism; Puritans, Quakers, Mormons; Temperance
- [3] Mass culture (circa 1900 - 1945)
- [4] Major literary trends (circa 1900 – 1945)

Reading List:

Bernard Bailyn, The Great Republic.
 Bernard Bailyn, The Ideological Origins of the American Revolution.
 Charles Beard, An Economic Interpretation of the American Constitution.
 Dee Brown, Bury My Heart at Wounded Knee, An Indian History of

the American West.

Peter Carroll and David Noble, *Free and Unfree: A New History of the United States*.

David B. Davis, *The Problem of Slavery in the Age of Revolution*.
32

U. Faulkner, *American Economic History*.

Robert Fogel, *Railroads and American Economic Growth*.

Eric Foner, *America's Black Past*.

John Hope Franklin, *From Slavery to Freedom*.

Gerald N. Grobb and George A. Billias, *Interpretations of American History: Patterns and Perspectives, 2 Vols*.

Richard Hofstadter, *The Age of Reform, From Bryan to FDR* Linda Kerber, *Women's America: Refocusing the Past*.

David M. Potter, *The Impending Crisis*.

W. Pratt, *A History of the United States Foreign Policy*.

James Randail, *The Civil War and Reconstruction*.

J. G. Randall and David Donald, *The Civil War and Reconstruction*.

Kenneth Stampp, *The Peculiar Institution, Slavery in the Antebellum South*.

Federick Jackson Turner, *The Frontier in American History*.

Robert Wiebe, *The Search for Order*.

Lee Benson, *The Concept of Jackson Democracy*.

Ray A. Billington, *Westward Expansion*.

Paul Boyer, Harvard Sitkoff, Nancy Woloch, *The Enduring Vision: A History of the American People, Vols. Land 2*.

Thomas Cochran, *The Inner Revolution*.

A. O. Craven, *The Growth of Southern Nationalism, 1848 - 1861*.

Lance E. Davis (ed.), *American Economic Growth*.

Carl N. Degler, *At Odds: Women and Family in America from the Revolution to the Present*.

Fogel and Engerman? *Time on the Cross-*.

Lewis L. Gould (ed.), *The Progressive Era*.

John D. Hicks, *The Federal Union: A History of USA Since 1865*.

R.P. Kaushik, *Significant Themes in American History*.

David M. Kennedy, Thomas Bailey and Mel Piehl, *The Brief American Pageant*.

Irving Kristol, Gordon Wood and others, *America's Continuing Revolution*.

Richard W. Leopold, *The Growth of American Foreign Policy*.

Perry Miller, *From Colony to Province*.

Gary Nash (ed.), *Retracing the Past*.

Henry Pelling, *American Labor*.

Edward Pessen, *Jacksonian Panorama*.

Charles Sellers, Henry May and Neil McMillen, *A Synopsis of American History; 2 Vols*.

Donald Shiham, *The Making of American History: The Emergence of the Nation, Vols. II & I*.

Dwijendra Tripathi and S.C. Tiwari, *Themes and Perspectives in American History*.

James Weinstein, *The Corporate Ideal in the Liberal state*.

GENERIC ELECTIVE (GE) PAPERS (For non-History students)

(1) HISTORY AND CULTURE OF ODISHA

Unit-I: Socio-political life of Early and Medieval Odisha:

- [1] Kalinga War (261 B.C.) and its significance
- [2] Mahameghavahan Kharavela: His times and achievements
- [3] The Bhauma Karas and The Somavamsis
- [4] The Gangas and The Suryavamsis

Unit-II: Religion, Art and Literature of Early and Medieval Odisha:

- [1] Budhism, Janisim and Sanatana Dharma in Odisha.
- [2] Development of Art and Architecture: Buddhist Art, Temples and Jaina Sculptures
- [3] Evolution and Growth of Odia Language and Literature: Sarala Mohabharata
- [4] Panchasakhas, Sri Chaitanya and Bhakti Movement in Odisha

Unit-III: Political and Economic structure in Medieval Odisha:

- [1] Mughal Administration
- [2] Maratha Administration
- [3] Impact on Odisha's Socio-Economic Condition

Unit-IV: Colonialism in Odisha:

- [1] The Early British Administration: Its Socio-economic impact
- [2] The Odia Identity Movement
- [3] Freedom Struggle in Odisha

Unit-V: Socio-cultural Changes in Modern Odisha:

- [1] Development of Modern Education
- [2] Social Reform Movements in Odisha
- [3] Modern Odia Literature: Radhanath Roy, Phakir Mohan Senapati and Gangadhar Meher

Reading List:

- A. Easchman et al (eds) The Cult of Jagannath and Regional Tradition of Orissa, Manohar, New Delhi, 1978.
- A. K. Mishra, Intellectual Tradition of Orissa, Bhubaneswar, 2006.
- , The Raj, Nationalists and Reforms, Bhubaneswar, 2007.
-, Indian Culture, Science and Technology (with special emphasis on Odisha), 2011.
- B.C. Ray, Orissa under the Mughals
- , Orissa under the Marahatas
- , Foundation of British Orissa
- B.K. Mallik, Medieval Orissa: Literature, Society, Economy, Bhubaneswar, 1996
- , Paradigms of Dissent and Protest: Social Movements in Eastern India (1400-1700 AD Manahar, New Delhi, 2004.

J. Dora, Sakta Monuments of Orissa, A Study of Art, Architecture and Iconography, New Delhi, 2010.

K.C. Mishra, The Cult Jagannath.

M.N. Das (ed) Sidelights on History and Culture of Orissa, Vidyapuri

M. A. Haq, Muslim Administration in Orissa

A.C. Pradhan, A Study of History of Orissa, Bhubaneswar, Panchsheel

K.C. Panigrahi, History of Orissa, Cuttack, Kitab Mahal, First edition, 1981

Chittaranjan Das, A Glimpse into Oriya Literature, Orissa Sahitya Akademi, Bhubaneswar, 1962

K.B. Tripathi, The Evolution of Oriya Language and Script, Utkal University, Bhubaneswar

K.C. Panigrahi, Sarala Dasa, Sahitya Akademi, New Delhi, 1975 Khageswar Mahapatra, (ed), Charyagitika

(2) FREEDOM MOVEMENT IN INDIA

Unit-I: Growth of National Consciousness in 19th century:

- [1] Socio-Economic impact of British Rule
- [2] Role of Press and Journalism
- [3] Formation of Political associations prior to 1885

Unit-II: Nationalism: Trends up to 1919:

- [1] Formation of Indian National Congress: Its ideology and Performance
- [2] Moderates and Extremists
- [3] Swadeshi Movement and its impact

Unit-III: Gandhian nationalism after 1919: Ideas and Movements:

- [1] Mahatma Gandhi: Perspectives and Methods
- [2] Non- Cooperation, Civil Disobedience, Quit India Movements
- [3] Indian National Army (INA) and Subash Chandra Bose

Unit-IV: Communalism and Partition:

- [1] Ideologies and practices: Hindu Mahasabha, Muslim League
- [2] Partition and Independence

Unit-V: Emergence of a New Nation:

- [1] Making of the Constitution
- [2] Integration of Princely States
- [3] Land Reforms and beginnings of Planning

Reading List:

Judith Brown, Gandhi's rise to Power, 1915-22.

Paul Brass, The Politics of India Since Independence, OUP, 1990.

Bipan Chandra, Nationalism and Colonialism in Modern India, 1979.

Bipan Chandra, Rise and Growth of Economic Nationalism in India.

Mohandas K. Gandhi, An Autobiography or The Story of My Experiments with Truth.

Ranjit Guha, ed., A Subaltern Studies Reader.

Peter Hardy, Muslims of British India.

Mushirul Hasan, ed., India's Partition, Oxford in India Readings.

D.A. Low, ed., Congress and the Raj.

John R. McLane, Indian Nationalism and the Early Congress.

Jawaharlal Nehru, An Autobiography.

Gyanendra Pandey, The Construction of Communalism in colonial north India.

Sumit Sarkar, Modern India, 1885-1947. Anil

Seal, Emergence of Indian Nationalism.
 Ram Lakhan Shukla (ed.), Adhunik Bharat ka Itihas.
 Eleanor Zelliott, From Untouchable to Dalit: Essays on the Ambedkar Movement.
 Judith Brown, Gandhi: (et al) A Prisoner of Hope.
 Bipan Chandra, Communalism in Modern India, 2nd ed., 1987. Bipan Chandra, K.N. Panikkar, Mridula Mukherjee, Sucheta Mahajan and Aditya Mukherjee, India's, Struggles for Independence.
 A.R. Desai, Social Background of Indian Nationalism.
 A.R. Desai, Peasant Struggles in India.
 Francine Frankel, India's Political Economy, 1947-77. Ranajit Guha, and G.C. Spivak, eds. Select Subaltern Studies.
 Charles Heimsath, Indian Nationalism and Hindu Social Reform.
 F. Hutchins, Illusion of Permanence.
 F. Hutchins, Spontaneous Revolution.
 V.C. Joshi (ed.), Rammohan Roy and the process of Modernization in India.
 J.Krishnamurti, Women in Colonial India

(3) MAKING OF CONTEMPORARY INDIA

Unit-I: Towards Independence and Emergence of the New State :

Government of India Act 1935; Working of the GOI Act; Negotiations for Independence

and Popular Movements; Partition: Riots and Rehabilitation

Unit-II: Making of the Republic -The Constituent Assembly:

Drafting of the Constitution, Integration of Princely States

Unit-III: Indian Democracy at Work c1950- 1970s:

Language, Region, Caste and Religion; Electoral Politics and the Changing Party System;

Regional Experiences, India and the World (Non Aligned Movement)

Unit-IV: Economy c 1950-1970s:

The Land Question, Planning and Economy, Industry and Labour

Unit-V: Society and Culture c 1950-1970s:

The Women's Question: Movements and Legislation

Cultural Trends: Education, Institutions and Ideas, Science, Literature, Media, Arts

Reading List:

Granville Austin, Indian Constitution: Cornerstone of a Nation, New Edition, OUP, 2011

Francine Frankel, India's Political Economy, 1947-2004, New Delhi: Oxford University Press, 2006.

Paul Brass, The Politics of India Since Independence, Cambridge: Cambridge University Press, 1994.

Ram Chandra Guha, India after Gandhi: The History of the World's Largest Democracy, New Delhi: Picador, 2007

Bipan Chandra, et al (ed) India after Independence, New Delhi: Penguin Books, 1999

Appadurai, Domestic Roots of India's Foreign Policy 1947-1972. New Delhi: Oxford University Press, 1979.

Rajni Kothari, *Politics in India*, New Delhi: Orient Longman, 1970.
Joya Chatterji, *The Spoils of Partition: Bengal and India, 1947-67*,
Cambridge: Cambridge University Press, 2007.
Sunil Khilnani, *The Idea of India*, Penguin Books, New Delhi, 2004

(4) ISSUES IN THE CONTEMPORARY WORLD

Unit-I: Colonialism and Nationalism: Social Transformation after the Second World War; United Nations and UNESCO; NAM, Cold War: the character of Communist States

Unit-II: Perspectives on Development and

Underdevelopment: Globalization and Liberalization--Impact

Unit-III: Social Movements in the North and the South:

Feminist & Human Rights issues

Unit-IV: Ecological Movements: Recent Issues and Developments

Unit-V: Modernity and Cultural Transformation: Emerging trends in Culture, Media and

Consumption

Reading List:

E.J. Hobsbawm, *The Age of Extremes, 1914 – 1991*, New York: Vintage, 1996

Carter V. Findley and John Rothay, *Twentieth-Century World*, Boston: Houghton-Mifflin, 5th ed., 2003.

Norman Lowe, *Mastering Modern World History*, London: Palgrave Macmillan, 1997

Mark Mazower, *The Balkans: A Short History* [especially chap.

4], New York: Modern Library, 2000: paperback, 2002

Basil Davidson, *Modern Africa: A Social and Political History*, 3d edn. London / New Jersey: Addison – Wesley, 1995

I, Rigoberta Menchu, *An India Woman in Guatemala* [Memoir of

1992 Nobel Peace Prize Winner, London: Verso. 1987 {Hindi translation available}

Jonathan Spence, *The Gate of Heavenly Peace: The Chinese and Their Revolution, 1895 – 1980*, Penguin, 1982

SYLLABUS FOR B.A. (HONORS) ODIA UNDER CHOICE
BASED CREDIT SYSTEM OF UTKAL
UNIVERSITY, BHUBANESWAR

ଓଡ଼ିଆ ଭାଷାରେ ସମ୍ମୁଖିକ ଶିକ୍ଷା

Ability Enhancement Compulsory Course (AECC)

ଓଡ଼ିଆ ଭାଷାରେ ସମ୍ମୁଖିକ ଶିକ୍ଷା-୧

MIL Communications-Odia

ଓଡ଼ିଆ ଭାଷାରେ ସମ୍ମୁଖିକ ଶିକ୍ଷା-୧, ଓଡ଼ିଆ ଭାଷାରେ ସମ୍ମୁଖିକ ଶିକ୍ଷା-୧-୨୦, ଓଡ଼ିଆ ଭାଷାରେ ସମ୍ମୁଖିକ ଶିକ୍ଷା-୧-୨୦

ଓଡ଼ିଆ ଭାଷାରେ ସମ୍ମୁଖିକ ଶିକ୍ଷା-୧ (୧୫ ଶିକ୍ଷା)

୧୫ ଶିକ୍ଷା-୧-୧୫, ଓଡ଼ିଆ ଭାଷାରେ ସମ୍ମୁଖିକ ଶିକ୍ଷା-୧-୨, ଓଡ଼ିଆ ଭାଷାରେ ସମ୍ମୁଖିକ ଶିକ୍ଷା-୧-୨୦

(Credits-2, total classes-20, one period-1 hours, course-II, Full Marks-50)

* ଓଡ଼ିଆ ଭାଷାରେ ସମ୍ମୁଖିକ ଶିକ୍ଷା-୧ (୧୫ ଶିକ୍ଷା):

Gjò _ôVýLiWÿûUò _i! | @ûiÚûbòðK (CBCS / iòàòìòGip) _ôVý _âYûkú @^êiûùe _âÊêZ ùjûAQòö aòbò^Û Éeùe @ûagýK @^êiûùe iciûcdòK _eòìÚòZòKê ù^A búaaò^òcd | _ûeÆeòK ù~ûMûù~ûM iÚû^ Kò_eò IWÿò@û bûhûùe ijRùe, iekùe | @û^!ùe ùjûA_ûeòà- G \òM _âZò G[òùe xû^ \ò@û~ûAQòö IWÿò@û bûhû | iûjòZýe i\ýZc _âûùdûMòK mû^e aòKûg ^òcòð +3 Éeúd aò\ýû[ðúuê Gòj _ôVýKâce LiWÿûUò iûjû~ý Keòàö ùi[ô_ûAñ _âPkòZ aòKûg ^òcòð +3 Éeúd aò\ýû[ðúuê Gjò _ôVýKâce LiWÿûUò iûjû~ý Keòàö ùi[ô_ûAñ _âPkòZ bûhûe ùa÷dûKeYòK, ayúajûeòK | _âûùdûMòK \òM _âZò G[òùe xû^ \ò@û~ûAQòö G[òùe iòû~ûM _âKòâdûee @^êaò]ô, ù~ûMûù~ûMe Z[ý | Zðß _âZò MêeêZß \ò@û~ûAQòö Gjû aò\ýû[ôðu búaaò^òcdûcòK \IZû aéjòùe ijû~ý Keòàö ùicûù^ gêj | _eòz^Û búauè ù~ùKøYìò _âKûe mû^e ìP^û Z[ý | iòjû«Kê ùcûLòK | fòLòZ Éeùe ijRùe _âKûg Keò_ûeòà Gaõ ùicû^u cûZébûhûe aòKûg NUò_ûeòàö

G[òùe _ôVý-1 / _ôVý-2 / _ôVý-3 / _ôVý-4 / _ôVý-5 / _ôVý-6 / _ôVý-7 Gjò_eò iûZùMûUò Z[ý, ìP^û | @û«aòð\ýûcìkK iòû~ûM _ûV ejòQòö aò\ýû[ðú ùicû^u eêPò | cêq _i! | @^êiûùe ù~ ùKøYìò \êAUòKê aûQò ù^A_ûeòàö _â[c Zòù^ûUòeê ùMûUòG _â[c _~ðýûde (1c ùicòÁûe) | ùgh PûùeûUòeê ùMûUòG \ßòZúd _~ðýûd (2d ùicòÁûe) _ûAñ

aúQòùäö

cífýûu^ aòbûR^ _jZò :

- (K) _ûVe _âùZýK GKKeê (dê^òUþ) ùMûUòG ùMûUòG Keò ùcûU 4Uò
 \úNđ_âgÛ _Wÿòäö 600eê 700 g± cæùe 2Uòe C?e ù\âûKê ùjaö
 (2"12=24)
- (L) _ûVe _âùZýK GKKeê 4Uò iöìò¯ _âgÛ _Wÿòäö 2Uòe C?e 200eê 300 g±
 cæùe ù\âûKê ùja (2"8=16)
- (M) _ûVe _âùZýK GKKeê 2Uò ùfLûG 8Uò @Zò iöìò¯ _âgÛ @ûiòäö aò\ýû[đú
 ùMûUòG aûKýùe 5Uòe C?e ù\ùäö (2"5=10)
 ùcûU ^'e / cífýûu - 50ö

iaòùgh _ûVý

ù~ûMûù~ûMcikK cûZébûhû-IWÿò@û (AECC)

ù~ùKøYìò 2Uò _ûV aûQ

Elective-Any Two

_â[c _~đýûd / 1st SEMESTER

ûVý-1 / Course-3: aòmû ^ Kkû I bûhû-iûjòZý

- 1c GKK : aòmû_ ^e _eòbûhû, _eòie, _âKû~đý
- 2d GKK : aòmû_ ^e KkûcôK Cùÿgý
- 3d GKK : aòmû_ ^e _âKûe I _âÉêZò
- 4[đ GKK : ùfûK iö_Kđ-aòmû_ ^ I aòmû_ ^e bûhû
- 5c GKK : aòmû_ ^ Kkû I iûjòZý
- iöaû\, bûhû I iûjòZý

_ûVý-2 / Course-5

- 1. íû\e _eòbûhû I _eòie
- 2. íû\e _âKûe I C_ù~ûMòZû
- 3. MYcûæc]cđú iöaû\ _âÉêZò
- 4. eì_KûcôK `òPe É,eP^û, iµû\Kúd
- 5. iöaû\ I iûjòZý, íû\e bûhû

gévkuùK÷!òâK Azû]ú^ _ûV-IWÿò@û

(ù~ùKøYiò 4Uò aûQòaûKê ùja)

DISCIPLINE SPECIFIC (CENTRIC) ELECTIVE-ODIA (ANY FOUR)

- * ahðûjð ~ðýûd - 5c I 6Â (Semester-V, VI)
- * ahðûj ~ðýûd-5c (Semester-V) _â[c I \βòZúd _Zâ100+100=200 ^'e
- * ahðûj ~ðýûd-6Â (Semester-VI) ZÉZúd _Zâ
20 ^'e @û«ü _eúlû / 80 ^'e cêLý _eúlû) 100 ^'e
- * PZê[ð _Zâ - _âKì _âÉÊZò (hÂ ~ðýûd / Semester-VI
(75 ^'e _âKì ùfLû + 25 ^'e iûlûZKûe) 100 ^'e
ùcûU 400 ^'e
- * ùcûU @ûiÚûcìfýûu (Total Credits) 6 " 4 = 24
- * cìfýûu I _âgÛ_Zâ aòbûR^ ^òdc : _â[c Zòù^ûUò _Zâ _âùZýK 100 ^'e
aògòÁö 80 ^'e cêLý _eúlû I 20 ^'e @û«ü _eúlûö @û«ü _eúlûe 20 ^'e
_âgÛ @Zò iöìò`cìkK ùjaû CPòZpö G cêLý _eúlû 80 ^'e Gjûe aòbûR^
^òdc ùjCQò-
- (K) _âùZýK _Zâe _âùZýK (5Uò~ûK) GKKeê ùMûUòG ùfLûGñ ùcûU 5Uò
_âgÛ _Wòàö aò\ýû[ðúuê _i! @^êiûùe 600 eê 700 g±ùe 3Uò _âgÛe
C☑e ù\àûKê ùjaö ùcûU cìfýûu- 3 " 12=36ö
- (L) _âùZýK _Zâe _âùZýK (5Uò~ûK) GKKeê iöìò` ùaû]mû^cìkK 5Uò _âgÛ
_Wòàö Zòù^ûUòe C☑e 400 g± cæùe ù\àûKê ùjaö cìfýûu aòbûR^
3"8=24ö
- (M) _âùZýK _Zâe 5Uò~ûK GKKeê ùcûU 15ùMûUò _âgÛ @ûiòàö 10Uò
_âgÛe iöìò` C☑e 50Uò g± @[aû 2Uò aûKý cæùe ù\àûKê ùjaö 10 "2=20ö
- * bìcòKû (_òdû`f) : Gjò _ûVýKâcUò aò\ýû[ðúcuê IWÿògûe iûöÄÉZòK,
iûcûRòK I eûR^úZòK AZòjûie aòa☑ð^ aòhdùe mû^ @ûjeY _ûAñ
iêù~ûM ù\àö IWÿò@û iûjòZýùe icûR I iöÄÉZòe _âZò`k^, iûjòZýZ☑β,
iRð^gúkZû, bûhòK gévkû, iûjòZýe aòàò]Zû, iûjòZý g±ùKûh, fòL^ ùKøgk,
ùKûhMâ^Úû\ò iµû\^û I _âPkòZ bûhûe ayûKeY, Kûö_êUeòK ùKøgk
aò\ýû gòIY AZýû\ò \òMKê æû^ \ò@û~ûA G _ûVýKâcUò _âÉÊZ
ùjûAQöö
Gjò _ûVýKâcùe ùcûU 13ùMûUò _ûV @Qòö aò\ýû[ðú ^òÿòðÁ gévkûe
aò\ýû bûaùe ù~ùKøYiò PûùeûUò _ûVKê aûQò_ùeòùàö G[ôcæeê
ùMûUòG _ûVKê @û]ûe Keò Zû' ijòZ @^ý aò\ýûKê iöù~ûM Keò hÂ

_~đýûd (ùicòÁe-6) _eúlû ùakKê _âKì Kû~đýUòG ùfLò 50 _éÂû cxùe
_âÉÊZ Keòau ùjuaö _âKìUò 4[đ _Zâ bûaùe aòuaPòZ ùjaö
aòugh \âÁáy : _â[c \éAUò _Zâ 1eê 8 iõLýK _ûVeê aQû~òao Zézúd _Zâ 9eê
iõLýK _ûVeê aQû~òao

iaòùgh _ûVýKâc

ùcûU 13 ùMûUò _ûV: 4Uò aûQòua

_Zâ iõLýû- 4

_âùZýK _Zâ- 100^'e (20 ^'e @û«ü _eúlû + 80^'e @«òc cêLý _eúlû)

@ûiÚû - cìfýûu = 6"4 = 24

_âùZýK _Zâ _ûAñ 40Uò _òeòdWp, _âZò _òeòdWp - 1N?û

ahđûiđ _~đýûd- 5/6 (ùicòÁe)

_ûVý-1: IWÿògûe iûõÄézòK AZòjûi | IWÿò@û iûjòZý (@ûiÚûcìfýûu 4+2=6)

1c GKK: IWÿògûe iõlò AZòjûi | IWâ RûZòe HZòjý Gaõ ùa÷gòÁýö

2d GKK: IWÿògûe iõÄézò (iõùl_ùe Kkû, aûYòRý, ice, gâúRM^Üû[iõÄézò)ö

3d GKK: IWÿògûe aòbò^Ü lcđe aòKûg | Zûle iûjòZòýK _âZò`k^ (iûeûõg
mû^bò?òK)ö

4[đ GKK: ùaøj iõÄézò | P~đýû_ \, IWÿògûe iûcûRòK | iûõÄézòK AZòjûiùe
i~đýaõg | IWÿò@û iûjòZýö

5c GKK: IWÿò@û iûjòZýùe Mûşòau\ú Pò«û]ûeûö

_ûVý-2: iûjòZý Z?ß | iûjòZý _eòbûhû

1c GKK: eúzò, iòjû« ùeûcû?òK Pò«û]ûeû, aòNU^aû\ (_âûPý-_û½ûZý
aòPûeùe)

2d GKK: iRđ^gúkZû (_âûPý-_û½ûZý \éÁòbwúùe)

3d GKK: \kòZ iûjòZý | Zêk^ûcòK iûjòZý(_eòbûhû | C_ù~ûMòZû)

4[đ GKK: @ûbûi Mì, @Yê _ZâòKû, PòZâKì, c^Éû?ßòK C_^ýûi, cêq]ûeùe
^ûUK, _âûùdûMòK icûùfûP^ûö

5c GKK: @bò]û^ _âÉÊZòKkû | @şd^/iûjòZý g±ùKûh MV^ aò]òö

_ûVý-3: K[ûiûjòZý @şd^

1c GKK: @ia%õđ(\kòZ C_^ýûi)- aòbìZò _...^ûdK

2d GKK: céZêý egàò (ùà÷mû^òK C_^ýûi)-ùMûKêkû^! cjû_ûZâ
 3d GKK: \lòYûa[đ (_âûùdûMòK C_^ýûi)- gû«^ê Kêcûe @ûPû~đý
 4[đ GKK: ceûke céZêý (_â[c 3Uò Mì)- iêue!â cjû«ò
 5c GKK: lê\âMì @xd^ (Mì gzû±úe)- iõKk^ ù\áú _âi^Û _...^ûdK, iõMc
 _aæòùKg^, aâjà_êe
 _ûVý Mì: cgûYòe `êf- iyò\û^! eûCZeûd
 Wòcòeò`êf- @Lòk ùcûj^ _...^ûdK
 cêLû- Ké¾ _âiû\ cògâ
 e^ôûKe- eaò _...^ûdK

_ûVý-4: ^ûUK I GKûuòKû @xd^ DSE III

1c GKK: @bò~û^ - KûkúPeY _...^ûdK
 2d GKK: aû^_âiÚ- aòRd cògâ
 3d GKK: aòZKđòZ @_eûjÛ- cù^ûeõR^ \ûi
 4[đ GKK: @[P PûYKý- e^ôKûe PA^ò
 5c GKK: GKûuòZû:
 _ûV: @kò_êeùe ^òùKûfûi- ùMû_ûk ùQûUeûd
 _âùag _âiÚû^ - aògßRòZp \ûi
 eûÉû ^ûjó- ^úkû\âò bìhY jeòP!^

_ûVý-5: IWÿò@û Kûaý-KaòZû @xd^ DSE I

1c GKK: M\û_ađ- iûekû \ûi
 2d GKK: ù_âciê]û^ò]ô (1c I 14g Qû!)- Cù_!â b-
 3d GKK: _gê_lúe Kûaý (_â[c Zòù^ûUò Mû[ûKaòZû)- eû]ûùcûj^ MWÿ^ûdK
 4[đ GKK: _âûPú^ cæKûkú^ KaòZû- _âûPú iûjòZý _âZòÂû^, KUK
 _ûVý KaòZû: bâce PòUûC- \ú^aşê eûRjeòP!^
 c^ùaû] PCZògû- bqPeY \ûi
 aûecûiú ùKûAfò- gue \ûi
 PKû^d^ ùj- cû]aú \ûiú
 5c GKK: @û]ê^òK KaòZû- KaòZû Pd^/iµû\^û- C}k aògßaò\ýûkd
 _ûVý KaòZû: K[êKòe bûa^û- eû]û^û[eûd
 a!úúe iûõæ @^êPò«û- ùMû_aşê \ûg
 ~ûZâû iwúZ- ùa÷KêY× ^û[_...^ûdK
 _âbûZ @aKûg- ^!Kòùgûe ak

icê\â I cêñ- ùiøbûMý Kêcûe cògâ

_ûVý-6/M\ý iûjòZý @xd^

1c GKK: cû\kû_û-ò- ~ûZò ùKgeú I @^wbúc ù\â- _âûPú^ M\ý _\ýû\gđ-
IWÿògû iûjòZý GKûùWcú

2d GKK: IWÿò@û ecýeP^û
_ûVý _âiw: aUê@û- ùMûaò! Zâò_ûVúd
Az«ò\û_òùK- ùa÷¾a PeY iûcf
bêf- bêaù^gße ùaùjeû

3d GKK: Rúa^iáZò(1-20 _éÂû) ^ûeûdY aúeae iûc«, Mâ^Úc! òe

4[đ GKK: ù\ùgù\ùg (_â[c 3Uò _ûV)- aûeòÁe ùMûaò! \ûi

5c GKK: iRđ^gúk _âa§- _âa§ Pd^, C}k aògßaò\ýûkd

_ûVý _âiw: @^« ù_âc- aògß^û[Ke
aògß bûZéZß- e^ôûKe _Zò
icûRaû\ú cû^aòKZû- eû]û^û[e[
Êû]ú^Zûe ^iZ^ cìfýuaû]- ùMûùfûK aòjûeú]k

_ûVý- 7: IWÿò@û bûhû I aýûajûeòK aýûKeY

1c GKK: IWÿò@û bûhûe ùcøkòK ùa÷gòÁý I HZòjûiòK aòa[đ^

2d GKK: IWÿò@û]ß^ò I a%ođcûkû

3d GKK: IWÿò@û g± aòba (@û[đkòK I ù\gR)

4[đ GKK: IWÿò@û g± MV^aò]ô (eì_òcZ[ß/Êeaý-^ iõù~ûM aò]ô/_âZýd
iõù~ûM)

5c GKK: I^ò@û eìXòe MV^ I _âùdûM

_ûVý-8: iûjòZý fòL^ Kkû DSE II

1c GKK: _âa§ fòL^ Kkû

2d GKK: KaòZû fòL^ Kkû

3d GKK: ^ûUK eP^û I c[C_iÚû_ ^ Kkû

4[đ GKK: lê\âMì eP^û Kkû

5c GKK: ù~ùKøYiò KaòZûe _âùdûMòK @ûùfûP^û

(_ûV\û^ icdùe gòIKcûù^ ù~ùKøYiò 3Uò KaòZû ^cê^û eìù_ C_iÚû_ ^ Keò
ùfLK I ùfLûe ^ûc ^ù\A aò\ýû[đú ^òùR ZûjûKê Kò_eò aêSò _âùdûMòK
\òMeê aýûLýû KeêQ«ò ZûjûKê ^òeì_Y Keòuaö _âùdûMòK icûùfûP^û

_jZòKê G ùlZâùe @^êieY Keû~òäö)

_ûVý-9: **IWÿò@û bûhûe Kõ_êýUeòK aýajûe**

1c GKK: Kõ_êUee _eòbûhû I C_ù~ûMòZû

2d GKK: ì`Up ùlßdûee I jûWðùlßdûe Kõ_êUe- _âKû~ðý

3d GKK: IWÿò@û bûhûe Kõ_êýUeúKeY- IWÿò@û `ãUip, Kò-ùâûWð,
Kõ_êýUeòK g± _âKâòdû, a^û^ I aýûKeY ~ûõPK _âKòâdû

4[ð GKK: IWÿò@ûèe AõUeù^U aýajûee aòâò] \òM

5c GKK : IWÿò@û iûcûRòK ùlßâpiûAUipip

_ûVý-10 / Course-10 : **IWÿò@û ùfûKiûjòZý** DSC-III

1c GKK : ùfûKaò\ýû I ùfûKiûjòZý (iõmû, Êeì_, _eòie)

2d GKK : IWÿò@û ùfûKMúz

3d GKK : IWÿò@û ùfûKKûjûYú I R^gîZò

4[ð GKK : IWÿò@û ùfûK ^ûUK

5c GKK : _âaû\, _âaP^, ^ñû\ò@û, eêXÿò, ùfûKûPûeúd (gKê^ aògßûi)

_ûVý-11 / Course-11 : **IWÿò@û iûjòZýe AZòjûi**

1c GKK : IWÿò@û iûjòZýee AZòjûi (AZòjûi I iûjòZýe AZòjûi, IWÿò@û iûjòZýe
AZòjûi eP^û]ûeû, ~êM aòbûMúKeY)

2d GKK : IWÿò@û @^êaû\ iûjòZýe AZòjûi

3d GKK : IWÿò@û _âa§ iûjòZýe AZòjûi

4[ð GKK : IWÿò@û _\ý iûjòZýe AZòjûi

5c GKK : IWÿò@û K[ûiûjòZý I ^ûUý iûjòZýe AZòjûi

_ûVý-12 / Course-12 : **gûÈúd IWÿò@û bûhûe @û`òìòK _âudûM**

1c GKK : bûhû-eûRbûhû, _âgûi^òK bûhû Gaõ IWÿò@û bûhûe eûRbûhû
bûaùe _âPkòZ ùjaùe AZòjûi, gûÈúd bûhû bûaùe IWÿò@û bûhûe
ùa÷gòÁýö

2d GKK : ^[úKeY _âKòâdûö

3d GKK : ieKûeú _Zâ, @û`òìòK aýqòMZ _Zâ, aûYòRòýK _Zâ, ùNûhYû _Zâö

4[ð GKK : @]ôìP^û, aòm^-ò, mû_^ I mû_^úd, aòaeYú fòL^, _âgûi^òK
g±ùKûhe bìcòKûö

5c GKK : PòVû, LiWÿû, \fòfp _âÉêZúKeY, ùa÷VKú _âÉûa I @^êùcû\^

_âKòâdûö

ijûdK Mâ^ÚîPú

1. _âúPú^ ù_ú[ô gèi iõ_ú\^ú _jZò | @^êaú\ ùKøgk-...^ûdK, @úgèùZùh, bêaù^gße
2. fò_òe KµêUe gòlû - _eòWû eùcg P!â, aò\ýú_êeú, KUK
3. ùcøkòK KµêUe gòlû - cògâ ù\àKû«, ù`âŠip _aägđip, KUK
4. IWÿò@ú _âa§ iûjòZýe AZòjûi - Ke aúCeúa§ê, ù`âŠip _aäògđip, KUK
5. K[ú iûjòZýe Kkû | KûeòMeú - \úi KòùgûeúPeY, AÁ%ođ ùcWò@ú, bêaù^gße
6. IWÿògûe iûöÄézòK AZòjûi - cògâ _âuaú] Kêcûe, aò\ýú_êeú
7. IWÿò@ú iûjòZýe @ú\ò_ađ - cjû«ò iêùe!â
8. IWÿò@ú iûjòZýe AZòjûi - _...^ûdK _VûYò, ^úf!ú
9. IWÿò@ú iûjòZýùKûh - aògßûk aõgú]e, jòcûõgê _âKûg^, KUK
10. Rúa^ú iûjòZý ùK @æd^ - IWÿògû eûRý _úVý _êÉK _âYd^ | _âKûg^ iõiÚû, bêaù^gße
11. _âùdûMòK IWÿò@ú bûhû - IWÿògû eûRý _úVý _êÉK _âYd^ | _âKûg^ iõiÚû, bêaù^gße
12. IWÿò@ú iûjòZýe iúcûRòK iûöÄézòK AZòjûi - \úi PòZeõR^, IWÿògû eûRý _úVý _êÉK _âYd^ | _âKûg^ iõiÚû, bêaù^gße
13. aòcgđ aòMâj - Zòâ_úVú iù«ûh, ù`âŠip _aäògđi, KUK
14. iûjòZýe îPú_Zâ - _...^ûdK aòbìZò, ^úf!ú, KUK
15. IWÿò@ú a%ođcûkû - UòKûdZ, ùK÷kûi P!â, _êeú
16. iûjòZýe Wûk_Zâ - iúcúf ùa÷¾a PeY
17. iûjòZýe eì_ùeL - jeòP!^ ^úkû\òâ bìhY
18. _âPkòZ IWÿò@ú bûhûe aýúKeY - cjû_úZâ aòRd _âiù\, aò\ýú_êeú
19. iõù~ûM @^êaò]ô - Zòâ_úVú iù«ûh, ^úf!ú, KUK

UTKAL UNIVERSITY

CBCS : BA (Hons.) 2015-16

C}k aògßaò\ýûkd

_i! | @úîÚûbòZòK _úVýLiWÿû : iÛûZK (IWÿò@ú i'û^) 2015-16

_â]û^ _úVýûõg- Core Course

ùcûU _Zâ iõLýû-14

_âùZýK _Zâ - 100 cìfýûu aògòÁ (20 ^'e cjûaò\ýûkd Éeúd @ú«ü _~đýûd _eúlû +k 80 aògßaò\ýûkd Éeúd cû^K @«òc _eúlû)

- i¹û[^] : RùY iÛûZK - i¹û[^]e (@[^]ið) aò\ýû[ðú - ùcûUþ 1400 [^]ee _eúlû ù\ùäö
- (K) @Zò Kcpùe (ùcûUþ) 50Uò Kû~ðý [^]òNððU (_òeòdWþ)ùe ùMûUòG
_Zâe _ûV\û[^] ùgh ùjaö ùMûUòG Kû~ðý [^]òNððU aû _òeòdWþ-60
cò[^]òUþ aû 1 NðUû)
- (L) _âùZýK _Zâ 5ùMûUò dê[^]òUþ / GKK / C_ûðgùe aòbq ùjûAQòö
- (M) _âùZýK _Zâ 6 @ûiÛûbòZòK Kû~ðý [^]òNðð (4+2 ùKâWòUþ) _ûAùäö
ùMûUòG @ûiÛûbòZòK Kû~ðý [^]òNððUe cjZß ùjCQò- 10 _òeòdWþ ijòZ
icû[^]ö
ùcûU 14 ùMûUò i¹û[^] _Zâe @ûiÛûcífýûu (ùKâWòUþ) ùjCQò - 14 " 6
(4+2)= 84ö G[ôcxeê 14 " 4 = 56 ZûZßòK _ûV (Theory) Gað 14 " 2 = 28
ÊKúd ùgâYú ùaû]K _ûV (Tutorial) ijòZ RWòZö
- (N) _eúlû _~ðýûdKâc (Semester) | _âÉûaòZ _ûV ù~ûR[^]û :
- (O) aò\ýû[ðú^{cû^}u Êû]ú[^] cêq ùc]ûaéZò _eúlû _ûAñ ùicû[^]u _i| |
ùaû]mû[^]cikK \úNð iðlò⁻, @Zò iðlò⁻ _eúlû [^]òcù« C_iÛû[^]û Keû~òäö
- (P) [^]e / cìkýûu aòbûR[^] _jZò :
1. _âùZýK _â]û[^] _ûVýûðg aû _âùZýK _Zâ - 100 [^]e aògòÁ
 2. cjûaò\ýûkdÉeúd @û«ü_eúlû - 20 [^]e
aògßaò\ýûkdÉeúd cêLý @û«ü_eúlû - 80 [^]e
 3. aògßaò\ýûkdÉeúd cêLý _eúlûùe [^]òcÛcùZ _âgÛ _Wÿòä:
- (K) _âùZýK _Zâe _âùZýK GKKeê 5Uò \úNð _âgÛ _Wÿòäö aò\ýû[ðú 3Uò
_âgÛe Cûe 600 eê 700Uò g± cæùe ù\ùäö (3"12=36 [^]e)
- (L) _âùZýK _Zâe _âùZýK GKKeê 5Uò iðlò⁻ _âgÛ _Wÿòäö aò\ýû[ðú 3Uò
_âgÛe CZe 300 g± cæùe ù\ùäö (3"8=24)
- (M) ùcûU 5ùMûUò iðlò⁻ _âgÛ _âùZýK GKKeê @û]ûe Keò _Wÿòäö 3Uò
_âgÛe CZe aò\ýû[ðú 50 g± cæùe ù\ùäö (3"5=15)
- (N) 8Uò @Zò iðlò⁻ _âgÛ _Wÿòäö aò\ýû[ðú 5Uòe CZe ùMûUòG g±ùe @[aû
ùMûUòG aûKýùe ù\ùäö (5"1=5)

_ûV bìcòKû (_òâd'k)

iÛûZK ùgâYúùe IWÿò@û bûhû | iûjòZý í'súð _ûV\û[^] [^]òcù« Gjò
_ûVýKâce LiWÿûUò _âÉêZ ùjûAQòö Gjûe _âÉêZò ùlZâùe aògßaò\ýûkd
@ûùdûMu _âùùdûRòZ " _i| | @ûiÛûbòZòK [^]iZ[^] _ûVýaò[^]ýûi _jZò"Kê
MâjY Keû~ûAQòö Gjò _ûVýLiWÿûUò i\ýZc bûhû iûjòZý í'súð mû[^]

aýaiÚû I Pk«ú icdùe C_ù~ûMòZûKê Pûjó _âÉÊZ ùjûAQòö \êAgj ahðe
 IWÿò@û bûhûe Cù^àh, àòKûg]ûeû ijòZ Gjûe iûõ_âZòK iUòZò,
 aýûKeYbòZòK I bûhûZûZßòK ùa÷gòÁý iõ_Kðùe àò\ýû[ðúcû^ue iaòùgh
]ûeYû Gjò _ûVýKâceê còkò_ûeêQòö G[ôijòZ IWÿò@û bûhûe fòLòZ
 IWÿò@û iûjòZýe _âûd 1200 ahðe iûjòZòýK àòKûg]ûeû àòhdùe
 àò\ýû[ðúcû^ue]ûeYû ^ò½òZ iKûeûcòK ùjûA_ûeòa G[ô_âZò xû^
 \ò@û~ûAQòö IWÿò@û iûjòZýe aýûajûeòK _âùdûR^ I cjZß _âZò xû^
 G[òùe \ò@û~ûAQòö IWÿò@û iûjòZýe àòàò] iûjòZòýK _âûei_, àòbò^Ü
 icde iûjòZý-]ûeû I àògòÁ iûjòZý-ùfLKu cìk_ûV ijòZ àò\ýû[ðúuê
 ù~ûWÿòù\âuùe _ûVýLiWÿûUò i`k ùjCQòö IWÿò@û bûhû I iûjòZýKê
 iaðbûeZúd bûhû iûjòZý ijòZ ù~ûWÿò ù\âuKê I @û«RðûZúd iûjòZý
 àò\ýû @^êKìk Keò àòPûe KeòâuKê Gjò LiWÿûUò àò\ýû[ðúu C_ù~ûMú
 ùjûA_ûeêQòö LiWÿûUòKê ùcûU 14ùMûUò _Zâùe I _âùZýK _ZâKê 5Uò
 ùfLûGñ GKK aû C_ûõgùe àòbq Keû~ûAQòö
 àòùgh \âÁáy : +3 i¹û^ (@^ið) ùgâYú ^òcòZ _âÉÊZ Gjò _ûVýKâce 14ùMûUò
 _ûV / _Zâeê ùgh \êAUòKê KûUò\ò@û~ûA iû]ûeY +3 Azû]ú^ (B.A
 Programme) ùgâYú _ûAñ _â]û^ _ûVýûõg eìù__âPk^ Keû~òàö @^êei_
 bûaùe Cbùd SEC / DSE icû^ bûaùe @^ý i¹û^ I Azû]ú^ (B.A. Honours /
 Pass) àò\ýû[ðú _â\Z _ûVýKâc @^êiùe @û«ügevku àò\ýZû bûaùe
 aûQò_ûeòàö

iaòùgh _ûVýKâc (Detail Syllabus)

â[c~ðýûd (Semester-1)

cìk_ûV : **IWÿò@û iûjòZýe AZòjûi**

_â]û^ _ûVýûõg-1 (Core Course-1): **IWÿò@û iûjòZýe AZòjûi** (i`ceê ùhûWÿg
 gZû±ú_~ðý«)

1c GKK / dê^òUþ-1 : _âûKþ-iûekû iûjòZý (P~ðýûMúz, ^û[iûjòZý)

2d GKK / dê^òUþ-2 : iûekû iûjòZý (iûekû \ûiu eP^ûi,ûe I ùiiaêe iûjòZòýK,
 iûcûRòK I iûõÄézòK ùa÷gòÁý)

3/ GKK / dê^òUþ-3 : _õPiLû iûjòZýe _éÂbìcò I ùfLK (akeûc RM^Üû[)

4[ð GKK / dê^òUþ-4 : _õPiLû iûjòZýe ùa÷gòÁý

5c GKK / dê^òUþ-5 : _õPiLû iûjòZýe iûcûRòK I iûõÄézòK @ûùa\^

_â]û^ _ûVýûõg-2 (Core Course-2: **ç~êMúd IWÿò@û iûjòZýe AZòjûi**

- 1c GKK / dê^òUþ-1 : cœ~êMúd / IWÿò@û iûjòZýe _éÂbìcò I aòKûg]ûeû
- 2d GKK / dê^òUþ-2 : cœ~êMúd / IWÿò@û iûjòZý (@ûLýûdòKû Kûáy, _êeûYgòâZ, ùa÷¾a Kûáy)
- 3d GKK / dê^òUþ-3 : cœ~êMúd Kûáy @ûwòK ùa÷PòZâý (@ûkuêeòKZû, iûwúZòKZû, eúZòùa÷PòZâý)
- 4[ð GKK / dê^òUþ-4 : cœ~êMúd Kûáy @ûcòK ùa÷PòZâý (eiùPZ^û, aòhdaÉê aò^ýûi, PeòZâPòZâY)
- 5c GKK / dê^òUþ-5 : cœ~êMúd MúZòKûáy _eõ_eû (Põ_ì, PC_ú, PCZògû)

\βòZúd _~đýûd (Semester-II)

_â]û^ _ûVýûõg-3 (Core Course-3): @û]ê^òK IWÿò@û iûjòZý

ZéZúd _Zâ

- 1c GKK / dê^òUþ-1 : @û]ê^òK IWÿò@û iûjòZýe _éÂbìcò I ^aRûMeYe bìcòKû
- 2d GKK / dê^òUþ-2 : _âûKþ @û]ê^òK Kûke IWÿò@û Kûáy KaòZû I K[ûiûjòZý
- 3d GKK / dê^òUþ-3 : IWÿò@û iûjòZýùe izýaû\ú]ûeû
- 4[ð GKK / dê^òUþ-4 : IWÿò@û iûjòZýùe iaêR]ûeû
- 5c GKK / dê^òUþ-5 : IWÿò@û _âMZòaû\ú I aûÉaaû\ú iûjòZý]ûeû

_â]û^ _ûVýûõg-4 (Core Course-4): Êû]ú^Zûe IWÿò@û ijòZý

PZê[ð _Zâ

- 1c GKK / dê^òUþ-1 : Êû]ú^Zû _eaZđú IWÿò@û KaòZû
- 2d GKK / dê^òUþ-2 : Êû]ú^Zû _eaZđú IWÿò@û C_ ^ýûi I Mì
- 3d GKK / dê^òUþ-3 : Êû]ú^Zû _eaZđú IWÿò@û ^ûUK I GKûuòKû
- 4[ð GKK / dê^òUþ-4 : Êû]ú^Zû _eaZđú IWÿò@û M\ý iûjòZý (_âa§ I icûùfûP^û)
- 5c GKK / dê^òUþ-5 : Êû]ú^Zû _eaZđú IWÿò@û iûjòZýùe _Zâ_ZòâKû
- _ûVýûõg 1 eê _ûVýûõg 4 ^òcù« ijûdK Mâ^ÚiìPú :
1. IWÿò@û iûjòZýe @û\ò_ađ I CZe cœ_ađ : cjû«ò iêùe!â, KUK ÁêùWõUip ùÁûe
 2. @û]ê^òK IWÿò@û iûjòZýe AZòjûi : iûc«eûd ^Uae, aûYúba^, bêaù^gße
 3. IWÿò@û iûjòZýe iõlò _eòPd : @ûPû~đý aé!ûa^, Mâ^Úc!òe, KUK

4. IWÿò@û iûjòZýe AZòjûi : cû^iòðj cûdû]e, Mâ^Úc|òe, KUK
5. IWÿò@û iûjòZýe AZòjûi : Ke aûCeúaŝê, ù`âŠip _aäògđip, KUK
6. @û]ê^òK IWÿò@û iûjòZýe aòKûg]ûeû : Zòâ_ûVú iù«ûh Kêcûe, iê|eMWÿ
7. IWÿò@û iûjòZýe AZòjûi : _...^ûdK _VûYò, ^ûk|û, KUK
8. IWÿò@û iûjòZýe AZòjûi : _ûXú ùaYê]e, _âûPú iûjòZý _âZòÂû^, KUK
9. @û]ê^òK Kûaý Ròmûiû, PòZâKÌ : \ûi \ûge[ô, @Mâ\iz, KUK
10. KaòZûe cû^PòZâ : cjû«ò Rû^Kú afäb, ù`âŠip _aäògđip, KUK
11. IWÿò@û iûjòZýe KâcaòKûg : cjû«ò iêue|â, @Mâ\iz, KUK
12. @^êaû\ iûjòZýe ZZß I _âùdûM : _â]û^ cû^ûeõR^, IWÿògû aêKp ùÁûe, KUK
13. iûjòZý iìPú_Zâ : _...^ûdK aòbìZò, ^ûf|û, KUK
14. CZe @û]ê^òKZû ZZß I _âùdûM : iõ. gZ_[ú ù\áú _âiû\, @Mâ\iz, KUK
15. @û]ê^òKaû\ I CZe @û]ê^òKaû\ : e[_â\ú_ Kêcûe, izý^ûeûdY aêKpùÁûe, KUK
16. IWÿò@û Kûaý ùKøgk : @ûPû~đý iê\gđ^, aâjà_êe
17. K[ûiûjòZýe K[^òKû : IZû aò¾ê_òâdû, _âûPú iûjòZý _âZòÂû^, KUK
18. iûekû cjûbûeZ iéÁòe bìcò_ađ : iûjê C\d^û[, Pò^àd _âKûg^, KUK
19. iaêReê iûõ_âZòK : gZ_[ú ^òZýû^|, Mâ^Úc|òe, KUK
20. IWÿò@û iûjòZýe _âMZòaû\ú]ûeû : gZ_[ú aòRd Kêcûe, IWÿògû aêKp ùÁûe, KUK
21. IWÿò@û C_^ýûi : ùaùjeû Ké¾PeY, RM^Ûû[e[, KUK
22. @ûùfûP^û cûkû : cògâ KûjÛëPeY, ù`âŠip _aäògđip, KUK
23. IWÿò@û iûjòZýe AZòjûi : @û\ý _âdûi - cjû«ò _âi^Û Kêcûe, KUK

ZéZúd _~đýûd (Semester-III)

_â]û^ _ûVýûõg-5 (Core Course-5): **IWÿò@û bûhûe HZòjûiòK aòKûgKâc_õPc_Zâ**

1c GKK / dê^òUp-1 : IWÿò@û bûhûe C_òZò I KâcaòKûg

2d GKK / dê^òUp-2 : IWÿò@û fò_òe HZòjûiòK aòZđ^ I fIY

3d GKK / dê^òUp-3 : IWÿò@û gòkûùfLe bûhû

4[đ GKK / dê^òUp-4 : P~đýû_ I iûekû iûjòZýe bûhû

5c GKK / dê^òUp-5 : IWÿò@û bûhû ijòZ @^ý bûhûe iµKđ (\âûaòWÿ, @ÁòK, ~ûa^òK, AõeûRú)

_â]û^ _ûVýûõg-6 (Core Course-6): IWÿò@û bûhûe ùcøkòK Êeì_ I fLY

hÂ _Zâ

1c GKK / dê^òUþ-1 : gûÊúd bûhû, IWÿò@û bûhûe gûÊúd fLY, IWÿò@û bûhûe ùcøkòK I ùa÷gòÁý

2d GKK / dê^òUþ-2 : IWÿògûe J_bûhòKú bûhûùlZâ I IWÿò@û @ûõPkòK bûhû-C_bûhû-ùâûfö

3d GKK / dê^òUþ-3 : IWÿò@û cû^K bûhû I K[ôZ bûhû

4[õ GKK / dê^òUþ-4 : IWÿò@û M\ý bûhûe àòâZõ^

5c GKK / dê^ò~þ-5 : IWÿò@û g± àòba I Gjûe @[õ ^ò¿Zò cìkK ùa÷gòÁý (@bò]ûcìkK, fLYûcìkK, aý~^ûcìkK)

_â]û^ _ûVýûõg-7 (Core Course-7): IWÿò@û bûhûe _âùdûM I aýûajûeòK aýûKeY

1c GKK / dê^òUþ-1 : IWÿò@û iûcûRòK I iûõÄézòK]ûeûùe iêbûhY I @_bûhY

2d GKK / dê^òUþ-2 : IWÿò@û iûcûRòK - ùfûKûPûecìkK g± I Zû'e _âùdûM

3d GKK / dê^òUþ-3 : @gêj a^û^ I bîfþ fòL^e KûeY I Zû'e gêj ^òeûKeY

4[GKK / dê^òUþ-4 : IWÿò@û @leZZß I a%õ òbûR^

5c GKK / dê^òUþ-5 : IWÿò@û aûKýe MXÿY, _âKûe I _âùdûMPûZêeú, aòeûcPòjÛe aýajûe, cê\âY ZîUò iõùgû]^ _jZò, aòmû ^e bûhû, ùNûhYû Kkû (@ûueòõ@ûUõ) I bûhòK C_ûd

PZê[õ _~õýûd (Semester-IV)

_â]û^ _ûVýûõg-8 (Core Course-8): (ùfûK]ûeû/IWÿò@û bûhûe ùcøLòK _eõ_eû)

1c GKK / dê^òUþ-1: ùfûK iõÄézò I ùfûKiûjòZý (iõmû, Êeì_, _âKûeùb\)

2d GKK / dê^òUþ-2 : IWÿò@û ùfûKMúz, Gjûe _âKûeùb\ I ùa÷gòÁý

3d GKK / dê^òUþ-3 : IWÿò@û ùfûKKûjûYú I R^gîZò

4[õ GKK / dê^òUþ-4 : IWÿò@û ùfûùKûqò, _âKûeùb\, iûcûRòK-iûõÄézòK @ûùà\^

5c GKK / dê^òUþ-5 : ùfûK^ûUK

bòZò _ûVýûõg-1 (Core Course-9): **IWyò@û iûjòZýe Êeì_, ZZß I iûjòZòýK g±**
 1c GKK / dê^òUþ-1 : KaòZû, C_ ^ýûi, @ûcôRúa^ú
 2d GKK / dê^òUþ-2 : @û]ê^òKZû, C_ ^òùagaû\, eiaû\
 3d GKK / dê^òUþ-3 : _âùdûMòK icúlû, ùg÷kúZûZßòK icúlû
 4[đ GKK / dê^òUþ-4 : Zêk^ûcôK iûjòZýe _eòbûhû I C_ ù~ûMòZû
 5c GKK / dê^òUþ-5 : @^êaû\ZZß I @^êaû\e _âKûeùb\

cìk / _â]û^ _ûVýûõg-10 (Core Course-10): **IWyò@û iûjòZýe iaòùgh @xd^**
ùfLKúd _ûV

1c GKK / dê^òUþ-1 : RM^Ûû[\ûi, C_ |â b-
 2d GKK / dê^òUþ-2 : búcùbûA, iyò\û^!
 3d GKK / dê^òUþ-3 : MùlòK gû«^ê Kêcûe @ûPû~đý, J_ ^ýûiòK ùMû_ú^û[
 cjû«ò
 4[đ GKK / dê^òUþ-4 : ^ûUýKûe RMù^àúj^ fûf I eùcg _âiû\ _ûYòMâújú
 5c GKK / dê^òUþ-5 : _âûaşòK PòZeõR^ \ûi I icûùfûPK ^Uae iúc«eùd

_?c _~đýûd (Semester-V)

cìk / _â]û^ _ûVýûõg-11 (Core Course-11): **IWyò@û iûjòZýe iaòùgh @xd^**
Kûaý KaòZû _ûV

1c GKK / dê^òUþ-1 : cjûbûeZ-M\û_ađ (iûekû \ûi)
 2d GKK / dê^òUþ-2 : Kòùgûûe P|âû^^ Põ_ì (K-N @^ê_âûi)- Kaòi~đý akù\ae[
 3d GKK / dê^òUþ-3 : PòfòKû-eû]û^û[
 4[đ GKK / dê^òUþ-4 : _âûPú^ cæKûkú^ IWyò@û KaòZû, _âûPú iûjòZý
 _âZòÂû^, KUK
 * gâúeûc ùKûAfò-akeûc \ûi
 * cjûaûjê - a^cûkò
 * @û\ý cûMđgúe - @PêýZû^! \ûi
 * c^ùaû] PCZògû - bqPeY
 5c GKK / dê^òUþ-5 : @û]ê^òK IWyò@û KaòZû - iõ_û\^û iÛûZùKûZe gòlû
 _eòh\, C}k aògßaò\ýûkd, iê]û _âKûg^ú, KUK
 * @céZcd- Mwû]e ùcùje
 * ^cÄûe - cûdû]e cû^iòđj
 * Mûşûeúe @ûgúaðû\ - Kûkò! úPeY _ûYòMâújú

* IWÿògû - iúZûKû« cjû_ûZâ

* bd - ecûKû« e[

cik / _â]û^ _ûVýûõg-12 (Core Course-12): **IWÿò@û iûjòZýe @xd^ - K[ûiûjòZý / ^ûUýiûjòZý**

1c GKK / dê^òUþ-1 : @ûKûge Aiûeû (C_ ^ýûi)- cù^ûR \ûi

2d GKK / dê^òUþ-2 : @cûaûiýûe P!â (C_ ^ýûi) - ùMûaò! iû

3d GKK / dê^òUþ-3 : lê\âMì

_ûVýMì : * eûšò_ê@ @^«û -`Kúeùcûj^

* ^úkcûÁâûYú-ùMû\ûaeúg cjû_ûZâ

* gâúKé¾u ùgh jûi - iêùe!â cjû«ò

* ùcûl - _âZòbû eûd

4[đ GKK / dê^òUþ-4 : cwK @cwK aòkß cwK (^ûUK) - aòRd Kêcûe gZ_ [ú, @Mâ\iZ, KUK

@[aû

* iaûùgh ùfûK (^ûUK) - ^eûdY iûjê

5c GKK / dê^òUþ-5 : GKûuòKû _ûV

_ûVý_âiw : * @ûaòÃûe - _âûYaşê Ke

* Q\àùagú - aògßRòZþ \ûi

* cKÿcû - ùMû_ûk ùQûUeûd

hÂ _~đýûd (Semester-VI)

_â]û^ _ûVýûõg-13 (Core Course-13): **IWÿò@û iûjòZý @xd^ - M\ý iûjòZý**

1c GKK / dê^òUþ-1 : ùcû icde IWÿògû-WKÖe Ké¾P!â _ûYòMâûjú (30 _éÂûe _ûVýûõg _V^úd)

2d GKK / dê^òUþ-2 : \êA \òM«e @ûKûg (bâcY KûjûYú)-Kê-aòjûeú \ûg _â[c 4Uò @xûd / 1c bûM

3d GKK / dê^òUþ-3 : Kûaý í'û\ (icûùfûP^û-1/2d @xûd) - \ûge[ô \ûi

4[đ GKK / dê^òUþ-4 : e[i_ K (1c, 2d @xûd)-P!âùgLe e[

5c GKK / dê^òUþ-5 : _âaş : @û]ê^òK IWÿò@û _âaş, iê]û _âKûg^ú,

_ûVý_âiw : cjûùiaûZ - aògß^û[Ke

* ^òR \ûdòZß - cûdû]e cû^iòđj

* _âkd iõùKZ - geZ Kêcûe cjû«ò

cik / _â]û^ _ûVýûõg-14 (Core Course-14): **IWyò@û bûhûe aýûajûeòK**

_âùdûM

1c GKK / dê^òUp-1 : aýûajûeòK fòL^Kkû - _eòbûhû, Êeì_, ùa÷PòZâý

2d GKK / dê^òUp-2 : Kû~đýûkd fòL^ @^êaò]ô (^[ô _âÉêZò I fòL^ / Uò®Yú fòL^ / _âÉûa fòL^ I @^êùcû\^ / PòVû _âÉêZò I fòL^ / @]ôiP^û, aòm`ò I ùNûhYû fòL^)

3d GKK / dê^òUp-3 : iûjòZý I cê\òâZ MYcûæc (iûjòZý I iû'û\òKZû / iûjòZý I iõ_û\Kúd fòL^ PûZêeú / É, aû `òPe eP^û / cê\òâZ MYcûæce bûhû)

4[đ GKK / dê^òUp-4 : _êÉK eP^û ùKøgk

5c GKK / dê^òUp-5 : iõ_û\^û Kkû (_Zâ/_ZòâKû)

_â]û^ _ûVýûõg-5eê _ûVýûõg 14 ^òcù« ijûdK Mâ^ÚiìPú:

1. IWyò@û bûhûe C_òZò I KâcaòKûg : cjû«ò aõgú]e, ù`âŠip _aäògđip, KUK
2. IWyò@û bûhûe Cù^àh I aòKûg : iûjê aûiêù\, ù`âŠip _aäògđip, KUK
3. IWyò@û bûhûZZß I fò_òe aòKûg : Zòâ_ûVú Kê-aòjûeú, eûRý_ûVý _êÉK _âYd^ I _âKûg^ iõiÚû, bêaù^gße
4. aéZò G ùcû ù_ûùh KêUé' : cjû«ò _õPû^^, bêaù^gße
5. iûekû cjûbûeZe bûhûZûZßòK @^êgúk^ : cjû_ûZâ]ù^gße, ù`âŠip _aäògđi, KUK
6. IWyò@û bûhû aòba : cjû_ûZâ aòRd _âiû\, aò\ýû_êeú, KUK
7. aýûajûeòK IWyò@û bûhû I _âùdûMûcôK aýûKeY : Zòâ_ûVú iù«ûh, ^ûk'û, KUK
8. aýûajûeòK IWyò@û aýûKeY : cògâ je_âiû\, _âûPú iûjòZý _âZòÂû^, KUK
9. IWyò@û ùfûKiûjòZý I ùfûK iõÄéZò : _â]û^ Ké¾P'â, aò\ýû_êeú, KUK
10. IWyò@û ùfûKiûjòZý icúlû : cjû_ûZâ gýûciê'e, aò\ýû_êeú, KUK
11. a%õđ _eòPd : UòKûdZeûd ùK÷kûi P'â, iêfb _âKûg^ú, _êeú
12. ùfûK^ûUK : \ûi ùjc« Kêcûe, Mâ^Úc'òe, KUK
13. IWyò@û @ûiuc I aõMkûe ùfûK^ûUý : iûjê ^ûeûdY, iZý^ûeûdY aêKp ùÁûe, KUK
14. IWyò@û ùfûKiõÄéZò I ùfûKiûjòZý : cògâ cùj'â Kêcûe, Mâ^Úc'òe, KUK
15. IWyò@û fò_ò I bûhû : cjû_ûZâ LùMgße, Mâ^Úc'òe, KUK
16. _âùdûMòK bûhû aòmû_ ^e \òMaò\òM : _...^ûdK ùK.aò., IWyò@û

- _ûVý_êÉK_âYd^ I _âKûg^ iõiÚû, bêaù^gße
17. aòPòZâ KaòZß : Zòâ_ûVú iù«ûh, ^ûk!û, KUK
 18. _âùdûMòK IWÿò@û bûhû : cògâ @Rd, KújûYú, KUK
 19. g±MV^ ùKûh : Zòâ_ûVú _â`êfä, bêaù^gße
 20. @û]ê^òK K[û iùjòZý : _...^ûdK aòbìZò, Mâ^Úc!òe, KUK
 21. IWÿò@û _âa§ iùjòZý : Ke aùCeòa§ê, cjúaúe _âKûg^, bêaù^gße
 22. _âùdûMòK IWÿò@û bûhû : eûRý _ûVý_êÉK_âYd^ I _âKûg^ iõiÚû, bêaù^gße
 23. _âPkòZ IWÿò@û bûhûe aýûKeY : cjû_ûZâ aòRd _âiû\, aò\ýû_êeú, KUK
 24. IWÿò@û iùjòZý ùKûh : aògßûk aõgú]e, jòcûõgê _âKûg^, KUK
 25. IWÿò@û iùjòZýe iúcûRòK I iùõÄéZòK AZòjûi : \ûi PòZeõR^, eûRý _ûVý_êÉK_âYd^ I _âKûg^ iõiÚû, bêaù^gße
 26. IWÿò@û bûhûZûZßòK _âa§ I icûùfûP^û : cògâ je_âiû\, @Mâ\ìZ, KUK
 27. IWÿò@û ùføKòK _\ (1c/2d bûM) : _âjeûR ùMû_ûk P!â, KUK ùUâWòõ Kõ_û^ú
 28. C]k MâûcýMúZ I Kkû : cjû_ûZâ PKâ]e, IWÿògû iùjòZý GKûùWcú
 29. iùjòZýe eì_ùeL : jeòP!^ ^úkû\òâ bìhY

**@û«üicÁòcìkK Azû]ú^ _ûV - IWÿò@û
GENERIC ELECTIVES (GE)- COURSE**

ìP^û

- * _ZâiõLýû - 4/8 ùMûUò _ûV \ò@û~òâ - 4ùMûUò _ûV 4Uò _Zâ_ûAñ aùQòaûKê ùjaö
- * _âùZýK _Zâ - 100 ^'e aògòÁ / ùcûU - 400
- * _âùZýK _Zâùe 5ùMûUò GKK ejòaö
- * _âùZýK _Zâe @ûiÚûcìfýûu (Credits) 6 / ùcûU cìfýûu 6 " 4 = 24
- * ahđûjđ _~đýûd 1, 2, 3, 4 (ùicòÁûe 1-2-3-4) _âùZýK _~đýûd aù ùicòÁûeùe ùMûUòG ùMûUòG _ûV_Zâ ejòaö ~[û-
 - * aùhđûjđ _~đýûd-1 (Sem-I) _â[c_Zâ / _ûV-1
 - * aùhđûjđ _~đýûd-2 (Sem-II)\ßòZúd _Zâ / _ûV-2
 - * aùhđûjđ _~đýûd-3 (Sem-III) _â[c_Zâ / _ûV-3
 - * aùhđûjđ _~đýûd-4 (Sem-IV) _â[c_Zâ / _ûV-4
- _âùZýK _Zâ_ûAñ ahđKê @ZòKcpùe 50Uò ùgâYú _ûV\û^ ùja Gaõ 10 ùMûUò ÊKúdùaû]^ cìkK ùgâYú gòlû\û^ (UêýùUêeû@ûfp Käûip) ùjaö

^'e aòbûR^ aò]ô

(K) ùcûU ^'e - 100

(L) @û«ü_eúlû - 20 / cêLý_eúlû - 80

(M) cêLý_eúlûe_âùZýK GKKeê ùMûUòG ùfLûGñ_i!cìkK ùaû]mû^ cû_K
5Uò \úNđ_âgÛ_Wÿòäö 5Uò \úNđ_âgÛeê 3Uòe CZe 600 g± cæùe
ù\âûKê ùjaö 3`12=36

(N) _âùZýK GKKeê ùMûUòG ùfLûGñ f²mû^cìkK iöìò`_âgÛ_Wòäö ùcûU
5ùMûUò_âgÛeê 3ùMûUò_âgÛe CZe 400 g± cæùe ù\âûKê ùjaö
3`8=24

(O) _ûðùPûUò GKKeê ùcûU 8Uò @Zò iöìò`cìkK_âgÛ_Wÿòäö 5Uòe CZe
ùMûUòG aûKýùe ù\âûKê ùjaö
1`5=5

iaòùgh_ûVýKâc

â[c~đýûd (Semester-1) (ùMûUòG aûQ)

_ûV-2 / _Zâ-1 (Core Course-2) : **iRđ^ûgúk Kkû**

1c GKK : iRđ^gúkZûe iöìò`_ I fIY

2d GKK : iRđ^gúkZûe @û]ûe

3d GKK : ^ûUK iöìò`_ eP^û / M_-C_^ýûiKê ^ûUý eì_û«e

4[đ GKK : fòL^ Kkû I bûa iö_âiûeY_ìZò

5c GKK : Mì eP^û ùKøgk

@[aû

_ûV-4 / _Zâ-2 (Core Course-4) : **iûjòZý @xd^**

1c GKK : _âa§ Pd^ (iö. C}k aògßaò\ýûkd)

_ûVý : * @^« ù_âc - aògß^û[Ke

* iûekû iûjòZý - aöğú]e cjû«ò

* cêñ iZý[cđû KjêQò - P!âùgLe e[

2d GKK : KaòZû Pd^ (iö. C}k aògßaò\ýûkd)

_ûVý : * KõPêKòe bûa^û - eû]û^û[eûd

* Zòù^ûUò iù^U - cûdû]e cû^iòöj

* icê\â I cêñ - ùiøbûMý Kêcûe cògâ

3d GKK : @aùaû]_eúlY - (ùMûUòG_ \ý_eòùz\ 200 g± cæùe @]aû lê\â
KaòZûUòG_Wÿòäö Zjòeê 5Uò_âgÛ @aùaû]_eúlYcìkK CZe_ûAñ

@ûMZ ùjaö)
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SYLLABUS FOR B.A. (HONORS) PHILOSOPHY UNDER CHOICE BASED
 CREDIT SYSTEM OF UTKAL UNIVERSITY, BHUBANESWAR

GENERAL PHILOSOPHY

- Unit-I** : Definition, Nature and Function of Philosophy, Philosophy in relation to other modes of thinking like science and Religion
- Unit – II** : Problems of Being : Monism and Pluralism
 Realism: (a) Naive Realism (b) Representative Realism (Locke), Idealism
 : Meaning, Esse est Percipi (Berkeley)
- Unit – III** : Problems of Knowledge: What is Knowledge? Sources of Knowledge
 : Empiricism, Rationalism
- Unit –IV** : Problems of Ethics : (1) Theories of Goodness : The Good and the Evil (2) Theories of Conduct : Egoism and Altruism
- Unit-V** : Problems of Metaphysics:
 (1) Substance and Universal
 (2) Mind and Body

Basic Study Materials:

1. John Hospers - An Introduction to Philosophical Analysis

2. G. T. W. Patrick - Introduction to Philosophy
3. G. W. Cunningham - Problems of Philosophy
4. B. Russell - Problems of Philosophy
5. D. W. Hamlyn - Metaphysics
6. Richard Taylor - Metaphysics

FIRST YEAR U. G. CORE COURSE

Semester – I

Paper – II: Logic & Scientific Method

Full Marks: 20 + 80 = 100

Credit Points: 04

- Unit-I** : Definition of Logic, Deductive & Inductive Arguments, Validity & Soundness of Arguments, Laws of Thought
- Unit – II** : Classification of Propositions (from Quality & quantity stand point) Distribution of terms, Square of Oppositions, Existential Import of Propositions, Interpretation of Categorical Propositions
- Unit-III** : Inference – Immediate Inference (Conversion & Observation) Mediate Inference (Syllogism) : Figure & Moods, Testing Validity of Arguments by syllogistic Rules
- Unit-IV** : Inductive Reasoning & Scientific Enquiry
- (a) Laws of Causation – Meaning & Definition cause and condition, Qualitative & Quantitative Marks of Causation
- (b) Mills Experimental Methods
- Unit-V** : Science & Probability : (a) Scientific Explanation and Unscientific explanation (b) Hypothesis & Confirmation

Recommended Books:

1. Copi, Cohen & MacMahan – Introduction to Logic (14th Edition)
2. Cohen & Nagel – Introduction to Logic & Scientific Method
3. Alex Rosenberg – Philosophy of Science : A Cont. Introduction
4. W. Kneale – Probability & Introduction
5. John Hospers – Philosophical Analysis

SYSTEMS OF INDIAN PHILOSOPHY (I)

Full Mark: 20 + 80 = 100

Credit Points: 04

- Unit-I** : Salient Features of Indian Philosophy, Astika & Nastika systems,
Basic concepts like Rta, Rna, Purusartha, Law of Karma
- Unit – II** : Carvakas – Epistemology and Metaphysics (Lokayatamata)
- Unit-III** : Jainism – Syadvada, Anekantavada Jaina ethics (concept of Triratna)
- Unit-IV** : Buddhism – Four Noble Truths, Doctrine of Momentariness,
Dependant Origination, No Soul Theory, Nirvana
- Unit-V** : Samkhya Dualistic System : Purusa, Prakriti, Theory of Causation,
Theory of Evolution

Books Recommended:

1. G. C. Nayak (ODIA) - Bharatiya Darshana
2. B. B. Choudhury (ODIA) - Bharatiya Darshanara Ruparekha (Trans.) of M. Hiriyana's Outline of Indian Philosophy
3. Dutta & Chatterjee – An Introduction to Indian Philosophy
4. C. D. Sharma – A Critical Survey of Indian Philosophy
5. R. K. Puligandla – Fundamentals of Indian Philosophy
6. S. Radhakrishnan – Indian Philosophy, Vol. I / II
7. J. N. Sinha – Indian Philosophy

Semester-II / Paper-IV / Phil. Core

SYMBOLIC LOGIC

Full Mark: 20 + 80 = 100

Credit Points: 04

Books Prescribed: Basson & O' Corner: Introduction to Symbolic Logic

Unit-I	Chapter-I	Introduction
	Chapter-II	The Calculus of Propositions
Unit – II	Chapter-III	Calculus of Propositions (Sec 1 to 60
Unit-III	Chapter – III	Calculation of Propositions (Sec 7 to 9)
Unit-IV	Chapter-V	The Elements of Predicate Calculus (Section 1 to 9)
Unit-V	Appendix	(Sec-1 to Sec-4)

2nd Year U. G. Philosophy (Core)

Semester-III / Paper-VI / Ethics

Full Mark: 20 + 80 = 100

Credit Points: 04

Unit-I	: Definition, Nature & Scope of Ethics. Ethics in relation to Politics, Sociology and Religion
Unit – II	: Distinction between moral and non-moral action Moral Judgement and factual judgement, subject or Moral judgement
Unit-III	: Utilitarianism, Hedonism
Unit-IV	: Rigorism, Perfectionism
Unit-V	: Theories of punishment; Retributive, Reformative and Preventive theory

Books for Reference:

1. J. N. Sinha – A Manual of Ethics
2. W. Frankena – Ethics

Semester – II Paper

– VII / Phil. (Core)

HISTORY OF GREEK PHILOSOPHY

F. M.: 20 + 80 = 100

Credits: 04

- Unit-I** : Nature of Greek Philosophy: What is Philosophy? Origin, development and salient features of early Greek Thought
- Unit – II** : Pre-Socratic Thought : The Being of Thales, Becoming of Heraclitus and Atomism of Democritus
- Unit-III** : Socrates : Problem before Socrates, Dialectical method, epistemology of Socrates and ethics
- Unit-IV** : Plato : Theory of Idea, Theory of Knowledge and Theory of Soul
- Unit-V** : Aristotle : A Critique of Plato, Theory of Form and Matter, Theory of Causation

Suggested Readings:

- (1) W. T. Stace - Greek Philosophy
- (2) Burnet - Greek Philosophy
- (3) Y. Masih - A Critical History of Philosophy
- (4) F. Thilly - A History of Philosophy
- (5) B. Russell - A History of Western Philosophy
- (6) B. A. G. Fuller - A History of Greek Philosophy

Semester – III

Paper – V / Phil. (Core)

SYSTEMS OF INDIAN PHILOSOPHY (II)

F. M.: 20 + 80 = 100

Credits: 04

- Unit-I** : Yoga system of Patanjali: Citta Vriti Nirodha and Astanga Yoga
- Unit – II** : Nyaya: Pramanas
Vaisesika: Categories (Padarthas)
- Unit-III** : Upanisadic view of Atman and Brahman Vidya & Avidya, Para
Vidya & Apra Vidya
- Unit-IV** : Sankara's View on Maya, Jiva, Isvara & Brahman and Liberation
(Jivanmukti & Videhamukti)
- Unit-V** : Ramanuja – Refutation of Sankara's view of Maya, Concept of
Brahman, Jiva and Liberation

Books Recommended:

- (1) G. C. Nayak (ODIA) - Bharatiya Darshana
- (2) B. B. Choudhury (ODIA) (Trans.) - Bharatiya Darshanara Ruparekha
- (3) Dutta & Chatterjee – An Introduction to Indian Philosophy
- (4) J. N. Sinha – Indian Philosophy
- (5) R. K. Puligandla – Fundamentals of Indian Philosophy
- (6) S. Radhakrishnan – Indian Philosophy (Vol. I & II)
- (7) J. N. Sinha – Indian Philosophy

Semester – IV

U. G. Arts Core (Philosophy)

Paper - VII

CONTEMPORARY INDIAN PHILOSOPHY

F. M.: 20 + 80 = 100

Credits: 04

- Unit-I** : R. N. Tagore : God and Reality, Nature of Religion Man and his destiny
- Unit – II** : Swami Vivekananda : Concept of Man and his Destiny, Practical Vedanta, Universal Religion
- Unit-III** : Sri Aurovindo: Nature of World, Maya, Theory of Evolution, Satchidananda, Integral Yoga
- Unit-IV** : M. K. Gandhi: Truth, God, Non-violence, Satyagraha and Sarvodaya
- Unit-V** : S. Radhakrishnan : Concept of Man, Reality, Intellect & Institution Religion

Basic Study Materials:

- (1) B. K. Lal – Contemporary Indian Philosophy
- (2) T. M. P. Mahadevan & V. Saroja – Contemporary Indian Philosophy
- (3) H. Sahoo (ed.) – Contemporary Indian Philosophy

Semester – IV

Paper – IX

(HISTORY OF MODERN EUROPEAN PHILOSOPHY)

F. M. : 20 + 80 = 100

Credits : 04

- Unit-I** : Bacon – Theory of Idola, Inductive Method
Descartes – Universal Doubt, Cogito-ergo-sum, Existence of God,
Interactionism
- Unit – II** : Spinoza – Substance, Attribute and Modes Psycho-physical parallelism
Leibnitz – Theory of Monads, pre-established Harmony
- Unit-III** : Locke : Refutation of Innate Ideas, Sources of Knowledge
Berkeley : Subjective Idealism, Esse-est-Percipi
- Unit-IV** : Hume – Impression & Ideas, Scepticism, Theory of Causality
- Unit-V** : Kant – Reconciliation between Empiricism and Rationalism, Possibility
of Synthetic Apriority Judgement Space & Time

Books Prescribed

1. Y. Masih – History of Western Philosophy
2. H. Ray & G. Das – (O) Paschatya Darshanara Itihasa
3. Fran Thilly – A History of Philosophy
4. Ira Sengupta – A History of Western Philosophy
5. B. Russell – History of Western Philosophy
6. Barlingay & Kulkarni – A critical survey of Western Philosophy

Semester – IV

(Philosophy Core)

Paper – X

(PHILOSOPHY OF LANGUAGE)

F. M.: 20 + 80 = 100

Credits: 04

- Textual Study** : John Hospers – An Introduction to Philosophical Analysis
- Unit-I** : Word – Meaning : Meaning of the word “Meaning” Ambiguity and vagueness
- Unit – II** : Definitions : Denotative, Connotative, & Ostensive Defining and Accompanying characteristics stipulate & Reparative Definition, Persuasive definition
- Unit-III** : Sentence – Meaning : Proposition and sentence word-meaning and sentence – meaning, criteria of sentence – meaning/
- Unit –IV** : Analytic – synthetic, a priori – a posteriori, distinction, logical possibility and impossibility.
- Unit – V** : Concept ; Nature and source
Truth : Correspondence, Coherence and Truth as it “Works”

B.A. (Hons)

Semester – V / Paper – XI

F.M. 20+80

=100

3rd Year

Study of Western Classic

Credits -04

[Meditations of Rene Descartes]

Unit-I

Meditation – I

Sceptical Doubts

Meditation – II

Cogito ergo sum, Sum res cogitans The wax
Argument

Unit – II

Meditation – III

Clear and distinct perceptions Theory of Ideas,
Existence of God

Unit-III

Meditation – IV

God is no Deceiver, Will, Intellect and
Possibility of Error

Unit – IV

Meditation – V

Essence of Material Things, Existence of God

Unit – V

Meditation – VI

Mind-body Dualism, Primary & Secondary
Quality

Book Recommended

1. Rene Descartes - Meditations on First Philosophy
2. Rae Langton - A study guide to Descartes Meditations
3. Amelie Rorty - Essays on Descartes Meditations

ISA UPANISADS WITH SANKARA’S COMMENTARY

Unit-I	What are Upanisads, place of Upanisads in Indian Philosophy and Culture – Isa Upanisad
Unit – II	Mantra 1 to 44
Unit-III	Mantra 5 to 9
Unit – IV	Mantra 10 to 14
Unit – V	Mantra 15 to 18

Basic Study Materials:

1. The Isa Upanisad with Sankara’s Commentary
2. S. Radhakrishnan - The Principal Upanisad
3. Satyavadi Mishra - Central Philosophy of the Upanisads

SOCIAL & POLITICAL PHILOSOPHY

Unit-I	Sociality, Social Science & Social Laws Philosophy of Social Science – Relation between Individual society (Mechanical, Organic and Idealistic view)
Unit – II	Political Ideals – Justice, Liberty, Equality, Equality Political Doctrines – Humanism, Secularism Feminism, Philosophy Ecology
Unit-III	Democratic Ideals: Democratic Government, Conditions for successful functioning of Democracy.
Unit – IV	Political Ideologies (a) Anarchism (b) Marxism (C) Sarvodaya
Unit – V	Social progress: Human Rights: Origin and development, Declaration of Human Rights : Theory and Practice

Basic for Suggested Readings:

1. O.P. Gauba – An Introduction to Political Philosophy
2. J. Sinha – Outlines of Political Philosophy
3. D.D. Raphael – Problems of Political Philosophy
4. Krishna Ray & Chhanda Gupta – Essays in Social & Political Philosophy
5. M.K. Gandhi – Hind Swaraj

APPLIED ETHICS

- Unit – I** What is Applied Ethics : Nature & Scope of applied ethics – Ethical Theories – Deontology, Utilitarianism, Relativism and Subjectivism
- Unit – II** **Taking Life : Animals** – Animals Rights, Reverence for life, killing of animals
- Unit – III** **Taking Life : Humans** – Euthanasia : Types Abortion
- Unit – IV** Environmental Ethics : Relation between man and nature, Anthropocentrism, Non-Anthropocentrism
Western Tradition – Responsibility for Future Generation, Deep Ecology
- Unit – V** Professional Ethics : (a) Business ethics – Rights and obligations, justice & honesty in ethics.
(b) Bio-medical Ethics – Hippocratic Oath, Rights and obligations of Health – care Professionals, Doctor- Patient-Relationship

Books Recommended

1. Peter Singer – Practical Ethics
2. J. Jagadev – Biomedical Ethics
3. Tom Regan – Animal Rights
4. J.P. Thirou – Ethics : Theory & Practice

Discipline Specific Elective (DSE)

Semester – V

(Credits 4/F.M. 100)

Paper – I

THE PHILOSOPHY OF BHAGBAD GITA

- Unit – I** The Bhagabad Gita: Concept of Yoga, Concept of life and death.
- Unit – II** Karma & Karmaphala in the Bhagabad Gita, classification of Karma :
Karma, Akarma, Vikarma
- Unit- III** Concepts like Jnana & Vijnana, Ksara and Aksara, Uttama Purusa in Bhagabad Gita.
- Unit – IV** Chapter XVIII (Verse 1 to 36) with Sankara’s commentary

Basic Study Materials:

1. S.Radhakrishnan (Trans. & Ed) - The Bhagabad Gita
2. S.C. Panigrahi - Concept of Yoga in the Gita
3. A.G.K. Warrior (Trans.) - Srimad Bhagabad Gita Bhasya of Sri Sankaracharya
4. K.M. Munshi & R.R. Diwakar - Bhagabad Gita & Modern Life
5. P.N. Srinivasachari - The Ethical Philosophy of the Gita

Paper – II Philosophy

of Religion (DSE-II)

- Basic Text** John Hick – Philosophy of Religion
- Unit – I** Introduction to Philosophy of Religion Judaism – Christian Concept of God (Chapter – 1)
- Unit – II** Grounds for belief in existence of God (Chapter – 2)
- Unit – III** Grounds for belief against existence of God (Chapter – 3)
- Unit – IV** The Problem of Evil (Chapter – 4)
- Unit- V** Conflicting Truth Claims of different Religions (Chapter – 9)
Religious Pluralism

Books for Reference

1. Y. Masih- Introduction to Religious Philosophy
2. Arvind Sharma – Philosophy of Religion

Paper – III

Philosophy of Mind (DSE-3)

- Unit – I Nature and Scope of Philosophy of Mind, Mind and Soul, Nature of Mental Phenomena Consciousness – Theories of Mental Phenomena
- Unit – II The Third Person Account: Merits and Limitations. The First Person Account, Theory of intentionality.
- Unit – III Some theories of Mind – Dualism, Materialism, Identity Theory, Double Aspect Theory.
- Unit – IV The Concept of a person and the problem of personal Identity.
- Unit – V Some theories of Mind – Interactionism, Parallelism, Epiphenomenalism, The Problem of Free will.

Basic Study Materials

1. J.A. Shaffer – Philosophy of Mind
2. S. Shoemaker – Self knowledge & self- identity
3. S. Hampshire – Philosophy of Mind
4. T.E. Wilkerson – Minds brains and people

SEMESTER – VI

PAPER - I

Project Compulsory

(Dissertation 60 + Viva 40 Marks)

The student has to prepare a project of his own selecting a topic from Philosophical perspective in consultation with a teacher. He / She has to prepare a dissertation of 60 marks which will be evaluated by an external examiner and he / she will face a viva-voice test (40 marks) by an external examiner along with his / her supervisor of the concerned project.

Paper – II

Gandhian Studies

- Unit – I Political Thought of Gandhi** : Gandhi's concept of Politics – goals and methods of action; concept and claim of spiritualizing politics, Satyagraha
- Unit – II Economic Thought of Gandhi** : Gandhi's ideas and efforts in the field of economics; Gandhi's critique of industrialization – evils and consequences; philosophy of work & employment, need and greed
- Unit – III Gandhi's Social Thought and Social Work:** Philosophy of Sarvodaya, concept of Gram Swaraj, Varnashrama Versus Caste system untouchability.
- Unit- IV Gandhi on Education:** Meaning and aims of education Basic education (Nai Talim), Duties of Students, Parents and Teachers in education and their interrelationship.
- Unit – V Gandhi's idea of Peace:** Meaning of peace and violence; peace and Disarmament; Non-violent way to world peace. Combating terrorism through non-violence; Gandhian Approach to conflict Resolution – Shanti Sena

Basic Study Materials :

1. Mahatma Gandhi - Autobiography
2. Mahatama Gandhi - Hind- Swaraj
3. Mahatama Gandhi - Towards Non-violent Socialism
4. Mahatma Gandhi - Towards New Education
5. S. Radhakrishnan (ed.) - Mahatma Gandhi: Essays & Reflect
6. R.K. Prabhu & U.R. Rao- The mind of Mahatma Gandhi
7. Sarat Mahanty (ODIA) - Gandhi Manisha

Semester – VI DSE**Study of Major Religions of the World****Paper –III**

- unit– I** Sanatan Dharma: Basic features of Sanatan Dharma, The
Conception of Man (amritasya Putra), His Pursuits: Dharma , Artha,
Kama &
Moksa
- Unit – II** Buddhism: Basic features of Buddhism, Four noble truths, Eight-fold
Path, Nirvana
- Unit – III** Jainism: Three Gems, Five Vows, Liberation
- Unit – IV** Christianity: Basic features, God, World ,Salvation
- Unit – V** Islam: Basic features, Man ,God & Human Destiny

Suggested Readings:

- 1.Y. Masih - A Comparative Study of Religions
2. Lloyd Ridgeon - Major World Religions
3. K. N.Tiwary - Comparative Religion

Ethics: Theory & Practice

Unit – I	Definition, Nature & Scope of Ethics , Distinction between moral & non-moral action, stages of development of voluntary Action.
Unit – II	Distinction between factual and moral judgment, objects of moral judgment.
Unit – III	Moral Standards : Hedonism, Mill’s Utilitarianism, Kant’s Rigorism & Perfectionism
Unit – IV	Environmental Ethics : Relation between Man & Nature, Anthropocentrism and Non - Anthropocentrism
Unit- V	Concept of Bio-centric, Egalitarianism, Deep Ecology – Man’s Responsibility for the future generation

Recommended Study Materials :

1. William Franken – Ethics
2. J.N. Sinha – A Manual of Ethics
3. Peter Singer – Practical Ethics

SKILL ENHANCEMENT COURSE

Paper – I

F.M 50

Critical Thinking

- Unit – I Introduction to Critical Thinking : Standards of Critical thinking, benefits and limitations
- Unit – II Arguments & Recognising arguments : Definition & Contents of argument premises, hidden premises, conclusions intermediate conclusions

Book Recommended :

1. Hurley, Patrick. J. – A concise Introduction to Logic (2015) 12th Ed.
2. Madhuchhanda Sen - An Introduction to Critical Thinking (2010)

SKILL ENHANCEMENT COURSE

Paper – II

F.M 50

Applied Reasoning

- Unit – I Fallacies: Introduction, fallacies of Relevance, fallacies of Presumption, Fallacies of Ambiguity, Illicit Transference, fallacies in Ordinary language
- Unit – II Types of Reasoning: Analogical, Legal and Moral
- Unit – III Science & Superstition: Distinction, Evidentiary Support, Objectivity Integrity

Book Recommended :

1. H. Patrick, J. – A Concise Introduction to Logic (2015) 12th Edition
2. M. Sen - An Introduction to Critical Thinking (2010)

**SYLLABUS FOR B.A. (HONORS) POLITICAL SCIENCE
UNDER CHOICE BASED CREDIT SYSTEM OF UTKAL
UNIVERSITY, BHUBANESWAR**

1.1

Paper I- Understanding Political Theory

Course Objective: This course is divided into two sections. Section A introduces the studentsto the idea of political theory, its history and approaches, and an assessment of its critical and contemporary trends. Section B is designed to reconcile political theory and practice through reflections on the ideas and practices related to democracy.

I: Introducing Political Theory (30 Lectures)

1. What is Politics: Theorizing the 'Political'
2. Traditions of Political Theory: Liberal, Marxist, Anarchist and Conservative
3. Approaches to Political Theory: Normative, Historical and Empirical
Critical and Contemporary Perspectives in Political Theory: Feminist and Postmodern

II: Political Theory and Practice (30 Lectures)

The Grammar of Democracy

1. Democracy: The history of an idea
2. Procedural Democracy and its critique
3. Deliberative Democracy

4. Participation and Representation

Essential Readings

I: Introducing Political Theory

Bhargava, R. (2008) 'What is Political Theory', in Bhargava, R and Acharya, A. (eds.) *Political Theory: An Introduction*. New Delhi: Pearson Longman, pp. 2-16.

Bellamy, R. (1993) 'Introduction: The Demise and Rise of Political Theory', in Bellamy, R. (ed.) *Theories and Concepts of Politics*. New York: Manchester University Press, pp. 1-14.

Glaser, D. (1995) 'Normative Theory', in Marsh, D. and Stoker, G. (eds.) *Theory and Methods in Political Science*. London: Macmillan, pp. 21-40.

Sanders, D. (1995) 'Behavioral Analysis', in Marsh, D. and Stoker, G. (eds.) *Theory and Methods in Political Science*. London: Macmillan, pp. 58-75.

Chapman, J. (1995) 'The Feminist Perspective', in Marsh, D. and Stoker, G. (eds.) *Theory and Methods in Political Science*. London: Macmillan, pp. 94-114.

Bhargava, R, 'Why Do We Need Political Theory', in Bhargava, R. and Acharya, A. (eds.) *Political Theory: An Introduction*. New Delhi: Pearson Longman, pp. 17-36.

Bannett, J. (2004) 'Postmodern Approach to Political Theory', in Kukathas, Ch. and Gaus, G. F. (eds.) *Handbook of Political Theory*. New Delhi: Sage, pp. 46-54.

Vincent, A. (2004) *The Nature of Political Theory*. New York: Oxford University Press, 2004, pp. 19-80.

II: The Grammar of Democracy

Srinivasan, J. (2008) 'Democracy', in Bhargava, R. and Acharya, A. (eds.) *Political Theory: An Introduction*. New Delhi: Pearson Longman, pp. 106-128.

Owen, D. (2003) 'Democracy', in Bellamy, R. and Mason, A. (eds.) *Political Concepts*. Manchester and New York: Manchester University Press, pp. 105-117.

Christiano, Th. (2008) 'Democracy', in Mckinnon, C. (ed.) *Issues in Political Theory*, New York: Oxford University Press, pp. 80-96.

Arblaster, A. (1994) *Democracy*. (2nd Edition). Buckingham: Open University Press.

Roy, A. 'Citizenship', in Bhargava, R. and Acharya, A. (eds.) *Political Theory: An Introduction*. New Delhi: Pearson Longman, pp. 130-146.

Brighouse, H. (2008) 'Citizenship', in Mckinnon, C. (ed.) *Issues in Political Theory*, New York: Oxford University Press, pp. 241-258.

1.2 Paper II- Constitutional Government and Democracy in India

Course objective: This course acquaints students with the constitutional design of state structures and institutions, and their actual working over time. The Indian Constitution accommodates conflicting impulses (of liberty and justice, territorial decentralization and a strong union, for instance) within itself. The course traces the embodiment of some of these conflicts in constitutional provisions, and shows how these have played out in political practice. It further encourages a study of state institutions in their mutual interaction, and in interaction with the larger extra-constitutional environment.

I. The Constituent Assembly and the Constitution (16 lectures)

- a. Philosophy of the Constitution, the Preamble, and Features of the Constitution (2 weeks or 8 lectures)
- b. Fundamental Rights and Directive Principles (2 weeks or 8 lectures)

II. Organs of Government (20 lectures)

- a. The Legislature: Parliament (1.5 weeks or 6 lectures)
- b. The Executive: President and Prime Minister (2 weeks or 8 lectures)
- c. The Judiciary: Supreme Court (1.5 weeks or 6 lectures)

III. Federalism and Decentralization (12 lectures)

- a. Federalism: Division of Powers, Emergency Provisions, Fifth and Sixth Schedules (2 weeks or 8 lectures)
- b. Panchayati Raj and Municipalities (1 week or 4 lectures)

READING LIST

I. The Constituent Assembly and the Constitution

a. Philosophy of the Constitution, the Preamble, and Features of the Constitution

Essential Readings:

G. Austin, (2010) 'The Constituent Assembly: Microcosm in Action', in *The Indian Constitution: Cornerstone of a Nation*, New Delhi: Oxford University Press, 15th print, pp.1-25.

R. Bhargava, (2008) 'Introduction: Outline of a Political Theory of the Indian Constitution', in R. Bhargava (ed.) *Politics and Ethics of the Indian Constitution*, New Delhi: Oxford University Press, pp. 1-40.

Additional Reading:

D. Basu, (2012) *Introduction to the Constitution of India*, New Delhi: Lexis Nexis.

S. Chaube, (2009) *The Making and Working of the Indian Constitution*, Delhi: National Book Trust.

b. Fundamental Rights and Directive Principles

Essential Readings:

G. Austin, (2000) 'The Social Revolution and the First Amendment', in *Working a Democratic Constitution*, New Delhi: Oxford University Press, pp. 69-98.

A. Sibal, (2010) 'From Niti to Nyaya,' *Seminar*, Issue 615, pp 28-34.

Additional Reading:

The Constitution of India: Bare Act with Short Notes, (2011) New Delhi: Universal, pp. 4-16.

II. Organs of Government

a. The Legislature: Parliament

Essential Readings:

B. Shankar and V. Rodrigues, (2011) 'The Changing Conception of Representation: Issues, Concerns and Institutions', in *The Indian Parliament: A Democracy at Work*, New Delhi: Oxford University Press, pp. 105-173.

V. Hewitt and S. Rai, (2010) 'Parliament', in P. Mehta and N. Jayal (eds.) *The Oxford Companion to Politics in India*, New Delhi: Oxford University Press, pp. 28-42.

b. The Executive: President and Prime Minister

Essential Readings:

J. Manor, (2005) 'The Presidency', in D. Kapur and P. Mehta P. (eds.) *Public Institutions in India*, New Delhi: Oxford University Press, pp.105-127.

J. Manor, (1994) 'The Prime Minister and the President', in B. Dua and J. Manor (eds.) *Nehruto the Nineties: The Changing Office of the Prime Minister in India*, Vancouver: University of British Columbia Press, pp. 20-47.

H. Khare, (2003) 'Prime Minister and the Parliament: Redefining Accountability in the Age of Coalition Government', in A. Mehra and G. Kueck (eds.) *The Indian Parliament: A Comparative Perspective*, New Delhi: Konark, pp. 350-368.

c. The Judiciary: Supreme Court

Essential Readings:

U. Baxi, (2010) 'The Judiciary as a Resource for Indian Democracy', *Seminar*, Issue 615, pp. 61-67.

R. Ramachandran, (2006) 'The Supreme Court and the Basic Structure Doctrine' in B. Kirpal et.al (eds.) *Supreme but not Infallible: Essays in Honour of the Supreme Court of India*, New Delhi: Oxford University Press, pp. 107-133.

Additional Reading:

L. Rudolph and S. Rudolph, (2008) 'Judicial Review Versus Parliamentary Sovereignty', in *Explaining Indian Institutions: A Fifty Year Perspective, 1956-2006: Volume 2: The Realm of Institutions: State Formation and Institutional Change*. New Delhi: Oxford University Press, pp. 183-210.

III. Federalism and Decentralization

a. Federalism: Division of Powers, Emergency Provisions, Fifth and Sixth Schedules

Essential Readings:

M. Singh, and R. Saxena (eds.), (2011) 'Towards Greater Federalization,' in *Indian Politics: Constitutional Foundations and Institutional Functioning*, Delhi: PHI Learning Private Ltd., pp.166-195.

V. Marwah, (1995) 'Use and Abuse of Emergency Powers: The Indian Experience', in B. Arora and D. Verney (eds.) *Multiple Identities in a Single State: Indian Federalism in a Comparative Perspective*, Delhi: Konark, pp. 136-159.

B. Sharma, (2010) 'The 1990s: Great Expectations'; 'The 2000s: Disillusionment Unfathomable', in *Unbroken History of Broken Promises: Indian State and Tribal People*, Delhi: Freedom Press and Sahyog Pustak Kuteer, pp. 64-91.

The Constitution of India: Bare Act with Short Notes, (2011) New Delhi: Universal, pp 192-213.

Additional Readings:

R. Dhavan and R. Saxena, (2006) 'The Republic of India', in K. Roy, C. Saunders and J. Kincaid (eds.) *A Global Dialogue on Federalism*, Volume 3, Montreal: Queen's University Press, pp. 166-197.

R. Manchanda, (2009) *The No Nonsense Guide to Minority Rights in South Asia*, Delhi: Sage Publications, pp. 105-109.

b. Panchayati Raj and Municipalities

Essential Readings:

P. deSouza, (2002) 'Decentralization and Local Government: The Second Wind of Democracy in India', in Z. Hasan, E. Sridharan and R. Sudarshan (eds.) *India's Living Constitution: Ideas, Practices and Controversies*, New Delhi: Permanent Black, pp. 370-404.

M. John, (2007) 'Women in Power? Gender, Caste and Politics of Local Urban Governance', in *Economic and Political Weekly*, Vol. 42(39), pp. 3986-3993.

Raghunandan, J. R (2012) *Decentralization and local governments: The Indian Experience*, Orient Black Swan, New Delhi

Baviskar, B.S and George Mathew (eds) 2009 *Inclusion and Exclusion in local governance: Field Studies from rural India*, New Delhi, Sage

2.1 Paper III – Political Theory-Concepts and Debates

Course Objective: This course is divided into two sections. Section A helps the student familiarize with the basic normative concepts of political theory. Each concept is related to a crucial political issue that requires analysis with the aid of our conceptual understanding. This exercise is designed to encourage critical and reflective analysis and interpretation of social practices through the relevant conceptual toolkit. Section B introduces the students to the important debates in the subject. These debates prompt

us to consider that there is no settled way of understanding concepts and that in the light of new insights and challenges, besides newer ways of perceiving and interpreting the world around us, we inaugurate new modes of political debates.

Section A: Core Concepts

I. Importance of Freedom (10 Lectures)

a) Negative Freedom: Liberty

b) Positive Freedom: Freedom as Emancipation and Development

Important Issue: Freedom of belief, expression and dissent

II. Significance of Equality (12 lectures)

a) Formal Equality: Equality of opportunity

b) Political equality

c) Egalitarianism: Background inequalities and differential treatment

Important Issue: Affirmative action

III. Indispensability of Justice (12 Lectures)

a) Procedural Justice

b) Distributive Justice

c) Global Justice

Important Issue: Capital punishment

IV. The Universality of Rights (13 Lectures)

a) Natural Rights

b) Moral and Legal Rights

c) Three Generations of Rights

d) Rights and Obligations

Important Issue: Rights of the girl child

Section B: Major Debates (13 Lectures)

I. Why should we obey the state? Issues of political obligation and civil disobedience.

II. Are human rights universal? Issue of cultural relativism.

III. How do we accommodate diversity in plural society? Issues of multiculturalism and toleration.

Essential Readings Section

A: Core Concepts

I. Importance of Freedom

Riley, Jonathan. (2008) 'Liberty' in McKinnon, Catriona (ed.) *Issues in Political Theory*, New York: Oxford University Press, pp. 103-119.

Knowles, Dudley. (2001) *Political Philosophy*. London: Routledge, pp. 69- 132.

Swift, Adam. (2001) *Political Philosophy: A Beginners Guide for Student's and Politicians*. Cambridge: Polity Press, pp. 51-88.

Carter, Ian. (2003) 'Liberty', in Bellamy, Richard and Mason, Andrew (eds.). *Political Concepts*. Manchester: Manchester University Press, pp. 4-15.

Sethi, Aarti. (2008) 'Freedom of Speech and the Question of Censorship', in Bhargava, Rajeev and Acharya, Ashok. (eds.) *Political Theory: An Introduction*. New Delhi: Pearson Longman, pp. 308-319.

II. Significance of Equality

Swift, Adam. (2001) *Political Philosophy: A Beginners Guide for Student's and Politicians*. Cambridge: Polity Press, pp. 91-132.

Casal, Paula & William, Andrew. (2008) 'Equality', in McKinnon, Catriona. (ed.) *Issues in Political Theory*. New York: Oxford University Press, pp. 149- 165.

Acharya, Ashok. (2008) 'Affirmative Action', in Bhargava, Rajeev and Acharya, Ashok. (eds.) *Political Theory: An Introduction*. New Delhi: Pearson Longman, pp. 298-307.

III. Indispensability of Justice

Menon, Krishna. (2008) 'Justice', in Bhargava, Rajeev and Acharya, Ashok. (eds.) *Political Theory: An Introduction*. New Delhi: Pearson Longman, pp. 74-86.

Wolf, Jonathan. (2008) 'Social Justice', in McKinnon, Catriona. (ed.) *Issues in Political Theory*. New York: Oxford University Press, pp. 172-187.

Swift, Adam. (2001) *Political Philosophy: A Beginners Guide for Student's and Politicians*.

Cambridge: Polity Press, pp. 9-48.

Knowles, Dudley. (2001) *Political Philosophy*. London: Routledge, pp. 177-238.

McKinnon, Catriona. (ed.) (2008) *Issues in Political Theory*. New York: Oxford University Press, pp. 289-305.

Bedau, Hugo Adam. (2003) 'Capital Punishment', in LaFollette, Hugh (ed.). *The Oxford Handbook of Practical Ethics*. New York: Oxford University Press, pp. 705-733.

IV. The Universality of Rights

Seglow, Jonathan. (2003) 'Multiculturalism' in Bellamy, Richard and Mason, Andrew (eds.). *Political Concepts*. Manchester: Manchester University Press, pp. 156-168.

Tulkdar, P.S. (2008) 'Rights' in Bhargava, Rajeev and Acharya, Ashok. (eds.) *Political Theory: An Introduction*. New Delhi: Pearson Longman, pp. 88-104.

McKinnon, Catriona. (2003) 'Rights', in Bellamy, Richard and Mason, Andrew. (eds.) *Political Concepts*. Manchester: Manchester University Press, pp. 16-27.

Menlowe, M.A. (1993) 'Political Obligations', in Bellamy Richard.(ed.) *Theories and Concepts of Politics*. New York: Manchester University Press, pp. 174-194.

Amoah, Jewel. (2007) 'The World on Her Shoulders: The Rights of the Girl-Child in the Context of Culture & Identity', in *Essex Human Rights Review*, 4(2), pp. 1-23.

Working Group on the Girl Child (2007), *A Girl's Right to Live: Female Foeticide and Girl Infanticide*, available on [http://www.crin.org/docs/Girl's infanticide CSW 2007.txt](http://www.crin.org/docs/Girl's%20infanticide%20CSW%202007.txt)

Section B: Major Debates

Hyums, Keith. (2008) 'Political Authority and Obligation', in Mckinnon, Catriona. (ed.) *Issues in Political Theory*, New York: Oxford University Press, pp. 9-26

Martin, Rex. (2003) 'Political Obligation', in Bellamy, Richard and Mason, Andrew. (eds.) *Political Concepts*, Manchester: Manchester University Press, pp. 41-51.

Campbell, Tom. (2008) 'Human Rights' in Mckinnon, Catriona. (ed.) *Issues in Political Theory*. New York: Oxford University Press, pp. 194-210.

Mookherjee, Monica, 'Multiculturalism', in Mckinnon, Catriona. (ed.) *Issues in*

Political Theory. New York: Oxford University Press, pp. 218- 234.

Seglow, Jonathan, 'Multiculturalism', in Bellamy, Richard and Mason, Andrew. (eds.) *Political Concepts*, Manchester: Manchester University Press, pp. 156-168.

2.2 Paper IV- Political Process in India

Course objective: Actual politics in India diverges quite significantly from constitutional legal rules. An understanding of the political process thus calls for a different mode of analysis - that offered by political sociology. This course maps the working of 'modern' institutions, premised on the existence of an individuated society, in a context marked by communitarian solidarities, and their mutual transformation thereby. It also familiarizes students with the working of the Indian state, paying attention to the contradictory dynamics of modern state power.

I. Political Parties and the Party System (1.5 weeks or 6 lectures)

Trends in the Party System; From the Congress System to Multi-Party Coalitions

II. Determinants of Voting Behaviour (2 weeks or 8 lectures)

Caste, Class, Gender and Religion

III. Regional Aspirations (2 weeks or 8 lectures)

The Politics of Secession and Accommodation

IV. Religion and Politics (2 weeks or 8 lectures)

Debates on Secularism; Minority and Majority Communalism

V. Caste and Politics (1.5 weeks or 6 lectures)

Caste in Politics and the Politicization of Caste

VI. Affirmative Action Policies (1.5 weeks or 6 lectures)

Women, Caste and Class

VII. The Changing Nature of the Indian State (1.5 weeks or 6 lectures)

Developmental, Welfare and Coercive Dimensions

READING LIST

I. Political Parties and the Party System: Trends in the Party System; From the Congress System to Multi-Party Coalitions

Essential Readings:

R. Kothari, (2002) 'The Congress System', in Z. Hasan (ed.) *Parties and Party Politics in India*, New Delhi: Oxford University Press, pp 39-55.

E. Sridharan, (2012) 'Introduction: Theorizing Democratic Consolidation, Parties and Coalitions', in *Coalition Politics and Democratic Consolidation in Asia*, New Delhi: Oxford University Press.

Additional Reading:

Y. Yadav and S. Palshikar, (2006) 'Party System and Electoral Politics in the Indian States, 1952-2002: From Hegemony to Convergence', in P. deSouza and E. Sridharan (eds.) *India's Political Parties*, New Delhi: Sage Publications, pp. 73-115.

II. Determinants of Voting Behaviour: Caste, Class, Gender and Religion

Essential Readings:

Y. Yadav, (2000) 'Understanding the Second Democratic Upsurge', in F. Frankel, Z. Hasan, and R. Bhargava (eds.) *Transforming India: Social and Political Dynamics in Democracy*, New Delhi: Oxford University Press, pp. 120-145.

C. Jaffrelot, (2008) 'Why Should We Vote? The Indian Middle Class and the Functioning of World's Largest Democracy', in *Religion, Caste and Politics in India*, Delhi: Primus, pp. 604-619.

R. Deshpande, (2004) 'How Gendered was Women's Participation in Elections 2004?', *Economic and Political Weekly*, Vol. 39, No. 51, pp. 5431-5436.

S. Kumar, (2009) 'Religious Practices Among Indian Hindus,' *Japanese Journal of Political Science*, Vol. 10, No. 3, pp. 313-332.

III. Regional Aspirations: The Politics of Secession and Accommodation

Essential Readings:

M. Chadda, (2010) 'Integration through Internal Reorganisation', in S. Baruah (ed.) *Ethnonationalism in India: A Reader*, New Delhi: Oxford University Press, pp. 379-402.

P. Brass, (1999) 'Crisis of National Unity: Punjab, the Northeast and Kashmir', in *The Politics of India Since Independence*, New Delhi: Cambridge University Press and Foundation Books, pp. 192-227.

IV. Religion and Politics: Debates on Secularism: Minority and Majority Communalism

Essential Readings:

T. Pantham, (2004) 'Understanding Indian Secularism: Learning from its Recent Critics', in R. Vora and S. Palshikar (eds.) *Indian Democracy: Meanings and Practices*, New Delhi: Sage, pp. 235-256.

N. Menon and A. Nigam, (2007) 'Politics of Hindutva and the Minorities', in *Power and Contestation: India since 1989*, London: Fernwood Publishing, Halifax and Zed Books, pp. 36-60.

Additional Reading:

N. Chandhoke, (2010) 'Secularism', in P. Mehta and N. Jayal (eds.) *The Oxford Companion to Politics in India*, New Delhi: Oxford University Press, pp. 333-346.

V. Caste and Politics: Caste in Politics and the Politicization of Caste

Essential Readings:

R. Kothari, (1970) 'Introduction', in *Caste in Indian Politics*, Delhi: Orient Longman, pp.3-25. M. Weiner, (2001) 'The Struggle for Equality: Caste in Indian Politics', in Atul Kohli (ed.) *The Success of India's Democracy*, New Delhi: Cambridge University Press, pp. 193-225.

G. Omvedt, (2002) 'Ambedkar and After: The Dalit Movement in India', in G. Shah (ed.) *Social Movements and the State*, New Delhi: Sage Publications, pp. 293-309.

VI. Affirmative Action Policies: Women, Caste and Class

Essential Readings:

M. Galanter, (2002) 'The Long Half-Life of Reservations', in Z. Hasan, E. Sridharan and R. Sudarshan (eds.) *India's Living Constitution: Ideas, Practices, Controversies*, New Delhi: Permanent Black, pp. 306-318.

C. Jaffrelot, (2005) 'The Politics of the OBCs', in *Seminar*, Issue 549, pp. 41-45.

M. John, (2011) 'The Politics of Quotas and the Women's Reservation Bill in India', in M. Tsujimura and J. Steele (eds.) *Gender Equality in Asia*, Japan: Tohoku University Press, pp. 169-195.

VII. Changing Nature of the Indian State: Developmental, Welfare and Coercive Dimensions

Essential Readings:

S. Palshikar, (2008) 'The Indian State: Constitution and Beyond', in R. Bhargava (ed.) *Politics and Ethics of the Indian Constitution*, New Delhi: Oxford University Press, pp. 143-163.

R. Deshpande, (2005) 'State and Democracy in India: Strategies of Accommodation and Manipulation', Occasional Paper, Series III, No. 4, Special Assistance Programme, Department of Politics and Public Administration, University of Pune.

M. Mohanty, (1989) 'Duality of the State Process in India: A Hypothesis', *Bhartiya Samajik Chintan*, Vol. XII (1-2)

Additional Readings:

T. Byres, (1994) 'Introduction: Development Planning and the Interventionist State Versus Liberalization and the Neo-Liberal State: India, 1989-1996', in T. Byres (ed.) *The State, Development Planning and Liberalization in India*, New Delhi: Oxford University Press, 1994, pp.1-35.

A. Verma, (2007) 'Police Agencies and Coercive Power', in S. Ganguly, L. Diamond and M. Plattner (eds.) *The State of India's Democracy*, Baltimore: John Hopkins University Press, pp. 130-139.

3.1 Paper V- Introduction to Comparative Government and Politics

Course objective: This is a foundational course in comparative politics. The purpose is to familiarize students with the basic concepts and approaches to the study of comparative politics. More specifically the course will focus on examining politics in a historical framework while engaging with various themes of comparative analysis in developed and developing countries.

I. Understanding Comparative Politics (8 lectures)

- a. Nature and scope
- b. Going beyond Eurocentrism

II. Historical context of modern government (16 lectures)

- a. Capitalism: meaning and development: globalization
- b. Socialism: meaning, growth and development
- c. Colonialism and decolonization: meaning, context, forms of colonialism; anti-colonialism struggles and process of decolonization

III. Themes for comparative analysis (24 lectures)

A comparative study of constitutional developments and political economy in the following countries: Britain, Brazil, Nigeria and China.

I. Understanding Comparative Politics

Essential Readings:

J. Kopstein, and M. Lichbach, (eds), (2005) *Comparative Politics: Interests, Identities, and Institutions in a Changing Global Order*. Cambridge: Cambridge University Press, pp.1-5; 16-36; 253-290.

M. Mohanty, (1975) 'Comparative Political Theory and Third World Sensitivity', in *Teaching Politics*, Nos. 1 and 2, pp. 22-38

Additional Readings:

A. Roy, (2001) 'Comparative Method and Strategies of Comparison', in *Punjab Journal of Politics*. Vol. xxv (2), pp. 1-15.

J. Blondel, (1996) 'Then and Now: Comparative Politics', in *Political Studies*. Vol. 47 (1), pp. 152-160.

N. Chandhoke, (1996) 'Limits of Comparative Political Analysis', in *Economic and Political Weekly*, Vol. 31 (4), January 27, pp. PE 2-PE2-PE8

II Historical context of modern government a. Capitalism

Essential Readings:

R. Suresh, (2010) *Economy & Society -Evolution of Capitalism*, New Delhi, Sage Publications, pp. 151-188; 235-268.

G. Ritzer, (2002) 'Globalization and Related Process I: Imperialism, Colonialism, Development, Westernization, Easternization', in *Globalization: A Basic Text*. London: Wiley-Blackwell, pp. 63-84.

Additional Readings:

M. Dobb, (1950) 'Capitalism', in *Studies in the Development of Capitalism*. London: Routledge and Kegan Paul Ltd, pp. 1-32.

E. Wood, (2002) 'The Agrarian origin of Capitalism', in *Origin of Capitalism: A Long View*. London: Verso, pp. 91-95; 166-181.

A. Hoogvelt, (2002) 'History of Capitalism Expansion', in *Globalization and Third World Politics*. London: Palgrave, pp. 14-28.

b. Socialism

Essential Readings:

A. Brown, (2009) 'The Idea of Communism', in *Rise and Fall of Communism*, Harpercollins (e-book), pp. 1-25; 587-601.

J. McCormick, (2007) 'Communist and Post-Communist States', in *Comparative Politics in Transition*, United Kingdom: Wadsworth, pp. 195-209

Additional Readings:

R. Meek, (1957) 'The Definition of Socialism: A Comment', *The Economic Journal*. 67 (265), pp. 135-139.

c. Colonialism, decolonization& postcolonial society

Essential Readings:

P. Duara, (2004) 'Introduction: The Decolonization of Asia and Africa in the Twentieth Century', in P. Duara, (ed), *Decolonization: Perspective From Now and Then*. London: Routledge, pp. 1-18.

J. Chiryankandath, (2008) 'Colonialism and Post-Colonial Development', in P. Burnell, et. al, *Politics in the Developing World*. New Delhi: Oxford University Press, pp. 31-52.

Additional Reading:

M. Mohanty, (1999) 'Colonialism and Discourse in India and China', Available at http://www.ignca.nic.in/ks_40033.html http, Accessed: 24.03.2011.

III. Themes for Comparative Analysis

Essential Reading:

L. Barrington et. al (2010) *Comparative Politics - Structures & Choices*, Boston, Wadsworth, pp. 212-13; 71-76; 84-89.

M. Grant, (2009) 'United Kingdom Parliamentary System' in *The UK Parliament*. Edinburgh: Edinburgh University Press, pp. 24-43

J. McCormick, (2007) *Comparative Politics in Transition*, UK: Wadsworth, pp. 260-270 (China)

M. Kesselman, J. Krieger and William (2010), *Introduction to Comparative Politics: Political Challenges and Changing Agendas*, UK: Wadsworth. pp. 47-70 (Britain); 364-388 (Nigeria); 625-648 (China); 415-440 (Brazil).

Additional Reading:

P. Rutland, (2007) 'Britain', in J. Kopstein and M. Lichbach. (eds.) *Comparative Politics: Interest, Identities and Institutions in a Changing Global Order*. Cambridge: Cambridge University Press, pp. 39-79.

3.2 PERSPECTIVES ON PUBLIC ADMINISTRATION

Objective: The course provides an introduction to the discipline of public administration. This paper encompasses public administration in its historical context with an emphasis on the various classical and contemporary administrative theories. The course also explores some of the recent trends, including feminism and ecological conservation and how the call for greater democratization is restructuring public administration. The course will also attempt to provide the students a comprehensive understanding on contemporary administrative developments.

I. PUBLIC ADMINISTRATION AS A DISCIPLINE [15 lectures]

- Meaning, Dimensions and Significance of the Discipline
- Public and Private Administration
- Evolution of Public Administration

II. THEORETICAL PERSPECTIVES [25 lectures]

CLASSICAL THEORIES

- Scientific management (F.W. Taylor)
- Administrative Management (Gullick, Urwick and Fayol)
- Ideal-type bureaucracy (Max Weber)

NEO-CLASSICAL THEORIES

- Human relations theory (Elton Mayo)
- Rational decision-making (Herbert Simon)

CONTEMPORARY THEORIES

- Ecological approach (Fred Riggs)
- Innovation and Entrepreneurship (Peter Drucker)

III. PUBLIC POLICY [10 lectures]

- Concept, relevance and approaches
- Formulation, implementation and evaluation

IV. MAJOR APPROACHES IN PUBLIC ADMINISTRATION [20 lectures]

- New Public Administration
- New Public Management
- New Public Service Approach
- Good Governance
- Feminist Perspectives

READINGS

I. Public Administration as a Discipline

Meaning, Dimensions and Significance of the Discipline.

Nicholas Henry, *Public Administration and Public Affairs*, Prentice Hall, 1999

D. Rosenbloom, R. Kravchuk. and R. Clerkin, (2009) *Public Administration: Understanding Management, Politics and Law in Public Sector*, 7th edition, New Delhi: McGraw Hill, pp. 1-40

W. Wilson, (2004) 'The Study of Administration', in B. Chakrabarty and M. Bhattacharya (eds), *Administrative Change and Innovation: a Reader*, New Delhi: Oxford University Press, pp. 85-101

b. Public and Private Administration.

M. Bhattacharya, (2008) *New Horizons of Public Administration*, 5th Revised Edition. New Delhi: Jawahar Publishers, pp. 37-44.

G. Alhson, (1997) 'Public and Private Management', in Shafritz, J. and Hyde, A. (eds.) *Classic of Public Administration*, 4th Edition. Forth Worth: Hartcourt Brace, TX, pp. 510-529.

Evolution of Public Administration

N. Henry, *Public Administration and Public Affairs*, 12th edition. New Jersey: Pearson, 2013

M. Bhattacharya, *Restructuring Public Administration: A New Look*, New Delhi: Jawahar Publishers, 2012

P. Dunleavy and C. Hood, "From Old Public Administration to New Public Management", *Public Money and Management*, Vol. XIV No-3, 1994

M. Bhattacharya, *New Horizons of Public Administration*, New Delhi: Jawahar

Publishers, 2011

Basu, Rumki, *Public Administration : Concepts and Theories* Sterling Publishers, New Delhi 2014

II. Theoretical Perspectives Scientific Management

D. Gvishiani, *Organisation and Management*, Moscow: Progress Publishers, 1972

F. Taylor, 'Scientific Management', in J. Shafritz, and A. Hyde, (eds.) *Classics of Public Administration*, 5th Edition. Belmont: Wadsworth, 2004

P. Mouzelis, 'The Ideal Type of Bureaucracy' in B. Chakrabarty, And M. Bhattacharya, (eds), *Public Administration: A Reader*, New Delhi: Oxford University Press, 2003

Administrative Management

H. Ravindra Prasad, Y. Pardhasaradhi, V. S. Prasad and P. Satyrnarayana, [eds.], *Administrative Thinkers*, Sterling Publishers, 2010

I. J. Ferreira, A. W. Erasmus and D. Groenewald , *Administrative Management*, Juta Academics, 2010

Ideal Type-Bureaucracy

R. Weber, 'Bureaucracy', in C. Mills, and H. Gerth, *From Max Weber: Essays in Sociology*. Oxford: Oxford University Press, 1946

Warren. G. Bennis, *Beyond Bureaucracy*, Mc Graw Hill, 1973

Human Relations Theory

D. Gvishiani, *Organisation and Management*, Moscow: Progress Publishers, 1972

B. Miner, 'Elton Mayo and Hawthorne', in *Organisational Behaviour 3: Historical Origins and the Future*. New York: M.E. Sharpe, 2006

Rational-Decision Making

S. Maheshwari, *Administrative Thinkers*, New Delhi: Macmillan, 2009

Fredrickson and Smith, 'Decision Theory', in *The Public Administration Theory Primer*. Cambridge: Westview Press, 2003

Ecological approach

R. Arora, 'Riggs' Administrative Ecology' in B. Chakrabarty and M. Bhattacharya (eds), *Public Administration: A reader*, New Delhi, Oxford University Press, 2003

A. Singh, *Public Administration: Roots and Wings*. New Delhi: Galgotia Publishing Company, 2002

F. Riggs, *Administration in Developing Countries: The Theory of Prismatic Society*. Boston: Houghton Mifflin, 1964

Innovation and Entrepreneurship

Peter Drucker, *Innovation and Entrepreneurship*, Harper Collins, 1999

Peter F. Drucker , *The Practice of Management*, Harper Collins, 2006

III. Public Policy

Concept, Relevance and Approaches

T. Dye, (1984) *Understanding Public Policy*, 5th Edition. U.S.A: Prentice Hall, pp. 1- 44
The Oxford Handbook of Public Policy ,OUP,2006

Xun Wu, M.Ramesh, Michael Howlett and Scott Fritzen ,*The Public Policy Primer: ManagingThe Policy Process*, Rutledge, 2010

Mary Jo Hatch and Ann .L. Cunliffe *Organisation Theory : Modern, Symbolicand Postmodern Perspectives*, Oxford University Press,2006

Michael Howlett, *Designing Public Policies : Principles And Instruments*, Rutledge, 2011
The Oxford Handbook Of Public Policy, Oxford University Press, 2006

Formulation, implementation and evaluation

Prabir Kumar De, *Public Policy and Systems*, Pearson Education, 2012

R.V. Vaidyanatha Ayyar, *Public Policy Making In India*, Pearson,2009

Surendra Munshi and Biju Paul Abraham [Eds.] *Good Governance, Democratic Societies AndGlobalisation*, Sage Publishers, 2004

IV. Major Approaches in Public Administration a. Development administration

M. Bhattacharya, 'Chapter 2 and 4', in *Social Theory, Development Administration andDevelopment Ethics*, New Delhi: Jawahar Publishers, 2006

F. Riggs,*The Ecology of Public Administration, Part 3*, New Delhi: Asia Publishing House, 1961

c. New Public Administration

Essential Reading:

M. Bhattacharya, *Public Administration: Issues and Perspectives*, New Delhi: Jawahar Publishers, 2012

H. Frederickson, 'Toward a New Public Administration', in J. Shafritz, & A. Hyde, (eds.) *Classics of Public Administration*, 5th Edition, Belmont: Wadsworth, 2004

d.New Public Management

U. Medury, *Public administration in the Globalization Era*, New Delhi: Orient Black Swan, 2010

A. Gray, and B. Jenkins, 'From Public Administration to Public Management' in E. Otenyo and N. Lind, (eds.) *Comparative Public Administration: The Essential Readings*: Oxford University Press, 1997

C. Hood, 'A Public Management for All Seasons', in J. Shafritz, & A. Hyde, (eds.) *Classics ofPublic Administration*, 5th Edition, Belmont: Wadsworth, 2004

d. New Public Service Approach

R.B.Denhardt & J.V.Denhardt [Arizona State University] “ The New Public Service: Serving Rather Than Steering”, in Public Administration Review ,Volume 60, No-6,November-December 2000

e. Good Governance

A. Leftwich, ‘Governance in the State and the Politics of Development’, in *Development and Change*. Vol. 25,1994

M. Bhattacharya, ‘Contextualizing Governance and Development’ in B. Chakrabarty and M. Bhattacharya, (eds.) *The Governance Discourse*. New Delhi: Oxford University Press,1998 B. Chakrabarty, *Reinventing Public Administration: The India Experience*. New Delhi: Orient Longman, 2007

U. Medury, *Public administration in the Globalisation Era*, New Delhi: Orient Black Swan, 2010

f. Feminist Perspective

Camila Stivers, *Gender Images In Public Administration*, California : Sage Publishers,2002 Radha Kumar, *The History of Doing*, New Delhi: Kali For Women, 1998

Sylvia Walby, *Theorising Patriarchy*, Oxford, Basil Blackwell.1997

Amy. S. Wharton, *The Sociology Of Gender*, West Sussex : Blackwell-Wiley Publishers,2012 Nivedita Menon [ed.], *Gender and Politics*, Delhi: Oxford University Press, 1999

Simone De Beauvoir, *The Second Sex*, London: Picador, 1988

Alison Jaggar, *Feminist Politics And Human Nature*, Brighton: Harvester Press,1983

Maxine Molyneux and Shahra Razavi , *Gender, Justice, Development and Rights* ,Oxford: Oxford University Press, 2002

3.3 Paper VII- Perspectives on International Relations and World History

Course Objective: This paper seeks to equip students with the basic intellectual tools for understanding International Relations. It introduces students to some of the most important theoretical approaches for studying international relations. The course begins by historically contextualizing the evolution of the international state system before discussing the agency-structure problem through the levels-of-analysis approach. After having set the parameters of the debate, students are introduced to different theories in International Relations. It provides a fairly comprehensive overview of the major political developments and events starting from the twentieth century. Students are expected to learn about the key milestones in world history and equip them with the tools to understand and analyze the same from different perspectives. A key objective of the course is to make students aware of the implicit Euro - centricism of International Relations by highlighting certain specific perspectives from the Global South.

A. Studying International Relations (15 Lectures)

- i. How do you understand International Relations: Levels of Analysis (3 lectures)
- ii. History and IR: Emergence of the International State System (2 Lectures)
- iii. Pre-Westphalia and Westphalia (5 lectures)
- iv. Post-Westphalia (5 lectures)

D. Theoretical Perspectives (25 Lectures)

- i. Classical Realism & Neo-Realism (6 lectures)
- ii. Liberalism & Neoliberalism (5 lectures)
- iii. Marxist Approaches (5 lectures)
- iv. Feminist Perspectives (4 lectures)
- v. Eurocentricism and Perspectives from the Global South (5 Lectures)

C. An Overview of Twentieth Century IR History (20 Lectures)

- i. World War I: Causes and Consequences (1 Lecture)
- ii. Significance of the Bolshevik Revolution (1 Lecture)
- iii. Rise of Fascism / Nazism (2 Lectures)
- iv. World War II: Causes and Consequences (3 Lectures)
- v. Cold War: Different Phases (4 Lectures)
- vi. Emergence of the Third World (3 Lectures)
- vii. Collapse of the USSR and the End of the Cold War (2 Lectures)
- viii. Post Cold War Developments and Emergence of Other Power Centers of Power (4 Lectures)

Essential Readings:

M. Nicholson, (2002) *International Relations: A Concise Introduction*, New York: Palgrave, pp. 1-4.

R. Jackson and G. Sorensen, (2007) *Introduction to International Relations: Theories and Approaches*, 3rd Edition, Oxford: Oxford University Press, pp. 2-7

S. Joshua. Goldstein and J. Pevehouse, (2007) *International Relations*, New York: Pearson Longman, 2007, pp. 29-35

C. Brown and K. Ainley, (2009) *Understanding International Relations*, Basingstoke: Palgrave, pp. 1-16.

Additional Readings:

K. Mingst and J. Snyder, (2011) *Essential Readings in International Relations*, New York: W.W. Norton and Company, pp. 1-15.

M. Smith and R. Little, (eds) (2000) 'Introduction', in *Perspectives on World Politics*, New York: Routledge, 2000, 1991, pp. 1-17.

J. Baylis and S. Smith (eds), (2008) *The Globalization of World Politics: An Introduction to International Relations*, New York: Oxford University Press, pp. 1- 6.

R. Mansbach and K. Taylor, (2008) *Introduction to Global Politics*, New York: Routledge, pp. 2-32.

Rumki Basu, (ed)(2012) *International Politics: Concepts, Theories and Issues* New Delhi, Sage.

History and IR: Emergence of the International State System:

Essential Readings:

R. Mansbach and K. Taylor, (2012) *Introduction to Global Politics*, New York: Routledge, pp. 33-68.

K. Mingst, (2011) *Essentials of International Relations*, New York: W.W. Norton and Company, pp. 16-63.

P. Viotti and M. Kauppi, (2007) *International Relations and World Politics: Security, Economy, Identity*, Pearson Education, pp. 40-85.

Additional Readings:

J. Baylis, S. Smith and P. Owens, (2008) *The Globalization of World Politics: An Introduction to International Relations*, New York: Oxford University Press, pp. 36- 89.

R. Mansbach and K. Taylor, (2008) *Introduction to Global Politics*, New York: Routledge, pp. 70-135.

J Goldstein and J. Pevehouse, (2007) *International Relations*, New York: Pearson Longman, pp. 50-69.

E. Hobsbawm, (1995) *Age of Extremes: The Short Twentieth Century 1914-1991*, Vikings.

S. Lawson, (2003) *International Relations*, Cambridge: Polity Press, pp. 21-60.

How do you Understand IR (Levels of Analysis):

Essential Readings:

J. Singer, (1961) 'The International System: Theoretical Essays', *World Politics*, Vol. 14(1), pp. 77-92.

B. Buzan, (1995) 'The Level of Analysis Problem in International Relations Reconsidered,' in K. Booth and S. Smith, (eds), *International Relations Theory Today*, Pennsylvania: The Pennsylvania State University Press, pp. 198-216.

Additional Readings:

K. Mingst, (2011) *Essentials of International Relations*, New York: W.W. Norton and Company, pp. 93-178.

J. Goldstein and J. Pevehouse, (2007) *International Relations*, New York: Pearson Longman, pp. 35-49.

K. Waltz, (1959) *Man, The State and War*, Columbia: Columbia University Press.

Theoretical Perspectives:

Classical Realism and Neorealism

Essential Readings:

E. Carr, (1981) *The Twenty Years Crisis, 1919-1939: An Introduction to the Study of International Relations*, London: Macmillan, pp. 63-94.

H. Morgenthau, (2007) 'Six Principles of Political Realism', in R. Art and R. Jervis, *International Politics*, 8th Edition, New York: Pearson Longman, pp. 7-14.

T. Dunne and B. Schmidt, (2008) 'Realism', in J. Baylis and S. Smith (eds), *The Globalization of World Politics: An Introduction to International Relations*, New York: Oxford University Press, pp. 90-107.

K. Waltz, (2007) 'The Anarchic Structure of World Politics', in R. Art and R. Jervis, *International Politics*, 8th Edition, New York: Pearson Longman, pp. 29-49.

Additional Readings:

M. Nicholson, (2002) *International Relations: A Concise Introduction*, New York: Palgrave, pp. 6-7.

H. Bull, (2000) 'The Balance of Power and International Order', in M. Smith and R. Little (eds), *Perspectives on World Politics*, New York: Routledge, pp. 115-124.

Liberalism and Neoliberalism

Essential Readings:

T. Dunne, (2008) 'Liberalism', in J. Baylis and S. Smith (eds.), *The Globalization of World Politics: An Introduction to International Relations*, New York: Oxford University Press, pp. 108-123.

R. Keohane and J. Nye, (2000) 'Transgovernmental Relations and the International Organization', in M. Smith and R. Little (eds.), *Perspectives on World Politics*, New York: Routledge, pp. 229-241.

Additional Readings:

J. Goldstein and J. Pevehouse, (2007) *International Relations*, New York: Pearson Longman, pp. 127-137.

R. Jackson and G. Sorensen, (2007) *Introduction to International Relations: Theories and Approaches*, 3rd Edition, Oxford: Oxford University Press, pp. 97- 128.

Marxist Approaches

Essential Readings:

I. Wallerstein, (2000) 'The Rise and Future Demise of World Capitalist System: Concepts for Comparative Analysis', in Michael Smith and Richard Little (eds), *Perspectives on World Politics*, New York: Routledge, pp. 305-317.

S. Hobden and R. Jones, (2008) 'Marxist Theories of International Relations' in J. Baylis and S. Smith (eds), *The Globalization of World Politics: An Introduction to International Relations*, New York: Oxford University Press, pp. 142-149; 155-158.

J. Goldstein and J. Pevehouse, (2007) *International Relations*, New York: Pearson Longman, pp. 494-496; 500-503.

Additional Readings:

J. Galtung, (2000) 'A Structural Theory of Imperialism', in M. Smith and R. Little, (eds), *Perspectives on World Politics*, New York: Routledge, pp. 292-304.

A. Frank, (1966) 'The Development of Underdevelopment' *Monthly Review*, pp. 17-30.

P. Viotti and M. Kauppi (2007), *International Relations and World Politics: Security, Economy, Identity*, Pearson Education, pp. 40-85.

Modern History Sourcebook: Summary of Wallerstein on World System Theory, Available at <http://www.fordham.edu/halsall/mod/Wallerstein.asp>, Accessed: 19.04.2013

Feminist Perspectives

Essential Readings:

J. Tickner, (2007) 'A Critique of Morgenthau's Principles of Political Realism', in R. Art and R. Jervis, *International Politics*, 8th Edition, New York: Pearson Longman, pp. 15-28.

F. Halliday, (1994) *Rethinking International Relations*, London: Macmillan, pp. 147-166. Additional Readings:

M. Nicholson, *International Relations: A Concise Introduction*, New York: Palgrave, 2002, pp. 120-122.

J. Goldstein and J. Pevehouse, (2007) *International Relations*, New York: Pearson

Longman, pp. 138-148.

S. Smith and P. Owens, (2008) 'Alternative Approaches to International Theory' in J. Baylis and S. Smith (eds), *The Globalization of World Politics: An Introduction to International Relations*, New York: Oxford University Press, pp. 181-184.

IR, Eurocentricism and Perspectives from the Global South on Eurocentricism

Essential Readings:

A. Acharya and B. Buzan, (2007) 'Why Is There No Non- Western IR Theory: Reflections on and From Asia', *International Relations Of The Asia- Pacific*, Vol 7(3), pp. 285-286.

T. Kayaoglu, (2010) 'Westphalian Eurocentrism in I R Theory', in *International Studies Review*, Vol. 12(2), pp. 193-217.

Additional Readings:

O. Weaver and A. Tickner, (2009) 'Introduction: Geocultural Epistemologies', in A. Tickner and O. Waever (eds), *International Relations: Scholarship Around The World*, London: Routledge, pp. 1-31.

R.Kanth (ed), (2009) *The Challenge of Eurocentrism: Global Perspectives, Policy & Prospects*, New York: Palgrave-McMillan.

S. Amin, (2010) *Eurocentrism: Modernity, Religion & Democracy*, New York: Monthly Review Press.

An Overview of Twentieth Century IR History

(a) World War I: Causes and Consequences

Hobsbawm, E. (1995) *Age of Extreme: The Short Twentieth Century, 1914—1991*. London: Abacus, pp. 22-35.

(b) Significance of the Bolshevik Revolution

Hobsbawm, E. (1995) *Age of Extreme: The Short Twentieth Century, 1914—1991*. London: Abacus, pp. 54-78.

(c) Rise of Fascism / Nazism

Hobsbawm, E. (1995) *Age of Extreme: The Short Twentieth Century, 1914—1991*. London: Abacus, pp. 108-141.

Carr, E.H. (2004) *International Relations between the Two World Wars: 1919-1939*. New York: Palgrave, pp. 197-231 and 258-278.

(d) World War II: Causes and Consequences

Taylor, A.J.P. (1961) *The Origins of the Second World War*. Harmondsworth: Penguin,

pp.29-65.

Carruthers, S.L. (2005) 'International History, 1900-1945' in Baylis, J. and Smith, S. (eds.) (2008)

The Globalization of World Politics. An Introduction to International Relations. 4th edn. Oxford: Oxford University Press, pp. 76-84.

(e) Cold War: Different Phases

Calvocoressi, P. (2001) *World Politics: 1945—2000*. Essex: Pearson, pp. 3-91.

Scott, L. (2005) 'International History, 1945-1990' in Baylis, J. and Smith, S. (eds.) (2008) *The Globalization of World Politics. An Introduction to International Relations.* 4th edn. Oxford: Oxford University Press, pp. 93-101.

Hobsbawm, E. (1995) *Age of Extreme: The Short Twentieth Century, 1914—1991*. London: Abacus, pp. 225-226.

(f) Emergence of the Third World

Hobsbawm, E. (1995) *Age of Extreme: The Short Twentieth Century, 1914—1991*. London: Abacus, pp. 207-222.

(g) Collapse of the USSR and the End of the Cold War

Scott, L. (2005) 'International History, 1945-1990' in Baylis, J. and Smith, S. (eds.) (2008) *The Globalization of World Politics. An Introduction to International Relations.* 4th edn. Oxford: Oxford University Press, pp. 93-101.

(h) Post Cold War Developments and Emergence of Other Power Centres of Power: Japan, European Union (EU) and Brazil, Russia, India, China (BRIC)

Brezekski, Z. (2005) *Choice: Global Dominance or Global Leadership*. New York: Basic Books, pp. 85-127.34

Gill, S. (2005) 'Contradictions of US Supremacy' in Panitch, L. and Leys, C. (eds.) *Socialist Register: The Empire Reloaded*. London: Merlin Press. 2004, London, Merlin Press and New York, Monthly Review Press. *Socialist Register*, pp.24-47.

Therborn, G. (2006) 'Poles and Triangles: US Power and Triangles of Americas, Asia and Europe' in Hadiz, V.R. (ed.) *Empire and Neo Liberalism in Asia*. London: Routledge, pp.23-37.

4.1 Paper VIII- Political Processes and Institutions in Comparative Perspective

Course objective: In this course students will be trained in the application of comparative methods to the study of politics. The course is comparative in both what we study and how we study. In the process the course aims to introduce undergraduate students to some of the range of issues, literature, and methods that cover comparative political.

I. Approaches to Studying Comparative Politics (8

lectures) a. Political Culture

b. New Institutionalism

II. Electoral System (8 lectures)

Definition and procedures: Types of election system (First Past the Post, Proportional Representation, Mixed Representation)

III. Party System (8 lectures)

Historical contexts of emergence of the party system and types of parties

IV. Nation-state (8 lectures)

What is nation–state? Historical evolution in Western Europe and postcolonial contexts
'Nation' and 'State': debates

V. Democratization (8 lectures)

Process of democratization in postcolonial, post- authoritarian and post-communist countries

VI. Federalism (8 lectures) Historical context Federation and Confederation: debates around territorial division of power.

READING LIST

I: Approaches to Studying Comparative Politics

Essential Readings:

M. Pennington, (2009) 'Theory, Institutional and Comparative Politics', in J. Bara and Pennington. (eds.) *Comparative Politics: Explaining Democratic System*. Sage Publications, New Delhi, pp. 13-40.

M. Howard, (2009) 'Culture in Comparative Political Analysis', in M. Lichback and A. Zuckerman, pp. 134- S. (eds.) *Comparative Political: Rationality, Culture, and Structure*. Cambridge: Cambridge University Press.

B. Rosamond, (2005) 'Political Culture', in B. Axford, et al. *Politics*, London: Routledge, pp. 57-81.

Additional Readings:

P. Hall, Taylor and C. Rosemary, (1996) 'Political Science and the Three New Institutionalism', *Political Studies*. XLIV, pp. 936-957.

L. Rakner, and R. Vicky, (2011) 'Institutional Perspectives', in P. Burnell, et .al. (eds.) *Politicalin the Developing World*. Oxford: Oxford University Press, pp. 53-70.

II: Electoral System

Essential Readings:

A. Heywood, (2002) 'Representation, Electoral and Voting', in *Politics*. New York: Palgrave, pp. 223-245.

A. Evans, (2009) 'Elections Systems', in J. Bara and M. Pennington, (eds.) *Comparativepolitics*. New Delhi: Sage Publications, pp. 93-119.

Additional Reading:

R. Moser, and S. Ethan, (2004) 'Mixed Electoral Systems and Electoral System Effects: Controlled Comparison and Cross-national Analysis', in *Electoral Studies*. 23, pp. 575-599.

III: Party System

Essential Readings:

A. Cole, (2011) 'Comparative Political Parties: Systems and Organizations', in J. Ishiyama, and M. Breuning, (eds) *21st Century Political Science: A Reference Book*. Los Angeles: Sage Publications, pp. 150-158.

A. Heywood, (2002) 'Parties and Party System', in *Politics*. New York : Palgrave, pp. 247-268.

Additional Readings:

- B. Criddle, (2003) 'Parties and Party System', in R. Axtmann, (ed.) *Understanding Democratic Politics: An Introduction*. London: Sage Publications, pp. 134-142.

IV: Nation-state

Essential Readings:

W. O'Conner, (1994) 'A Nation is a Nation, is a Sate, is a Ethnic Group, is a ...', in J. Hutchinson and A. Smith, (eds.) *Nationalism*. Oxford: Oxford University Press, pp. 36-46.

K. Newton, and J. Deth, (2010) 'The Development of the Modern State ', in *Foundations ofComparative Politics: Democracies of the Modern World*. Cambridge: Cambridge UniversityPress, pp. 13-33.

Additional Reading:

A. Heywood, (2002), 'The State', in *Politics*. New York: Palgrave, pp. 85-102

V. Democratization

Essential Readings:

T. Landman, (2003) 'Transition to Democracy', in *Issues and Methods of Comparative Methods: An Introduction*. London: Routledge, pp. 185-215.

K. Newton, and J. Deth, (2010) 'Democratic Change and Persistence', in *Foundations of Comparative Politics: Democracies of the Modern World*. Cambridge: Cambridge University Press, pp. 53-67.

J. Haynes, (1999) 'State and Society', in *The Democratization*. Oxford: Blackwell, pp. 20-38; 39-63.

Additional Reading:

B. Smith, (2003) 'Democratization in the Third World', in *Understanding Third World Politics: Theories of Political Change and Development*. London: Palgrave Macmillan, pp.250-274.

VI: Federalism

Essential Readings:

M. Burgess, (2006) *Comparative Federalism: Theory and Practice*. London: Routledge, pp. 135-161.

R. Watts, (2008) 'Introduction', in *Comparing Federal Systems*. Montreal and Kingston: McGill Queen's University Press, pp. 1-27

Additional Reading:

R. Saxena, (2011) 'Introduction', in Saxena, R (eds.) *Varieties of Federal Governance: Major Contemporary Models*. New Delhi: Cambridge University Press, pp. xii-x1.

4.2 Paper-IX PUBLIC POLICY AND ADMINISTRATION IN INDIA

Objective: The paper seeks to provide an introduction to the interface between public policy and administration in India. The essence of public policy lies in its effectiveness in translating the governing philosophy into programs and policies and making it a part of the community living. It deals with issues of decentralization, financial management, citizens and administration and social welfare from a non-western perspective.

I. Public Policy [10 lectures]

a. Definition, characteristics and models

b. Public Policy Process in India

II. Decentralization [10 lectures]

- g. Meaning, significance and approaches and types
- h. Local Self Governance: Rural and Urban

III. Budget [12 lectures]

- h. Concept and Significance of Budget
- i. Budget Cycle in India
- j. Various Approaches and Types Of Budgeting

IV. Citizen and Administration Interface [15 lectures]

- a. Public Service Delivery
- b. Redressal of Public Grievances: RTI, Lokpal, Citizens' Charter and E-Governance

V. Social Welfare Administration [20 lectures]

- a. Concept and Approaches of Social Welfare
- b. Social Welfare Policies:
 - Education:** Right To Education,
 - Health:** National Health Mission,
 - Food:** Right To Food Security
 - Employment:** MNREGA

READINGS

Public Policy

T. Dye, (1984) *Understanding Public Policy*, 5th Edition. U.S.A: Prentice Hall

R.B. Denhardt and J.V. Denhardt, (2009) *Public Administration*, New Delhi: Brooks/Cole

J. Anderson, (1975) *Public Policy Making*. New York: Thomas Nelson and sons Ltd.

M. Howlett, M. Ramesh, and A. Perl, (2009), *Studying Public Policy: Policy Cycles and Policy subsystems*, 3rd edition, Oxford: Oxford University Press

T. Dye, (2002) *Understanding Public Policy*, New Delhi: Pearson

Y. Dror, (1989) *Public Policy Making Reexamined*. Oxford: Transaction Publication

Decentralization

Satyajit Singh and Pradeep K. Sharma [eds.] *Decentralisation: Institutions And Politics In Rural India*, OUP, 2007

D. A. Rondinelli and S. Cheema, *Decentralisation and Development*, Beverly Hills: Sage Publishers, 1983

N.G. Jayal, *Democracy and The State: Welfare, Secular and Development in Contemporary India*, Oxford : Oxford University Press, 1999

Bidyut Chakrabarty, *Reinventing Public Administration: The Indian Experience*, Orient Longman, 2007

Noorjahan Bava, *Development Policies and Administration in India*, Delhi: Uppal Publishers, 2001

Gabriel Almond and Sidney Verba, *The Civic Culture*, Boston: Little Brown, 1965 M.P. Lester,

Political Participation- How and Why do People Get Involved in Politics
Chicago: McNally, 1965

III. Budget

Erik-Lane, J. (2005) *Public Administration and Public Management: The Principal Agent Perspective*. New York: Routledge

Henry, N. (1999) *Public Administration and Public Affairs*. New Jersey: Prentice Hall

Caiden, N. (2004) 'Public Budgeting Amidst Uncertainty and Instability', in Shafritz, J.M. & Hyde, A.C. (eds.) *Classics of Public Administration*. Belmont: Wadsworth

IV Citizen And Administration Interface

R. Putnam, *Making Democracy Work*, Princeton University Press, 1993

Jenkins, R. and Goetz, A.M. (1999) 'Accounts and Accountability: Theoretical Implications of the Right to Information Movement in India', in *Third World Quarterly*. June

Sharma, P.K. & Devasher, M. (2007) 'Right to Information in India' in Singh, S. and Sharma, P. (eds.) *Decentralization: Institutions and Politics in Rural India*. New Delhi: Oxford University Press

Vasu Deva, *E-Governance In India: A Reality*, Commonwealth Publishers, 2005

World Development Report, World Bank, Oxford University Press, 1992.

M.J. Moon, *The Evolution of Electronic Government Among Municipalities: Rhetoric or Reality*, American Society For Public Administration, *Public Administration Review*, Vol 62, Issue 4, July – August 2002

Pankaj Sharma, *E-Governance: The New Age Governance*, APH Publishers, 2004

Pippa Norris, *Digital Divide: Civic Engagement, Information Poverty and the Internet*

in Democratic Societies, Cambridge: Cambridge University Press, 2001.

Stephan Goldsmith and William D. Eggers, *Governing By Network: The New Shape of the Public Sector*, Brookings Institution [Washington], 2004

United Nation Development Programme, *Reconceptualising Governance*, New York, 1997
Mukhopadhyay, A. (2005) 'Social Audit', in *Seminar*. No.551.

V. Social Welfare Administration

Jean Drèze and Amartya Sen, *India, Economic Development and Social Opportunity*, Oxford: Oxford University Press, 1995

J.Dreze and Amartya Sen, *Indian Development: Selected Regional Perspectives*, Oxford: Clarendon Press, 1997

Reetika Khera- Rural Poverty And Public Distribution System, EPW, Vol-XLVIII, No.45-46, Nov 2013

Pradeep Chaturvedi [ed.], *Women And Food Security: Role Of Panchayats*, Concept Publishers, 1997

National Food Security Mission: nfsm.gov.in/Guidelines/XIIPlan/NFSMXII.pdf

Jugal Kishore, *National Health Programs of India: National Policies and Legislations*, Century Publications, 2005

K. Lee and Mills, *The Economic Of Health In Developing Countries*, Oxford: Oxford University Press, 1983

K. Vijaya Kumar, *Right to Education Act 2009: Its Implementation as to Social Development in India*, Delhi: Akansha Publishers, 2012.

Marma Mukhopadhyay and Madhu Parhar(ed.) *Education in India: Dynamics of Development*, Delhi: Shipra Publications, 2007

Nalini Juneja, *Primary Education for All in the City of Mumbai: The Challenge Set By Local Actors'*, International Institute For Educational Planning, UNESCO: Paris, 2001

Surendra Munshi and Biju Paul Abraham [eds.] *Good Governance, Democratic Societies and Globalisation*, Sage Publishers, 2004

Basu Rumki (2015) *Public Administration in India Mandates, Performance and Future Perspectives*, New Delhi, Sterling Publishers

www.un.org/millenniumgoals
<http://www.cefsindia.org>
www.righttofoodindia.org

4.3 Paper X- Global Politics

Course objective: This course introduces students to the key debates on the meaning and nature of globalization by addressing its political, economic, social, cultural and technological dimensions. In keeping with the most important debates within the globalization discourse, it imparts an understanding of the working of the world economy, its anchors and resistances offered by global social movements while analyzing the changing nature of relationship between the state and trans-national actors and networks. The course also offers insights into key contemporary global issues such as the proliferation of nuclear weapons, ecological issues, international terrorism, and human security before concluding with a debate on the phenomenon of global governance.

I. Globalization: Conceptions and Perspectives (23 lectures)

- a. Understanding Globalization and its Alternative Perspectives (6 lectures)
- b. Political: Debates on Sovereignty and Territoriality (3 lectures)
- c. Global Economy: Its Significance and Anchors of Global Political Economy: IMF,
- d. World Bank, WTO, TNCs (8 lectures)
- e. Cultural and Technological Dimension (3 lectures)
- f. Global Resistances (Global Social Movements and NGOs) (3 lectures)

II. Contemporary Global Issues (20 lectures)

- a. Ecological Issues: Historical Overview of International Environmental Agreements, Climate Change, Global Commons Debate (7 lectures)
- b. Proliferation of Nuclear Weapons (3 lectures)
- c. International Terrorism: Non-State Actors and State Terrorism; Post 9/11 developments (4 lectures)
- d. Migration (3 lectures)
- e. Human Security (3 lectures)

III. Global Shifts: Power and Governance (5 lectures)

READING LIST

I. Globalization – Conceptions and Perspectives Understanding Globalization and its Alternative Perspectives

Essential Readings:

G. Ritzer, (2010) *Globalization: A Basic Text*, Sussex: Wiley-Blackwell, pp. 33-62.
M. Strager, (2009) *Globalization: A Very Short Introduction*, London: Oxford University Press, pp. 1-16.
R. Keohane and J. Nye Jr, (2000) 'Globalization: What's New? What's Not? (And So What?)', in *Foreign Policy*, No 118, pp. 104-119.

Additional Reading:

A. McGrew, (2011) 'Globalization and Global Politics', in J. Baylis, S. Smith and P. Owens (eds.) *Globalization of World Politics: An Introduction to International Relations*, New York: Oxford University Press, pp. 14-31.
A. Heywood, (2011) *Global Politics*, New York: Palgrave-McMillan, pp. 1-24.
W. Ellwood, (2005) *The No-nonsense Guide to Globalization*, Jaipur: NI-Rawat Publications, pp. 12-23.

Political: Debates on Sovereignty and Territoriality

Essential Readings:

A. Heywood, (2011) *Global Politics*, New York: Palgrave-McMillan, pp. 112-134.
R. Keohane, (2000) 'Sovereignty in International Society', in D. Held and A. McGrew (eds.) *The Global Trans-Formations Reader*, Cambridge: Polity Press, pp. 109-123.

Additional Reading:

K. Shimko, (2005) *International Relations: Perspectives and Controversies*, New York: Houghton Mifflin, pp. 195-219.

Global Economy: Its Significance and Anchors of Global Political Economy: IMF, World Bank, WTO, TNCs

Essential Readings:

A. Heywood, (2011) *Global Politics*, New York: Palgrave-McMillan, pp. 454-479.
T. Cohn, (2009) *Global Political Economy: Theory and Practice*, pp. 130-140 (IMF), 208-218 (WTO).
R. Picciotto, (2003) 'A New World Bank for a New Century', in C. Roe Goddard et al., *International Political: State-Market Relations in a Changing Global Order*, Boulder: LynneReinner, pp. 341-351.
A. Narlikar, (2005) *The World Trade Organization: A Very Short Introduction*, New York: Oxford University Press, pp. 22-98.
J. Goldstein, (2006) *International Relations*, New Delhi: Pearson, pp. 392-405 (MNC).
P. Hirst, G. Thompson and S. Bromley, (2009) *Globalization in Question*, Cambridge: Polity Press, pp. 68-100 (MNC).

Additional Readings:

G. Ritzer, (2010) *Globalization: A Basic Text*, Sussex: Wiley-Blackwell, pp. 180-190.
F. Lechner and J. Boli (ed.), (2004) *The Globalization Reader*, London: Blackwell, pp. 236-239 (WTO).
D. Held et al, (1999) *Global Transformations: Politics, Economics and Culture*,

California: Stanford University Press, pp. 242-282 (MNC).

T. Cohn, (2009) *Global Political Economy*, New Delhi: Pearson, pp. 250-323 (MNC).

Cultural and Technological Dimension

Essential Readings:

D. Held and A. McGrew (eds.), (2002) *Global Transformations Reader: Politics, Economics and Culture*, Cambridge: Polity Press, pp. 1-50; 84-91.

M. Steger, (2009) 'Globalization: A Contested Concept', in *Globalization: A Very Short Introduction*, London: Oxford University Press, pp. 1-16.

A. Appadurai, (2000) 'Grassroots Globalization and the Research Imagination', in *Public Culture*, Vol. 12(1), pp. 1-19.

Additional Reading:

J. Beynon and D. Dunkerley, (eds.), (2012) *Globalisation: The Reader*, New Delhi: Rawat Publications, pp. 1-19.

A. Vanaik, (ed.), (2004) *Globalization and South Asia: Multidimensional Perspectives*, New Delhi: Manohar Publications, pp. 171-191, 192-213, 301-317, 335-357.

Global Resistances (Global Social Movements and NGOs)

Essential Readings:

G. Ritzer, (2010) *Globalization: A Basic Text*, Sussex: Wiley-Blackwell, pp. 487-504.

R. O'Brien et al., (2000) *Contesting Global Governance: Multilateral Economic Institutions and Global Social Movements*, Cambridge: Cambridge University Press, pp. 1-23.

J. Fisher, (1998) *Non-Governments: NGOs and Political Development in the Third World*, Connecticut: Kumarian Press, pp. 1- 37 (NGO).

Additional Readings:

G. Laxter and S. Halperin (eds.), (2003) *Global Civil Society and Its Limits*, New York: Palgrave, pp. 1-21.

A. Heywood, (2011) *Global Politics*, New York: Palgrave-McMillan, pp. 150-156 (NGO).

P. Willets, (2011) 'Trans-National Actors and International Organizations in Global Politics', in J. Baylis, S. Smith and P. Owens (eds.) *Globalization of World Politics*, New York: Oxford University Press, pp. 334-342. (NGO)

II. Contemporary Global Issues

Ecological Issues: Historical Overview of International Environmental Agreements, Climate Change, Global Commons Debate

Essential Readings:

J. Volger, (2011) 'Environmental Issues', in J. Baylis, S. Smith and P. Owens (eds.) *Globalization of World Politics*, New York: Oxford University Press, pp. 348-362.

A. Heywood, (2011) *Global Politics*, New York: Palgrave, pp. 383-411.

N. Carter, (2007) *The Politics of Environment: Ideas, Activism, Policy*, Cambridge: Cambridge University Press, pp. 13-81.

Additional Readings:

P. Bidwai, (2011) 'Durban: Road to Nowhere', in *Economic and Political Weekly*,

Vol.46, No. 53, December, pp. 10-12.

K.Shimko, (2005) *International Relations Perspectives and Controversies*, New York: Hughton-Mifflin, pp. 317-339.

Proliferation of Nuclear Weapons

Essential Readings:

D. Howlett, (2011) 'Nuclear Proliferation', in J. Baylis, S. Smith and P. Owens (eds.) *Globalization of World Politics*, New York: Oxford University Press, pp. 384-397.

P. Viotti and M. Kauppi, (2007) *International Relations and World Politics: Security, Economy and Identity*, New Delhi: Pearson, pp. 238-272.

Additional Reading:

A. Heywood, (2011) *Global Politics*, New York: Palgrave, pp. 264-281.

International Terrorism: Non-State Actors and State Terrorism; Post 9/11 developments

Essential Readings:

P. Viotti and M. Kauppi, (2007) *International Relations*, New Delhi: Pearson, pp. 276-307.

A.Heywood, (2011) *Global Politics*, New York: Palgrave, pp. 282-

301. Additional Readings:

J. Kiras, (2011) 'Terrorism and Globalization', in J. Baylis, S. Smith and P. Owens (eds.) *Globalization of World Politics*, New York: Oxford University Press, pp. 366- 380.

A.Vanaik, (2007) *Masks of Empire*, New Delhi: Tulika, pp. 103-128.

Migration

Essential Readings:

G. Ritzer, (2010) *Globalization: A Basic Text*, Sussex: Wiley-Blackwell, pp. 298-322.

S. Castles, (2012) 'Global Migration', in B. Chimni and S. Mallavarapu (eds.) *International Relations: Perspectives For the Global South*, New Delhi: Pearson, pp. 272-285.

Human Security

Essential Readings:

A. Acharya, (2011) 'Human Security', in J. Baylis, S. Smith and P. Owens (eds.) *Globalization of World Politics*, New York: Oxford University Press, pp. 480-493.

S. Tadjbakhsh and A. Chenoy, (2007) *Human Security*, London: Routledge, pp. 13-19; 123-127; 236-243.

Additional Reading:

A. Acharya, (2001) 'Human Security: East versus West', in *International Journal*, Vol. 56, no. 3, pp. 442-460.

III. Global Shifts: Power and Governance

Essential Readings:

J. Rosenau, (1992) 'Governance, Order, and Change in World Politics', in J. Rosenau, and

E. Czempiel (eds.) *Governance without Government: Order and Change in World Politics*, Cambridge: Cambridge University Press, pp. 1-29.

A. Kumar and D. Messner (eds), (2010) *Power Shifts and Global Governance: Challenges from South and North*, London: Anthem Press.

P. Dicken, (2007) *Global Shift: Mapping the Changing Contours of the World Economy*, New York: The Guilford Press.

J. Close, (2001) 'The Global Shift: A quantum leap in human evolution', Available at <http://www.stir-global-shift.com/page22.php>, Accessed: 19.04.2013.

5.1

Paper XI- Classical Political Philosophy

Course objective: This course goes back to Greek antiquity and familiarizes students with the manner in which the political questions were first posed. Machiavelli comes as an interlude inaugurating modern politics followed by Hobbes and Locke. This is a basic foundation course for students.

I. Text and Interpretation (2 weeks)

II. Antiquity Plato (2 weeks)

Philosophy and Politics, Theory of Forms, Justice, Philosopher King/Queen, Communism Presentation theme: Critique of Democracy; Women and Guardianship, Censorship

Aristotle (2 weeks)

Forms, Virtue, Citizenship, Justice, State and Household
Presentation themes: Classification of governments; man as zoon politikon

III. Interlude:

Machiavelli (2 weeks)

Virtu, Religion, Republicanism
Presentation themes: morality and statecraft; vice and virtue

IV. Possessive

Individualism Hobbes (2 weeks)

Human nature, State of Nature, Social Contract, State
Presentation themes: State of nature; social contract; Leviathan; atomistic individuals.

Locke (2 weeks)

Laws of Nature, Natural Rights, Property,
Presentation themes: Natural rights; right to dissent; justification of property

READING LIST

I. Text and Interpretation

Essential Readings:

T. Ball, (2004) 'History and Interpretation' in C. Kukathas and G. Gaus, (eds.) *Handbook of Political Theory*, London: Sage Publications Ltd. pp. 18-30.

B. Constant, (1833) 'The Liberty of the Ancients Compared with that of the Moderns', in D. Boaz, (ed), (1997) *The Libertarian Reader*, New York: The Free Press.

Additional Readings:

J. Coleman, (2000) 'Introduction', in *A History of Political Thought: From Ancient Greece to Early Christianity*, Oxford: Blackwell Publishers, pp. 1-20.

Q. Skinner, (2010) 'Preface', in *The Foundations of Modern Political Thought Volume I*, Cambridge: Cambridge University Press pp. ix-xv.

II.

Antiquity:

Plato

Essential Readings:

A. Skoble and T. Machan, (2007) *Political Philosophy: Essential Selections*. New Delhi: Pearson Education, pp. 9-32.

R. Kraut, (1996) 'Introduction to the study of Plato', in R. Kraut (ed.) *The Cambridge Companion to Plato*. Cambridge: Cambridge University Press, pp. 1-50.

C. Reeve, (2009) 'Plato', in D. Boucher and P. Kelly, (eds) *Political Thinkers: From Socrates to the Present*, Oxford: Oxford University Press, pp. 62-80

Additional Readings:

S. Okin, (1992) 'Philosopher Queens and Private Wives', in S. Okin *Women in Western Political Thought*, Princeton: Princeton University Press, pp. 28-50

R. Kraut, (1996) 'The Defence of Justice in Plato's Republic', in R. Kraut (ed.) *The Cambridge Companion to Plato*. Cambridge: Cambridge University Press, pp. 311-337

T. Saunders, (1996) 'Plato's Later Political Thought', in R. Kraut (ed.) *The Cambridge Companion to Plato*. Cambridge: Cambridge University Press, pp. 464-492.

Aristotle

Essential Readings:

A. Skoble and T. Machan, (2007) *Political Philosophy: Essential Selections*. New Delhi: Pearson Education, pp. 53-64.

T. Burns, (2009) 'Aristotle', in D. Boucher, and P. Kelly, (eds) *Political Thinkers: From*

Socrates to the Present. Oxford: Oxford University Press, pp.81-99.

C. Taylor, (1995) 'Politics', in J. Barnes (ed.), *The Cambridge Companion to Aristotle*. Cambridge: Cambridge University Press, pp. 232-258

Additional Readings:

J. Coleman, (2000) 'Aristotle', in J. Coleman *A History of Political Thought: From Ancient Greece to Early Christianity*, Oxford: Blackwell Publishers, pp.120-186

D. Hutchinson, (1995) 'Ethics', in J. Barnes, (ed.), *The Cambridge Companion to Aristotle* Cambridge: Cambridge University Press, pp. 195-232.

III. Interlude:

Machiavelli

Essential Readings:

A. Skoble and T. Machan, (2007) *Political Philosophy: Essential Selections*. New Delhi: Pearson Education, pp. 124-130

Q. Skinner, (2000) 'The Adviser to Princes', in *Machiavelli: A Very Short Introduction*, Oxford: Oxford University Press, pp. 23-53

J. Femia, (2009) 'Machiavelli', in D. Boucher, and P. Kelly, (eds) *Political Thinkers: From Socrates to the Present*. Oxford: Oxford University Press, pp. 163-184

Additional Reading:

Q. Skinner, (2000) 'The Theorist of Liberty', in *Machiavelli: A Very Short Introduction*. Oxford: Oxford University Press, pp. 54-87.

IV. Possessive

Individualism Hobbes

Essential Readings:

A. Skoble and T. Machan, (2007) *Political Philosophy: Essential Selections*. New Delhi: Pearson Education pp. 131-157.

D. Baumgold, (2009) 'Hobbes', in D. Boucher and P. Kelly (eds) *Political Thinkers: From Socrates to the Present*. Oxford: Oxford University Press, pp. 189-206.

C. Macpherson (1962) *The Political Theory of Possessive Individualism: Hobbes to Locke*. Oxford University Press, Ontario, pp. 17-29.

Additional Readings:

I. Hampsher-Monk, (2001) 'Thomas Hobbes', in *A History of Modern Political Thought: Major Political Thinkers from Hobbes to Marx*, Oxford: Blackwell Publishers, pp. 1-67.

A. Ryan, (1996) 'Hobbes's political philosophy', in T. Sorell, (ed.) *Cambridge Companion to Hobbes*. Cambridge: Cambridge University Press, pp. 208-245.

Locke

Essential Readings:

A. Skoble and T. Machan, (2007) *Political Philosophy: Essential Selections*. New Delhi: Pearson Education, pp. 181-209.

J. Waldron, (2009) 'John Locke', in D. Boucher and P. Kelly, (eds) *Political Thinkers: From Socrates to the Present*. Oxford: Oxford University Press, pp. 207-224

C. Macpherson, (1962) *The Political Theory of Possessive Individualism: Hobbes to Locke*. Oxford University Press, Ontario, pp. 194-214.

Additional Readings:

R. Ashcraft, (1999) 'Locke's Political Philosophy', in V. Chappell (ed.) *The Cambridge Companion to Locke*, Cambridge. Cambridge University Press, pp. 226-251.

I. Hampsher-Monk, (2001) *A History of Modern Political Thought: Major Political Thinkers from Hobbes to Marx*, Oxford: Blackwell Publishers, pp. 69-116

5.2 Paper XII- Indian Political Thought-I

Course objective: This course introduces the specific elements of Indian Political Thoughtspanning over two millennia. The basic focus of study is on individual thinkers whose ideas are however framed by specific themes. The course as a whole is meant to provide a sense of the broad streams of Indian thought while encouraging a specific knowledge of individual thinkers and texts. Selected extracts from some original texts are also given to discuss in class. The list of additional readings is meant for teachers as well as the more interested students.

I. Traditions of Pre-colonial Indian Political Thought (8 lectures)

- a. Brahmanic and Shramanic
- b. Islamic and Syncretic.

II. Ved Vyasa (Shantiparva): Rajadharma (5 lectures)

III. Manu: Social Laws (6 lectures)

IV. Kautilya: Theory of State (7 lectures)

V. Aggannasutta (Digha Nikaya): Theory of kingship (5 lectures)

VI. Barani: Ideal Polity (6 lectures)

VII. Abul Fazal: Monarchy (6 lectures)

VIII. Kabir: Syncretism (5 lectures)

READING LIST

I. Traditions of Pre-modern Indian Political Thought:

Essential Readings:

B. Parekh, (1986) 'Some Reflections on the Hindu Tradition of Political Thought', in T. Pantham, and K. Deutsch (eds.), *Political Thought in Modern India*, New Delhi: Sage Publications, pp. 17- 31.

A. Altekar, (1958) 'The Kingship', in *State and Government in Ancient India*, 3rd edition, Delhi: Motilal Banarsidass, pp. 75-108.

M. Shakir, (1986) 'Dynamics of Muslim Political Thought', in T. Pantham, and K. Deutsch (eds.), *Political Thought in Modern India*, New Delhi: Sage Publications, pp. 142- 160

G. Pandey, (1978) *Sraman Tradition: Its History and Contribution to Indian Culture*, Ahmedabad: L. D. Institute of Indology, pp. 52-73.

S. Saberwal, (2008) 'Medieval Legacy', in *Spirals of Contention*, New Delhi: Routledge, pp.1-31

II. Ved Vyasa (Shantiparva): Rajadharm

Essential Readings:

The Mahabharata (2004), Vol. 7 (Book XI and Book XII, Part II), Chicago and London:University of Chicago Press.

V. Varma, (1974) *Studies in Hindu Political Thought and Its Metaphysical Foundations*, Delhi: Motilal Banarsidass, pp. 211- 230.

B. Chaturvedi, (2006) 'Dharma-The Foundation of Raja-Dharma, Law and Governance', in
The Mahabharata: An Inquiry in the Human Condition, Delhi: Orient Longman, pp. 418- 464.

III. Manu: Social Laws

Essential Readings:

Manu, (2006) 'Rules for Times of Adversity', in P. Olivelle, (ed. & trans.) *Manu's Code of Law: A Critical Edition and Translation of the Manava- Dharamsastra*, New Delhi: OUP, pp. 208-213.

V. Mehta, (1992) 'The Cosmic Vision: Manu', in *Foundations of Indian Political Thought*, Delhi: Manohar, pp. 23- 39.

R. Sharma, (1991) 'Varna in Relation to Law and Politics (c 600 BC-AD 500)', in *Aspects of Political Ideas and Institutions in Ancient India*, Delhi: Motilal Banarsidass, pp. 233-251.

P. Olivelle, (2006) 'Introduction', in *Manu's Code of Law: A Critical Edition and Translation of the Manava –Dharmasastra*, Delhi: Oxford University Press, pp. 3- 50.

IV. Kautilya: Theory of State

Essential Readings:

Kautilya, (1997) 'The Elements of Sovereignty' in R. Kangle (ed. and trns.), *Arthashastra of Kautilya*, New Delhi: Motilal Publishers, pp. 511- 514.

V. Mehta, (1992) 'The Pragmatic Vision: Kautilya and His Successor', in *Foundations of Indian Political Thought*, Delhi: Manohar, pp. 88- 109.

R. Kangle, (1997) *Arthashastra of Kautilya-Part-III: A Study*, Delhi: Motilal Banarsidass, rpt., pp. 116- 142.

Additional Reading:

J. Spellman, (1964) 'Principle of Statecraft', in *Political Theory of Ancient India: A Study of Kingship from the Earliest time to Circa AD 300*, Oxford: Clarendon Press, pp. 132-170.

V. Agganna Sutta (Digha Nikaya): Theory of Kingship

Essential Readings:

S. Collins, (ed), (2001) *Agganna Sutta: An Annotated Translation*, New Delhi: Sahitya Academy, pp. 44-49.

S. Collins, (2001) 'General Introduction', in *Agganna Sutta: The Discussion on What is Primary (An Annotated Translation from Pali)*, Delhi: Sahitya Akademi, pp. 1- 26.

B. Gokhale, (1966) 'The Early Buddhist View of the State', in *The Journal of Asian Studies*, Vol. XXVI, (1), pp. 15- 22.

Additional Reading:

L. Jayasurya, 'Buddhism, Politics and Statecraft', Available at ftp.buddhism.org/Publications/.../Voll1_03_Laksiri%20Jayasuriya.pdf, Accessed: 19.04.2013.

VI. Barani: Ideal Polity

Essential Reading:

I. Habib, (1998) 'Ziya Barani's Vision of the State', in *The Medieval History Journal*, Vol. 2,

(1), pp. 19- 36.

Additional Reading:

M. Alam, (2004) 'Sharia Akhlaq', in *The Languages of Political Islam in India 1200- 1800*, Delhi: Permanent Black, pp. 26- 43

VII. Abul Fazal: Monarchy

Essential Readings:

A. Fazl, (1873) *The Ain-i Akbari* (translated by H. Blochmann), Calcutta: G. H. Rouse, pp. 47-57.

V. Mehta, (1992) 'The Imperial Vision: Barani and Fazal', in *Foundations of Indian Political Thought*, Delhi: Manohar, pp. 134- 156.

Additional Readings:

M. Alam, (2004) 'Sharia in Naserean Akhlaq', in *Languages of Political Islam in India 1200-1800*, Delhi: Permanent Black, pp. 46- 69.

I. Habib, (1998) 'Two Indian Theorist of The State: Barani and Abul Fazal', in *Proceedings of the Indian History Congress*. Patiala, pp. 15- 39.

VIII. Kabir: Syncreticism

Essential Readings:

Kabir. (2002) *The Bijak of Kabir*, (translated by L. Hess and S. Singh), Delhi: Oxford University Press, No. 30, 97, pp. 50- 51 & 69- 70.

V. Mehta, (1992) *Foundation of Indian Political Thought*, Delhi: Manohar, pp. 157- 183.

G. Omvedt, (2008) 'Kabir and Ravidas, Envisioning Begumpura', in *Seeking Begumpura: The Social Vision of Anti Caste Intellectual*, Delhi: Navayana, pp. 91- 107.

Additional Reading:

L. Hess and S. Singh, (2002) 'Introduction', in *The Bijak of Kabir*, New Delhi: Oxford University Press, pp. 3- 35.

6.1 Paper XIII- Modern Political Philosophy

Course objective: Philosophy and politics are closely intertwined. We explore this convergence by identifying four main tendencies here. Students will be exposed to the manner in which the questions of politics have been posed in terms that have implications for larger questions of thought and existence.

I. Modernity and its discourses (8 lectures)

This section will introduce students to the idea of modernity and the discourses around modernity. Two essential readings have been prescribed.

II. Romantics (16 lectures)

a. Jean Jacques Rousseau (8 Lectures)

Presentation themes: General Will; local or direct democracy; self-government; origin of inequality.

b. Mary Wollstonecraft (8 Lectures)

Presentation themes: Women and paternalism; critique of Rousseau's idea of education; legal rights

III. Liberal socialist (8 lectures)

a. John Stuart Mill

Presentation themes: Liberty, suffrage and subjection of women, right of minorities; utility principle.

IV. Radicals (16 lectures)

a. Karl Marx (8 Lectures)

Presentation themes: Alienation; difference with other kinds of materialism; class struggle

b. Alexandra Kollontai (8 Lectures)

Presentation themes: Winged and wingless Eros; proletarian woman; socialization of housework; disagreement with Lenin

Reading List

I. Modernity and its discourses

Essential Readings:

I. Kant. (1784) 'What is Enlightenment?,' available at <http://theliterarylink.com/kant.html>, Accessed: 19.04.2013

S. Hall (1992) 'Introduction', in *Formations of Modernity* UK: Polity Press pages 1-16

II. Romantics

Essential Readings:

B. Nelson, (2008) *Western Political Thought*. New York: Pearson Longman, pp. 221- 255.

M. Keens-Soper, (2003) 'Jean Jacques Rousseau: The Social Contract', in M. Forsyth and M. Keens-Soper, (eds) *A Guide to the Political Classics: Plato to Rousseau*. New York: Oxford University Press, pp. 171-202.

C. Jones, (2002) 'Mary Wollstonecraft's *Vindications* and their Political Tradition' in C. Johnson, (ed.) *The Cambridge Companion to Mary Wollstonecraft*, Cambridge: Cambridge University Press, pp. 42-58.

S. Ferguson, (1999) 'The Radical Ideas of Mary Wollstonecraft', in *Canadian Journal of Political Science* XXXII (3), pp. 427-50, Available at <http://digitalcommons.ryerson.ca/politics>, Accessed: 19.04.2013.

III. Liberal Socialist

Essential Readings:

H. Magid, (1987) 'John Stuart Mill', in L. Strauss and J. Cropsey, (eds), *History of Political Philosophy*, 2nd edition. Chicago: Chicago University Press, pp. 784-801.

P. Kelly, (2003) 'J.S. Mill on Liberty', in D. Boucher, and P. Kelly, (eds.) *Political Thinkers: From Socrates to the Present*. New York: Oxford University Press, pp. 324- 359.

IV. Radicals

Essential Readings:

J. Cropsey, (1987) 'Karl Marx', in L. Strauss and J. Cropsey, (eds) *History of Political Philosophy*, 2nd Edition. Chicago: Chicago University Press, pp. 802-828.

L. Wilde, (2003) 'Early Marx', in D. Boucher and P. Kelly, P. (eds) *Political Thinkers: From Socrates to the Present*. New York: Oxford University Press, pp. 404-435.

V. Bryson, (1992) 'Marxist Feminism in Russia' in *Feminist Political Theory*, London: Palgrave Macmillan, pp. 114-122

C. Sypnowich, (1993) 'Alexandra Kollontai and the Fate of Bolshevik Feminism' *Labour/Le Travail* Vol. 32 (Fall 1992) pp. 287-295

A. Kollontai (1909), *The Social Basis of the Woman Question*, Available at <http://www.marxists.org/archive/kollonta/1909/social-basis.htm>, Accessed: 19.04.2013

Additional Readings:

A. Bloom, (1987) 'Jean-Jacques Rousseau', in Strauss, L. and Cropsey, J. (eds.) *History of Political Philosophy*, 2nd edition. Chicago: Chicago University Press, pp. 559-580.

Selections from *A Vindication of the Rights of Woman*, Available at <http://oregonstate.edu/instruct/phl302/texts/wollstonecraft/woman-a.html#CHAPTER%20II>, Accessed: 19.04.2013.

A. Skoble and T. Machan, (2007) *Political Philosophy: Essential Selections*, New Delhi: Pearson Education, pp. 328-354.

B. Ollman (1991) *Marxism: An Uncommon Introduction*, New Delhi: Sterling Publishers.

G. Blakely and V. Bryson (2005) *Marx and Other Four Letter Words*, London: Pluto

A. Skoble, and T. Machan, (2007) *Political Philosophy: Essential Selections*, New Delhi: Pearson Education, pp. 286-327.

A. Kollontai, (1977) 'Social Democracy and the Women's Question', in *Selected Writings of Alexandra Kollontai*, London: Allison & Busby, pp. 29-74.

A. Kollontai, (1977) 'Make Way for Winged Eros: A Letter to the Youth', in *Selected Writings of Alexandra Kollontai* Allison & Busby, pp. 201-292.

C. Porter, (1980) *Alexandra Kollontai: The Lonely Struggle of the Woman who defied Lenin*, New York: Dutton Children's Books.

6.2 Paper XIV- Indian Political Thought-II

Course objective: Based on the study of individual thinkers, the course introduces a wide span of thinkers and themes that defines the modernity of Indian political thought. The objective is to study general themes that have been produced by thinkers from varied social and temporal contexts. Selected extracts from original texts are also given to discuss in the class. The list of additional readings is meant for teachers as well as the more interested students.

I. Introduction to Modern Indian Political Thought (4 lectures)

II. Rammohan Roy: Rights (4 lectures)

III. Pandita Ramabai: Gender (4 lectures)

IV. Vivekananda: Ideal Society (5 lectures)

V. Gandhi: Swaraj (5 lectures)

VI. Ambedkar: Social Justice (5 lectures)

VII. Tagore: Critique of Nationalism (4 lectures)

VIII. Iqbal: Community (5 lectures)

IX. Savarkar: Hindutva (4 lectures)

X. Nehru: Secularism (4 lectures)

XI. Lohia: Socialism (4 lectures)

Reading List

I. Introduction to Modern Indian Political Thought

Essential Readings:

V. Mehta and T. Pantham (eds.), (2006) '*A Thematic Introduction to Political Ideas in Modern India: Thematic Explorations, History of Science, Philosophy and Culture in Indian civilization*'

Vol. 10, Part: 7, New Delhi: Sage Publications, pp. xxvii-ixi.

D. Dalton, (1982) 'Continuity of Innovation', in *Indian Idea of Freedom: Political Thought of Swami Vivekananda, Aurobindo Ghose, Rabindranath Tagore and Mahatma Gandhi*, Academic Press: Gurgaon, pp. 1-28.

II. Rammohan Roy: Rights

Essential Readings:

R. Roy, (1991) 'The Precepts of Jesus, the Guide to Peace and Happiness', S. Hay, (ed.) *Sources of Indian Tradition, Vol. 2*. Second Edition. New Delhi: Penguin, pp. 24-29.

C. Bayly, (2010) 'Rammohan and the Advent of Constitutional Liberalism in India 1800-1830', in Sh. Kapila (ed.), *An intellectual History for India*, New Delhi: Cambridge University Press, pp. 18- 34.

T. Pantham, (1986) 'The Socio-Religious Thought of Rammohan Roy', in Th. Panthom and K. Deutsch, (eds.) *Political Thought in Modern India*, New Delhi: Sage, pp.32-52.

Additional Reading:

S. Sarkar, (1985) 'Rammohan Roy and the break With the Past', in *A Critique on colonial India*, Calcutta: Papyrus, pp. 1-17.

III. Pandita Ramabai: Gender

Essential Readings:

P. Ramabai, (2000) 'Woman's Place in Religion and Society', in M. Kosambi (ed.), *Pandita Ramabai Through her Own Words: Selected Works*, New Delhi: Oxford

University Press, pp.150-155.

M. Kosambi, (1988) 'Women's Emancipation and Equality: Pandita Ramabai's Contribution to Women's Cause', in *Economic and Political Weekly*, Vol. 23(44), pp. 38-49.

Additional Reading:

U. Chakravarti, (2007) *Pandita Ramabai - A Life and a Time*, New Delhi: Critical Quest, pp. 1-40.

G. Omvedt, (2008) 'Ramabai: Women in the Kingdom of God', in *Seeking Begumpura: The Social Vision of Anti Caste Intellectuals*, New Delhi: Navayana. pp. 205-224.

IV. Vivekananda: Ideal Society

Essential Readings:

S. Vivekananda, (2007) 'The Real and the Apparent Man', S. Bodhasarananda (ed.), *Selections from the Complete Works of Swami Vivekananda*, Kolkata: Advaita Ashrama, pp.126-129.

A. Sen, (2003) 'Swami Vivekananda on History and Society', in *Swami Vivekananda*, Delhi: Oxford University Press, pp. 62- 79.

H. Rustav, (1998) 'Swami Vivekananda and the Ideal Society', in W. Radice (ed.), *Swami Vivekananda and the Modernisation of Hinduism*, Delhi: Oxford University Press, pp. 264-280.

Additional Reading:

Raghuramaraju, (2007) 'Swami and Mahatma, Paradigms: State and Civil Society', in *Debates in Indian Philosophy: Classical, Colonial, and Contemporary*, Delhi: Oxford University Press, pp. 29-65.

V. Gandhi: Swaraj

Essential Readings:

M. Gandhi, (1991) 'Satyagraha: Transforming Unjust Relationships through the Power of the Soul', in S. Hay (ed.), *Sources of Indian Tradition*, Vol. 2. Second Edition, New Delhi: Penguin, pp. 265-270.

A. Parel, (ed.), (2002) 'Introduction', in *Gandhi, freedom and Self Rule*, Delhi: Vistaar Publication.

D. Dalton, (1982) *Indian Idea of Freedom: Political Thought of Swami Vivekananda, Aurobindo Ghose, Mahatma Gandhi and Rabindranath Tagore*, Gurgaon: The Academic Press, pp. 154- 190.

Additional Reading:

R. Terchek, (2002) 'Gandhian Autonomy in Late Modern World', in A. Parel (ed.), *Gandhi, Freedom and Self Rule*. Delhi: Sage.

VI. Ambedkar: Social Justice

Essential Readings:

B. Ambedkar, (1991) 'Constituent Assembly Debates', S. Hay (ed.), *Sources of Indian Tradition, Vol. 2*, Second Edition, New Delhi: Penguin, pp. 342-347.

V. Rodrigues, (2007) 'Good society, Rights, Democracy Socialism', in S. Thorat and Aryama (eds.), *Ambedkar in Retrospect - Essays on Economics, Politics and Society*, Jaipur: IIDS and Rawat Publications.

B. Mungekar, (2007) 'Quest for Democratic Socialism', in S. Thorat, and Aryana (eds.), *Ambedkar in Retrospect - Essays on Economics, Politics and Society*, Jaipur: IIDS and Rawat Publications, pp. 121-142.

Additional Reading:

P. Chatterjee, (2005) 'Ambedkar and the Troubled times of Citizenship', in V. Mehta and Th. Pantham (eds.), *Political ideas in modern India: Thematic Explorations*, New Delhi: Sage, pp. 73-92.

VII. Tagore: Critique of Nationalism

Essential Readings:

R. Tagore, (1994) 'The Nation', S. Das (ed.), *The English Writings of Rabindranath Tagore, Vol. 3*, New Delhi: Sahitya Akademi, pp. 548-551.

R. Chakravarty, (1986) 'Tagore, Politics and Beyond', in Th. Panthams and K. Deutsch (eds.), *Political Thought in Modern India*, New Delhi: Sage, pp. 177-191.

M. Radhakrishnan, and Debasmita, (2003) 'Nationalism is a Great Menace: Tagore and Nationalism' in P. Hogan, Colm and L. Pandit, (eds.) *Rabindranath Tagore: Universality and Tradition*, London: Rosemont Publishing and Printing Corporation, pp. 29-39.

Additional Reading:

A. Nandy, (1994) 'Rabindranath Tagore & Politics of Self', in *Illegitimacy of Nationalism*, Delhi: Oxford University Press, pp. 1-50.

VIII. Iqbal: Community

Essential Readings:

M. Iqbal, (1991) 'Speeches and Statements', in S. Hay (ed.), *Sources of Indian Tradition, Vol.2*, Second Edition, New Delhi: Penguin, pp. 218-222.

A. Engineer, (1980) 'Iqbal's Reconstruction of Religious Thought in Islam', in *Social Scientist*, Vol.8 (8), pp. 52-63.

Madani, (2005) *Composite Nationalism and Islam*, New Delhi: Manohar, pp. 66-91.

Additional Reading:

L. Gordon-Polonskya, (1971) 'Ideology of Muslim Nationalism', in H. Malik (ed.), *Iqbal: Poet-Philosopher of Pakistan*, New York: Columbia University Press, pp. 108- 134.

IX. Savarkar: Hindutva

Essential Readings:

V.Savarkar, 'Hindutva is Different from Hinduism', available at <http://www.savarkar.org/en/hindutva-/essentials-hindutva/hindutva-different-hinduism>, Accessed: 19.04.2013

J. Sharma, (2003) *Hindutva: Exploring the Idea of Hindu Nationalism*, Delhi: Penguin, pp. 124-172.

Additional Reading:

Dh. Keer, (1966) *Veer Savarkar*, Bombay: Popular Prakashan, pp. 223-250.

X. Nehru: Secularism

Essential Readings:

J. Nehru, (1991) 'Selected Works', in S. Hay (ed.), *Sources of Indian Tradition, Vol. 2*, Second Edition, New Delhi: Penguin, pp. 317-319.

R. Pillai, (1986) 'Political thought of Jawaharlal Nehru', in Th. Pantham, and K. Deutsch (eds.), *Political Thought in Modern India*, New Delhi: Sage, pp. 260- 274.

B. Zachariah, (2004) *Nehru*, London: Routledge Historical Biographies, pp. 169-213.

Additional Reading:

P. Chatterjee, (1986) 'The Moment of Arrival: Nehru and the Passive Revolution', in *Nationalist Thought and the Colonial World: A Derivative Discourse?* London: Zed Books, pp.131-166

XI. Lohia: Socialism

Essential Readings:

M. Anees and V. Dixit (eds.), (1984) *Lohia: Many Faceted Personality*, Rammanohar Lohia Smarak Smriti.

S. Sinha, (2010) 'Lohia's Socialism: An underdog's perspective', in *Economic and Political Weekly*, Vol. XLV (40) pp. 51-55.

- A. Kumar, (2010) 'Understanding Lohia's Political Sociology: Intersectionality of Caste, Class, Gender and Language Issue', in *Economic and Political Weekly*, Vol. XLV (40), pp. 64-70.

B) Generic Elective (Interdisciplinary): 4

1.

Feminism: Theory and Practice

Course Objective: The aim of the course is to explain contemporary debates on feminism and the history of feminist struggles. The course begins with a discussion on construction of gender and an understanding of complexity of patriarchy and goes on to analyze theoretical debates within feminism. Part II of the paper covers history of feminism in the west, socialist societies and in anti-colonial struggles. Part III focuses a gendered analysis of Indian society, economy and polity with a view to understanding the structures of gender inequalities. And the last section aims to understand the issues with which contemporary Indian women's movements are engaged with.

I. Approaches to understanding Patriarchy (22 Lectures)

- Feminist theorising of the sex/gender distinction. Biologism versus social constructivism
- Understanding Patriarchy and Feminism
- Liberal, Socialist, Marxist, Radical feminism, New Feminist Schools/Traditions

II. History of Feminism (22 Lectures)

- Origins of Feminism in the West: France, Britain and United States of America
- Feminism in the Socialist Countries: China, Cuba and erstwhile USSR
- Feminist issues and women's participation in anti-colonial and national liberation movements with special focus on India

III. The Indian Experience (16 Lectures)

- Traditional Historiography and Feminist critiques. Social Reforms Movement and position of women in India. History of Women's struggle in India
- Family in contemporary India - patrilineal and matrilineal practices. Gender Relations in the Family, Patterns of Consumption: Intra Household Divisions, entitlements and bargaining, Property Rights
- Understanding Woman's Work and Labour – Sexual Division of Labour, Productive and Reproductive labour, Visible - invisible work – Unpaid (reproductive and

care), Underpaid and Paid work,- Methods of computing women's work , Female headed households

Essential Readings

I. Approaches to understanding Patriarchy

Geetha, V. (2002) *Gender*. Calcutta: Stree.

Geetha, V. (2007) *Patriarchy*. Calcutta: Stree.

Jagger, Alison. (1983) *Feminist Politics and Human Nature*. U.K.: Harvester Press, pp. 25-350.

Supplementary Readings:

Ray, Suranjita. *Understanding Patriarchy*. Available at:

http://www.du.ac.in/fileadmin/DU/Academics/course_material/hrge_06.pdf

Lerner, Gerda. (1986) *The Creation of Patriarchy*. New York: Oxford University Press.

II. History of Feminism

Rowbotham, Shiela. (1993) *Women in Movements*. New York and London: Routledge, Section I, pp. 27-74 and 178-218.

Jayawardene, Kumari. (1986) *Feminism and Nationalism in the Third World*. London: Zed Books, pp. 1-24, 71-108, and Conclusion.

Forbes, Geraldine (1998) *Women in Modern India*. Cambridge: Cambridge University Press, pp. 1-150.

Supplementary Readings:

Eisentein, Zillah. (1979) *Capitalist Patriarchy and the Case for Socialist Feminism*. New York: Monthly Review Press, pp. 271-353.

Funk, Nanette & Mueller, Magda. (1993) *Gender, Politics and Post-Communism*. New York and London: Routledge, Introduction and Chapter 28.

Chaudhuri, Maiyatee. (2003) 'Gender in the Making of the Indian Nation State', in Rege, Sharmila. (ed.) *The Sociology of Gender: The Challenge of Feminist Sociological Knowledge*. New Delhi: Sage.

Banarjee, Sikata. (2007) 'Gender and Nationalism: The Masculinisation of Hinduism and

Female Political Participation', in Ghadially, Rehana. (ed.) *Urban Women in Contemporary India: A Reader*. New Delhi: Sage.

III. Feminist Perspectives on Indian Politics

Roy, Kumkum. (1995) 'Where Women are Worshipped, There Gods Rejoice: The Mirage of the Ancestress of the Hindu Women', in Sarkar, Tanika & Butalia, Urvashi. (eds.) *Women and the Hindu Right*. Delhi: Kali for Women, pp. 10-28.

Chakravarti, Uma. (1988) 'Beyond the Altekarian Paradigm: Towards a New Understanding of Gender Relations in Early Indian History', *Social Scientist*, Volume 16, No. 8.

Banerjee, Nirmala. (1999) 'Analysing Women's work under Patriarchy' in Sangari, Kumkum & Chakravarty, Uma. (eds.) *From Myths to Markets: Essays on Gender*. Delhi: Manohar.

Additional Readings

Gandhi, Nandita & Shah, Nandita. (1991) *The Issues at Stake – Theory and Practice in Contemporary Women's Movement in India*. Delhi: Zubaan, pp. 7-72.

Shinde, Tarabai (1993) 'Stri-Purush Tulna', in Tharu, Susie & Lalita, K. (eds.) *Women Writing in India, 600 BC to the Present. Vol. I*. New York: Feminist Press.

Desai, Neera & Thakkar, Usha. (2001) *Women in Indian Society*. New Delhi: National Book Trust.

2. Gandhi and the Contemporary World

Course objective: Locating Gandhi in a global frame, the course seeks to elaborate Gandhian thought and examine its practical implications. It will introduce students to key instances of Gandhi's continuing influence right up to the contemporary period and enable them to critically evaluate his legacy.

I. Gandhi on Modern Civilization and Ethics of Development (2 weeks)

- a. Conception of Modern Civilisation and Alternative Modernity
- b. Critique of Development: Narmada Bachao Andolan

II. Gandhian Thought: Theory and Action (4 weeks)

- a. Theory of Satyagraha
- b. Satyagraha in Action
 - i. Peasant Satyagraha: Kheda and the Idea of Trusteeship
 - ii. Temple Entry and Critique of Caste
 - iii. Social Harmony: 1947 and Communal Unity

III. Gandhi's Legacy (4 weeks)

- a) Tolerance: Anti - Racism Movements (Anti - Apartheid and Martin Luther King)
- b) The Pacifist Movement
- c) Women's Movements
- d) *Gandhigiri*: Perceptions in Popular Culture

IV. Gandhi and the Idea of Political (2 weeks)

- a) Swaraj
- b) Swadeshi

READINGS

I. Gandhi on Modern Civilization and Ethics of Development

Essential Readings:

B. Parekh, (1997) 'The Critique of Modernity', in *Gandhi: A Brief Insight*, Delhi: Sterling Publishing Company, pp. 63-74.

K. Ishii, (2001) 'The Socio-economic Thoughts of Mahatma Gandhi: As an Origin of Alternative Development', *Review of Social Economy*. Vol. 59 (3), pp. 297-312.

D. Hardiman, (2003) 'Narmada Bachao Andolan', in *Gandhi in his Time and Ours*. Delhi: Oxford University Press, pp. 224- 234.

A Baviskar, (1995) 'The Politics of the Andolan', in *In the Belly of the River: Tribal Conflict Over Development in the Narmada Valley*, Delhi: Oxford University Press, pp.202-228.

R Iyer, (ed) (1993) 'Chapter 4' in *The Essential Writings of Mahatma Gandhi*, New Delhi: Oxford University Press.

R. Ramashray, (1984) 'Liberty Versus Liberation', in *Self and Society: A Study in Gandhian Thought*, New Delhi: Sage Publication.

II. Gandhian Thought: Theory and Action

Essential Readings:

B. Parekh, (1997) 'Satyagrah', in *Gandhi: A Brief Insight*, Delhi: Sterling Publishing Company, pp. 51-63.

D. Dalton, (2000) 'Gandhi's originality', in A. Parel (ed) *Gandhi, Freedom and Self- Rule*, New Delhi: Lexington Books, pp.63-86.

D. Hardiman, (1981) 'The Kheda Satyagraha', in *Peasant Nationalists of Gujarat: Kheda District, 1917-1934*, Delhi: Oxford University Press, pp. 86-113.

J. Brown, (2000) 'Gandhi and Human Rights: In search of True humanity', in A. Parel

(ed) *Gandhi, Freedom and Self-Rule*, New Delhi: Lexington Books, pp. 93- 100.

R. Iyer, (2000) 'Chapter 10 and 11', in *The Moral and Political Thought of Mahatma Gandhi*, New Delhi: Oxford University Press, pp. 251-344

I. Knudegaard, (2010), *Gandhi's Vision for Indian Society: Theory and Action*, Master Thesis in History, University of Oslo, Available at

[https://docs.google.com/viewer?a=v&q=cache:Eqj9br1n3_oJ:https://www.duo.uio.no/bi](https://docs.google.com/viewer?a=v&q=cache:Eqj9br1n3_oJ:https://www.duo.uio.no/bi%20tst)

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ream/handle/123456789/23275/IngridKnudegaardxmasteroppavexixhistorie.pdf?sequence%3D1+gandhi+and+temple+entry&hl=en&gl=in&pid=bl&srcid=ADGEEsiKGssA7q2z1kxiutm3bciHPH_HI3chWKbJIVo9HE4LcWCLmKdKXCirPalzh7Tp47fyobQJHX9GUesefn8YCAQeaQSKMRdrwvYT2Q8c7XV95tQhSGuO9bNCGEdIYGoBjzoVdJc&sig=AHIEtbQ78zwxGvh92AnwmRHiA7t2wWXXJQ](https://docs.google.com/viewer/a=v&q=cache:Eqj9br1n3_oJ:https://www.duo.uio.no/bi%20tst%20ream/handle/123456789/23275/IngridKnudegaardxmasteroppavexixhistorie.pdf?sequence%3D1+gandhi+and+temple+entry&hl=en&gl=in&pid=bl&srcid=ADGEEsiKGssA7q2z1kxiutm3bciHPH_HI3chWKbJIVo9HE4LcWCLmKdKXCirPalzh7Tp47fyobQJHX9GUesefn8YCAQeaQSKMRdrwvYT2Q8c7XV95tQhSGuO9bNCGEdIYGoBjzoVdJc&sig=AHIEtbQ78zwxGvh92AnwmRHiA7t2wWXXJQ), Accessed: 14.04.2013, pp.27-38.

P. Rao, (2009) 'Gandhi, Untouchability and the Postcolonial Predicament: A Note'. *SocialScientist*. Vol. 37 (1/2). Pp. 64-70.

B. Parekh, (1999) 'Discourse on Unsociability', in *Colonialism, Tradition and Reform: An Analysis of Gandhi's Political Discourse*, New Delhi: Sage Publication.

D. Hardiman, (2003) 'Fighting Religious Hatreds', in *Gandhi in His Time and Ours*. Delhi: Oxford University Press.

III. Gandhi's Legacy

Essential Readings:

D. Hardiman, (2003) 'Gandhi's Global Legacy', in *Gandhi in His Time and Ours*. Delhi: Oxford University Press, pp. 238-283.

Manimala, (1984) 'Zameen Kenkar? Jote Onkar: Women's participation in the Bodhgaya struggles', in M. Kishwar and R. Vanita (eds) *In Search of Answers: Indian Women's Voices from Manushi*, London: Zed Press.

M. Shah, (2006) 'Gandhigiri; A Philosophy of Our Times', *The Hindu* Available at <http://www.hindu.com/2006/09/28/stories/2006092802241000.htm>, Accessed: 14.04.2013.

A. Ghosh and T. Babu, (2006) 'Lage Raho Munna Bhai: Unravelling Brand 'Gandhigiri'', *Economic and Political Weekly*, 41 (51), pp. 5225 – 5227.

H. Trivedi (2011) 'Literary and Visual Portrayal of Gandhi', in J Brown and A Parel (eds) *Cambridge Companion to Gandhi*, Cambridge University Press 2011, pp. 199-218.

IV. Gandhi and the Idea of Political

Essential Readings:

P. Chatterjee, (1986) 'The Moment of Maneuver', in *Nationalist Thought and the Colonial World: A derivative discourse?*, Delhi: Zed Books.

Indian Council for Historical Research (1976) 'The Logic of Gandhian Nationalism: Civil Disobedience and the Gandhi – Irwin Pact, 1930-31', *Indian Historical Review*, Available at <http://www.ichrindia.org/journal.pdf>, Accessed: 18.04.2013.

D. Dalton, (1996) 'Swaraj: Gandhi's Idea of Freedom', in *Mahatma Gandhi: Selected Political Writings*, USA: Hackett Publishing, pp. 95-148.

A. Parel (ed.) (1997) 'Editor's Introduction', in *Gandhi, Hind Swaraj and Other Writings* Cambridge: Cambridge University Press.

Additional Readings:

A. Baviskar, (1995) 'National Development, Poverty and the environment', in *In the Belly of the River: Tribal Conflict Over Development in the Narmada Valley*, Delhi: Oxford University Press, pp. 18-33.

B. Parekh, (1997) 'Religious Thought', in *Gandhi: A Brief Insight*, Delhi: Sterling Publishing Company.

R. Iyer, (1993) *The Essential Writings of Mahatma Gandhi*, New Delhi: Oxford University Press, pp. 299-344; 347-373.

S. Sarkar, (1982) *Modern India 1885-1947*, New Delhi: Macmillan, pp. 432-39.

R. Iyer, (2001) *The Moral and Political Thought of Mahatma Gandhi*, New Delhi: Oxford University Press. pp. 344-358.

H. Coward, (2003) 'Gandhi, Ambedkar, and Untouchability', in H. Coward (ed) *Indian Critiques of Gandhi*, New York: State University of New York Press, pp. 41-66.

J. Lipner, (2003) 'A Debate for Our Times', in Harold Coward (ed) *Indian Critiques of Gandhi*, New York: State University of New York Press, pp. 239-58

M. Gandhi, (1941) 'Chapter 1, 2, 9, 15, and 16', in *Constructive Programme: Its Meaning and Place*, Ahmedabad: Navjivan Trust.

R. Terchek, (1998) *Gandhi: Struggling for Autonomy*, USA: Rowman and Littlefield Publishers.

N. Dirks, (2001), 'The Reformation of Caste: Periyar, Ambedkar and Gandhi', in *Castes of Mind: Colonialism and the making of Modern India*, Princeton: Princeton University

Press.

R. Mukharjee, (ed) (1995), *The Penguin Gandhi Reader*, New Delhi: Penguin.

T. Weber, (2006) 'Gandhi is dead, Long live Gandhi- The Post Gandhi Gandhian Movement in India', in *Gandhi, Gandhism and the Gandhians*, New Delhi: Roli.

A. Taneja, (2005) *Gandhi Women and the National Movement 1920-1947*, New Delhi: Haranand Publishers.

J. Brown, (2008) *Gandhi and Civil Disobedience: The Mahatma in Indian Politics*, Cambridge: Cambridge University Press, 2008

R. Ramashray, (1984) 'What Beyond the Satanic Civilization?', in *Self and Society: A Study in Gandhian Thought*, New Delhi: Sage Publication.

Activities

Topic 1

1. Reading of primary texts:- M K Gandhi Chapter VI and XIII "Hind Swaraj" Navjeevan Trust, Ahmedabad, 1910

2. A site visit to any on-going developmental project preferably in NCT Delhi by students and submission of report on Environmental law Violation and Resistance by People in a Gandhian Way.

Topic 2

1. Reading of primary texts:- M K Gandhi Chapter XII&XIII, "Satyagraha in South Africa, Navjivan Trust, Ahmedabad, 1928, pp. 95-107

2. A Report followed by presentation on functioning of Cooperative and Community engagement for example Amul and/or SEWA in Gujarat to understand Trusteeship and its relevance

Topic 3

1. Movie Screenings (Movies like Lage Raho Munna Bhai, Gandhi by Richard Attenborough and Student's Participation in reviewing/discussing the movie from a Gandhian perspective or Cultural engagement of Students with Gandhian Ideas through Staging of a street play.

Topic 4

Student Visit to Any Gandhian Institution in Delhi like, Gandhi Darshan and Smriti to understand on-going Gandhian work and programme and interacting with Gandhian activists.

3. GOVERNANCE: ISSUES AND CHALLENGES

Objectives: This paper deals with concepts and different dimensions of governance highlighting the major debates in the contemporary times. There is a need to understand the importance of the concept of governance in the context of a globalising world, environment, administration, development. The essence of governance is explored through the various good governance initiatives introduced in India.

1. GOVERNMENT AND GOVERNANCE: CONCEPTS [12 lectures]

Role of State In The Era Of Globalisation State, Market and Civil Society

2. GOVERNANCE AND DEVELOPMENT [12 lectures]

Changing Dimensions of Development Strengthening Democracy through Good Governance

3. ENVIRONMENTAL GOVERNANCE [12 lectures]

Human-Environment Interaction

Green Governance: Sustainable Human Development

4. LOCAL GOVERNANCE [12 lectures]

Democratic

Decentralisation

n

People's Participation In Governance

5. GOOD GOVERNANCE INITIATIVES IN INDIA: BEST PRACTICES [20 lectures]

- a. Public Service Guarantee Acts
- b. Electronic Governance
- c. Citizens Charter & Right to Information
- d. Corporate Social Responsibility

READINGS

GOVERNMENT AND GOVERNANCE: CONCEPTS

B. Chakrabarty and M. Bhattacharya, (eds.) *The Governance Discourse*. New Delhi: Oxford University Press, 1998

Surendra Munshi and Biju Paul Abraham [eds.], *Good Governance, Democratic Societies And Globalisation*, Sage Publishers, 2004

United Nation Development Programme, *Reconceptualising Governance*, New York, 1997

Carlos Santiso, *Good Governance and Aid Effectiveness: The World Bank and Conditionality*

Johns Hopkins University, The Georgetown Public Policy Review ,Volume VII, No.1, 2001

Vasudha Chotray and Gery Stroker , *Governance Theory: A Cross Disciplinary Approach* ,

Palgrave Macmillan ,2008

J. Rosenau, 'Governance, Order, and Change in World Politics', in J. Rosenau, and E. Czempiel (eds.) *Governance without Government: Order and Change in World Politics*, Cambridge: Cambridge University Press ,1992

B. Nayar (ed.), *Globalization and Politics in India*. Delhi: Oxford University Press, 2007 pp. 218-240.

Smita Mishra Panda , *Engendering Governance Institutions: State, Market And Civil Society*, Sage Publications,2008

Neera Chandhoke, *State And Civil Society Explorations In Political Theory* , Sage Publishers,1995

GOVERNANCE AND DEVELOPMENT

B. C. Smith, *Good Governance and Development*, Palgrave, 2007

World Bank Report, *Governance And Development*, 1992

P. Bardhan, 'Epilogue on the Political Economy of Reform in India', in *The Political Economy of Development in India*. 6th edition, Delhi: Oxford University Press, 2005

J. Dreze and A. Sen, *India: Economic Development and Social Opportunity*. New Delhi: Oxford University Press, 1995

Niraja Gopal Jayal[ed.], *Democracy in India*, Oxford University Press, 2007

ENVIRONMENTAL GOVERNANCE

Ramachandra Guha, *Environmentalism: A Global History*, Longman Publishers, 1999

J.P. Evans, *Environmental Governance*, Routledge , 2012

Emilio F. Moran, *Environmental Social Science: Human - Environment interactions and Sustainability*, Wiley-Blackwell, 2010

Burns H Weston and David Bollier, *Green Governance: Ecological Survival, Human Rights, and the Law of the Commons*, Cambridge University Press, 2013

Bina Agarwal, *Gender And Green Governance* , Oxford University Press, Oxford, 2013

J. Volger, 'Environmental Issues', in J. Baylis, S. Smith and P. Owens (eds.) *Globalization of World Politics*, New York: Oxford University Press, 2011, pp. 348- 362.

A. Heywood, *Global Politics*, New York: Palgrave, 2011, pp. 383-411.

N. Carter, *The Politics of Environment: Ideas, Activism, Policy*, Cambridge: Cambridge University Press, 2007, pp. 13-81.

LOCAL GOVERNANCE

Pranab Bardhan and Dilip Mookherjee, *Decentralization And Local Governance In Developing Countries: A Comparative Perspective*, MIT Press, 2006

T.R. Raghunandan, *Decentralization And Local Governments: The Indian Experience, Readings On The Economy, Polity And Society*, Orient Blackswan, 2013

Pardeep Sachdeva, *Local Government In India*, Pearson Publishers, 2011

P. de Souza, (2002) 'Decentralization and Local Government: The Second Wind of Democracy in India', in Z. Hasan, E. Sridharan and R. Sudarshan (eds.) *India's Living Constitution: Ideas, Practices and Controversies*, New Delhi: Permanent Black, 2002

Mary John, 'Women in Power? Gender, Caste and Politics of Local Urban Governance', in *Economic and Political Weekly*, Vol. 42(39), 2007

GOOD GOVERNANCE INITIATIVES IN INDIA: BEST PRACTICES

Niraja Gopal Jayal, *Democracy and the State: Welfare, Secularism, and Development in Contemporary India*, Oxford University Press, 1999

Reetika Khera [ed.], *The Battle for Employment Guarantee*, Oxford University Press, 2011

Nalini Juneja, *Primary Education for All in the City of Mumbai: The Challenge Set By Local Actors'*, International Institute For Educational Planning, UNESCO : Paris, 2001

Maxine Molyneux and Shahra Razavi, *Gender, Justice, Development, and Rights*, Oxford University Press, 2002

Jugal Kishore, *National Health Programs of India: National Policies and Legislations*, Century Publications, 2005

Jean Drèze and Amartya Sen, *India, Economic Development and Social Opportunity*, Oxford University Press, 1995

K. Lee and Mills, *The Economic Of Health In Developing Countries*, Oxford University Press, 1983

Marmar Mukhopadhyay and Madhu Parhar (eds.) *Education in India: Dynamics of Development*, Shipra Publications, 2007

K. Vijaya Kumar, *Right to Education Act 2009: Its Implementation as to Social Development in India*, Akansha Publishers, 2012

Amartya Sen and Jean Dreze, *Omnibus: Poverty and Famines, Hunger and Public Action, India- Economic Development and Social Opportunity*, Oxford University Press, 1998

Jean Dreze and Amartya Sen, *An Uncertain Glory: India And Its Contradictions*, Princeton University Press, 2013

Reetika Khera- *Rural Poverty And Public Distribution System*, EPW, Vol- XLVIII, No. 45-46, Nov 2013

Pradeep Chaturvedi , *Women And Food Security: Role Of Panchayats* , Concept Publishing House, 2002

Bidyut Mohanty, "Women, Right to Food and Role of Panchayats", *Mainstream*, Vol. LII, No. 42, October 11, 2014

D. Crowther, *Corporate Social Responsibility*, Deep and Deep Publishers, 2008

Sanjay K. Agarwal, *Corporate Social Responsibility in India*, Sage Publishers, 2008

Pushpa Sundar, *Business & Community: The Story of Corporate Social Responsibility in India*, New Delhi: Sage Publications, 2013

4. UNITED NATIONS AND GLOBAL CONFLICTS

Course Objective: This course provides a comprehensive introduction to the most important multilateral political organization in international relations. It provides a detailed account of the organizational structure and the political processes of the UN, and how it has evolved since 1945, especially in terms of dealing with the major global conflicts. The course imparts a critical understanding of the UN's performance until now and the imperatives as well as processes of reforming the organization in the context of the contemporary global system.

I. The United Nations (29 Lectures)

(a) An Historical Overview of the United Nations

(b) Principles and Objectives

(c) Structures and Functions: General Assembly; Security Council, and Economic and Social Council; the International Court of Justice and the specialised agencies (International Labour Organisation [ILO], United Nations Educational, Scientific and Cultural Organisation [UNESCO], World Health Organisation [WHO], and UN programmes and funds: United Nations Children's Fund [UNICEF], United Nations Development Programme [UNDP], United

Nations Environment Programme [UNEP], United Nations High Commissioner for Refugees [UNHCR])

(d) Peace Keeping, Peace Making and Enforcement, Peace Building and Responsibility to Protect (e) Millennium Development Goals

II. Major Global Conflicts since the Second World War (20 Lectures)

(a) Korean War

(b) Vietnam War

(c) Afghanistan Wars

(d) Balkans: Serbia and Bosnia

III. Assessment of the United Nations as an International Organisation: Imperatives of Reforms and the Process of Reforms (11 Lectures)

Essential Readings I. The United Nations (a) An Historical Overview of the United Nations

Moore, J.A. Jr. and Pubantz, J. (2008) *The new United Nations*. Delhi: Pearson Education, pp. 39-62.

Goldstein, J. and Pevehouse, J.C. (2006) *International relations*. 6th edn. New Delhi: Pearson, pp. 265-282.

Taylor, P. and Groom, A.J.R. (eds.) (2000) *The United Nations at the millennium*. London: Continuum, pp. 1-20.

Gareis, S.B. and Varwick, J. (2005) *The United Nations: an introduction*. Basingstoke: Palgrave, pp. 1-40.

Gowan, P. (2010) 'US: UN', in Gowan, P. 'A calculus of power: grand strategy in the twenty-first century. London: Verso, pp. 47-71.

Baylis, J. and Smith, S. (eds.) (2008) *The globalization of world politics. an introduction to international relations*. 4th edn. Oxford: Oxford University Press, pp. 405-422.

Thakur, R. (1998) 'Introduction', in Thakur, R. (eds.) *Past imperfect, future uncertain: The UN at Fifty*. London: Macmillan, pp. 1-14.

Basu, Rumki (2014) *United Nations: Structure and Functions of an international organization*, New Delhi, Sterling Publishers

(b) Principles and Objectives

Gareis, S.B. and Varwick, J. (2005) *The United Nations: An introduction*. Basingstoke: Palgrave, pp. 15-21.

(c) Structures and Functions: General Assembly; Security Council, and Economic and Social Council; the International Court of Justice and the specialised agencies (International Labour Organisation [ILO], United Nations Educational, Scientific and Cultural Organisation [UNESCO], World Health Organisation [WHO], and UN programmes and funds: United Nations Children's Fund [UNICEF], United Nations Development Programme [UNDP], United Nations Environment Programme [UNEP], United Nations High Commissioner for Refugees [UNHCR])

Taylor, P. and Groom, A.J.R. (eds.) (2000) *The United Nations at the millennium*. London: Continuum, pp. 21-141.

Moore, J.A. Jr. and Pubantz, J. (2008) *The new United Nations*. Delhi: Pearson Education, pp. 119-135.

(d) Peace Keeping, Peace Making and Enforcement, Peace Building and Responsibility to Protect

Nambiar, S. (1995) 'UN peace-keeping operations', in Kumar, S. (eds.) *The United Nations at fifty*. New Delhi, UBS, pp. 77-94.

Whittaker, D.J. (1997) 'Peacekeeping', in *United Nations in the contemporary world*. London: Routledge, pp. 45-56.

White, B. et al. (eds.) (2005) *Issues in world politics*. 3rd edn. New York: Macmillan, pp. 113-132.

(e) Millennium Development Goals

Moore, J.A. Jr. and Pubantz, J. (2008) *The new United Nations*. Delhi: Pearson Education, pp.264-266.

Sangal, P.S. (1986) 'UN, peace, disarmament and development', in Saxena, J.N. et.al. *United Nations for a better world*. New Delhi: Lancers, pp.109-114.

Baxi, U. (1986) 'Crimes against the right to development', in Saxena, J.N. et.al. *United Nations for a better world*. New Delhi: Lancers, pp.240-248.

Ghali, B.B. (1995) *An agenda for peace*. New York: UN, pp.5-38.

United Nations Department of Public Information. (2008) *The United Nations Today*. New York: UN.

II. Major Global Conflicts since the Second World War (a) Korean War

Calvocoressi, P. (2001) *World Politics: 1945-200*. 3rd edn. Harlow: Pearson Education, pp. 116-124.

Armstrong, D., Lloyd, L. and Redmond, J. (2004) *International organisations in world politics*. 3rd edn. New York: Palgrave Macmillan, pp. 42-43.

Moore, J.A. Jr. and Pubantz, J. (2008) *The new United Nations*. Delhi: Pearson Education, pp. 64-65 and 172-173.

(b) Vietnam War

Calvocoressi, P. (2001) *World Politics: 1945-200*. 3rd edn. Harlow: Pearson Education, pp. 528-546.

Baylis, J. and Smith, S. (eds.) (2008) *The globalization of world politics. an introduction to international relations*. 4th edn. Oxford: Oxford University Press, pp. 562-564.

(c) Afghanistan Wars

Achcar, G. (2004) *Eastern cauldron*. New York: Monthly Review Press, pp. 29-45 and 234-241.

Achcar, G. (2003) *The clash of barbarisms: Sept. 11 and the making of the new world disorder*. Kolkata: K.P. Bachi & Co., pp. 76-81.

Prashad, V. (2002) *War against the planet*. New Delhi: Leftword, pp. 1-6. Ali, T. (ed.) (2000) *Masters of the Universe*. London: Verso, pp. 203-216.

Calvocoressi, P. (2001) *World Politics: 1945-200*. 3rd edn. Harlow: Pearson Education, pp. 570-576.

(d) Balkans: Serbia and Bosnia Ali, T. (ed.) (2000) *Masters of the Universe*. London: Verso, pp. 230-245 and 271-284.

Kaldor, M. and Vashee, B. (eds.) (1997) *New wars*. London: Wider Publications for the UN University, pp. 137-144 and 153-171.

Viotti, P.R. and Kauppi, M.V. (2007) *International relations and world politics- security, economy, identity*. 3rd edn. New Delhi: Pearson Education, pp. 470-471.

Goldstein, J.S. (2003) *International relations*. 3rd edn. Delhi: Pearson Education, pp. 43-51.

Moore, J.A. Jr. and Pubantz, J. (2008) *The new United Nations*. Delhi: Pearson Education, pp. 24-27.

III. Political Assessment of the United Nations as an International Organisation: Imperatives of Reforms and the Process of Reforms

Roberts, A. and Kingsbury, B. (eds.) (1994) *United Nations, Divided World*. 2nd edn. Oxford: Clarendon Press, pp. 420-436.

Taylor, P. and Groom, A.J.R. (eds.) (2000) *The United Nations at the millennium*. London: Continuum, pp. 196-223 and 295-326.

Gareis, S.B. and Varwick, J. (2005) *The United Nations: An introduction*. Basingstoke: Palgrave, pp. 214-242.

Moore, J.A. Jr. and Pubantz, J. (2008) *The new United Nations*. Delhi: Pearson Education, pp. 91-112.

Additional Readings

Claude, I. (1984) *Swords into plowshares: the progress and problems of international organisation*. 4th edn. New York: Random House.

Dodds, F. (ed.) (1987) *The way forward: beyond the agenda 21*. London: Earthscan.

Rajan, M.S., Mani, V.S and Murthy, C.S.R. (eds.) (1987) *The nonaligned and the United Nations*. New Delhi: South Asian Publishers.

South Asia Human Rights Documentation Centre. (2006) *Human rights: an overview*. New Delhi: Oxford University Press.

Anan, K. (1997) *Renewing the United Nations: A Programme for Survival*. General Assembly Document: A/51/950; 14 July 1997. Available from:

[http://daccessdds.un.org/doc/UNDOC/GEN/N97/189/79/1MG/n9718979.pdf](http://daccessdds.un.org/doc/UNDOC/GEN/N97/189/79/1MG/n9718979.pdf?OpenElement), Open Element (accessed on 13 October 2011).

(C) DISCIPLINE SPECIFIC ELECTIVE -4 (DSE)

1.

Human Rights in a Comparative Perspective

Course objective: This course attempts to build an understanding of human rights amongst students through a study of specific issues in a comparative perspective. It is important for students to see how debates on human rights have taken distinct forms historically and in the contemporary world. The course seeks to anchor all issues in the Indian context, and pulls out another country to form a broader comparative frame. Students will be expected to use a range of resources, including films, biographies, and official documents to study each theme. Thematic discussion of sub-topics in the second and third sections should include state response to issues and structural violence questions.

I. Human Rights: Theory and Institutionalization (3 weeks)

- a. Understanding Human Rights: Three Generations of Rights
- b. Institutionalization: Universal Declaration of Human Rights
- c. Rights in National Constitutions: South Africa and India

II. Issues (5 weeks)

- a. Torture: USA and India
- b. Surveillance and Censorship: China and India

c. Terrorism and Insecurity of Minorities: USA and India

III. Structural Violence (4 weeks)

a. Caste and Race: South Africa and India

b. Gender and Violence: India and Pakistan

c. Adivasis/Aboriginals and the Land Question: Australia and India

READING LIST

I. Human Rights: Theory and Institutionalization

Essential Readings:

J. Hoffman and P. Graham, (2006) 'Human Rights', *Introduction to Political Theory*, Delhi, Pearson, pp. 436-458.

SAHRDC (2006) 'Introduction to Human Rights'; 'Classification of Human Rights: An Overview of the First, Second, and Third Generational Rights', in *Introducing Human Rights*, New Delhi: Oxford University Press.

The Constitution of the Republic of South Africa, Chapter 2: Bill of Rights.

The Constitution of India, Chapter 3: Fundamental Rights

II. Issues

a. Torture: USA and India

Essential Readings:

M. Lippman, (1979) 'The Protection of Universal Human Rights: The Problem of Torture' *Universal Human Rights*, Vol. 1(4), pp. 25-55

J. Lokaneeta, (2011) 'Torture in the TV Show 24: Circulation of Meanings'; 'Jurisprudence on Torture and Interrogations in India', in *Transnational Torture Law, Violence, and State Power in the United States and India*, Delhi: Orient Blackswan,

D. O'Byrne, (2007) 'Torture', in *Human Rights: An Introduction*, Delhi: Pearson, pp. 164-197.

b. Surveillance and Censorship: China and India

Essential Readings:

D. O'Byrne, (2007) 'Censorship', in *Human Rights: An Introduction*, Delhi: Pearson, pp. 106-138.

D. Lyon, (2008) Surveillance Society, Talk for Festival del Diritto, Piacenza, Italia, September 28, pp.1-7.

Fu Hualing, (2012) 'Politicized Challenges, Depoliticized Responses: Political Monitoring in China's Transitions', paper presented at a conference on States of Surveillance: Counter-Terrorism and Comparative Constitutionalism, at the

University of New South Wales, Sydney, 13-14 December.

U. Singh, (2012) 'Surveillance Regimes in India', paper presented at a conference on States of Surveillance: Counter-Terrorism and Comparative Constitutionalism, at the University of New South Wales, Sydney, 13-14 December.

c. Terrorism and Insecurity of Minorities: USA and India

Essential Readings:

E. Scarry, (2010) 'Resolving to Resist', in *Rule of Law, Misrule of Men*, Cambridge: Boston Review Books, MIT, pp.1-53.

M. Ahmad, (2002) 'Homeland Insecurities: Racial Violence the Day after September 11', *Social Text*, 72, Vol. 20(3), pp. 101-116.

U. Singh, (2007) 'The Unfolding of Extraordinariness: POTA and the Construction of Suspect Communities', in *The State, Democracy and Anti-terror Laws in India*, Delhi: Sage Publications, pp.165-219

3. Structural Conflicts

a. Caste and Race: South Africa and India

Essential Readings:

A. Pinto, (2001) 'UN Conference against Racism: Is Caste Race?', in *Economic and Political Weekly*, Vol. 36(30)

D. O'Byrne, (2007) 'Apartheid', in *Human Rights: An Introduction*, Delhi: Pearson, pp. 241-262.

R. Wasserstorm, (2006), 'Racism, Sexism, and Preferential Treatment: An approach to the Topics', in R. Goodin and P. Pettit, *Contemporary Political Philosophy: an Anthology*, Oxford: Blackwell, pp-549-574

R. Wolfrum, (1998) 'Discrimination, Xenophobia and Racism' in J. Symonides, *Human Rights: New Dimensions and Challenges*, Aldershot, Ashgate/UNESCO, pp.181-198.

b. Gender and Violence: India and Pakistan

Essential Readings:

A. Khan and R. Hussain, (2008), 'Violence Against Women in Pakistan: Perceptions and Experiences of Domestic Violence', *Asian Studies Review*, Vol. 32, pp. 239 – 253

K. Kannabiran (2012) 'Rethinking the Constitutional Category of Sex', in *Tools of Justice: Non-Discrimination and the Indian Constitution*, New Delhi, Routledge, pp.425-443

N. Menon (2012) 'Desire', *Seeing Like a Feminist*, New Delhi: Zubaan/Penguin, pp. 91-146

c. Adivasis/Aboriginals and the Land Question: Australia and India

Essential Readings:

H. Goodall, (2011) 'International Indigenous Community Study: Adivasi Indigenous People in India', in A. Cadzow and J. Maynard (eds.), *Aboriginal Studies*, Melbourne: Nelson Cengage Learning, pp.254-259.

K. Kannabiran, (2012) 'Adivasi Homelands and the Question of Liberty', in *Tools of Justice: Non-Discrimination and the Indian Constitution*, New Delhi: Routledge, pp.242-271.

N. Watson (2011) 'Aboriginal and Torres Strait Islander Identities' in A. Cadzow and J. Maynard (eds.), *Aboriginal Studies*, Melbourne: Nelson Cengage Learning, pp.43-52.

W. Fernandes (2008) 'India's Forced Displacement Policy and Practice. Is Compensation up to its Functions?', in M. Cernea and H. Mathus (eds), *Can Compensation Prevent Impoverishment? Reforming Resettlement through Investments and Benefit-Sharing*, pp.181-207, New Delhi: Oxford University Press.

Additional Readings:

A. Laws and V. Iacopino, (2002) 'Police Torture in Punjab, India: An Extended Survey', in *Health and Human Rights*, Vol. 6(1), pp. 195-210

D. O'Byrne, (2007) 'Theorizing Human Rights', in *Human Rights: An Introduction*, Delhi, Pearson, pp.26-70.

J. Morsink, (1999) *The Universal Declaration of Human Rights: Origins, Drafting and Intent*, Philadelphia: University of Pennsylvania Press, pp. ix-xiv

J. Nickel, (1987) *Making Sense of Human Rights: Philosophical Reflections on the Universal Declaration of Human Rights*, Berkeley: University of California Press.

J. Goldman, (2005) 'Of Treaties and Torture: How the Supreme Court Can Restrain the Executive', in *Duke Law Journal*, Vol. 55(3), pp. 609-640.

K. Tsutsui and C. Wotipka, (2004) Global Civil Society and the International Human Rights Movement: Citizen Participation in Human Rights International Nongovernmental Organizations, in *Social Forces*, Vol. 83(2), pp. 587-620.

L. Rabben, (2001) Amnesty International: Myth and Reality, in *Agni*, No. 54, Amnesty International Fortieth Anniversary pp. 8-28

M. Mohanty, (2010) 'In Pursuit of People's Rights: An Introduction', in M. Mohanty et al., *Weapon of the Oppressed: Inventory of People's Rights in India*, New Delhi: Danish Books, pp.1-11

M. Cranston, (1973) *What are Human Rights?* New York: Taplinger

M. Ishay, (2004) *The History of Human Rights: From Ancient Times to the Globalization Era*, Delhi: Orient Blackswan.

R. Sharan, (2009) 'Alienation and Restoration of Tribal Land in Jharkhand in N Sundar (ed.) *Legal Grounds*, New Delhi: Oxford University Press, pp. 82-112

Text of UDHR available at <http://www.un.org/en/documents/udhr/index.shtml>

U. Baxi, (1989) 'From Human Rights to the Right to be Human: Some Heresies', in S. Kothari and H. Sethi (eds.), *Rethinking Human Rights*, Delhi: Lokayan, pp.181-166

2. Development Process and Social Movements in Contemporary India

Course objective: Under the influence of globalization, development processes in India have undergone transformation to produce spaces of advantage and disadvantage and new geographies of power. The high social reproduction costs and dispossession of vulnerable social groups involved in such a development strategy condition new theatres of contestation and struggles. A variety of protest movements emerged to interrogate and challenge this development paradigm that evidently also weakens the democratic space so very vital to the formulation of critical consensus. This course proposes to introduce students to the conditions, contexts and forms of political contestation over development paradigms and their bearing on the retrieval of democratic voice of citizens.

I. Development Process since Independence (2 weeks)

a. State and planning

b. Liberalization and reforms

II. Industrial Development Strategy and its Impact on the Social Structure (2 weeks)

a. Mixed economy, privatization, the impact on organized and unorganized labour

b. Emergence of the new middle class

III. Agrarian Development Strategy and its Impact on the Social Structure (2 weeks)

a. Land Reforms, Green Revolution

b. Agrarian crisis since the 1990s and its impact on farmers

IV. Social Movements (6 weeks)

a. Tribal, Peasant, Dalit and Women's movements

b. Maoist challenge

c. Civil rights movements

READING LIST

I. The Development Process since Independence

Essential Readings:

A. Mozoomdar, (1994) 'The Rise and Decline of Development Planning in India', in T. Byres (ed.) *The State and Development Planning in India*. Delhi: Oxford University Press, pp. 73-108.

A. Varshney, (2010) 'Mass Politics or Elite Politics? Understanding the Politics of India's Economic Reforms' in R. Mukherji (ed.) *India's Economic Transition: The Politics of Reforms*, Delhi: Oxford University Press, pp 146-169.

P. Chatterjee, (2000) 'Development Planning and the Indian State', in Zoya Hasan (ed.), *Politics and the State in India*, New Delhi: Sage, pp.116-140.

P. Patnaik and C. Chandrasekhar, (2007) 'India: Dirigisme, Structural Adjustment, and the Radical Alternative', in B. Nayar (ed.), *Globalization and Politics in India*. Delhi: Oxford University Press, pp. 218-240.

P. Bardhan, (2005) 'Epilogue on the Political Economy of Reform in India', in *The Political Economy of Development in India*. 6th impression, Delhi: Oxford University Press.

T. Singh, (1979) 'The Planning Process and Public Process: a Reassessment', *R. R. Kale Memorial Lecture*, Pune: Gokhale Institute of Politics and Economics.

II. Industrial development strategy and its impact on social structure

Essential Readings:

A. Aggarwal, (2006) 'Special Economic Zones: Revisiting the Policy Debate', in *Economic and Political Weekly*, XLI (43-44), pp.4533-36.

B. Nayar (1989) *India's Mixed Economy: The Role of Ideology and its Development*, Bombay: Popular Prakashan.

F. Frankel, (2005) 'Crisis of National Economic Planning', in *India's Political Economy (1947-2004): The Gradual Revolution*, Delhi: Oxford University Press, pp. 93-340.

L. Fernandes, (2007) *India's New Middle Class: Democratic Politics in an Era of Economic Reform*, Delhi: Oxford University Press.

S. Shyam, (2003) 'Organizing the Unorganized', in *Seminar*, [Footloose Labour: A Symposium on Livelihood Struggles of the Informal Workforce, 531] pp. 47-53.

S. Chowdhury, (2007) 'Globalization and Labour', in B. Nayar (ed.) *Globalization and Politics in India*, Delhi: Oxford University Press, pp.516-526.

V. Chibber, (2005) 'From Class Compromise to Class Accommodation: Labor's Incorporation into the Indian Political Economy' in R. Ray, and M.F. Katzenstein (eds.) *Social Movements in India*, Delhi: Oxford University Press, pp 32-60.

III. Agrarian development strategy and its impact on social structure

Essential Readings:

A. Desai, (ed.), (1986) *Agrarian Struggles in India After Independence*, Delhi: Oxford University Press, pp. xi-xxxvi

F. Frankel, (1971) *India's Green Revolution: Economic Gains and Political Costs*, Princeton and New Jersey: Princeton University Press.

F. Frankel, (2009) *Harvesting Despair: Agrarian Crisis in India*, Delhi: Perspectives, pp. 161-169.

J. Harriss, (2006) 'Local Power and the Agrarian Political Economy' in Harriss, J. (ed) *Power Matters: Essays on Institutions, Politics, and Society in India*, Delhi. Oxford University Press, pp. 29-32.

K. Suri, (2006) 'Political economy of Agrarian Distress', in *Economic and Political Weekly*, XLI(16) pp. 1523-1529.

P. Joshi, (1979) *Land Reforms in India: Trends and Perspectives*, New Delhi: Allied publishers.

P. Appu, (1974) 'Agrarian Structure and Rural Development', in *Economic and Political Weekly*, IX (39), pp.70 – 75.

P. Sainath, (2010) 'Agrarian Crisis and Farmers', Suicide', *Occasional Publication 22*, New Delhi: India International Centre (IIC).

M. Sidhu, (2010) 'Globalisation vis-à-vis Agrarian Crisis in India', in R. Deshpande and S. Arora, (eds.) *Agrarian Crises and Farmer Suicides (Land Reforms in India Series)*, New Delhi: Sage, pp. 149-174.

V. Sridhar, (2006) 'Why Do Farmers Commit Suicide? The Case Study of Andhra Pradesh', in *Economic and Political Weekly*, XLI (16).

IV. Social Movements

Essential Readings:

G. Haragopal, and K. Balagopal, (1998) 'Civil Liberties Movement and the State in India', in M. Mohanty, P. Mukherji and O. Tornquist, (eds.) *People's Rights: Social Movements and the State in the Third World* New Delhi: Sage, pp. 353-371.

M. Mohanty, (2002) 'The Changing Definition of Rights in India', in S. Patel, J. Bagchi, and K. Raj (eds.) *Thinking Social Sciences in India: Essays in Honour of Alice Thorner*

Patel, New Delhi: Sage.

G. Omvedt, (2012) 'The Anti-caste Movement and the Discourse of Power', in N. Jayal (ed.) *Democracy in India*, New Delhi: Oxford India Paperbacks, sixth impression, pp.481-508.

P. Ramana, (2011) 'India's Maoist Insurgency: Evolution, Current Trends and Responses', in M. Kugelman (ed.) *India's Contemporary Security Challenges*, Woodrow Wilson International Centre for Scholars Asia Programme, Washington D.C., pp.29-47.

A.Ray, (1996) 'Civil Rights Movement and Social Struggle in India', in *Economic and Political Weekly*, XXI (28). pp. 1202-1205.

A.Roy, (2010) 'The Women's Movement', in N.Jayal and P. Mehta (eds.) *The Oxford Companion to Politics in India*, New Delhi: Oxford University Press, pp.409-422.

N. Sundar, (2011) 'At War with Oneself: Constructing Naxalism as India's Biggest Security Threat', in M. Kugelman (ed.) *India's Contemporary Security Challenges*, Woodrow Wilson International Centre for Scholars Asia Programme, Washington D.C., pp.46-68.

M. Weiner, (2001) 'The Struggle for Equality: Caste in Indian Politics', in A.Kohli. (ed.) *The Success of India's Democracy*, Cambridge: CUP, pp.193-225.

S. Sinha, (2002) 'Tribal Solidarity Movements in India: A Review', in G. Shah. (ed.) *Social Movements and the State*, New Delhi: Sage, pp. 251-266.

Additional Readings:

S. Banerjee, (1986) 'Naxalbari in Desai', in A.R. (ed.) *Agrarian Struggles in India After Independence*. Delhi: Oxford University Press, pp.566-588.

B. Nayar, (ed.), (2007) *Globalization and Politics in India*. Delhi: Oxford University Press. S. Roy and K. Debal, (2004) *Peasant Movements in Post-Colonial India: Dynamics of Mobilization and Identity*, Delhi: Sage.

G. Omvedt, (1983) *Reinventing Revolution, New Social Movements and the Socialist Tradition in India*, New York: Sharpe.

G. Shah, (ed.), (2002) *Social Movements and the State*. New Delhi: Sage Publications.

G. Shah, (2004) *Social Movements in India: A Review of Literature*, New Delhi: Sage Publications.

G. Rath, (ed.), (2006) *Tribal development in India: The Contemporary Debate*,

New Delhi: Sage Publications.

J. Harris, (2009) *Power Matters: Essays on Institutions, Politics, and Society in India*. Delhi: Oxford University press.

K. Suresh, (ed.), (1982) *Tribal Movements in India*, Vol I and II, New Delhi: Manohar (emphasis on the introductory chapter).

M. Mohanty, P. Mukherji and O.Tornquist, (1998) *People's Rights: Social Movements and the State in the Third World*. New Delhi: Sage Publications.

M. Rao, (ed.), (1978) *Social Movements in India*, Vol. 2, Delhi: Manohar.

N. Jayal, and P. Mehta, (eds.), (2010) *The Oxford Companion to Politics in India*, Delhi:Oxford University Press.

P. Bardhan, (2005) *The Political Economy of Development in India*, 6th impression, Delhi: Oxford University Press.

R. Mukherji, (ed.), (2007) *India's Economic Transition: The Politics of Reforms*, Delhi: Oxford University Press.

R, Ray and M. Katzenstein, (eds.), (2005) *Social Movements in India*, Delhi: Oxford University Press.

S. Chakravarty, (1987) *Development Planning: The Indian Experience*, Delhi: Oxford University Press.

3.

India's Foreign Policy in a globalizing world

Course objective: This course's objective is to teach students the domestic sources and the structural constraints on the genesis, evolution and practice of India's foreign policy. The endeavour is to highlight integral linkages between the 'domestic' and the 'international' aspects of India's foreign policy by stressing on the shifts in its domestic identity and the corresponding changes at the international level. Students will be instructed on India's shifting identity as a postcolonial state to the contemporary dynamics of India attempting to carve its identity as an 'aspiring power'. India's evolving relations with the superpowers during the Cold War and after, bargaining strategy and positioning in international climate change negotiations, international economic governance, international terrorism and the United Nations facilitate an understanding of the changing positions and development of India's role as a global player since independence.

I. India's Foreign Policy: From a Postcolonial State to an Aspiring Global Power (7 lectures)

II. India's Relations with the USA and USSR/Russia (9

lectures) III. India's Engagements with China (6 lectures)

IV. India in South Asia: Debating Regional Strategies (9 lectures)

V. India's Negotiating Style and Strategies: Trade, Environment and Security Regimes (11 lectures)

VI. India in the Contemporary Multipolar World (6 lectures)

READING LIST

I. India's Foreign Policy: From a Postcolonial State to an Aspiring Global Power

Essential Readings:

S. Ganguly and M. Pardesi, (2009) 'Explaining Sixty Years of India's Foreign Policy', in *IndiaReview*, Vol. 8 (1), pp. 4–19.

Ch. Ogden, (2011) 'International 'Aspirations' of a Rising Power', in David Scott (ed.), *Handbook of India's International Relations*, London: Routledge, pp.3-31

W. Anderson, (2011) 'Domestic Roots of Indian Foreign Policy', in W. Anderson, *Trusts with Democracy: Political Practice in South Asia*, Anthem Press: University Publishing Online.

Additional Reading:

J. Bandhopadhyaya, (1970) *The Making Of India's Foreign Policy*, New Delhi: Allied Publishers.

II: India's Relations with the USA and USSR/Russia

Essential Readings:

S. Mehrotra, (1990) 'Indo-Soviet Economic Relations: Geopolitical and Ideological Factors', in *India and the Soviet Union: Trade and Technology Transfer*, Cambridge University Press: Cambridge, pp. 8-28.

R. Hathaway, (2003) 'The US-India Courtship: From Clinton to Bush', in S. Ganguly (ed.), *India as an Emerging Power*, Frank Cass: Portland.

A. Singh, (1995) 'India's Relations with Russia and Central Asia', in *International Affairs*, Vol. 71 (1): 69-81.

M. Zafar, (1984), 'Chapter 1', in *India and the Superpowers: India's Political Relations with the Superpowers in the 1970s*, Dhaka, University Press.

Additional Readings:

H. Pant, (2008) 'The U.S.-India Entente: From Estrangement to Engagement', in H. Pant, *Contemporary Debates in Indian Foreign and Security Policy: India Negotiates Its Rise in the International System*, Palgrave Macmillan: London.

D. Mistry, (2006) 'Diplomacy, Domestic Politics, and the U.S.-India Nuclear Agreement', in *Asian Survey*, Vol. 46 (5), pp. 675-698.

III: India's Engagements with China

Essential Readings:

H. Pant, (2011) 'India's Relations with China', in D. Scott (ed.), *Handbook of India's International Relations*, London: Routledge, pp. 233-242.

A. Tellis and S. Mirski, (2013) 'Introduction', in A. Tellis and S. Mirski (eds.), *Crux of Asia: China, India, and the Emerging Global Order*, Carnegie Endowment for International Peace: Washington.

S. Raghavan, (2013) 'Stability in Southern Asia: India's Perspective', in A. Tellis and S. Mirski (eds.), *Crux of Asia: China, India, and the Emerging Global Order*, Carnegie Endowment for International Peace: Washington.

Additional Reading:

Li Li, (2013) 'Stability in Southern Asia: China's Perspective', in A. Tellis and S. Mirski (eds.), *Crux of Asia: China, India, and the Emerging Global Order*, Carnegie Endowment for International Peace: Washington.

IV: India in South Asia: Debating Regional Strategies

Essential Readings:

S. Muni, (2003) 'Problem Areas in India's Neighbourhood Policy', in *South Asian Survey*, Vol. 10 (2), pp. 185-196.

S. Cohen, (2002) *India: Emerging Power*, Brookings Institution Press. V. Sood, (2009) 'India and regional security interests', in Alyssa Ayres and C. Raja Mohan (eds), *Power realignments in Asia: China, India, and the United States*, New Delhi: Sage.

Additional Readings:

M. Pardesi, (2005) 'Deducing India's Grand Strategy of Regional Hegemony from Historical and Conceptual Perspectives', IDSS Working Paper, 76, Available at <http://www.rsis.edu.sg/publications/WorkingPapers/WP76.pdf>, Accessed: 19.04.2013.

D. Scott, (2009) 'India's "Extended Neighbourhood" Concept: Power Projection for a Rising Power', in *India Review*, Vol. 8 (2), pp. 107-143

V: India's Negotiating Style and Strategies: Trade, Environment and Security Regimes

Essential Readings:

S. Cohen, (2002) 'The World View of India's Strategic Elite', in S. Cohen, *India: Emerging Power*, Brookings Institution Press, pp. 36-65.

A. Narlikar, (2007) 'All that Glitters is not Gold: India's Rise to Power', in *Third World Quarterly*, Vol. 28 (5) pp. 983 – 996.

N. Dubash, (2012) 'The Politics of Climate Change in India: Narratives of Enquiry and Co-benefits', Working Paper, New Delhi: Centre for Policy Research.

N. Jayaprakash, (2000) 'Nuclear Disarmament and India', in *Economic and Political Weekly*, Vol. 35 (7), pp. 525-533.

Additional Readings:

P. Bidwai, (2005) 'A Deplorable Nuclear Bargain', in *Economic and Political Weekly*, Vol. 40 (31), pp. 3362-3364.

A. Anant, (2011) 'India and International Terrorism', in D. Scott (ed.), *Handbook of India's International Relations*, London: Routledge, pp. 266-277.

VI: India in the Contemporary Multipolar World

Essential Readings:

R. Rajgopalan and V. Sahni (2008), 'India and the Great Powers: Strategic Imperatives, Normative Necessities', in *South Asian Survey*, Vol. 15 (1), pp. 5– 32.

C. Mohan, (2013) 'Changing Global Order: India's Perspective', in A. Tellis and S. Mirski (eds.), *Crux of Asia: China, India, and the Emerging Global Order*, Carnegie Endowment for International Peace: Washington.

A. Narlikar, (2006) 'Peculiar Chauvinism or Strategic Calculation? Explaining the Negotiating Strategy of a Rising India', in *International Affairs*, Vol. 82 (1), pp. 59-76.

Additional Reading:

P. Mehta, (2009) 'Still Under Nehru's Shadow? The Absence of Foreign Policy Frameworks in India', in *India Review*, Vol. 8 (3), pp. 209–233.

Online Resources:

Government of India's Ministry of External Relations website at <http://www.mea.gov.in/> and specially its library which provides online resources at <http://mealib.nic.in/>

The Council of Foreign Relations has a regularly updated blog on India's foreign policy: <http://www.cfr.org/region/india/ri282> Centre for Policy Research's blog on IR and strategic affairs though it is not exclusively on India's foreign policy. <http://www.cprindia.org/blog/international-relations-and-security-blog>

Institute for Defence Studies and Analyses: <http://www.idsa.in/>
Research and Information System: www.ris.org.in/

Indian Council of World Affairs: www.icwa.in/
Institute of Peace and Conflict Studies:
www.ipcs.org/

Indian Council for Research on International Economic Relations: www.icrier.org/

4. Women, Power and Politics

Course objective: This course opens up the question of women's agency, taking it beyond 'women's empowerment' and focusing on women as radical social agents. It attempts to question the complicity of social structures and relations in gender inequality. This is extended to cover new forms of precarious work and labour under the new economy. Special attention will be paid to feminism as an approach and outlook. The course is divided into broad units, each of which is divided into three sub- units.

I. Groundings (6 weeks)

1. Patriarchy (2 weeks)

- a. Sex-Gender Debates
- b. Public and Private
- c. Power

2. Feminism (2 weeks)

3. Family, Community,
State (2weeks)

- a. Family
- b. Community
- c. State

II. Movements and Issues (6 weeks)

1. History of the Women's Movement in India (2 weeks)

2. Violence against women (2 weeks)

3. Work and Labour (2 weeks)

- a. Visible and Invisible work
- b. Reproductive and care work
- c. Sex work

Reading List

I. Groundings

1. Patriarchy

Essential Readings:

T. Shinde, (1993) 'Stree Purusha Tulna', in K. Lalitha and Susie Tharu (eds), *Women Writing in India*, New Delhi, Oxford University Press, pp. 221-234

U. Chakravarti, (2001) 'Pitrasatta Par ek Note', in S. Arya, N. Menon & J. Lokneeta (eds.)

Naarivaadi Rajneeti: Sangharsh evam Muddey, University of Delhi: Hindi Medium Implementation Board, pp.1-7

a. Sex Gender Debates

Essential Reading:

V. Geetha, (2002) *Gender*, Kolkata, Stree, pp. 1- 20 **b.**

Public and Private

Essential Reading:

M. Kosambi, (2007) *Crossing the Threshold*, New Delhi, Permanent Black, pp. 3-10; 40-46 **c.**

Power

Essential Reading:

N. Menon, (2008) 'Power', in R. Bhargava and A. Acharya (eds), *Political Theory: An Introduction*, Delhi: Pearson, pp.148-157

2. Feminism

Essential Readings:

B. Hooks, (2010) 'Feminism: A Movement to End Sexism', in C. Mc Cann and S. Kim (eds), *The Feminist Reader: Local and Global Perspectives*, New York: Routledge, pp. 51-57

R. Delmar, (2005) 'What is Feminism?', in W. Kolmar & F. Bartkowski (eds)

Feminist Theory: A Reader, pp. 27-37

3. Family, Community and State

a. Family

Essential Readings:

R. Palriwala, (2008) 'Economics and Patriliney: Consumption and Authority within the Household' in M. John. (ed) *Women's Studies in India*, New Delhi: Penguin, pp. 414-423

b. Community

Essential Reading:

U. Chakravarti, (2003) *Gendering Caste through a Feminist Lens*, Kolkata, Stree, pp. 139-159.

c. State

Essential Reading:

C. MacKinnon, 'The Liberal State' from *Towards a Feminist Theory of State*, Available at <http://fair-use.org/catharine-mackinnon/toward-a-feminist-theory-of-the-state/chapter-8>, Accessed: 19.04.2013.

Additional Readings:

K. Millet, (1968) *Sexual Politics*, Available at <http://www.marxists.org/subject/women/authors/millett-kate/sexual-politics.htm>, Accessed: 19.04.2013.

N. Menon (2008) 'Gender', in R. Bhargava and A. Acharya (eds), *Political Theory: An Introduction*, New Delhi: Pearson, pp. 224-233

R.Hussain, (1988) 'Sultana's Dream', in *Sultana's Dream and Selections from the Secluded Ones – translated by Roushan Jahan*, New York: The Feminist Press

S.Ray 'Understanding Patriarchy', Available at http://www.du.ac.in/fileadmin/DU/Academics/course_material/hrge_06.pdf, Accessed: 19.04.2013.

S.de Beauvoir (1997) *Second Sex*, London: Vintage.

Saheli Women's Centre, (2007) *Talking Marriage, Caste and Community: Women's Voices from Within*, New Delhi: monograph

II. Movements and Issues

1. History of Women's Movement in India

Essential Readings:

I. Agnihotri and V. Mazumdar, (1997) 'Changing the Terms of Political Discourse: Women's Movement in India, 1970s-1990s', *Economic and Political Weekly*, 30 (29), pp. 1869-1878.

R. Kapur, (2012) 'Hecklers to Power? The Waning of Liberal Rights and Challenges to Feminism in India', in A. Loomba *South Asian Feminisms*, Durham and London: Duke University Press, pp. 333-355

2. Violence against Women

Essential Readings:

N. Menon, (2004) 'Sexual Violence: Escaping the Body', in *Recovering Subversion*, New Delhi: Permanent Black, pp. 106-165

3. Work and Labour

a. Visible and Invisible work

Essential Reading:

P. Swaminathan, (2012) 'Introduction', in *Women and Work*, Hyderabad: Orient Blackswan, pp.1-17

b. Reproductive and care work

Essential Reading:

J. Tronto, (1996) 'Care as a Political Concept', in N. Hirschmann and C. Stephano, *Revisioning the Political*, Boulder: Westview Press, pp. 139-156

c. Sex work

Essential Readings:

Darbar Mahila Samanwaya Committee, Kolkata (2011) 'Why the so-called Immoral Traffic (Preventive) Act of India Should be Repealed', in P. Kotiswaran, *Sex Work*, New Delhi, Women Unlimited, pp. 259-262

N. Jameela, (2011) 'Autobiography of a Sex Worker', in P. Kotiswaran, *Sex Work*, New Delhi: Women Unlimited, pp. 225-241

Additional Readings:

C. Zetkin, 'Proletarian Woman', Available at <http://www.marxists.org/archive/zetkin/1896/10/women.htm>, Accessed: 19.04.2013.

F. Engels, *Family, Private Property and State*, Available at <http://readingfromtheleft.com/PDF/EngelsOrigin.pdf>, Accessed: 19.04.2013.

J. Ghosh, (2009) *Never Done and Poorly Paid: Women's Work in Globalising India*, Delhi: Women Unlimited

Justice Verma Committee Report, Available at <http://nlrd.org/womens-rights-initiative/justice-verma-committee-report-download-full-report>, Accessed: 19.04.2013.

N. Gandhi and N. Shah, (1992) *Issues at Stake – Theory and Practice in the Women's Movement*, New Delhi: Kali for Women.

V. Bryson, (1992) *Feminist Political Theory*, London: Palgrave-MacMillan, pp. 175- 180; 196-200

M. Mies, (1986) 'Colonisation and Housewifisation', in *Patriarchy and Accumulation on a World Scale* London: Zed, pp. 74-111, Available at

<http://caringlabor.wordpress.com/2010/12/29/maria-mies-colonization-and-housewifization/>, Accessed: 19.04.2013.

R. Ghadially, (2007) *Urban Women in Contemporary India*, Delhi: Sage Publications.

S. Brownmiller, (1975) *Against our Wills*, New York: Ballantine.

Saheli Women's Centre (2001) 'Reproductive Health and Women's Rights, Sex Selection and feminist response' in S Arya, N. Menon, J. Lokneeta (eds), *Nariwadi Rajneeti*, Delhi, pp. 284-306

V. Bryson (2007) *Gender and the Politics of Time*, Bristol: Polity Press

Readings in Hindi:

D. Mehrotra, (2001) *Bhartiya Mahila Andolan: Kal, Aaj aur Kal*, Delhi: Books for Change

G. Joshi, (2004) *Bharat Mein Stree Asmaanta: Ek Vimarsh*, University of Delhi: Hindi Medium Implementation Board

N. Menon (2008) 'Power', in R. Bhargava and A. Acharya (eds) *Political Theory: An Introduction*, New Delhi: Pearson

N. Menon (2008) 'Gender', in R. Bhargava and A. Acharya (eds) *Political Theory: An Introduction*, New Delhi, Pearson

R. Upadhyay and S. Upadhyay (eds.) (2004) *Aaj ka Stree Andolan*, Delhi: Shabd Sandhan.

S. Arya, N. Menon and J. Lokneeta (eds.) (2001) *Naarivaadi Rajneeti: Sangharsh evam Muddey*, University of Delhi: Hindi Medium Implementation Board.

(D) Ability Enhancement (Skill Based)-2 1.

Legislative Practices and Procedures

Course objective: To acquaint the student broadly with the legislative process in India at various levels, introduce them to the requirements of peoples' representatives and provide elementary skills to be part of a legislative support team and expose them to real life legislative work. These will be, to understand complex policy issues, draft new legislation, track and analyse ongoing bills, make speeches and floor statements, write articles and press releases, attend legislative meetings, conduct meetings with various stakeholders, monitor media and public developments, manage constituent relations and handle inter-office communications. It will also deepen their understanding and appreciation of the political process and indicate the possibilities of making it work for democracy.

I. Powers and functions of people's representative at different tiers of governance (6 lectures)

Members of Parliament, State legislative assemblies, functionaries of rural and urban local self-government from Zila Parishad, Municipal Corporation to Panchayat/ward.

II. Supporting the legislative process (2 lectures)

How a bill becomes law, role of the Standing committee in reviewing a bill, legislative consultants, the framing of rules and regulations.

III. Supporting the Legislative Committees (6 lectures)

Types of committees, role of committees in reviewing government finances, policy, programmes, and legislation.

IV. Reading the Budget Document (6 lectures)

Overview of Budget Process, Role of Parliament in reviewing the Union Budget, Railway Budget, Examination of Demands for Grants of Ministries, Working of Ministries.

V. Support in media monitoring and communication (4 lectures)

Types of media and their significance for legislators; Basics of communication in print and electronic media.

READING LIST

I. Powers and functions of people's representative at different tiers of governance

Essential Readings:

M. Madhavan, and N. Wahi, (2008) *Financing of Election Campaigns* PRS, Centre for Policy Research, New Delhi, Available at:

http://www.prsindia.org/uploads/media/conference/Campaign_finance_brief.pdf, Accessed: 19.04.2013

S. Vanka, (2008) *Primer on MPLADS*, Centre for Policy Research, New Delhi, Available at <http://www.prsindia.org/parliamenttrack/primers/mplads-487/>, Accessed: 19.04.2013

H. Kalra, (2011) *Public Engagement with the Legislative Process* PRS, Centre for Policy Research, New Delhi, Available at:

<http://www.prsindia.org/administrator/uploads/media/Conference%202011/Public%20Engagement%20with%20the%20Legislative%20Process.pdf>, Accessed: 19.04.2013.

Government of India (Lok Sabha Secretariat), (2009) *Parliamentary Procedures (Abstract Series)*, Available at <http://164.100.47.132/LssNew/abstract/index.aspx>, Accessed: 19.04.2013

II. Supporting the legislative process

Essential Readings:

Government of India, (Ministry of Parliamentary Affairs), (2009) *Legislation, Parliamentary Procedure*, Available at http://mpa.nic.in/Manual/Manual_English/Chapter/chapter-09.htm, Accessed: 19.04.2013

Government of India, (Ministry of Parliamentary Affairs) (2009), *Subordinate Legislation, Parliamentary Procedure*, Available at: http://mpa.nic.in/Manual/Manual_English/Chapter/chapter-11.htm Accessed: 19.04.2013

D. Kapur and P. Mehta, (2006) 'The Indian Parliament as an Institution of Accountability', *Democracy, Governance and Human Rights*, Programme Paper Number 23, United Nations Research Institute for Social Development, Available at: [http://www.unrisd.org/UNRISD/website/document.nsf/240da49ca467a53f80256b4f005ef245/8e6fc72d6b546696c1257123002fcceb/\\$FILE/KapMeht.pdf](http://www.unrisd.org/UNRISD/website/document.nsf/240da49ca467a53f80256b4f005ef245/8e6fc72d6b546696c1257123002fcceb/$FILE/KapMeht.pdf), Accessed: 19.04.2013

O. Agarwal and T. Somanathan, (2005) '*Public Policy Making in India: Issues and Remedies*', Available at: http://www.cprindia.org/admin/paper/Public_Policy_Making_in_India_14205_TV_SO_MANA_THAN.pdf, Accessed: 19.04.2013

B. Debroy, (2001) 'Why we need law reform' *Seminar* January.

III. Supporting the Legislative Committees

Essential Readings:

P. Mehta, 'India's Unlikely Democracy: The Rise of Judicial Sovereignty', *Journal of Democracy*, Vol. 18(2), pp.70-83.

Government link: <http://loksabha.nic.in/>; <http://rajyasabha.nic.in/>; <http://mpa.nic.in/>

K. Sanyal, (2011) *Strengthening Parliamentary Committees* PRS, Centre for Policy Research, New Delhi, Available at: <http://www.prsindia.org/administrator/uploads/media/Conference%202011/Strengthening%20Parliamentary%20Committees.pdf>, Accessed: 19.04.2013

IV. Reading the Budget Document

Essential Readings

A. Celestine, (2011) *How to Read the Union Budget* PRS, Centre for Policy Research, New Delhi, Available at <http://www.prsindia.org/parliamenttrack/primers/how-to-read-the-union-budget-1023/>, Accessed: 19.04.2013

V. Support in media monitoring and communication

Essential Reading:

G. Rose, (2005) 'How to Be a Media Darling: There's No getting Away From It', *State Legislatures*, Vol. 31(3).

Additional Readings:

N. Jayal and P. Mehta (eds), (2010) *The Oxford Companion to Politics in India*, Oxford University

Press: New Delhi,

B. Jalan, (2007) *India's Politics*, New Delhi: Penguin.

Initiating Discussion on Various Type of Debates in *Rajya Sabha*, Available at http://rajyasabha.nic.in/rsnew/publication_electronic/75RS.pdf, Accessed: 19.04.2013. *Praxis of Parliamentary Committees: Recommendations of Committee on Rules* published by *Rajya Sabha*, available at: http://rajyasabha.nic.in/rsnew/publication_electronic/Praxis.pdf, Accessed: 19.04.2013.

S.J. Phansalkar, *Policy Research in the Indian Context*

N. Singh, '*Some Economic Consequences of India's Institutions of Governance: A Conceptual Framework*', Available at: http://econ.ucsc.edu/faculty/boxjenk/wp/econ_conseq_2003_rev2.pdf, Accessed: 19.04.2013.

R. Guha, (2007), *India After Gandhi*, Macmillan: New Delhi. *Parliamentary Procedures (Abstract Series)* published by *Lok Sabha*, Available at <http://164.100.47.132/LssNew/abstract/index.aspx>, website: www.loksabha.nic.in, Accessed: 19.04.2013.

Committees of Lok Sabha, Available at: http://164.100.47.134/committee/committee_list.aspx Accessed: 19.04.2013. *Ethics Committee of Rajya Sabha*, available at: http://rajyasabha.nic.in/rsnew/publication_electronic/ethics_committee.pdf, Accessed: 19.04.2013.

Committees of Parliament, Parliamentary Procedure, Ministry of Parliamentary Affairs, Available at http://mpa.nic.in/Manual/Manual_English/Chapter/chapter-12.htm, Accessed: 19.04.2013.

Nomination of Members of Parliament on Committees, Councils, Boards and Commissions, etc., set up by the Government, Ministry of Parliament Affairs, Available at http://mpa.nic.in/Manual/Manual_English/Chapter/chapter-14.htm, Accessed: 19.04.2013.

Parliamentary Procedures: Problems and Perspectives 2009 Published by *Rajya Sabha*, Available at http://rajyasabha.nic.in/rsnew/publication_electronic/parl_procedure2009.pdf, Accessed: 19.04.2013.

Primer on the Budget Process published by PRS, Available at <http://www.prsindia.org/parliamenttrack/primers/the-budget-process-484/>, Accessed: 19.04.2013.

Background note on Financial Oversight by Parliament published by PRS, Available at <http://www.prsindia.org/administrator/uploads/media/Conference%20note/Conference%20note%20on%20financial%20oversight.pdf>, Accessed: 19.04.2013.

P. Keefer and S Khemani, (2009) 'When Do Legislators Pass On "Pork"? The Determinants of Legislator Utilization of a Constituency Development Fund in India', in *World Bank Policy Research Working Paper Series* 4929, pp. 1-45, Available at SSRN: <http://ssrn.com/abstract=1405160>, Accessed: 19.04.2013.

Parliamentary Procedures (Abstract Series), Lok Sabha, Available at<http://164.100.47.132/LssNew/abstract/process.htm>
Budget, Parliamentary Procedure, Ministry of Parliamentary Affairs, available athttp://mpa.nic.in/Manual/Manual_English/Chapter/chapter-07.htm, Accessed: 19.04.2013. <http://mpa.nic.in/mpahandbook/parlia13.pdf>

2. Peace and Conflict Resolution

Course Objective: The objective of an undergraduate application course for common students in Peace and Conflict Studies will cover in-depth knowledge of conflict analysis, conflict resolution, conflict prevention, as well as the historical and cultural context of organized violence. Peace and Conflict Resolution addresses the sources of war, social oppression and violence and the challenges of promoting peace and justice internationally and domestically. It also introduces more equitable, cooperative and nonviolent methods that can be used to transform unjust, violent or oppressive world situations. This course provides students with an overview of the Peace and Conflict Studies discipline, including key concepts and related theories. The course is designed to familiarize students with the historical background of various peace movements, to analyze principles used to resolve conflict, and to provide a view of how peace and conflict resolution are being pursued today. The course will also cover extensive understanding of current research and development within the field of peace and conflict studies and perspective of the environment, gender, migration, and ethnicity.

Unit-1 International Peace and Conflict Resolution: Sources of War: International and Domestic Issues and Trends

Unit-2-What is Conflict: Introduction to International Conflict Resolution

Unit-3 International Conflict Resolution Theory: Models developed by Johan Galtung, Joseph Montville, Morton Deutsch, William Zartman, Levy Jack

Unit-4-Conflict resolution: Back ground of Various Peace Movements and Concepts, Principles used to resolve conflict

Unit-5-Cross-boarder relationships between the world's peaceful and war-torn zones (migration and information flows, economic transactions, international rules and regulations, normative concepts and political decisions)

Unit-6 -Conflict Transformation: is Peace Possible? Resolve problems through conflict analyses and instrumentation of peace concepts

Unit-7 -Current perspective of peace and conflict resolution: Grass-roots level perspective on war and Peace

READING LIST

Essential Readings

International Conflict Resolution: Sources of War: International and Domestic Issues and Trends

Kriesberg, Louis, *Constructive Conflicts: From Escalation to Resolution*, Rowman & Littlefield, Maryland, 1998, pp. 58-150

Starkey, Boyer, and Wilkenfield, *Negotiating a Complex World*. Rowman & Littlefield, Maryland, 1999, pp. 1-74

Desirable Readings:

Zartman, William (ed.), *Collapsed States: The Disintegration and Restoration of Legitimate Authority*, Reiner, Boulder, 1995, pp. 1-14 and 267-273

Zartman, William & Touval, Saadia "International Mediation in the Post- Cold War Era", in Crocker et al., *Managing Global Chaos*, USIP, 1996, pp. 445-461

Essential Readings

What is Conflict: Introduction to International Conflict Resolution

Zartman, William, "Dynamics and Constraints in Negotiations in Internal Conflicts", in Zartman, William (ed), *Elusive Peace: Negotiating an End to Civil Wars*, The Brookings Institution, Washington, 1995, pp. 3-29

Desirable Readings

Zartman, William (ed.), *Collapsed States: The Disintegration and Restoration of Legitimate Authority*, Reiner, Boulder, 1995, pp. 1-14 and 267-273

Zartman, William & Touval, Saadia "International Mediation in the Post- Cold War Era", in Crocker et al., *Managing Global Chaos*, USIP, 1996, pp. 445-461

Essential Readings

International Conflict Resolution Theory: Models developed by Johan Galtung, Joseph Montville, Morton Deutsch, William Zartman, Levy Jack

Levy, Jack, "Contending Theories of International Conflict: A Levels-of- Analysis Approach" in Crocker et al, *Managing Global Chaos*, USIP, 1995, pp. 3-24

Carr, Edward H., "Realism and Idealism," Richard Betts (ed), *Conflict After the Cold War*, Boston: Simon & Schuster, 1994.

Desirable Readings

Carr, Edward H., "Realism and Idealism," Richard Betts (ed), *Conflict After the Cold War*, Boston: Simon & Schuster, 1994.

Waltz, Kenneth N., "Structural Causes and Economic Effects," Richard Betts (ed), *Conflict After the Cold War*, Boston: Simon & Schuster, 1994.

Conflict resolution: Back ground of Various Peace Movements and Concepts, Principles used to

resolve conflict

Essential Readings

Hampson, Fen Osler, Nurturing Peace, USIP, 1996, pp. 3-25

Galtung, Johan, There Are Alternatives: Four Roads to Peace and Security, Nottingham, Spokesman, 1984, pp. 162-205

Desirable Readings

Galtung, Johan, Peace by Peaceful Means: Peace and conflict, Development and Civilization, Sage, London, 1996, pp. 9-114

Galtung, Johan, The True Worlds: A Transnational Perspective, New York, Free Press, 1980, pp. 107-149

Cross-boarder relationships between the world's peaceful and war-torn zones (migration and information flows, economic transactions, international rules and regulations, normative concepts and political decisions)

Essential Readings

Kelman, Herbert C., "Interactive Problem Solving", in Fisher, Ronald J. (ed.) Interactive Conflict Resolution, Syracuse University Press, 1997, pp. 56-74

Kritz, Neil J., "The Rule of Law in the Post-conflict Phase: Building a Stable Peace", in Crocker et al, Managing Global Chaos, USIP, 1996, pp. 587-606

Desirable Readings

Galtung, Johan, "The Basic Need Approach", in Human Needs: a Contribution to the Current Debate, Verlag, Cambridge, 1980, pp. 55-126

Saunders, Harold H., A Public Peace Process: Sustained Dialogue to Transform Racial and Ethnic Conflicts, New York, 1999, pp. 1-80

Conflict Transformation: is Peace Possible: Resolve problems through conflict analyses and instrumentation of peace concepts

Essential Readings

Galtung, Johan, There Are Alternatives: Four Roads to Peace and Security, Nottingham, Spokesman, 1984, pp. 162-205

Galtung, Johan, "The Basic Need Approach", in Human Needs: a Contribution to the Current Debate, Verlag, Cambridge, 1980, pp. 55-126

Desirable Readings

Galtung, Johan, Peace by Peaceful Means: Peace and conflict, Development and Civilization, Sage, London, 1996, pp. 9-114

Galtung, Johan, The True Worlds: A Transnational Perspective, New York, Free Press, 1980, pp. 107-149

1980, pp. 107-149

Current perspective of peace and conflict resolution: Grass-roots level perspective on war and Peace: Grass-roots level perspective on war and Peace

Essential Readings

Deutsch, Morton, *The Resolution of Conflict: Constructive and Destructive Processes*, New Haven, Yale University Press, 1973, pp. 1-123

Galtung, Johan, *Peace by Peaceful Means: Peace and conflict, Development and Civilization*, Sage, London, 1996, pp. 9-114

Desirable Readings

Zartman, William, "Dynamics and Constraints in Negotiations in Internal Conflicts", in Zartman, William (ed), *Elusive Peace: Negotiating an End to Civil Wars*, The Brookings Institution, Washington, 1995, pp. 3-29

Kelman, Herbert C., "Interactive Problem Solving", in Fisher, Ronald J. (ed.) *Interactive Conflict Resolution*, Syracuse University Press, 1997, pp. 56-74

PSYCHOLOGY(HONOURS)

SEMESTER-I

C:1-INTRODUCTORY PSYCHOLOGY

(Credits:6, Theory-4, Practical-2) Lectures:
60 (Theory:40, Practical:20) Max.
Marks:100(Theory:70, Practical:30)

Introduction:

The course is designed to give the student a basic understanding of the psychology of human behavior. The students will be given exposure to concepts, terminology, principles, and theories that comprise an introductory course in psychology.

Learning Objectives:

1. To help the students to know the sources and processes of development of modern scientific psychology.
2. To help the students to develop a scientific temperament in studying and understanding human behavior.

Expected outcomes: Students will be able to

1. Define the term psychology and demonstrate command of the basic terminology, concepts, and principles of the discipline.
2. Gain knowledge of scientific methodology the variety of ways in which psychological data are gathered and evaluated / interpreted.
3. Identify and compare the major perspectives in psychology: Recognize how each approach views human thought and behavior.
4. Understand the physiological and biochemical links of human behavior.

UNIT-I: Introducing Psychology

- (i) Concept and definition of psychology, Roots of psychology, Psychology as a scientific discipline.
- (ii) Key Perspectives in Psychology- Behavioral, Cognitive, Humanistic, Psychodynamic, and Sociocultural

UNIT-II: Methods in Psychology

- (i) Natural Observation, Survey and Case Study- Nature, advantages and limitations.
- (ii) Experimental and Correlational methods-Nature, advantages and limitations.

UNIT-III: Biological Bases of Behavior

- (i) Structure and functions of the neurons, Communication within and between neurons, Chemical regulation of the endocrine glands.
- (ii) Structure and functions of the Central nervous system and Autonomic nervous system.

UNIT-IV: States of Mind

- (i) Nature of consciousness; changes in consciousness- sleep-wake schedules
- (ii) Extended states of Consciousness- Hypnosis, Meditation and Hallucinations

PRACTICAL

(i) R.L. by Method of Limits: To find out the R. L. of volar surface of the right arm of a subject by method of limits.

(ii) D.L. by Method of Constant Stimuli: To find out the D.L. for lifted weight of your subject by method of constant stimuli.

Recommended Books

1. Baron, R. A. (2002). Psychology (5th Edition), New Delhi: Pearson Education.
2. Dash, U.N., Dash, A.S., Mishra, H.C., Nanda, G.K. & Jena, N. (2004). Practical Exercises in Psychology: Learning about Yourself and Others. Panchasila, Bhubaneswar
3. Feldman, R.S. (2004). Understanding Psychology (6th Edition), New Delhi, Tata-McGraw Hill.
4. Gerrig, R.J. & Zimbardo, P.G. (2010). Psychology and Life (19th Ed.). Delhi: Allyn & Bacon.
5. Hilgard & Atkinson- Introduction to Psychology (2003) 14th Edition, Thomson Learning Inc.
6. Mohanty, N., Varadwaj, K. & Mishra, H.C. (2014). Explorations of Human Nature and Strength: Practicals in Psychology, Divya Prakashani, Samantarapur, Bhubaneswar.
7. Morgan, C.T., King, R.A., Weisz, J.R., & Schopler, J. (2008). Introduction to psychology (7th edition) Bombay: Tata-McGraw Hill.
8. Morris, C. G. (1990). Psychology: An Introduction. New Delhi: Prentice Hall.
9. Passer, M.W. & Smith, R.E. (2007). Psychology: The Science of Mind and Behaviour (3rd Ed.). New Delhi: Tata McGraw-Hill
10. Zimbardo, P.G. & Weber, A.L. (1997 Ed.)- Psychology- New York, Harper Collins College Publishers

C:2-BASIC DEVELOPMENTAL PROCESSES

(Credits:6, Theory-4, Practical-2) Lectures:
60 (Theory:40, Practical:20) Max.
Marks:100(Theory:70, Practical:30)

Introduction:

The course is designed to expose students to a basic understanding about the fundamental concerns of developmental psychology and provide examples of the following three dimensions of development: growth, differentiation, and orderly progression.

Learning Objectives:

1. To help students gain some key ideas about human development and the perspectives to understand and explain such developments.
2. To help the students to understand the significance of prenatal period for human development.
3. To help the students to understand the developmental preparations of the childhood and the implications of developmental milestones for the normal human development.

Expected outcomes: Students will be able to

1. Understand the nature, types, and principle of development.
2. Understand the processes of formation of life and development during pre- and post-natal periods.
3. Understand about the different aspects of preparation for future life.

UNIT-I: Basics of development

- (i) Meaning, nature, and types of development; Principles of development; Factors influencing development
- (ii) Perspectives of development- Psychoanalytic; Mechanistic; Organismic; Humanistic

UNIT-II: Life in formation

- (i) Fertilization, determination of sex, multiple birth; Prenatal development- germinal stage, embryonic stage, fetal stage; Factors influencing prenatal development
- (ii) Physical and motor developments, Social and emotional developments during childhood.

UNIT-III: Life in preparation

- (i) Physical and motor developments, Social and emotional developments during adolescence.
- (ii) Piagets stage of cognitive development; Kohlbergs stages of moral development

UNIT-IV: Self and identity

- (i) Emergence of self; Structure of the self; Development of personal identity

- (ii) Development of self control; Development of gender differences and gender roles

PRACTICAL

- (i) **Locus of Control:** To assess the Locus of Control of four college students by using Rotters Locus of Control Scale.
- (ii) **Emotional Intelligence:** To measure the emotional intelligence of four college students by using the Schuttles Emotional Intelligence Scale

Recommended Books

1. Baron, R. A. (2002). Psychology (5th Edition), New Delhi, Pearson Education.
2. Berk, L. E. (2010). Child Development (8th Ed.). New Delhi: Prentice Hall.
3. Dash, U.N., Dash, A.S., Mishra, H.C., Nanda, G.K. & Jena, N. (2004). Practical Exercises in Psychology: Learning about Yourself and Others. Panchasila, Bhubaneswar
4. Hurlock, E. Developmental Psychology (1995). IV Edition. New Delhi: Tata McGraw Hill.
5. Mohanty, N., Varadwaj, K. & Mishra, H.C. (2014). Explorations of Human Nature and Strength: Practicals in Psychology, DivyaPrakashani, Samantarapur, Bhubaneswar.
6. Papilia, Diane E., Sally Wendos Olds (2006). Human Development. 9th Edition. New Delhi: Tata McGraw Hill
7. Santrock, J. W. (2008). Child Development (11th Ed.). New Delhi: Tata McGraw Hill.
8. Sigelman, G.K. & Schaffer, D.R. (1995). Life-span Human Development, Brooks / Cole Publishing Co. Pacific Grove, California

GE:1-INTRODUCTORY PSYCHOLOGY

(Credits:6, Theory-4, Practical-2) Lectures:
60 (Theory:40, Practical:20) Max.
Marks:100(Theory:70, Practical:30)

Introduction:

The course is designed to give the student a basic understanding of the psychology of human behavior. The students will be given exposure to concepts, terminology, principles, and theories that comprise an introductory course in psychology.

Learning Objectives:

1. To help the students to know the sources and processes of development of modern scientific psychology.
2. To help the students to develop a scientific temperament in studying and understanding human behavior.

Expected outcomes: Students will be able to

1. Define the term psychology and demonstrate command of the basic terminology, concepts, and principles of the discipline.
2. Gain knowledge of scientific methodology the variety of ways in which psychological data are gathered and evaluated / interpreted.
3. Identify and compare the major perspectives in psychology: Recognize how each approach views human thought and behavior.
4. Understand the physiological and biochemical links of human behavior.

UNIT-I: Introducing Psychology

- (i) Concept and definition of psychology, Roots of psychology, Psychology as a scientific discipline.
- (ii) Key Perspectives in Psychology- Behavioral, Cognitive, Humanistic, Psychodynamic, and Sociocultural

UNIT-II: Methods in Psychology

- (i) Natural Observation, Survey and Case Study- Nature, advantages and limitations.
- (ii) Experimental and Correlational methods-Nature, advantages and limitations.

UNIT-III: Biological Bases of Behavior

- (i) Structure and functions of the neurons, Communication within and between neurons, Chemical regulation of the endocrine glands.
- (ii) Structure and functions of the Central nervous system and Autonomic nervous system.

UNIT-IV: States of Mind

- (i) Nature of consciousness; changes in consciousness- sleep-wake schedules
- (ii) Extended states of Consciousness- Hypnosis, Meditation and Hallucinations

PRACTICAL

- (i) R.L. by Method of Limits:** Students are required to find out the R. L. of volar surface of the right arm of a subject by method of limits
- (ii) D.L. by Method of Constant Stimuli:** To find out the D.L. for lifted weight of your subject by method of constant stimuli.

Recommended Books

1. Baron, R. A. (2002). Psychology (5th Edition), New Delhi: Pearson Education.

2. Dash, U.N., Dash, A.S., Mishra, H.C., Nanda, G.K. & Jena, N. (2004). Practical Exercises in Psychology: Learning about Yourself and Others. Panchasila, Bhubaneswar
3. Feldman, R.S. (2004). Understanding Psychology (6th Edition), New Delhi, Tata-McGraw Hill.
4. Gerrig, R.J. & Zimbardo, P.G. (2010). Psychology and Life (19th Ed.). Delhi: Allyn & Bacon.
5. Hilgard & Atkinson- Introduction to Psychology (2003) 14th Edition, Thomson Learning Inc.
6. Mohanty, N., Varadwaj, K. & Mishra, H.C. (2014). Explorations of Human Nature and Strength: Practicals in Psychology, Divya Prakashani, Samantarapur, Bhubaneswar.
7. Morgan, C.T., King, R.A., Weisz, J.R., & Schopler, J. (2008). Introduction to psychology (7th edition) Bombay: Tata-McGraw Hill.
8. Morris, C. G. (1990). Psychology: An Introduction. New Delhi: Prentice Hall.
9. Passer, M.W. & Smith, R.E. (2007). Psychology: The Science of Mind and Behaviour (3rd Ed.). New Delhi: Tata McGraw-Hill
10. Zimbardo, P.G. & Weber, A.L. (1997 Ed.)- Psychology- New York, Harper Collins College Publishers

SEMESTER-II

C:3-BASIC PSYCHOLOGICAL PROCESSES

(Credits:6, Theory-4, Practical-2) Lectures:
60 (Theory:40, Practical:20) Max.
Marks:100(Theory:70, Practical:30)

Introduction:

The course is designed to provide the student a basic understanding of the psychological processes from sensation to thought and communication. The student will be given exposure to the concepts, terminology, principles, and theories relating to each of the mental processes that constitute human psychology.

Learning Objectives:

1. To help the students to understand the mental processes to begin with sensation and perception up to how it results in thoughts and communication.
2. To help the students gather knowledge about the structural and functional dynamics of each of the mental processes and their interconnectedness.

Expected outcomes: Students will be able to

1. Understand the bases sensory actions and the processes of integration of sensory actions in creating and interpreting perceptual events.

2. Gain knowledge of the important processes and principles of human learning as well as the structural functional attributes of human memory to help conserve the learning outcomes.
3. Understand the structural and functional properties of language and the way it helps thought, communication, problem solving and decision making through development of concepts, ideas, images, and so on.

UNIT-I: Sensation and Perception

- (i) Basics of sensation- Sensory receptors (eye and ear), transduction, sensory thresholds, and sensory adaptation
- (ii) Nature of perceptual process- Figure and ground, Grouping (Gestalt laws), Perceptual constancies, and illusions, Perception of distance and depth.

UNIT-II: Learning and Memory

- (i) Nature and principles of Classical conditioning, Operant conditioning, and Observational learning
- (ii) The Atkinson and Shiffrin Model of Memory; Types of Memory- episodic, semantic and procedural; Causes of Forgetting- interference, repression, and amnesia

UNIT-III: Language and Communication

- (i) Properties and structure of language, Linguistic hierarchy, Language acquisition-predisposition, Nature of effective communication
- (ii) Stages of language development; critical period controversy; speech error and its implications

UNIT-IV: Thinking and Reasoning

- (i) Thinking process; concepts, categories and prototypes, Decision making and factors of influencing decision making.
- (ii) Inductive and deductive reasoning; Problem solving approaches; Steps in problem solving

PRACTICAL

- (i) Learning Curve:** To demonstrate the Learning Curve as a function of Learning trials using Nonsense Syllables.
- (ii) Serial Position Effect:** To demonstrate the serial position effect on memory in learning a list of nonsense syllables.

Recommended Books

1. Baron, R. A. (2002). Psychology (5th Edition), New Delhi, Pearson Education.
2. Dash, U.N., Dash, A.S., Mishra, H.C., Nanda, G.K. & Jena, N. (2004). Practical Exercises in Psychology: Learning about Yourself and Others. Panchasila, Bhubaneswar
3. Feldman, R.S. (2004). Understanding Psychology (6th Edition), New Delhi, Tata Mc. Graw Hill.
4. Gallotti, K.M.: Cognitive Psychology In and Out of the Laboratory. 3rd Ed, Int. Thomson Pub. Co. Bangalore, 2004

5. Gerrig, R.J. & Zimbardo, P.G. (2010). Psychology and Life (19th Ed.). Delhi: Allyn & Bacon.
6. Mohanty, N., Varadwaj, K. & Mishra, H.C. (2014). Explorations of Human Nature and Strength: Practicals in Psychology, DivyaPrakashani, Samantarapur, Bhubaneswar.
7. Morgan, C.T., King, R.A., Weisz, J.R., & Schopler, J. (2008). Introduction to psychology (7th edition) Bombay: Tata-McGraw Hill.
8. Morris, C. G. (1990). Psychology: An Introduction. New Delhi: Prentice Hall.
9. Passer, M.W. & Smith, R.E. (2007). Psychology: The Science of Mind and Behavior (3rd Ed.). New Delhi: Tata McGraw-Hill
10. Solso, R.L. (2000). Cognitive Psychology (6th Edition), USA, Allyn Bacon.
11. Zimbardo, P.G. & Weber, A.L. (1997 Ed.)- Psychology- New York, Harper Collins College Publishers

C:4-PROCESSES OF HUMAN EMPOWERMENT

(Credits:6, Theory-4, Practical-2) Lectures:
60 (Theory:40, Practical:20) Max.
Marks:100(Theory:70, Practical:30)

Introduction:

Human empowerment is ultimately an individual condition of gaining the power to control and modulate changes in one's own life those are considered important to one's identity and adjustment. The purpose of the course is to introduce students to the basics of human empowerment and how the empowerment processes are strengthened and improved.

Learning Objectives:

1. To help students gain ideas about intelligence and personality as foundations of human empowerment.
2. To make students understand how motivation and emotion are empowering processes to human development.
3. To help students gain insight into human behavior as products of empowerment

Expected outcomes: Students will be able to

1. Know the structural components and functional dynamics of both intelligence and personality.
2. Understand the significance of emotion and motivation in behavior management.
3. Understand significant aspects of social behavior as resulting in happiness, well-being and personal growth.

UNIT-I: Basics of empowerment

- (i) Intelligence- Theories of Gardner, and Stenberg; Heredity, environment, and intelligence

- (ii) Measuring Intelligence: intelligence tests; Interpretation of test score, Cross-cultural issues in testing intelligence

UNIT-II: Sources of Power (1)

- (i) Personality- Freuds theory, Humanistic theories, and Social cognitive theory
- (ii) Personality-Trait and type approach, Biological and sociocultural determinants, Psychometric and projective assessment.

UNIT-III: Sources of Power(2)

- (i) Motivation-Drive theory, Arousal theory, Expectancy theory, Maslows need hierarchy
- (ii) Emotion-Theories of James-Lange, Cannon-Bard, Schachter-Singer, and Opponent-Process

UNIT-IV: Proving empowered

- (i) Social behavior- Meaning of attribution and errors in attribution, Meaning of social cognition and processing of social information Motivation-Drive theory, Arousal theory, Expectancy theory, Maslows need hierarchy
- (ii) Positive Psychology-Scope and aims, Nature and characteristics of happiness, Subjective well-being and personal growth

PRACTICAL

- (i) Intelligence test-** To test the non-verbal intelligence of Two college students using Ravens Standard Progressive Matrices
- (ii) Personality Type-** To assess the personality type of a student obtaining responses from the student and two other significant persons in his /her life by using Glazers test of Personality Type

Recommended Books

1. Baron, R. A. & Byrne, D. (2003). Social Psychology, 10th Edition, Prentice Hall
2. Baron, R.A. (1995). Psychology- The Essential Science, Pearson Education Company of India Pvt. Ltd.
3. Dash, U.N., Dash, A.S., Mishra, H.C., Nanda, G.K. & Jena, N. (2004). Practical Exercises in Psychology: Learning about Yourself and Others. Panchasila, Bhubaneswar
4. Gerrig, R.J. & Zimbardo, P.G. (2010). Psychology and Life (19th Ed.). Delhi: Allyn & Bacon
5. Hilgard & Atkinson. Introduction to Psychology (2003). 14th Edition Thomson Learning Inc.
6. Misra, G. (2009). Psychology in India, Vol 1: Basic Psychological Processes and Human Development. India: Pearson

7. Mohanty, N., Varadwaj, K. & Mishra, H.C. (2014). Explorations of Human Nature and Strength: Practicals in Psychology, DivyaPrakashani, Samantarapur, Bhubaneswar.
8. Sigelman, G.K. & Schaffer, D.R. (1995 Eds.) Lifespan Human Development, Brooks/ Cole Publishing Co. , Pacific Group
9. Snyder, C.R. & Shane, J.L. (2005) Handbook of Positive Psychology: Oxford University Press.

GE:2-BASIC PSYCHOLOGICAL PROCESSES

(Credits:6, Theory-4, Practical-2) Lectures:
60 (Theory:40, Practical:20) Max.
Marks:100(Theory:70, Practical:30)

Introduction:

The course is designed to provide the student a basic understanding of the psychological processes from sensation to thought and communication. The student will be given exposure to the concepts, terminology, principles, and theories relating to each of the mental processes that constitute human psychology.

Learning Objectives:

1. To help the students to understand the mental processes to begin with sensation and perception up to how it results in thoughts and communication.
2. To help the students gather knowledge about the structural and functional dynamics of each of the mental processes and their interconnectedness.

Expected outcomes: Students will be able to

1. Understand the bases sensory actions and the processes of integration of sensory actions in creating and interpreting perceptual events.
2. Gain knowledge of the important processes and principles of human learning as well as the structural functional attributes of human memory to help conserve the learning outcomes.
3. Understand the structural and functional properties of language and the way it helps thought, communication, problem solving and decision making through development of concepts, ideas, images, and so on.

UNIT-I: Sensation and Perception

- (i) Basics of sensation- Sensory receptors (eye and ear), transduction, sensory thresholds, and sensory adaptation
- (ii) Nature of perceptual process- Figure and ground, Grouping (Gestalt laws), Perceptual constancies, and illusions, Perception of distance and depth.

UNIT-II: Learning and Memory

- (i) Nature and principles of Classical conditioning, Operant conditioning, and Observational learning
- (ii) The Atkinson and Shiffrin Model of Memory; Types of Memory- episodic, semantic and procedural; Causes of Forgetting- interference, repression, and amnesia

UNIT-III: Language and Communication

- (i) Properties and structure of language, Linguistic hierarchy, Language acquisition-predisposition, Nature of effective communication
- (ii) Stages of language development; critical period controversy; speech error and its implications

UNIT-IV: Thinking and Reasoning

- (i) Thinking process; concepts, categories and prototypes, Decision making and factors of influencing decision making.
- (ii) Inductive and deductive reasoning; Problem solving approaches; Steps in problem solving

PRACTICAL

(i) Learning Curve: To demonstrate the Learning Curve as a function of Learning trials using Non-sense Syllables.

(ii) Serial Position Effect: To demonstrate the serial position effect on memory in learning a list of nonsense syllables.

Recommended Books

1. Baron, R. A. (2002). Psychology (5th Edition), New Delhi, Pearson Education.
2. Dash, U.N., Dash, A.S., Mishra, H.C., Nanda, G.K. & Jena, N. (2004). Practical Exercises in Psychology: Learning about Yourself and Others. Panchasila, Bhubaneswar
3. Feldman, R.S. (2004). Understanding Psychology (6th Edition), New Delhi, Tata Mc. Graw Hill.
4. Gallotti, K.M.: Cognitive Psychology In and Out of the Laboratory. 3rd Ed, Int. Thomson Pub. Co. Bangalore, 2004
5. Gerrig, R.J. & Zimbardo, P.G. (2010). Psychology and Life (19th Ed.). Delhi: Allyn & Bacon.
6. Mohanty, N., Varadwaj, K. & Mishra, H.C. (2014). Explorations of Human Nature and Strength: Practicals in Psychology, DivyaPrakashani, Samantarapur, Bhubaneswar.
7. Morgan, C.T., King, R.A., Weisz, J.R., & Schopler, J. (2008). Introduction to psychology (7th edition) Bombay: Tata-McGraw Hill.
8. Morris, C. G. (1990). Psychology: An Introduction. New Delhi: Prentice Hall.
9. Passer, M.W. & Smith, R.E. (2007). Psychology: The Science of Mind and Behavior (3rd Ed.). New Delhi: Tata McGraw-Hill
10. Solso, R.L. (2000). Cognitive Psychology (6th Edition), USA, Allyn Bacon.
11. Zimbardo, P.G. & Weber, A.L. (1997 Ed.)- Psychology- New York, Harper Collins College Publishers

SEMESTER-III

C:5-PSYCHOLOGICAL STATISTICS

(Credits:6, Theory-4, Practical-2) Lectures:
60 (Theory:40, Practical:20) Max.
Marks:100(Theory:70, Practical:30)

Introduction:

The course is designed to equip students with knowledge in the fundamentals of statistics and research methods so that they understand the application of statistics to different research problems in psychology.

Learning Objectives:

1. To help students develop knowledge and understanding of the application of Statistics within Psychology
2. To help students develop Critical Thinking for application of appropriate statistical analysis in Psychological research

Expected outcomes: Students will be able to

1. The nature psychological variables and how to measure them with appropriate scale.
2. The processes of describing and reporting statistical data.
3. The methods of drawing inferences and conclusions for hypothesis testing by using appropriate statistical analysis.

UNIT-I: Fundamentals of statistics

- (i) Meaning and scope of statistics, Nature of variables- Categorical and Continuous, Levels of Measurement- Nominal, Ordinal, Interval, and Ratio
- (ii) Drawing frequency distribution; Graphical representation of grouped data-Polygon, Histogram, Ogive.

UNIT-II: Measures of Statistics

- (i) Measures of Central Tendency- Characteristics of mean, median and mode; Computation of mean, median, and mode
- (ii) Measures of Variability- Concept of variability, computation of semi-inter quartile range, Standard deviation and variance, Co-efficient of variation

UNIT-III: Sources and Applications

- (i) Concept of Probability; Characteristics of Normal Probability curve, Applications of NPC, Deviation from NPC- Skewness and Kurtosis
- (ii) Concept of correlation, Product-moment correlation (ungrouped data), Rank order correlation, Chi-square test (Contingency Table)

UNIT-IV: Hypothesis Testing

(i) Level of significance; Type I and Type II error; Computation of t for independent and dependent samples, The Mann-Whitney U test

(ii) Purpose and assumptions of ANOVA; One-way and two-way ANOVA; Kruskal-Wallis H test

PRACTICAL

(i) **Reporting of Statistical Results:** To collect data of 60 (30 boys and 30 girls) High School students about their Annual examination marks in four subjects and to report by descriptive statistical analyses.

(ii) **Computer Awareness:** To be familiar with software packages of statistics and their applications.

Recommended Books

1. Aron, A., Aron, E.N., & Coups, E.J. (2007). Statistics for Psychology. (4thEd.) India: Pearson Education, Prentice Hall.
2. Dash, U.N., Dash, A.S., Mishra, H.C., Nanda, G.K. & Jena, N. (2004). Practical Exercises in Psychology: Learning about Yourself and Others. Panchasila, Bhubaneswar
3. Ferguson, G.A. & Takane, Y. (1989). Statistical Analysis in Psychology & Education, Tata McGraw Hill Publishing Company, New Delhi
4. Garrett, H. E. & Woodworth, R.S. (1985). Psychology in Statistics and Education, Vakils, Feffer & Simons Ltd. Mumbai
5. Mangal, S.K. (2002) Statistics in Psychology and Education. (2ndedt). New Delhi: Prentice Hall of India.
6. Mohanty, N., Varadwaj, K. & Mishra, H.C. (2014). Explorations of Human Nature and Strength: Practicals in Psychology, DivyaPrakashani, Samantarapur, Bhubaneswar.
7. Siegal, S. (1994). Nonparametric Statistics. McGraw Hill, New Delhi
8. Singh, A.K. (1986). Tests, Measurements, & Research Methods in Behavioral Sciences, Tata McGraw Hill Publishing Company, New Delhi
9. Walaram, G. Statistics for Behavioral Sciences

C:6-SOCIAL PSYCHOLOGY

(Credits:6, Theory-4, Practical-2) Lectures:
60 (Theory:40, Practical:20) Max.
Marks:100(Theory:70, Practical:30)

Introduction:

Social psychology is the scientific study of the nature and causes of human behavior in a social context. This course is designed to introduce the students to the field of social psychology, to explain how social psychologists think about and study human behavior; to introduce the body of knowledge and underlying principles that currently exist in the field and to encourage reflection about the implications of social psychology for the situations we encounter in everyday life.

Learning Objectives:

1. To help students develop awareness of the concepts, problems and issues in the discipline of social psychology

2. To make students understand the individuals and groups in respect to patterns of social behavior and attitudes
3. To help students gain insight into the dynamics of intergroup relationships, conflict, prejudice and cooperation.

Expected outcomes: Students will be able to

1. Know the scope of studying social psychology and the methods to gather data in the social context to explain them.
2. Understand the significance of social cognition, attitudes, stereotypes and prejudices in explaining human behavior in the social contexts.
3. Understand the significant aspects group behavior and social influence that constitute the core of human relationships.

UNIT-I: Introduction

- (i) Nature, goal, and scope of Social Psychology; Methods of Social Psychology- Observation; Questionnaire, Interview, and Experiment
- (ii) Social Cognition- Perceiving ourselves: self-concept, self-esteem, self-presentation and self expression; Perceiving others and forming impressions

UNIT-II: Attitude, Prejudice and Stereotypes

- (i) Attitudes- Nature, characteristics and functions of attitude; Attitude formation and change; Attitude measurement
- (ii) Measures of Variability- Concept of variability, computation of semi-inter quartile range, Standard deviation and variance, Co-efficient of variation

UNIT-III: Group and Leadership

- (i) Group- Group structure and function, Task performance: Social facilitation, Social loafing; Conformity, Obedience and social modeling; Group cohesiveness-
- (ii) Leadership- Definitions and functions, Trait, situational, interactional and contingency approaches to leadership; Leadership effectiveness, The charismatic leadership

UNIT-IV: Social Behavior

- (i) Prosocial behavior-Cooperation and helping, personal, situational and socio-cultural determinants, Theoretical explanations of prosocial behavior.
- (ii) Aggression- Theoretical perspectives, Trait, situational and social learning approaches, social and personal determinants of aggression, prevention and control of aggression.

PRACTICAL

- (i) Ethical Values:** To assess the ethical values of five adolescents by using Donelsons Ethical Position Questionnaire (EPQ)
- (ii) Attitude towards Women:** To measure the attitude of three boys and three girls towards Women by using Spence, Helmrich & Stapps Attitude towards Women scale.

Recommended Books

1. Baron R. A & Byrne. D. (2003). Social Psychology. 10th Edition, Prentice Hall
2. Baron. R.A., Byrne, D. & Bhardwaj. G (2010). Social Psychology (12th Ed). New Delhi: Pearson
3. Dash, U.N., Dash, A.S., Mishra, H.C., Nanda, G.K. & Jena, N. (2004). Practical Exercises in Psychology: Learning about Yourself and Others. Panchasila, Bhubaneswar
4. Developments (ICSSR survey of advances in research). New Delhi: Pearson.
5. Misra, G. (1990) .Applied Social Psychology. New Delhi: Sage.
6. Misra, G. (2009). Psychology in India, Volume 4: Theoretical and Methodological
7. Mohanty, N., Varadwaj, K. & Mishra, H.C. (2014). Explorations of Human Nature and Strength: Practicals in Psychology, DivyaPrakashani, Samantarapur, Bhubaneswar.
8. Myers, David G. (2002). Social Psychology. 7th Edition, McGraw Hill Book Co.
9. Taylor,S.E., Peplau,L.A. & Sears, D.O. (2006). Social Psychology (12th Ed). New Delhi: Pearson

C:7-ENVIRONMENTAL PSYCHOLOGY

(Credits:6, Theory-4, Practical-2) Lectures:
60 (Theory:40, Practical:20) Max.
Marks:100(Theory:70, Practical:30)

Introduction:

Environmental psychology is an interdisciplinary field focused on the interplay between individuals and their surroundings. The field defines the term environment broadly, encompassing natural environments, social settings, built environments, learning environments, and informational environments. The course is designed to introduce to the students about all these aspects of environment.

Learning Objectives:

1. To highlight the simultaneous mutual interaction of environment and behavior.
2. To delineate psychological approaches to the study of environment.
3. To discuss the impact of ecological degradation and the need for enhanced awareness programs

Expected outcomes: Students will be able to

1. understand the interactional relationships between environment and behavior
2. understand the problems occurring to ecology and environment at the present time
3. understand different psychological approaches to the study of man-environment relationship.

UNIT-I: Environment and Behavior

- (i) Earth as a living system: The gala hypothesis, Deep ecology; Man-environment relationship-physical, social, cultural, orientation and product.
- (ii) Effects of Environment on behavior: Noise pollution, Air pollution, Crowding and population explosion.

UNIT-II: Ecology and Development

- (i) Human behavior Environmental Problems: Global warming, Greenhouse effect, energy depletion; Pro-environmental behaviors.
- (ii) Ecosystem and their components; Sustainable development; Resource use: Common property resources. Ecology: Acculturation and psychological adaptation

UNIT-III: Psychological Approaches to environment

- (i) Field theory approach; Eco-cultural Psychology (Berry); Biosocial Psychology (Dawson);
- (ii) Person environment transaction (Sokols & Ittelson); Ecological Psychology (Barker); Ecological system approach (Bronfenbrenner)

UNIT-IV: Environmental Assessment

- (i) Socio-psychological dimensions of environmental impact; Environmental deprivation-nature and consequences.
- (ii) Creating environmental awareness; Social movements- Chipko, Tehri, Narmada.

PRACTICAL

- (i) To assess the environmental literacy of 4 college students using Bob Simpsons Environment literacy and awareness survey questionnaire.
- (ii) To assess the environmental attitude, concern and sensitivity of 4 college students using Bob Simpsons Environment literacy and awareness survey questionnaire.

Recommended Books

1. Dash, U.N., Dash, A.S., Mishra, H.C., Nanda, G.K. & Jena, N. (2004). Practical Exercises in Psychology: Learning about Yourself and Others. Panchasila, Bhubaneswar
2. Dreze, J. and Sen, A. (1992). Indian Development. Delhi: Oxford University Press.
3. Gadgil, M. and Guha. R. (1995). Ecology and Equity. New Delhi, Penguin Books
4. Goldsmith, E. (1991). The way: The ecological World View. Boston: Shambhala
5. Mohanty, N., Varadwaj, K. & Mishra, H.C. (2014). Explorations of Human Nature and Strength: Practicals in Psychology, DivyaPrakashani, Samantarapur, Bhubaneswar.

GE:3-PSYCHOLOGICAL STATISTICS

(Credits:6, Theory-4, Practical-2) Lectures:
60 (Theory:40, Practical:20) Max.
Marks:100(Theory:70, Practical:30)

Introduction:

The course is designed to equip students with knowledge in the fundamentals of statistics and research methods so that they understand the application of statistics to different research problems in psychology.

Learning Objectives:

1. To help students develop knowledge and understanding of the application of Statistics within Psychology
2. To help students develop Critical Thinking for application of appropriate statistical analysis in Psychological research

Expected outcomes: Students will be able to

1. The nature psychological variables and how to measure them with appropriate scale.
2. The processes of describing and reporting statistical data.
3. The methods of drawing inferences and conclusions for hypothesis testing by using appropriate statistical analysis.

UNIT-I: Fundamentals of statistics

- (i) Meaning and scope of statistics, Nature of variables- Categorical and Continuous, Levels of Measurement- Nominal, Ordinal, Interval, and Ratio
- (ii) Drawing frequency distribution; Graphical representation of grouped data-Polygon, Histogram, Ogive.

UNIT-II: Measures of Statistics

- (i) Measures of Central Tendency- Characteristics of mean, median and mode; Computation of mean, median, and mode
- (ii) Measures of Variability- Concept of variability, computation of semi-inter quartile range, Standard deviation and variance, Co-efficient of variation

UNIT-III: Sources and Applications

- (i) Concept of Probability; Characteristics of Normal Probability curve, Applications of NPC, Deviation from NPC- Skewness and Kurtosis
- (ii) Concept of correlation, Product-moment correlation (ungrouped data), Rank order correlation, Chi-square test (Contingency Table)

UNIT-IV: Hypothesis Testing

- (i) Level of significance; Type I and Type II error; Computation of t for independent and dependent samples, The Mann-Whitney U test
- (ii) Purpose and assumptions of ANOVA; One-way and two-way ANOVA; Kruskal-Wallis H test

PRACTICAL

- (i) **Reporting of Statistical Results:** To collect data of 60 (30 boys and 30 girls) High School students about their Annual examination marks in four subjects and to report by descriptive statistical analyses.

(ii) Computer Awareness: To be familiar with software packages of statistics and their applications.

Recommended Books

1. Aron, A., Aron, E.N., & Coups, E.J. (2007). Statistics for Psychology. (4thEd.) India: Pearson Education, Prentice Hall.
2. Dash, U.N., Dash, A.S., Mishra, H.C., Nanda, G.K. & Jena, N. (2004). Practical Exercises in Psychology: Learning about Yourself and Others. Panchasila, Bhubaneswar
3. Ferguson, G.A. & Takane, Y. (1989). Statistical Analysis in Psychology & Education, Tata McGraw Hill Publishing Company, New Delhi
4. Garrett, H. E. & Woodworth, R.S. (1985). Psychology in Statistics and Education, Vakils, Feffer & Simons Ltd. Mumbai
5. Mangal, S.K. (2002) Statistics in Psychology and Education. (2ndedt). New Delhi: Prentice Hall of India.
6. Mohanty, N., Varadwaj, K. & Mishra, H.C. (2014). Explorations of Human Nature and Strength: Practicals in Psychology, DivyaPrakashani, Samantarapur, Bhubaneswar.
7. Siegal, S. (1994). Nonparametric Statistics. McGraw Hill, New Delhi
8. Singh, A.K. (1986). Tests, Measurements, & Research Methods in Behavioral Sciences, Tata McGraw Hill Publishing Company, New Delhi
9. Walaram, G. Statistics for Behavioral Sciences

C:8-PSYCHOPATHOLOGY

(Credits:6, Theory-4, Practical-2) Lectures:
60 (Theory:40, Practical:20) Max.
Marks:100(Theory:70, Practical:30)

Introduction:

Psychopathology refers to the study of mental illness. This course is designed to expose students to the key concepts in psychopathology as well as the major theories associated with the etiology and treatment of psychological disorders and disabilities. Students will be able to understand the distinction between normal and abnormal and the qualities that are used to differentiate what is typical versus atypical through citations of different disorders.

Learning Objectives:

1. To help students define and understand the basic concepts underlying psychopathology and the perspectives which contributed to the development of modern psychopathology.
2. To help students understand the assessment techniques for identifying and classifying maladaptive behavior and mental disorders.

3. To guide students to gain specific knowledge about different types of mental disorders.

Expected outcomes: Students will be able to

1. Understand the differences between normality and abnormality along with the perspectives explaining them.
2. Know the importance and the use of assessment techniques in identifying different forms of maladaptive behavior.
3. Learn the symptoms, causes and treatment of anxiety disorders, mood disorders and schizophrenia.

UNIT-I: Basics of Pathology

- (i) Concept of abnormality; Perspectives of abnormal behavior- Psychodynamic, Behavioral, Cognitive, Humanistic-Existential, and Sociocultural
- (ii) Classification of maladaptive behavior-DSM-IV; Assessment techniques- Diagnostic tests, Rating scales, History taking interview, Projective tests

UNIT-II: Anxiety and Mood disorder

- (i) Symptoms, causes and treatment of Generalized anxiety disorder, Phobic disorder, Obsessive-Compulsive disorder
- (ii) Depressive disorder Symptoms, causes and treatment of Bipolar affective disorder, and Dysthymia

UNIT-III: Personality Disorders

- (i) Paranoid, Schizoid, Dissociative, Impulsive
- (ii) Borderline, Anxious, Avoidance, Dependent personality

UNIT-IV: Schizophrenia and Therapies

- (i) Characteristics, Major subtypes, Causes and treatment of Schizophrenia
- (ii) Psychodynamic, and Cognitive Behavior therapy.

PRACTICAL

- (i) Anxiety:** Assessment of Anxiety of a subject by Hamilton Anxiety Rating Scale (HARS)
- (ii) Depression:** Assessment of Depression Profile of a subject by Becks Depression Inventory (BDI)

Recommended Books

1. Ahuja N. (2011). A Short Textbook of Psychiatry (7th Ed). New Delhi: Jaypee

2. Barlow D.H. and Durand V.M. (2005). Abnormal Psychology: An Integrated Approach (4th Ed.).Wadsworth: New York.
3. Baron, R.A. (1995 Edition)-Psychology- The Essential Science, Pearson Education Company of India Pvt. Ltd.
4. Carson R.C., Butcher J.N., Mineka, S., & Hooley J.M. (2007). Abnormal Psychology (13th Ed.).ND: Pearson Education.
5. Dash, U.N., Dash, A.S., Mishra, H.C., Nanda, G.K. & Jena, N. (2004). Practical Exercises in Psychology: Learning about Yourself and Others. Panchasila, Bhubaneswar
6. Irwin G. Sarason, Barbara Sarason (2005). Abnormal Psychology. New Delhi: Prentice Hall Publication
7. James C. Coleman (1981). Abnormal Psychology and Modern Life. D.B. Taraporevala with Scott, Foresman and Company, Mumbai
8. Kring,A.M.,Johnson,S.L.,Davison G.C. & Neale J.M. (2010). Abnormal Psychology (11th Ed.).NY: John Wiley
9. Mohanty, N. (2008). Psychological Disorders: Text and Cases. New Delhi: Neelkamal Publications Pvt. Ltd.
10. Mohanty, N., Varadwaj, K. & Mishra, H.C. (2014). Explorations of Human Nature and Strength: Practicals in Psychology, DivyaPrakashani, Samantarapur, Bhubaneswar.

C:9-EDUCATIONAL PSYCHOLOGY

(Credits:6, Theory-4, Practical-2) Lectures:
60 (Theory:40, Practical:20) Max.
Marks:100(Theory:70, Practical:30)

Introduction:

This course provides an introduction to concepts, theories, and research in educational psychology. The topics covered include cognitive development during the school years, classroom management, instructional approaches, motivation, assessment, and individual differences.

Learning Objectives:

1. To provide students with an overview of the purposes and uses of educational psychology.
2. To help students understand human development focusing mainly on the years of formal education including those with ability differences
3. To make students understand the ways that educators motivate their students to learn and strive for excellence
4. To make students explore the ways that educators manage learning environments to maximize learning and social cohesion

Expected outcomes: Students will be able to

1. Define educational psychology and give examples of the different topics educational psychologists study.
2. Describe the developmental issues faced by school age children.
3. Describe the challenges presented by children with ability differences.
4. Explain the role of motivation on learning and classroom behavior.
5. Describe classroom management techniques.
6. Identify commonly used standardized tests, their strengths and limitations, and use in school settings.

UNIT-I Foundations of Educational Psychology

- (i) Concepts and principles of educational psychology, The teaching-learning process, Goals of teaching and objectives for learning.
- (ii) Theories of cognitive development-Piaget, Bruner and Vygotsky.

UNIT- II Motivation and Classroom Management

- (i) Meaning of motivation, Intrinsic and extrinsic motivation, Approaches to understand classroom motivation, Motivational techniques in classroom teaching.
- (ii) The goals of classroom management, Creating a positive learning environment, Characteristics of an effective teacher, Teacher expectation and students performance.

UNIT III Creativity and Aptitude

- (i) Nature and characteristics of creativity; Theories of creativity; Fostering creativity among children.
- (ii) Nature and characteristics of aptitude; Types of aptitude; Measurement of aptitude; Utility of aptitude tests.

UNIT -IV Dealing with ability differences and Testing

- (i) Teaching children with mental retardation, learning disability, social class differences, and attention deficit Hyperactive disorder.
- (ii) Types of standardized tests- Achievement test, and aptitude tests, Advantages and limitations of standardized test.

PRACTICAL

- (i) Academic Behavior: To assess the academic attitude and behavior of college students by using Sias Academic Behavior Scale.
- (ii) Academic Stress: To assess the academic stress of two higher Secondary students using Raos Academic Stress Scale.

Recommended Books

1. Agrawal, J.C. (2009). Essentials of Educational Psychology (2ndEdn.) Vikas Publishing House, New Delhi.
2. Dash, U.N., Dash, A.S., Mishra, H.C., Nanda, G.K. & Jena, N. (2004). Practical Exercises in Psychology: Learning about Yourself and Others. Panchasila, Bhubaneswar

3. Gage, N. L., & Berliner, D. C. (2009) Educational psychology (5th ed.). Boston, MA: Houghton Mifflin.
4. Mangal, S.K. (2013). Advanced Educational Psychology (2ndEdn.) PHI Learning Pvt. Ltd., New Delhi
5. Mohanty, N., Varadwaj, K. & Mishra, H.C. (2014). Explorations of Human Nature and Strength: Practicals in Psychology, DivyaPrakashani, Samantarapur, Bhubaneswar.
6. Slavin, Robert E. (2012). Educational Psychology: Theory and Practice. Delhi, Pearson,
7. Woolfolk, A.E. (2004). Educational Psychology (9th Ed.), Allyn & Bacon, London / Boston.

C:10-PSYCHOLOGICAL ASSESSMENT

(Credits:6, Theory-4, Practical-2) Lectures:
60 (Theory:40, Practical:20) Max.
Marks:100(Theory:70, Practical:30)

Introduction:

The course is designed to expose students to a basic understanding about approaches to psychological assessment and develop skill in the administration and interpretation of psychological tests.

Learning Objectives:

1. To train students in various psychological assessment techniques
2. To impart skills necessary for selecting and applying different tests for different purposes such as evaluation, training, rehabilitation etc.

Expected outcomes: Students will be able to

1. Understand the basic facts about psychological assessment.
2. Understand the processes of test construction and standardization.
3. Understand about the assessment of different types of skills and abilities.

UNIT-I Introduction

- (i) Nature and Scope of human assessment;Parameters of assessment.
- (ii) Psychological scaling, Methods of scaling.

UNIT- II Psychological Tests

- (i) Principles of test construction and standardization- Item analysis, reliability, validity and development of norms.
- (ii) Types of psychological tests- Individual, group, performance, verbal, nonverbal.

UNIT III Assessment of Ability

- (i) Assessment of general abilities- Intelligence, interest, interpersonal interaction.
- (ii) Assessment of personality- Use of self report inventories, interview, projective and non-projective tests.

UNIT IV Classroom Assessment

- (i) Classroom as assessment context, Traditional tests, Alternative assessment.
- (ii) Grading and reporting of performance, Computer and assessment.

PRACTICAL

(i) Empathy: To assess the empathy behavior of Five college students using Sprengs Empathy questionnaire.

(ii) Sense of Humor: To assess the Sense of Humor of 4 College Students Using McGhees Scale of Sense of Humor (MSSH).

Recommended Books

1. Baron, R. A. (2002). Psychology (5th Edition), New Delhi, Pearson Education.
2. Berk, L. E. (2010). Child Development (8th Ed.). New Delhi: Prentice Hall.
3. Dash, U.N., Dash, A.S., Mishra, H.C., Nanda, G.K. & Jena, N. (2004). Practical Exercises in Psychology: Learning about Yourself and Others. Panchasila, Bhubaneswar
4. Hurlock, E. Developmental Psychology (1995). IV Edition. New Delhi: Tata McGraw Hill.
5. Mohanty, N., Varadwaj, K. & Mishra, H.C. (2014). Explorations of Human Nature and Strength: Practicals in Psychology, DivyaPrakashani, Samantarapur, Bhubaneswar.
6. Papilia, Diane E., Sally Wendos Olds (2006). Human Development. 9th Edition. New Delhi: Tata McGraw Hill
7. Santrock, J. W. (2008). Child Development (11th Ed.). New Delhi: Tata McGraw Hill.
8. Sigelman, G.K. & Schaffer, D.R. (1995). Life-span Human Development, Brooks / Cole Publishing Co. Pacific Grove, California

GE:6-PSYCHOPATHOLOGY

(Credits:6, Theory-4, Practical-2) Lectures:
60 (Theory:40, Practical:20) Max.
Marks:100(Theory:70, Practical:30)

Introduction:

Psychopathology refers to the study of mental illness. This course is designed to expose students to the key concepts in psychopathology as well as the major theories associated with the etiology and treatment of psychological disorders and disabilities. Students will be able to understand the distinction between normal and abnormal and the qualities that are used to differentiate what is typical versus atypical through citations of different disorders **Learning Objectives:**

1. To help students define and understand the basic concepts underlying psychopathology and the perspectives which contributed to the development of modern psychopathology.
2. To help students understand the assessment techniques for identifying and classifying maladaptive behavior and mental disorders.
3. To guide students to gain specific knowledge about different types of mental disorders.

Expected outcomes: Students will be able to

1. Understand the differences between normality and abnormality along with the perspectives explaining them.
2. Know the importance and the use of assessment techniques in identifying different forms of maladaptive behavior.
3. Learn the symptoms, causes and treatment of anxiety disorders, mood disorders and schizophrenia.

UNIT-I Basics of Pathology

- (i) Concept of abnormality; Perspectives of abnormal behavior- Psychodynamic, Behavioral, Cognitive, Humanistic-Existential, and Sociocultural.
- (ii) Classification of maladaptive behavior-DSM-IV; Assessment techniques- Diagnostic tests, Rating scales, History taking interview, Projective tests.

UNIT- II Anxiety and Mood disorder

- (i) Symptoms, causes and treatment of Generalized anxiety disorder, Phobic disorder, Obsessive-Compulsive disorder.
- (ii) Depressive disorder Symptoms, causes and treatment of Bipolar affective disorder, and Dysthymia.

UNIT III Personality Disorders

- (i) Paranoid, Schizoid, Dissociative, Impulsive. (ii) Borderline, Anxious, Avoidance, Dependent personality.

UNIT IV Schizophrenia and Therapies

- (i) Characteristics, Major subtypes, Causes and treatment of Schizophrenia.
- (ii) Psychodynamic, and Cognitive Behavior therapy.

PRACTICAL

- (i) Anxiety: Assessment of Anxiety of a subject by Hamilton Anxiety Rating Scale (HARS).
- (ii) Depression: Assessment of Depression Profile of a subject by Becks Depression Inventory (BDI).

Recommended Books

1. Ahuja N. (2011). A Short Textbook of Psychiatry (7th Ed). New Delhi: Jaypee.
2. Barlow D.H. and Durand V.M. (2005). Abnormal Psychology: An Integrated Approach (4th Ed.). Wadsworth: New York.
3. Baron, R.A. (1995 Edition)-Psychology- The Essential Science, Pearson Education Company of India Pvt. Ltd.
4. Carson R.C., Butcher J.N., Mineka, S., & Hooley J.M. (2007). Abnormal Psychology (13th Ed.). ND: Pearson Education.
5. Dash, U.N., Dash, A.S., Mishra, H.C., Nanda, G.K. & Jena, N. (2004). Practical Exercises in Psychology: Learning about Yourself and Others. Panchasila, Bhubaneswar.
6. Irwin G. Sarason, Barbara Sarason (2005). Abnormal Psychology. New Delhi: Prentice Hall Publication.
7. James C. Coleman (1981). Abnormal Psychology and Modern Life. D.B. Taraporevala with Scott, Foresman and Company, Mumbai.
8. Kring, A.M., Johnson, S.L., Davison G.C. & Neale J.M. (2010). Abnormal Psychology (11th Ed.). NY: John Wiley.
9. Mohanty, N. (2008). Psychological Disorders: Text and Cases. New Delhi: Neelkamal Publications Pvt. Ltd.

10. Mohanty, N., Varadwaj, K. & Mishra, H.C. (2014). Explorations of Human Nature and Strength: Practicals in Psychology, DivyaPrakashani, Samantarapur, Bhubaneswar.
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SEMESTER-V

C:11-ORGANIZATIONAL BEHAVIOR

(Credits:6, Theory-4, Practical-2) Lectures:
60 (Theory:40, Practical:20) Max.
Marks:100(Theory:70, Practical:30)

Introduction:

The course provides an overview of the main fields of organizational and personnel psychology. It focuses on topics such as organizational system; work behavior, attitudes and motivation as related to organizational set up; management of power and politics in the organizations; and finally development and evaluation of human resources for sustainable growth of an organizations. **Learning Objectives:**

1. To help students able to understand the structure, functions, and designs of different organizations.
2. To make students understand the processes of group decision making and leadership functions in different organizations.
3. To make students understand the theories of work motivation and related issues of power and politics in the organizational set up.
4. To help students demonstrate professional skills in the evaluation, management, and development of human resources in the organizations.

Expected outcomes: Students will be able to

1. Understand different concepts and dynamics related to organizational system, behavior, and management.
2. Identify steps managers can take to motivate employees in the perspectives of the theories of work motivation.
3. Understand the tricks of power and politics management in the organizations.
4. Understand significance of human resource development, evaluation and management for the interest and benefit of the organization.

UNIT-I Historical context of organizational behavior

- (i) Contributions of Taylor, Weber and Fayoll; Challenges, Scope and opportunities for OB.
- (ii) OB perspectives-Open system approach, Human relations perspective, Socio-technical approach, OB model responsive to Indian realities.

UNIT- II Organization System

- (i) Structure and functions of organization, Common organizational designs, Management roles, functions and skills.
- (ii) Group decision making processes in organizations, Organizational leadership and types of leadership in organizations.

UNIT III Work, Power and Politics

(i) Contemporary theories of work motivation- ERG theory, McClelland's theory of needs, Cognitive evaluation theory, Goal-setting theory, Reinforcement theory.

(ii) Defining power in organization, Bases of power, Power tactics, Nature of organizational politics, Impression management, and defensive behavior.

UNIT IV Human resource development and Evaluation

(i) Human Skills and Abilities, Selection Practices for Optimal Use of Human Resources; Training Programs for the Development of Human Resources.

(ii) Performance Evaluation- Purpose, Methods, Potential Problems and methods to overcome them.

PRACTICAL

(i) **Leadership Style:** To measure his basic leadership style of 4 college students by using Green- berg Basic Leadership Style scale.

(ii) **Conflict-Handling:** To measure the conflict-handling style of 4 college students by using Rahims scale to identify their conflict handling style.

Recommended Books

1. Dash, U.N., Dash, A.S., Mishra, H.C., Nanda, G.K. & Jena, N. (2004). Practical Exercises in Psychology: Learning about Yourself and Others. Panchasila, Bhubaneswar.
2. Greenberg, J. & Baron, R.A. (2007). Behaviour in Organizations (9th Ed.). India: Dorling Kindersley.
3. Luthans, F. (2009). Organizational behavior. New Delhi: McGraw Hill.
4. Mohanty, N., Varadwaj, K. & Mishra, H.C. (2014). Explorations of Human Nature and Strength: Practicals in Psychology, DivyaPrakashani, Samantarapur, Bhubaneswar.
5. Pareek, U.(2010). Understanding organizational behaviour. Oxford: Oxford University Press.
6. Robbins, S.P.; Timothy, A.J. & Vohra, N. (2012). Organizational Behavior, 15th Edn. Pearson Education: New Delhi
7. Schultz, D. and Schultz, S.E. (2004). Psychology and Work Today. Delhi: Pearson Inc.
8. Singh, K. (2010). Organizational Behaviour: Texts & Cases. India: Dorling Kindersley.

C:12-HEALTH PSYCHOLOGY

(Credits:6, Theory-4, Practical-2) Lectures:
60 (Theory:40, Practical:20) Max.
Marks:100(Theory:70, Practical:30)

Introduction:

Health psychology is a specialty area that focuses on how biology, psychology, behavior and social factors influence health and illness. This course is designed to provide an introduction to the area of health psychology to help students understand how Health Psychology as a specialty within psychology addresses the role of behavioral factors in health and illness. Basic theories, models and applications are also included.

Learning Objectives:

1. To help the students understand the issues of Health Psychology and how to address them by the bio-psychosocial model of health and illness.
2. To help the students to describe behavioral factors that influence health and illness.
3. To guide the students understand about health enhancing behaviors including coping with illness.

Expected outcomes: Students will be able to

1. Know the basics of health and illness from the Bio-psychosocial perspectives.
2. Understand the significance of behavioral and psychological correlates of health and illness.
3. Understand the significant aspects coping and importance of health enhancing behavior.

UNIT-I Introduction

- (i) Goals of Health Psychology, , Biopsychosocial model of health and illness.
- (ii) Basic nature of stress, Cognitive appraisal of stressors, Some major causes of stress, Management of stress.

UNIT- II Health and Illness

- (i) Behavioral and psychological correlates of illness, Approaches to promoting wellness, Some common health beliefs and their implications.
- (ii) Models of health- The cognition models- The health belief model, The protection motivation model, Leventhals self regulatory model.

UNIT III Health and Coping

- (i) Individual differences in symptom perception, Coping with the crises of illness; Compliance behavior and improving compliance.
- (ii) Health enhancing behavior- Diet management, Yoga and Exercise.

UNIT IV Health Issues

- (i) Children health issues- Malnutrition, Immunization, Autism, ADHD.
- (ii) Health issues of women and elderly:Diabetes,Osteoporosis, Alzheimers Disease, Depression.

PRACTICAL

- (i) **Sleep Quality:** To assess the Sleep quality of 4 college students The Pittsburgh Sleep Quality Index (PSQI).
- (ii) **Coping Strategies:** To assess of the Coping Strategies of 4 college students by Tobins Coping Strategy Inventory (TCSI).

Recommended Books

1. Baron, R.A. (1995 Edition)-Psychology- The Essential Science, Pearson Education Company of India Pvt. Ltd.
2. Brannon and Feist. Health Psychology.
3. Carr, A. (2004). Positive Psychology: The science of happiness and human strength.UK: Routledge.
4. Dash, U.N., Dash, A.S., Mishra, H.C., Nanda, G.K. & Jena, N. (2004). Practical Exercises in Psychology: Learning about Yourself and Others. Panchasila, Bhubaneswar
5. Edward P.Sarafino (1994). Health Psychology. John Wiley and Sons
6. Khatoon, N. (2012). Health Psychology, Dorling Kindersley (India) Pvt. Ltd. New Delhi
7. Mohanty, N., Varadwaj, K. & Mishra, H.C. (2014). Explorations of Human Nature and Strength: Practicals in Psychology, DivyaPrakashani, Samantarapur, Bhubaneswar.
8. Sarafino, E.P. (2002). Health psychology: Bio psychosocial interactions (4th Ed.).NY: Wiley.
9. Snyder, C.R., & Lopez,S.J.(2007).Positive psychology :The scientific and practical explorations of human strengths. Thousand Oaks, CA: Sage.
10. Taylor, S.E. (2006). Health Psychology (6th Ed.). New York: Tata McGraw Hill

DISCIPLINE SPECIFIC ELECTIVES

DSE-1: PSYCHOLOGICAL RESEARCH & MEASUREMENT

(Credits:6, Theory-4, Practical-2) Lectures:
60 (Theory:40, Practical:20) Max.
Marks:100(Theory:70, Practical:30)

Introduction:

The research methods course is among the most frequently required in the psychology and with good reason. It helps the students know about the difference between an experiment and a correlational study, the function of independent and dependent variables, the importance of reliability and validity in psychological measurement, and the need for replication in psychological research. In other words, psychologists research methods are at the very core of their discipline. The course is designed to train the students in psychological research and measurement. **Learning Objectives:**

1. To provide an overview of scientific approaches to psychological research in term of sampling techniques, scientific method, and experimental designs.
2. To acquaint the students with respect to psychometric, projective techniques and non-testing approaches like interview.

Expected outcomes: Students will be able to

UNIT-I Psychological Research

- (i) Assumptions of science, Characteristics of scientific methods, Psychological research: Correlational and experimental.
- (ii) Sampling frame: probability and non-probability samples, sample size, sampling error.

UNIT- II Psychological Scaling and Construction of test

- (i) Purpose of scaling and types of psychological data, Psychological scaling methods: Familiarity with Thurstone, Likert and Guttman scale.
- (ii) Construction of test: Theory of measurement error; Operationalizing a concept, Generating items, Item analysis, Item response theory.

UNIT III Experimental Designs

- (i) Pretest- post-test design, Factorial designs, RandomizedBlock design Standardization of tests.
- (ii) Reliability and validity of tests, Development of norms and interpreting test scores.

UNIT IV Assessment of Personality

- (i) Psychometric and projective techniques, Familiarity with MMPI, Rorachs, WAT, and TAT Interviewing.
- (ii) Principles and procedures of interviewing, gaining cooperation, motivating respondents, training of interviewers, ethics of interviewing.

PRACTICAL

- (i) **TAT**: To administer the TAT on a subject and give summary report.
- (ii) **Word Association test**: To administer the Jung / Kent-Rosanoff list of WAT on a subject and report on his areas of emotional difficulties.

Recommended Books

1. Anastasi, A. (1988). Psychological Testing. New York: MacMillan.
2. Minium, E.W., King, B.M. & Bear, G. (1993). Statistical Reasoning in Psychology and Education. New York: John Willey.
3. Kerlinger, F.N. (1983). Foundations of Behavioral Research. New York: Surjeet Publications.
4. Freeman, F.S. (1972). Theory and Practice of Psychological Testing. New Delhi: Oxford & IBH.

DSE-2: PSYCHOLOGY & SOCIAL ISSUES

(Credits:6, Theory-4, Practical-2) Lectures:
60 (Theory:40, Practical:20) Max.
Marks:100(Theory:70, Practical:30)

Introduction:

Psychologists can play a larger role in the solution of important social problems. Psychology brings two important qualities to the study of social problems: attention to psychological process and rigorous methodology. The key task in the designed course is to define social problems in part as psychological problems.

Learning Objectives:

1. The course will provide social psychological analysis of some major social issues in India.

Expected outcomes: Students will be able to

UNIT-I Understanding Social Systems

- (i) Indian Family System; Social stratification; caste, class, power, Religious ethics Poverty and Deprivation.
- (ii) Theories of poverty, Concomitants of poverty, Sources of deprivation, inequality and social justice.

UNIT- II Health and wellbeing

- (i) Role of behavior in health problems, Shortcomings of the biomedical model, Behavioral sciences in disease prevention and control, India's health scenario.

Political Behavior

- (ii) Development of ideology, Use of small groups in politics, Issues of human and social development, Quality of life and development.

UNIT III Antisocial Behavior

- (i) Corruption and bribery, Juvenile delinquency, terrorism, Crime and criminal behavior, Alcoholism and drug abuse.

(ii) Crime and criminal behavior, Alcoholism and drug abuse, Psychopath.

UNIT IV Social integration

(i) The concept of social integration; Causal factors of social conflicts and prejudices; Psychological strategies for handling the conflicts and prejudices; Measures to achieve social integration.

Violence

(ii) Nature and categories of violence, violence in family and marriage, rape, Collective violence for social change.

PRACTICAL

(i) **Quality of Life:**To assess the quality of life family of 4 families using Beach Center Family Quality of Life Scale.

(ii) **Community Integration:**To assess the community integration of a village by using Community integration questionnaire (CIQ) of Barry Willer.

Recommended Books

1. Banerjee, D. (1998). Poverty, class and health culture in India, Vol. I, Delhi Prachi Prakashan
2. Dube, S.C. (1987) Modernization and Development. ND: Sage
3. Fonseca, M. (1998). Family and Marriage in India. Jaipur: Sachin
4. Mishra, G. (1990). Applied Social Psychology in India. ND: Sage
5. Mishra, G. (1999). Psychological perspectives on stress and Health. New Delhi: Concept
6. Mishra, H.C. and Misra, S. (2009). Psychology of Deviants, Divya Prakashani, Bhubaneswar
7. Mohanty, A .K. and Mishra, G. (Eds.) (2000). Psychology of Poverty and Disadvantage. New Delhi: Concept
8. Sen, A. & Sen A.K. (Eds.). (1998). Challenges of contemporary Realities: A psychological Perspective. New Delhi: New Age International
9. Srinivas, M.N. (1966). Social change in modern India. Bombay: Allied.

SEMESTER-VI

C:13-COUNSELING PSYCHOLOGY

(Credits:6, Theory-4, Practical-2) Lectures:
60 (Theory:40, Practical:20) Max.
Marks:100(Theory:70, Practical:30)

Introduction:

The course is designed to develop entry level counseling psychologists who will be capable of understanding and demonstrating behavior and attitudes in the basic areas of professional counseling.

Learning Objectives:

1. To help students able to understand and integrate current scientific knowledge and theory into counseling practice.
2. To make students learn the history and professional issues related to counseling psychology.
3. To help students integrate and convey information in the core areas of counseling practice.
4. To help students demonstrate professional behavior in their various roles as counseling psy³²⁸

chologists.

Expected outcomes: Students will be able to

1. Understand the purpose of counseling and practice counseling ethically following different approaches.
2. Understand the basics of counseling process and use them for counseling students, families, couples, distressed, and handicaps.

UNIT-I Basics of Counseling

(i) Meaning, scope and purpose of counseling with special reference to India; The counseling process, counseling relationship, counseling interview.

(ii) Characteristics of a good counselor, Ethics and values in counseling; Education and training of the counselor.

UNIT- II Theories and Techniques of Counseling

(i) Psychodynamic approach-Freud and Neo Freudians; Humanistic approach-Existential and Client centered. (ii) Cognitive approach- Rational-emotive and transaction analysis; Behavioral approach- Behavior modification; Indian contribution- yoga and meditation.

UNIT III Counseling Programs

(i) Working in a counseling relationship, transference and counter transference, termination of counseling relationship, Factors influencing counseling.

(ii) Student counseling, Emphases, roles and activities of the school, and college counselor.

UNIT IV Counseling application

(i) Family and Marriage Counseling, Family life and family cycle, Models and methods of family counseling.

(ii) Alcohol and drug abuse counseling; Counseling the persons with Suicidal tendencies, and Victims of Harassment and Violence.

PRACTICAL

(i) **Marital Relationship-** To assess the marital relationship of 2 couples using Lerner's Couple adjustment scale.

(ii) **Case Reporting:** To complete four case studies of high school students with problem behavior in the appropriate case record proforma.

Recommended Books

1. Burnard Philip. (1995). Counselling Skills Training A sourcebook of Activities. New Delhi: Viva Books Private Limited.
2. Dash, U.N., Dash, A.S., Mishra, H.C., Nanda, G.K. & Jena, N. (2004). Practical Exercises in Psychology: Learning about Yourself and Others. Panchasila, Bhubaneswar
3. Feltham, C and Horton, I. (2000). Handbook of Counseling and Psychotherapy. London: Sage.
4. Gibson, R.L & Mitchell M.H. (2003). Introduction to counseling and Guidance. 6th edn. Delhi: Pearson Education
5. Gladding, S.T. (2009). Counselling: A comprehensive profession (6th Ed.). New Delhi: Pearson India
6. Mishra, H.C. & Varadwaj, K. (2009). Counseling Psychology: Theories, Issues and Applications, DivyaPrakashini, Samantarapur, Bhubaneswar, Odisha

7. Misra, G. (Ed) (2010). Psychology in India, Volume 3: Clinical and Health Psychology. New Delhi: Pearson India.
8. Mohanty, N., Varadwaj, K. & Mishra, H.C. (2014). Explorations of Human Nature and Strength: Practicals in Psychology, DivyaPrakashani, Samantarapur, Bhubaneswar.
9. Nelson-Jones. (1995). The theory and practice of counseling. 2ndEdn. London: Holt, Rinehart and Winston Ltd
10. Rao, S. (2002). Counselling and Guidance (2nd Ed.). New Delhi: McGraw Hill.

C:14-POSITIVE PSYCHOLOGY

(Credits:6, Theory-4, Practical-2) Lectures:
60 (Theory:40, Practical:20) Max.
Marks:100(Theory:70, Practical:30)

Introduction:

Positive psychology is the scientific study of optimal human functioning to help people flourish. This is a foundation course in positive psychology to help students not only to understand the core themes of positive psychology, but also to equip them with the helpful positive interventions in various areas of professional psychology, such as clinical, health, education, organization and community.

Learning Objectives:

1. To help students to understand the rationale behind positive psychology.
2. To guide students to identify and analyze the key conceptual and theoretical frameworks underpinning positive psychology.
3. To encourage students to appreciate the contributions of scholars from a range of disciplines and their influence on developing a positive approach to mental health.
4. To make students understand and apply a strengths-based approach to mental health issues.

Expected outcomes: Students will be able to

1. The goal of positive psychology and the basic behavior patterns that result in positive human growth from the point of view of leading positive psychologists
2. The concepts of flow and happiness and the related theories and models explaining happiness behavior and its consequences.
3. All the precursors to positive psychology from character strength and altruism to resilience.

UNIT-I: Foundations

- (i) Historical roots and goals of positive psychology, Positive emotions, Positive Individual traits, and positive subjective experience.
- (ii) Contribution of Martin Seligman, Albert Bandura, Carol Dweck and Abraham Maslow to positive psychology

UNIT-II: Flow and Happiness

- (i) Components of flow, Conditions and mechanisms of flow, Positive and negative consequences of flow experience.
- (ii) Meaning and nature of happiness, Sources of happiness, Theories of happiness- Set-point theory, Life satisfaction and Affective state theories.

UNIT-III: Precursors to Positive Psychology

- (i) Character strength, Altruism, Hope and Optimism, Positive thinking, Resilience
- (ii) Psychology of well-being: Meaning of well-being, The well-being models, Factors affecting well-being, Promoting well-being among people

UNIT-IV: Ways to Positive Psychology

- (i) Discovering strength, Increasing optimism, Self-direction, Purpose, gratitude, Mindfulness, and Activities and experience
- (ii) Effects of exercise, Yoga, meditation and spiritual intelligence on development of positive psychology; Positive psychology in building relationship

PRACTICAL

(i) Happiness: To measure the happiness of 4 adults using Oxford Happiness questionnaire

(ii) Spiritual Intelligence: To measure the spiritual intelligence of 4 adults using Kings Spiritual Intelligence test.

Recommended Books

1. Carr, A. (2004). Positive Psychology: The science of happiness and human strength.UK: Routledge.
2. Dash, U.N., Dash, A.S., Mishra, H.C., Nanda, G.K. & Jena, N. (2004). Practical Exercises in Psychology: Learning about Yourself and Others. Panchasila, Bhubaneswar
3. Mohanty, N., Varadwaj, K. & Mishra, H.C. (2014). Explorations of Human Nature and Strength: Practicals in Psychology, DivyaPrakashani, Samantarapur, Bhubaneswar.
4. Peterson, C. (2006). A Primer in Positive Psychology; Oxford University Press
5. Seligman, M.E. (2002).Authentic Happiness: Using the New Positive Psychology to Realize Your Potential for Lasting Fulfillment: Oxford University Press
6. Seligman, M.E. (2012). Flourish:A Visionary New Understanding of Happiness and Well-being. Oxford University Press
7. Snyder, C.R. & Shane, J.L. (2005). Handbook of Positive Psychology. .Oxford University Press
8. Snyder, C.R., & Lopez,S.J.(2007).Positive psychology :The scientific and practical explorations of human strengths. Thousand Oaks, CA: Sage.

DSE-3: CONTEMPORARY APPLIED PSYCHOLOGY

(Credits:6, Theory-4, Practical-2) Lectures:
60 (Theory:40, Practical:20) Max.
Marks:100(Theory:70, Practical:30)

Introduction:

Applied psychology is the use of psychological principles and theories to overcome problems in real life situations. Mental health,organizational psychology, counseling psychology, clinical psychology, business management, education, and law are just a few of the areas that have been influenced by the application of psychological principles and findings. Some of the current areas of applied psychology include community psychology, Psychology of the disadvantaged, psychology of economic development, population psychology, gender psychology, and defense psychology. The course is designed to help students understand the application of psychology to these new fields.

Learning Objectives:

...

Expected outcomes: Students will be able to

...

UNIT-I: Community Psychology:

(i) Definition and concept of Community Psychology; Use of small groups in social action, Arousing community consciousness, Effective strategies for social change.

(ii) **Rehabilitation Psychology:** Primary, secondary, tertiary rehabilitation programs, Rehabilitation of physically, mentally and socially challenged persons including the old persons

UNIT-II:

(i) **Helping the disadvantaged:** Concept of disadvantaged and deprivation, social, physical, cultural and economic consequences of disadvantaged groups, Educating and motivating the disadvantaged

(ii) **Psychology and IT:** Psychological consequences of the developments in IT; Role of psychologists in the present scenario of IT

UNIT-III:

(i) **Psychology in economic development:** Achievement motivation and Economic development; Characteristics of entrepreneurial behavior, Consumer rights and awareness

(ii) **Population psychology:** Psychological consequences of population explosion and high population density; Psychosocial effects of crowding; motivating for small family norms

UNIT-IV

(i) **Psychology of Gender:** Issues of discrimination; Glass ceiling effect, Self-fulfilling prophecy, Management of diversity

(ii) **Defense psychology:** Psychological tests for defense personnel; Promoting positive mental health of defense personnel, Human engineering in defense

PRACTICAL

(i) To assess the sense of gender equality of 8 college students by using Student Gender equality Questionnaire

(ii) To assess the attitude and knowledge of 4 women towards family planning using the Family Planning Knowledge Attitude Survey Questionnaire.

Recommended Books

1. Banerjee, D. (1998). Poverty, class and health culture in India, Vol. I, Delhi Prachi Prakashan
2. Dalton, J.H. (2006). Community Psychology: Linking Individuals and Communities: :Oxford University Press
3. Dube, S.C. (1987) Modernization and Development. ND: Sage
4. Fonseca, M. (1998). Family and Marriage in India. Jaipur: Sachin

5. Mishra, G. (1990). Applied Social Psychology in India. ND: Sage
6. Mishra, G. (1999). Psychological perspectives on stress and Health. New Delhi: Concept
7. Mishra, H.C. , Mishra, G.C. & Varadwaj , K. (2014). Fundamentals of Applied Psychology, Divya Prakashani, Bhubaneswar
8. Mishra, H.C. and Misra, S. (2009). Psychology of Deviants, Divya Prakashani, Bhubaneswar
9. Mohanty, A .K. and Mishra, G. (Eds.) (2000). Psychology of Poverty and Disadvantage. New Delhi: Concept
10. Sen, A. & Sen A.K. (Eds.). (1998). Challenges of contemporary Realities: A psychological Perspective. New Delhi: New Age International
11. Srinivas, M.N. (1966). Social change in modern India. Bombay: Allied
12. Swain, S. Applied Psychology

DSE-4: RESEARCH PROJECT

(Credits:6, Theory-4, Practical-2) Lectures:
60 (Theory:40, Practical:20) Max.
Marks:100(Theory:70, Practical:30)

Introduction:

The research experience of students is greatly enriched by early exposure to conducting research. There are numerous benefits of undergraduate students who get involved in research. They are better off in understanding published works, determine an area of interest, can discover their passion for research and may start their career as a researcher. Further students will be able develop ability for scientific inquiry and critical thinking, ability in the knowledge base and communication of psychology. This course is included to promote above mentioned abilities among the students.

Learning Objectives:

1. To help students to learn how to develop scientific research designs in the study of psychology.
2. To guide students to understand the previous research in their field of interest and review them to arrive at a research problem
3. To encourage the students to learn ways to describe and measure human behavior.
4. To help students understand the logic of hypothesis testing and application of appropriate statistical analysis.
5. To make students to learn the methods of writing a research report.

Expected outcomes: Students will be able to

1. Independently prepare a research design to carry out a research project
2. Review the related research papers to find out a research problem and relevant hypotheses
3. Understand the administration, scoring and interpretation of the appropriate instrument for measurement of desired behavior
4. Learn the use of statistical techniques for interpretation of data.
5. Learn the APA style of reporting a research project.

UNIT-I: A student is required to carry out a project on an issue of interest to him / her under the guidance and supervision of a teacher. In order to do so s/he must have the knowledge in research methodology and of steps in planning and conducting a research. The supervisors may help the students to go on field study / study tour relevant to their work. Thirty hours of class may be arranged in the routine to help students understand research methodology, and planning, conduction and reporting on the research. An external examiner with the supervisor as the internal examiner will evaluate the research project on the basis of scientific methodology in writing the report, and presentation skill and performance in the viva.

Format

1. **Abstract** 150 words including problem, method and results.
2. **Introduction** Theoretical considerations leading to the logic and rationale for the present research
3. **Review-** Explaining current knowledge including substantive findings and theoretical and methodological contributions to the topic, objectives and hypotheses of the present research
4. **Method** Design, Sample, Measures, Procedure
5. **Results-** Quantitative analysis of group data (Raw data should not be attached in Appendix) Graphical representation of data wherever required. Qualitative analysis wherever done should indicate the method of qualitative analysis.

6. Discussion

7. References (APA Style) & Appendices

1. Project should be in Soft binding. It should be typed in Times New Roman 14 letter size with 1.5 spacing on one sides of the paper. Total text should not exceed 50 pages (References & Appendices extra).
2. Two copies of the project should be submitted to the College.

3. Project - American Psychological Association (APA) Publication Manual 2006 to be followed for project writing

**SYLLABUS FOR B.A. (HONORS) SANSKRIT UNDER
CHOICE BASED CREDIT SYSTEM OF UTKAL UNIVERSITY,
BHUBANESWAR**

1st YEAR

SEMESTER-I

CC- 1 MORAL TEACHINGS AND BASICS OF SANSKRIT

1. *Hitopodeśa Mitralabha* (From *Kathāmukha* to *Ḡḍhravidalakatha*) 30Marks
2. *Yaksaprasna of Mahabharata*(*Aranyakaparva, ch.313*
from Verses no. 41 to 133) 30Marks
3. *Śabdarupa&Dhaturupa* 20 Marks

('a' karanta, 'i' karanta, 'ī'karanta, 'u'karanta, 'ū' karanta, 'in' bhaganta, *Mātr, Pitṛ, Asmad, Yusmad, Tad*(*sabdarupas*).*Lat, Lañ, Vidhiliñ, Lrt, Lot* and *Litlakarar* *Path, Ni, Kṛ, Sev, Han, Pā, Dā, Śru, Śī* and *Kṛiñ* in the form of *Ātmanepada, Parasmaipada* or *Ubhayapada* whichever is applicable. (*Dhaturupas*)

- Unit-I & II *HitopodeśaMitralabha* (From *Kathamukha* to *Ḡḍhravidalakatha*) 30 Marks
- Long Questions -1 15 Marks
- Short Questions -3 5×3=15 Marks
- Unit-III & IV *Yaksaprasna of Mahabharata* 30 Marks
- Long Questions-1 15 Marks
- Explanation - 1 8 Marks
- Translation of a textualVerse 7 Marks

- Unit-V *Śabdarupa&Dhaturupa* 20 Marks
- Śabdarupa* - 5 2×5= 10 Marks
- Dhaturupa* - 5 2×5= 10 Marks

Books for Reference:

3. *Hitopadesah*(*Mitralabhah*) (Ed.) Kapildev Giri, Chaukhamba Publications, Varanasi.
4. *Hitopadesah* (*Mitralabhah*) (Ed.) N.P. Dash and N.S. Mishra, Kalyani Publishers, New Delhi
5. *Vyakaranadarpana*, The Odisha State Bureau of Text Book Preparation and Production, Bhubaneswar, 2013
6. Critical edition of the *Mahabharata*, (Ed.) V.S. Sukthankar, BORI, Pune
7. *Mahabharata*, Gitapress, Gorakhpur (Prescribed Text)
8. *Yaksaprasna*, T. K. Ramaayiyar, R. S. Vadhyar & Sons. Palkad, Kerala

CC-2 . DRAMA-I & HISTORY OF SANSKRIT LITERATURE - I

1. *Abhijnanasakuntalam* (Act I-IV) 50 Marks
2. *History of Sanskrit Literature-I* 30 Marks

(*Ramayana, Mahabharata*, General out lines of *Puranas* and Sanskrit Drama)

1. **Abhijnanasakuntalam (Act I-IV)**

Unit-I	Long Questions -1	14 Marks
Unit- II	Short Questions -2	7×2=14 Marks
	Explanation of Verse- 1	8 Marks
Unit-III	Textual Grammar	14 Marks
	i) <i>Sandhi</i>	1×2= 2 Marks
	ii) <i>Prakṛti- Pratyaya</i>	2×2= 4 Marks
	iii) <i>Karaka&Vibhakti</i>	2×2= 4 Marks
	iv) <i>Samasa</i>	2×2= 4 Marks

2. **History of Sanskrit Literature-I**

30 Marks

Unit- IV *Ramayana & Mahabharata*

Long Questions -1	10 Marks
Short Questions -1	05 Marks

3. **General Outlines of Puranas and Sanskrit Drama**

Unit- V General Outlines of *Puranas* and Sanskrit Drama

(Defination and Classification of *Puranas*, *Bhasa*, *Kalidasa*, *Sudraka*, *Visakhadatta*, *Bhavabhuti*, *Bhattanarayana*)

Long Questions -1	10 Marks
Short Questions -1	05 Marks

Books for Reference:

1. *Abhijnanasakuntalam* (Ed.) R.M. Bose, Modern Book Agency Pvt. Ltd., 10 BankimChatterjee Street, Calcutta
2. *Abhijnanasakuntalam* (Ed.) M.R. Kale, Motilal Banarsidass Publishers Pvt. Ltd., NewDelhi-11007, 8th Reprint-2010
3. *Abhijnanasakuntalam* (Ed.) R.M Mohapatra, Books & Books, Cuttack
4. *Abhijnanasakuntalam* (Ed.) H.K. Satapathy, Students Store, Cuttack
4. *History of Sanskrit literature*, Baladev Upadhyay, Chaukhamba Publications, Varanasi.
5. *Sanskrit Drama*, A.B.Keith, Oxford University Press, London
6. *Samskrta Sahiytara Itihasa*, (Odia) H.K. Satapathy, Kitab Mahal, Cuttack- 753003.

SEMESTER-II

CC - 3 DRAMA - II & DRAMATURGY

1. *Abhijnanasakuntalam* (Acts V-VII) 50 Marks

2. *Dramaturgy* 30 Marks

(*Nandi*, *Prastavana*, *Purvaranga*, *Pancha-arthaprakṛti*, *Panchasandhi*, *Pancha-arthopaksepaka*, *Nataka*, *Prakarana*.)

1. **Abhijnanasakuntalam (Acts V-VII)**

Unit-I	Long Questions - 1	14 Marks
Unit- II	Short Questions - 2	8×2= 16 Marks
Unit-III	i) Explanation of Verse- 1	8 Marks
	ii) Verse/ Dialogue Translation-1	7 Marks
	iii) Translation from Prakṛit to Sanskrit	5 Marks

2. Dramaturgy (Sahityadarpana, Chapter- VI)	30 Marks
Unit-IV	
Nandi, Prastavana, Purvaranga, Nataka, Prakarana, Pancasandhi	
Short Notes on any three	5×3= 15 Marks
Unit-V	
Panca - arthaprakrti and Panca- arthopaksepaka	
(Short Notes on any three))	5×3= 15Marks

Books for Reference:

4. *Abhijnanasakuntalam* (Ed.) R.M. Bose, Modern Book Agency Pvt. Ltd., 10 BankimChatterjee Street, Calcutta
5. *Abhijnanasakuntalam* (Ed.) M.R. Kale, Motilal Banarsidass Publishers Pvt. Ltd., NewDelhi-11007, 8th Reprint-2010
6. *Abhijnanasakuntalam* (Ed.) R.M.Mohapatra, Books &Books , Cuttack
4. *Abhijnanasakuntalam* (Ed.) H.K. Satapathy, Students Store, Cuttack
4. For Dramaturgy- *Sahitya Darpana* (Ed.) P.V.Kane, Motilal Banarsidass Publishers Pvt. Ltd., New Delhi
5. *Odia Translation of Sahityadarpana* by Narayana Mohapatra, Odisha Sahitya Academy, Bhubaneswar.
6. *Sahitya Darpana* with Laksmi Tika (Sanskrit) and Vimala Tika, (Hindi) (Ed.) K.M.Sastri, Chaukhamba Publications, Varanasi.
7. *Sahityadarpana* evam Chanda (Ed.) Dr. Braja Sundar Mishra, Satyanarayan Book Store, Cuttack
9. *Sahityadarpanao Chanda* (Ed.) Niranjan Pati, Vidyapuri, Cuttack

CC- 4 AN INTRODUCTION TO THE TECHNIQUE OF PANINIAN GRAMMAR & PROSODY

1. **Vocabulary relevant to Sanskrit Grammar and Arrangement of Paninian Grammar** 15 Marks
2. **Samjna-prakaranam** 45 Marks
3. **Chanda** 20 Marks

1. Vocabulary relevant to Sanskrit Grammar and Arrangement of Paninian Grammar

Unit- I 15 Marks

(Astadyayi, Siddhantakaumudi, Ganapatha, Dhatupatha, Dhatu, Antaranga, Bahiranga, Apavada, Agama, Adesa, Nadi, Nistha, Krdanta, Taddhita, Tinanta, Nijanta, Sananta, Yananta, Namadhatu, Vikarana, Luk, Lopa, Sarvadhataka, Ardhadhataka, ti & Upadha = 26)

Short Notes on any – 5 3×5= 15Marks

2. Samjnaprakaranam 45Marks

Unit- II Two Sutras / Vrttis out of 1st 10 Sutras (Upto *tulyasyaprayatnam savarnam*) to be explained. 7½ ×2=15 Marks

Unit- III Two Sutras / Vrttis out of 2nd 10Sutras (From *a a* upto *cadayo'sattve*) to be explained. 7½ ×2= 15 Marks

Unit- IV Two Sutras / Vrttis out of rest Sutras (From *pradayah* upto *dirgham ca*) to be explained. 7½ ×2= 15 Marks

3. Chanda (Prosody)-Srutabodhah

20Marks

Unit- V Definition and Examples of 4 Chandas - out of 7

5×4=20 marks

(Chandas such as -: Arya, Anustubh, Indravajra, Upendravajra, Upajati, Vamsastha, Vasantatilaka, Mandakranta, Malini, Shikharini, Shardula-vikridita, Sragdhara.)

Books for Reference:

1. Siddhanta-kaumudi with Balamanorama and Tattvabodhini, Vol.I (Ed.) Giridhara Sharma Chaturveda, Motilal Banarsidass
2. Siddhanta-kaumudi with Mitabhasini Com., (Ed.) S.R. Ray, Sanskrit Pustak Bhandar, 38 Cornwallis St., Calcutta
3. Siddhanta-kaumudi with Eng Tr. (Ed.), S.C. Basu, Motilal Banarsidass, New Delhi-110007, Rpt-1995
4. Vaiyakarana Siddhanta Kaumudi (Ed.) M.V. Mahashabde, Dadar Book depot, Bombay.
5. Siddhanta-kaumudi (Ed.) Prof. G.K. Dash & Dr(Mrs) K.Dash with Navanita tika, A.K.Mishra Publishers Pvt. Ltd, Cuttack.
6. Siddhanta-kaumudi (Ed.) Minati Mishra, Vidyapuri, Cuttack
7. Siddhanta-kaumudi (Ed.) Dr. Niranjana Pati, Kalyani Publishers, New Delhi
8. Siddhanta-kaumudi (Ed.) P.R.Ray, Sailabala Womens College, (Skt.Deptt.) Cuttack.
9. Vyakaranadarpana, The Odisha State Bureau of Text Book Preparation and Production, Bhubaneswar- 2013
10. Shrutabodha, Hari Prasad Sharma, Nirnaya Sagar Press
11. Sahityadarpana Evam Chhanda (Ed.) Dr. Brajasundar Mishra, Satyanarayana Book Store, Cuttack.

2nd YEAR

SEMESTER-III

CC-5 POETRY & HISTORY OF SANSKRIT LITERATURE- II

1. Meghadutam- (Purvamegha) 50 Marks
 2. History of Sanskrit Literature-II 30 Marks
- (Gitikavyas, Khandakavyas, Gadyakavyas and Kathasahitya)

1. Meghadutam- (Purvamegha) 50 Marks

- Unit-I Long Questions - 1 15 Marks
- Unit- II Short Questions - 2 7 ½ × 2 = 15 Marks
- Unit-III i) Explanation of One Verse 12 Marks
- ii) Translation of One Verse 8 Marks

2. History of Sanskrit Literature-II 30 Marks

- Unit-IV (Gitikavyas & Khandakavyas)
- Long Questions -1 10 Marks
- Short Questions -1 05 Marks
- Unit- V (Gadyakavyas, Kathasahitya)
- Long Questions -1 10 Marks
- Short Questions -1 05 Marks

Books for Reference:

1. *Meghadutam* (Ed.) S.R. Ray, Sanskrit Pustak Bhandar, 38 Cornwallis St., Calcutta
2. *Meghadutam* (Ed.) M.R. Kale, Motilal Banarsidass, Delhi
3. *Meghadutam* (Ed.) Radhamohan Mahapatra, Books and Books, Vinodvihari, Cuttack, 1984
4. *Meghadutam* (Ed.) Dr. Braja Sundar Mishra, Vidyapuri, Cuttack, 1st Edn-1999
5. *Samskrta Sahitya ka Itihasa*, Baladeva Upadhyaya, Choukhamba, Varanasi.
6. *Samskrta Sahitya ka Ruparekha*, Vacaspati Goreilla, Choukhamba Vidyabhavan, Varanasi.
4. *Samskrta Sahitya Itihasa*, H.K. Satapathy, Kitab Mahal, Cuttack
5. *Samskrta Sahitya Itihasa*, Text Book Bureau, Govt. of Odisha, Bhubaneswar

CC-6 META - RULES OF PANINIAN GRAMMAR, POETICS & FIGURES OF SPEECH

1. *Paribhasaprakaranam of Siddhantakaumudi* 30 Marks
2. *Sahityadarpanah(Ch.I &II)* 30 Marks
3. *Sahityadarpanah (Selected Alamkaras from Ch.X)* 20 Marks

1. **Paribhasaprakaranam** 30 Marks
Unit- I Four *Sutras* to be explained. 5×4= 20 Marks
Unit- II Two *Vrttis/ Vartikas* to be explained. 5×2= 10 Marks

2. Poetics

- Unit- III *Sahityadarpana Ch. I*
Long Questions -1 10 Marks
Short Questions -1 05 Marks
- Unit- IV *Sahityadarpana Ch. II (Vakya, Pada, Abhidha, Laksana, Vyanjana)*
Long Questions -1 10 Marks
Short Questions -1 05 Marks

3. Figures of speech (without Sub-division)

- Unit- V *Sahityadarpana(Ch.X)* 5×4= 20 Marks

(Alamkarassuch

as *Anuprasa, Yamaka, Slesa, Upama, Rupaka, Utpreksa, Bhrantiman, Nidarsana, Arthantaranyasa, Aprastuta-prasamsa, Apahnuti, Vyatireka, Vibhavana, Visesakti, Samasakti, Svabhavokti*)

Definition and Examples of **Four Alamkaras** (figures of speech) out of **seven**.

Books for Reference:

1. *Siddhanta-kaumudi* with Balamanorama and Tattvabodhini, Vol.I (Ed.) Giridhara Sharma Chaturveda, Motilal Banarsidass
2. *Siddhanta-kaumudi* with Mitabhasini Com., (Ed.) S.R. Ray, Sanskrit Pustak Bhandar, 38 Cornwallis St., Calcutta
3. *Siddhanta-kaumudi* with Eng Tr. (Ed.), S.C. Basu, Motilal Banarsidass, New Delhi-110007, Rpt-1995
4. *Vaiyakarana Siddhanta Kaumudi* (Ed.) M.V. Mahashabde, Dadar Book depot, Bombay.
5. *Siddhanta-kaumudi* (Ed.) Prof. G.K. Dash & Dr(Mrs) K.Dash with Navanita tika, A.K. Mishra Publishers Pvt. Ltd, Cuttack.

4. Siddhanta-kaumudi (Ed.) Minati Mishra, Vidyapuri, Cuttack
5. Siddhanta-kaumudi (Ed.) Dr. Niranjan Pati, Kalyani Publishers, New Delhi
6. Siddhanta-kaumudi (Ed.) P.R.Ray, Sailabala Womens College,(Skt.Deptt.) Cuttack.
7. Sahitya Darpana (Ed.) P.V. Kane, Motilal Banarsidass Publishers Pvt. Ltd., New Delhi
8. Odia Translation of Sahityadarpana by Narayana Mohapatra, Odisha Sahitya Academy, Bhubaneswar.
9. Sahitya Darpana with Laksmi Tika (Sanskrit) and Vimala Tika, (Hindi) (Ed.) K.M. Sastri, Chaukhamba Publications, Varanasi.
10. Sahityadarpana evam Chhanda (Ed.) Braja Sundar Mishra, Satyanarayan Book Store, Cuttack
11. Sahityadarpana o Chhanda (Ed.) Niranjan Pati, Vidyapuri, Cuttack
12. Samskrta Kavyatattva Vicara, Ketaki Nayak, Odisha Text Book Bureu, Bhubaneswar.

CC-7 CASES AND CASE ENDINGS IN PANINIAN GRAMMAR & TRANSLATION - I

1. *Siddhantakaumudi(Karaka-Vibhakti I-IV)* 50 Marks
2. Translation from Sanskrit unseen passage to Odia/ English 30 Marks

1. *Siddhantakaumudi(Karaka-Vibhakti I-IV)* 50 Marks

- Unit- I & II (*Prathama&Dvitiya*)
 Four *Sutras/ Vrtti/ Vartika* to be explained. 5×4= 20 Marks
- Unit- III (*Trtiya*)
 Two *Sutras/ Vrtti/ Vartika* to be explained 5×2= 10 Marks
- Unit- IV (*Caturthi*)
 Four *Sutras/ Vrtti/ Vartika* to be explained. 5×4= 20 Marks
- Unit -V *Translation from Sanskrit unseen passage into Odia/ English*
 One unseen Sanskrit Passage is to be given for Translation into Odia/ English
 (At least 10 sentences) 10×3= 30 Marks

Books for Reference:

1. Siddhanta-kaumudi with Balamanorama and Tattvabodhini, Vol.I (Ed.) Giridhara Sharma Chaturveda, Motilal Banarsidass
2. Siddhanta-kaumudi with Mitabhasini Com., (Ed.) S.R. Ray, Sanskrit Pustak Bhandar, 38 Cornwallis St., Calcutta
3. Siddhanta-kaumudi with Eng Tr. (Ed.), S.C. Basu, Motilal Banarsidass, New Delhi- 110007, Rpt-1995
4. Vaiyakarana Siddhanta Kaumudi (Ed.) M.V. Mahashabde, Dadar Book depot, Bombay.
5. Siddhanta-kaumudi (Ed.) Prof. G.K. Dash & Dr(Mrs) K.Dash with Navanita tika, A.K. Mishra Publishers Pvt. Ltd, Cuttack.
6. Siddhanta-kaumudi (Ed.) Minati Mishra, Vidyapuri, Cuttack
7. Siddhanta-kaumudi (Ed.) Dr. Niranjan Pati, Kalyani Publishers, New Delhi
8. Siddhanta-kaumudi (Ed.) P.R.Ray, Sailabala Womens College,(Skt.Deptt.) Cuttack.
9. *Vyakaranadarpana*, The Odisha State Bureau of Text Book Preparation and Production, Bhubaneswar- 2013
A Guide to Sanskrit Composition and Translation, M.R.Kale, Motilal Banarsidass, New Delhi
11. *Brhat Anuvada Candrika*, Chakradhara Hamsa Nautial Shastri, Motilal Banarsidass, New Delhi

CC-8 INSCRIPTIONS , UPANISAD&BHAGAVADGITA

1. Incriptions	30 Marks
2. Kathopanisad(Vallis-I,II&III)	30 Marks
3. Bhagavadgita (Chap.XV)	20 Marks

1. Incriptions	30 Marks
(Girnar inscription of Rudradaman, Allahabad Stone Pillar Inscription of Samudragupta and Mandasore Inscription of Yasodharman)	
Unit- I Long Questions -1	15 Marks
Unit- II Short Questions -3	5×3= 15 Marks

2. Kathopanisad(Adhyaya I, Vallis-I,II&III)	30 Marks
Unit- III Long Questions -1	15 Marks
Unit- IV i) Explanation - 1 Mantra	08 Marks
ii) Translation- 1 Mantra	07 Marks
3. Bhagavadgita(Ch.XV)	20 Marks
Unit- V Long Questions -1	12 Marks
Translation- 1 Verse	08 Marks

Books for Reference:

1. *Selected Sanskrit Incriptions* (Ed.) D.B. Pusalkar, Classical Publishers, New Delhi
2. *Abhilekhamala* (Ed.) Sarojini Bhuyan, Cuttack
3. *Abhilekhamala* (Ed.) Sujata Dash, Cuttack
4. *Abhilekhacayana*(Ed.) Jayanta Tripathy, Vidyapuri, Cuttack
5. *Isadi Nau Upanisad* with Sankarabhasya - Gita Press, Gorakhpur
6. *Kathopanisad* with *Sankarabhasya*(Ed.) V.K. Sharma, Sahitya Bhandar, SubhasBazar, Meerut
7. *The Message of the Upanisad* , Swami Ranganathananda, Bharatiya VidyaBhavan,K.M. Munsii Marg Mumbai.
8. *Shrimad-bhagavad-gita* (Ed.) S. Radhakrishnan, Bharatiya Vidya Bhavan
9. *Shrimad-bhagavad-gita* (Ed.) Gambhirananda, Ramakrishna Mission
10. *Shrimad-bhagavad-gita*, Gita Press, Gorakhpur

CC-9 CASE AND CASE ENDINGS OF PANINIAN GRAMMAR, TRANSLATION- I IAND LEXICON

1. Siddhantakaumudi(Karaka-Vibhakti V-VII)	40 Marks
2. Translation of an unseen Odia/ English passage into Sanskrit	30Marks
3. Amarakosa	10 marks

1. Siddhantakaumudi(Karaka- Vibhakti V-VII)	
Unit-I (CASE-V) Answer any two Sutras/ Vrtti/ Vartika	5×2= 10 Marks
Unit-II (CASE-VI) Answer any four Sutras/ Vrtti/ Vartika	5×4= 20 Marks
Unit-III (CASE-VII) Answer any two Sutras/ Vrtti/ Vartika	5×2= 10 Marks
2. Translation- II	30 Marks
Unit-IV	30 Marks

One unseen Passage of Odia is to be translated into Sanskrit.

(At least Ten sentences)

3. Amarakosa (Devata, Svarga, Visnu, Laksmi, Durga, Surya, Brahma,Siva, Kartikeya, Ganesa, Sarasvati from Svargavarga)

Unit- V Answer any Two Questions s 5×2= 10 Marks

Books for Reference:

1. Siddhanta-kaumudi with Balamanorama and Tattvabodhini, Vol.I (Ed.) Giridhara Sharma Chaturveda, Motilal Banarsidass
2. Siddhanta-kaumudi with Mitabhasini Com., (Ed.) S.R. Ray, Sanskrit Pustak Bhandar, 38 Cornwallis St., Calcutta
3. Siddhanta-kaumudi with Eng Tr. (Ed.), S.C. Basu, Motilal Banarsidass, New Delhi-110007, Rpt-1995
4. Vaiyakarana Siddhanta Kaumudi (Ed.) M.V. Mahashabde, Dadar Book depot, Bombay.
5. Siddhanta-kaumudi (Ed.) Prof. G.K. Dash & Dr(Mrs) K.Dash with Navanita tika, A.K. Mishra Publishers Pvt. Ltd, Cuttack.
6. Siddhanta-kaumudi (Ed.) Minati Mishra, Vidyapuri, Cuttack
7. Siddhanta-kaumudi (Ed.) Dr. Niranjan Pati, Kalyani Publishers, New Delhi
8. Siddhanta-kaumudi (Ed.) P.R.Ray, Sailabala Womens College,(Skt.Deptt.) Cuttack.
9. *Vyakaranadarpana*, The Odisha State Bureau of Text Book Preparation and Production, Bhubaneswar- 2013
10. *A Guide to Sanskrit Composition and Translation*, M.R.Kale, Motilal Banarsidass, New Delhi
11. *Brhat Anuvada Candrika*, Chakradhara Hamsa Nautial Shastri, Motilal Banarsidass, New Delhi
12. *Namalinganuasanam (Amarakosa)*, D.G. Padhye et al. Choukhamba Sanskrit Series, New Delhi
13. *Amarakosa* with Ramasrami tika, Choukhamba Sanskrit Series office, Varanasi

CC-10 ORNATE PROSE & PROSE WRITING

- | | |
|--|-----------------|
| 1. <i>Dasakumaracaritam</i> (<i>Purvapithika, Dvitiya Ucchvasa</i>) | 25 Marks |
| 2. <i>Sukanasopadesa</i> | 25 Marks |
| 2. <i>Essay in Sanskrit</i> | 20 Marks |
| 3. <i>Expansion of Idea in Sanskrit</i> | 10 Marks |
| 1. <i>Dasakumaracaritam</i>(<i>Purvapithika Dvitiya Ucchvasa</i>) | 25 Marks |
| Unit-I Long Questions – 1 | 15 Marks |
| Unit-II Short Questions – 2 | 5×2=10Marks |
| 2. <i>Sukanasopadesa</i> | 25 Marks |
| Unit-III One Long Question | 15 Marks |
| Unit-IV One Explanation | 10Marks |
| 3. <i>Essay in Sanskrit</i> | 20 Marks |
| Unit-V Essay in Sanskrit (One) | 20 Marks |
| 4. <i>Expansion of Idea in Sanskrit</i> | 10 Marks |
| Expansion of Idea in Sanskrit- One | 10 Marks |

Books for Reference:

1. *Dasakumaracarita* (Ed.) M.R. Kale, Motilal Banarsidass, Delhi
2. *Dasakumaracarita*, Chaukhamba Publications, Varanasi.
3. *Samskrta-nibandha-shatakam*, Kapila Dev Dvivedi
4. *Brhat Anuvada Shiksha*. Chakradhara Hansa Nautiyal, MLBD, Delhi
5. *Samskrta-nibandhadarshah*, Ramamurti Sharma, Sahitya Niketan, Kanpur
6. *Sukanasopadesa*, (Ed.) Ramakanta Jha, Choukhamba Vidyabhavan, Varanasi
7. *Sukanasopadesa* (Ed.) Nimal Sundar Mishra, Kalyani Publishers, New Delhi
8. *Kadambari (Purvardham)* with the Com. of Bhanuchandra Siddhanjani, MLBD, New Delhi

3rd YEAR**SEMESTER-V****CC-11 ORNATE POETRY IN SANSKRIT & HISTORY OF SANSKRIT LITERATURE -III**

1. <i>Sisupalabadham</i> (Canto-I Verses 01-48)	30 Marks
2. <i>Kiratarjuniyam</i> (Canto-I)	30 Marks
3. History of Sanskrit literature- III (<i>Mahakavya and Campu</i>).	20 Marks
1. <i>Sisupalabadham</i> (Canto-I Verses 01-48)	30 Marks
Unit-I Long Questions -1	15 Marks
Unit- II i) Explanation of One Verse	10 Marks
ii) Translation of One Verse	05 Marks
2. <i>Kiratarjuniyam</i> (Canto-I)	30 Marks
Unit-III Long Questions -1	15 Marks
Unit- IV i) Explanation of One Verse	10 Marks
ii) Translation of One Verse	05 Marks
3. <i>History of Sanskrit literature- III (Mahakavya and Campu)</i>	20 Marks
Unit- V i) Long Questions -1	12 Marks
ii) Short Notes- 2	4×2= 8 Marks

Books for Reference:

1. *Sisupalabadham* (Ed.) S.R. Ray/ Vallabhatika, Bharatiya Vidya Prakashan, New Delhi.
2. *Sisupalabadham - Canto-I* (Ed.), Devanarayan Mishra, (With *Sarvankasa-tika* of Mallinatha) Sahitya Bhandar, Meerut
3. *Kiratarjuniyam* (Cantos I-III) (Ed.) M.R. Kale, Motilal Banarsidass Publishers Pvt. Ltd., Delhi, 4th Edn-1966, Rpt-1993
4. *Kiratarjuniyam* (Canto- I) (Ed.) Niranjan Pati, Vidyapuri, Cuttack.
4. *History of Sanskrit Literature*, H.R. Agarwal, Mohanlal Munsiram, Delhi
5. *History of Indian Literature* (Vol. III) M. Winternitz, Motilal Banarsidass Publishers Pvt. Ltd.

CC- 12 VEDA,VEDIC GRAMMAR & HISTORY OF VEDIC LITERATURE

1. **Vaidika Suktas** 30 Marks
2. **Vedic Grammar** 20 Marks
3. **History of Vedic Literature** 30 Marks

1. Veda

30 Marks

Vedic Suktas from different Samhitas

Agni (RV- I.1), Indra (RV- II.12) , Savitr (RV- I.35), Usas (RV- I.48), Purusa-sukta (YV XXXI.1.16), Siva-samkalpa (YV-XXX.1.6), Samjnana(RV X.191), Vak(RV X.125)

- Unit-I i) Long Questions -1 12 Marks
i) Explanation - 1 Mantra 08 Marks
Unit- II i) Translation -1 Mantra 05 Marks
ii) Grammar from the text- 2 Questions $2^{1/2} \times 2 = 05$ Marks

2. Vedic Grammar

20 Marks

The following Sutras are to be taught:

Chandasi pare'pi, Vyavahitasca, Caturthyarthe bahulam chandasi, Chandasi lun-lan-litah, Linarthe let,Leto'datau, Sibbahulam leti, Itasca lopah parasmaipadesu, Sa uttamasya, Ata ai, Vaito'nyatra, Hr-grahor bhaschandasi, Chandasi ubhayatha, Tumarthe se-sen-ase-asen- kse-kasen-adhyai-adhyain-kadhyai-kadhyain-shadhyai-shadhyain-tavai-taven-tavenah, Va chandasi, Ses chandasi bahulam, Prakrtya'ntapadam avyapare, Nipatasya ca, Supam suluk purva-savarnac che-ya-da-dya- ya-jalah, Idanto masi, Ajjaserasuk, Dirghadati samanapade

- Unit- III Two sutras to be explained $5 \times 2 = 10$ Marks
Two sadhanas to be done $5 \times 2 = 10$ Marks

3. History of Vedic Literature

30 Marks

(*Samhita, Brahmana, Aranyaka, Upanisad*)

- Unit-IV Long Questions -1 15 Marks
Unit- V Short Questions - 2 $7 \frac{1}{2} \times 2 = 15$ Marks

Books for Reference:

1. *New Vedic Selection* (Part-I) (Ed.) Telang and Chaubey, Bharatiya Vidya Prakashan, NewDelhi
2. *Veda O Vaidika Prakarana*,(Ed) Niranjan Pati, Vidyapuri, Cuttack.
3. *History of Indian Literature* Vol. I, M.Winternitz, MLBD, New Delhi
4. *Vaidika Sahitya aur Samskriti*, Baladeva Upadhyaya, Chaukhamba, Varanasi
5. *Vaidik sahyaki Ruparekha*, Umashankar Sharma Rsi, Chawkhamba Vidyapublishan, Varanasi
6. *Vaidika sahyta o Samskriti* , A.C. Das, Grantha Mandira, Cuttack
7. *Vaidika Sahitya O Samskriti*, Bholanath Rout, Chitrotpala Publication, Salipur

SEMESTER-VI

CC-13 ARTHASASTRA, DHARMASTRA AND AYURVEDA

1. **Arthasastra** (*Vinayadhikarana* Ch., II - VIII) from *Vidyasamuddesa* to *Amatyotpatti*. 30 Marks
2. **Manusmṛti** (Chap- II. Verses from 1 to 52) 30 Marks
3. **Ayurveda** (*Carakasamhita, Dirghamjivitiyadhyaya*-Verses 53-103) 20 Marks

1. Arthasastra (Adhikarana I. II-VIII)

30 Marks

- Unit I & Unit- II *Arthasastra* from the beginning up to *Vinayadhikarana, Adhikarana* I.1-4
Short Notes-4 $7 \frac{1}{2} \times 4 = 30$ Marks

2. Manusmṛti (Chap- II. Verses from 1 to 52)	30 Marks
Unit- III & IV Manusmṛti Chap.II, Verses 1-52	
Short Notes-4	7½ ×4=30 Marks
3.Ayurveda (Carakasamhita, Dirghajivitiyadhyaya-Verses 53-103)	20 marks
Unit- V Long Questions -1	10 Marks
Short Questions -2	5 ×2= 10 Marks

Books for reference:

1. *Kautilya Arthashastra*, (Ed. &Trans.) R.P. Kangle, 3 Vols., Motilal Banarsidass, New Delhi
2. *TheArthashastra*. (Ed.& Trans),L.N. Rangarajan, Penguin Classics, India, 1992
3. *TheArthashastra*. (Ed.) N.P. Unni, Bharatiya Vidya Prakashan, New Delhi
4. *Arthashastra* (Odia Trans.) Anantarma Kar, Odisha Sahitya Academy, Bhubaneswar
 - *Manu's Code of Law: A Critical Edition and Translation of the Mānava-Dharmaśāstra*. (Ed. Olivelle, Patrick, Oxford: Oxford University Press
 - *Kautilya Arthashastra*, (Ed.) Vachaspati Gairala, Chaukhamba publication, Varansi
7. *Manusmṛti*, (Ed.) Braja Kishor Swain, Sadgrantha Niketan, Srimandira, Puri
8. *The Charaka Samhita*, (Trans.) A.C. Kaviratna and P. Sharma, 5 Vols., Indian Medical Science Series, Sri Sadguru Publications, a division of Indian Books Centre, Delhi 81
9. *Caraka-Samhitā: Agniveśa's Treatise Refined and annotated by Caraka and Redacted by Drdhabala* (text with English translation), Sharma, P. V. , Chaukhambha Orientalia, 1981--1994.
10. *Agniveśa's Caraka Samhitā* (Text with English Translation & Critical Exposition Based on Cakrapāṇi Datta's Āyurveda Dīpikā), R.K. Sharma & Bhagwan Dash, Chowkhamba Sanskrit Series Office, 1976--2002. Another good English translation of the whole text, with paraphrases of the commentary of Cakrapānidatta.

CC – 14 TECHNICAL LITERATURE IN SANSKRIT (JYOYISA & VASTU)

1. Jyotisa (Jyotihsara-ratnavali, Chap I)	40 Marks
(Graha-naksatra-paricaya-prakaranam)	
2. Vastu (Vasturatnakara, Chap-I)	40 Marks
(Bhuparigraha-prakaranam)	
1. Jyotisa	40 Marks
Unit-I,II& III Four Questions	10×4= 40 Marks
2. Vastu	40 Marks
Unit-IV & V Four Questions	10 ×4= 40 Marks

Books for Reference:

1. *Jyotihsara-ratnavali*(Part-I) (Ed.) Pandit Baikoli Mahapatra, Radhakrishna Pustakalaya, Satyanarayan Temple Road, Berhampur, Ganjam, Odisha
2. *Vasturatnakar* (Ed.) Vindhreshwari Prasad Dwivedi, Chowkhamba Krishnadas Academy, Varanasi

DETAILS OF ABILITY ENHANCEMENT COMPULSORY COURSE (AECC)

50 Marks /02 Credits each

SEMESTER-II

AECC-2 M.I.L.(SANSKRIT) (10 Mid+40 End) 02 Credits

M.I.L. (ALTERNATIVE SANSKRIT) 40 Marks 3 Credits

UNIT- I : SANSKRIT PROSE

10 Marks

- Shri-bhojarajasya rajyapraaptih* from the text *Bhojaprabandhah, Samskrta Pravesa*, Utkal University
- Yasya bhavah tasya devah* from the text *Madhurah kathah*, Samskrtabharati, Bangaluru
- Ambarisha-charitam, Samskrta pravesa*, Utkal University

2 Questions to be answered out of 4 asked

5 ×2= 10 Marks

UNIT-II: SANSKRIT POEMS (The following Poems)

10 Marks

1. *Canakyanitih* 3rd Chapter from the text *Chanakya-niti-darpanah*, Swami JagadishaParananda Saraswati, Vijaya Kumar Govindaram Ashananda, 4408, Newsadak, Delhi- 110006, 2014. (Prescribed Text)
2. *Raksa raksa bharamam* by Prof. Srinivasa Rath from the Anthology *Tadeva gaganam saiva dhara*, Rashtriya Sanskruta Samsthan, New Delhi, 1995
3. *Samyogah* by Prof. Radhavallabh Tripathi, from the Anthology *Kavyagodavari*, (Ed.)P.K. Mishra, Rashtriya Sanskrit Sansthan, New Delhi, 2011
4. *Krusakasyakatha (Verses 1-15)* by Prof. Prafulla Kumar Mishra from the anthology *Kavita bhuvanesvari*, P.G. Dept. of Sanskrit, Utkal University, Vanivihar, Bhubaneswar
5. *Jangama-dura-bhasini* by Sri Sundararaja from the anthology *Kavita bhuvanesvari*, P.G. Dept. of Sanskrit, Utkal University, Vanivihar, Bhubaneswar
6. *Dhanurbhanga* by Sri Bhubaneswar Kar, from the anthology *Kavya-vaitarani*, Vidyapuri, Cuttack
7. *Arunapranamah (Verses 10-21 of Kargil Kavyam)* by Dr. Braja Sundar Mishra, Adisaila Publications, Kendrapada, 2008.

2 Questions to be answered out of 4 asked

5×2= 10 Marks

UNIT-III : TRANSLATION

20 Marks

Translation from Odia/ English to Sanskrit

5 sentences to be translated out of 8 asked

4 × 5 =20 Marks

DETAILS OF SKILL ENHANCEMENT COURSES (50 Marks /02 Credits each) (A Students has to choose any two Papers out of these four groups namely P, Q, R & S)
Group- P YOGA (10 Mid +40 End)

(Patanjalayogasutram ch.I sutra 1-25)

Unit-I& II (Sutra 1-15)	03 Questions	8×3= 24 Marks
Unit-III (Sutra 16-25)	02 Questions	8×2= 16 Marks

Books for References

1. *Pātañjalayogadarśanam* (Ed.) Narayana Mishra, Choukhamba Prakashan, NewDelhi
2. *Yogasūtra of Patañjali*, (Ed.) M.R. Yardi, BORI, Poona
3. *Pātañjalayogadarśana* (Odia Tr.) Priyabratya Das, Arya samaj, Bhubaneswar

Group- Q PRIESTLY TRAINING IN SANSKRIT LITERATURE (KARMAKĀṆḌA)
(10 Mid +40 End)

Unit-I <i>Ācamanavidhi, Saṁkalpa, Snāna, Tarpaṇa, Aṅganyāsa</i> and <i>Karanyāsa</i>	4'2= 8 Marks
<u>Two</u> Questions s <i>Sandhyā (Gāyatrī, Prāṇāyāma), Dhyāna, mantras</i> of Gaṇeśa, Viṣṇu, Śiva, Bhāskara, Durgā, Sarasvatī and Lakṣmī	4*2= 8 Marks
<u>Two</u> Questions s	4*2= 8 Marks
Unit-II <i>Ṣoḍaśopacārapūjā</i>	
<u>Two</u> Questions <i>Vivāhapaddhati</i> from <i>Biharilal Karmakāṇḍa</i> –topics such as <i>Vivāha-bheda</i> (Verse 378), <i>Vivāha-lakṣaṇa</i> (416), <i>Svikaraṇavidhi</i> (417), <i>Varunapuja</i> (419)	4*2= 8 Marks
<u>Two</u> Questions	4*2= 8 Marks
Unit-III <i>Vivāhapaddhati</i> from <i>Biharilal Karmakāṇḍa</i> - <i>Mahāvākya</i> (422), <i>Kanyādāṇa</i> (442) <i>Hastagranthi</i> (443), <i>Lajāhoma</i> (461) and <i>Saptapadi</i> (465) <u>Two</u> Questions	

Books for References

1. *Nityakarma-pujā-prakasa*, Sriramabhabanji Mishra and Lalbihariji Mishra, Gitapress, Gorakhpur
2. *Ṣoḍaśa-upacāra*, Gitapress, Gorakhpur
3. *Biharilal Karmakāṇḍa*, Dharmagrantha Store, Cuttack

Group- R VASTU (VASTU RATNAKAR) (10 Mid +40 End)

(*Vastupurusa, Vastuyantra, Subhasubhavrksanirupana, Grhacchadanavyavasta, Prakosthasthananirupana, Jalasayakhodana*)

Unit-I & II(<i>Vastupurusa, Vastuyantra, Subhasubhavrksanirupana, Grhacchadanavyavasta</i>)	03 Questions.	8×3=2 4 Marks
Unit-III (<i>Prakosthasthananirupana, Jalasayakhodana</i>)	02 Questions.	8×2=16 Marks

Books for References

1. *Vasturatnakar* (Ed.) Vindhreshwari Prasad Dwivedi, Chowkhamba KrishnadasAcademy, Varanasi
2. *Brhatsamhita* varahmihira,(Ed.) N. Chidambaram Iyer, Divine Books, New Delhi.

Group- S TRANSLATION AND EDITING SKILL

(10 Mid +40 End)

- Unit-I Anuvada Kala- 10 Marks
Translation of one Odia/ English Paragraph in to Sanskrit
- Unit-II Precises Writing- 10 Marks
One Sanskrit Paragraph is to be precised in 1/3rd words and a suitable title is to be suggested.
- Unit-III Proof Correction and Transliteration 20 Marks
i. Proof Correction-
Two wrongly printed Sanskrit Verses from the Prescribe text are to set for necessary Proof Correction- 5*2= 10 Marks
ii. Two Sanskrit Verses from Prescribe text are to be written in Roman/ Italic script with diacritical marks. 5*2= 10 Marks

Books for References

1. Samskrta Vyakaranadarpana, Odisha Text Book Bureau, Bhubaneswar

DETAILS OF THE DSE COURSES (80 Term-end + 20 Mid-Term)

(A Student has to choose two DSE Papers in 5th Semester and two DSE Papers in 6th Semester including one Project work)

SEMESTER-V (A Student has to opt two DSE papers out of Groups- A, B, C & D)

Group- A

THE SCIENCE OF VĀSTU AND VṚKṢĀ

80+20 = 100

1. Vāstuvīdyā in Bṛhatsamhitā (Chap-53) 50 Marks
 2. Vṛkṣāyurveda in Bṛhatsamhitā (Chap- 52) 30 Marks
- Units I, II & III – (Vāstuvīdyā in Bṛhatsamhitā) Five Questions 10*5= 50 Marks
2. Vṛkṣāyurveda in Bṛhatsamhitā (Chap- 52) 30 Marks
- Units IV & V - Three Questions 10*3= 30 Marks

Books for References

1. Bṛhatsamhitā of Varāhamihira, (Ed.) N. Chidambaram Iyer, Divine Books, New Delhi
2. Bṛhatsamhitā with Vattapaliya vivrti (Ed.) Sudhakar Dwivedi and (re-edited by) Krushnachandra Dwivedi, Sampurnananda Samskrta Viswavidyalaya, Varanasi
3. Bṛhatsamhitā (Hindi Trans.), Achyutananda Jha, Choukhamba Prakashan, Varanasi
4. Vṛkṣāyurveda in Ancient India (with original text and translation), Lallanji Gopal, Sandeep Prakashan, New Delhi
5. Vṛkṣāyurveda of Bṛhatsamhitā, (Ed.), N.P. Dash, Vidyapuri, Cuttack

Group- B

SOCIO-POLITICAL THOUGHT IN ANCIENT INDIA

80+20 = 100

1. *Yājñavalkyasmṛti* (Vyavahārādhyāya verses 1-65) 40 marks
2. *Manusmṛti* (Chap- VII Verses 1-60) 40 marks
- Units- I & II - *Yājñavalkyasmṛti* Five Short Questions 7'5= 35 marks
- Units III & IV - *Manusmṛti* Five Short Questions 7'5=35 marks
- Unit- V Translation of Two verses from the above Units 5'2= 10 marks

Books for References

1. *Yājñavalkyasmṛti*, (Ed.) M.N. Dutta, Parimal Publications, New Delhi
2. *Yājñavalkyasmṛti* (Vyavahārādhyāya), (Ed.) Kishore Chandra Mahapara, Jageswarilane, Balighat, Puri
3. *Manusmṛti*, (Ed.) Braja Kishore Swain, Sadgrantha Niketana, Puri
4. *Manu's Code of Law: A Critical Edition and Translation of the Mānava Dharmasāstra*, (Ed.) Ollivele, Patrick, Oxford University Press

Group- C

YOGA : THEORY AND PRACTICE

80+20 = 100 MARKS

1. *Pātañjalayogadarśana* (Chap-I upto Iswara) 40marks
2. *Haṭhayogapradīpikā* of Svātmārāma (Chap-II) 40marks

1. *Aṣṭāṅgayoga*

Unit-I One Long Questions 15 marks

Unit-II Two Short Questions 7.5'2= 15 marks

2. *Haṭhayogapradīpikā*

Unit-III One Long Questions 15 marks

Unit-IV Two Short Questions 7.5'2= 15 marks

Unit-V Demonstration of Two *Yogāsanas* 10'2= 20 marks

Books for References

1. *Pātañjalayogadarśanam* (Ed.) Narayana Mishra, Choukhamba Prakashan, New Delhi
2. *Yogasūtra of Patañjali*, (Ed.) M.R. Yardi, BORI, Poona
3. *Pātañjalayogadarśana* (Odia Tr.) Priyabratya Das, Arya samaj, Bhubaneswar.
4. *Hathayogapradipika*, with *jyotsna Vyakhya*, chowkhamba Sanskrit series office, Varanasi.

Group- D

TRENDS OF INDIAN PHILOSOPHY

80+20 = 100 Marks

1. *Āstikas* 45 marks
2. *Nāstikas* 35 marks

1. *Astikas*

45 marks

Unit-I *Sāṃkhya* and *Yoga*

Twenty-five elements of *Sāṃkhya* and *Aṣṭāṅgayoga* of *Yogadarśana*

Two Short Questions s

7.5'2= 15 marks

Unit-II *Nyāya-Vaiśeṣika*
Asatkāryavāda, Saptapadārthas
Two Short Questions s

7.5*2= 15 marks

Unit-III *Vedānta* and *Mīmāṃsā*
Śaktidvaya of *Māyā* in *Vedānta* and *Karma* in *Mīmāṃsā*
Two Short Questions s

7.5*2= 15 marks

2. *Nāstikas*

35 marks

Unit-IV *Nāstikas* : *Cārvāk* and *Jaina*

Yadrcchāvāda and *Nairātmyavāda* of *Cārvāka*, *Sapta-bhaṅga-nyāya* of *Jaina*

Two Short Questions s

7.5*2= 15 marks

Unit-V *Bauddhadarśana Āryasatyas*

and Eight Noble-paths

Four Short Questions s

5*4= 20 marks

Books for References

1. *History of Indian Philosophy*, S.N. Dasgupta, MLBD, New Delhi
2. *Indian Philosophy*, S. Radhakrishnan, George Allen and Unwin Ltd., New York
3. *A Critical Survey of Indian Philosophy*, MLBD, New Delhi
4. *Outlines of Indian Philosophy*, M. Hiriyana, MLBD, New Delhi
5. *Bharatiya Darshana* (Odia), Gouranga Charan nayak, The Odisha State Bureau of Text Book Preparation and Production, Bhubaneswar

SEMESTER-VI (A Student has to opt one DSE paper out of Groups- E, F, G and one project work of 100 marks)

Group- E

ETHICAL LITERATURE IN SANSKRIT

80+20 = 100 Marks

1. *Cāṅkyaṇīti* (Chaps- I, II and III from *Cāṅkyaṇītidarpaṇa*) 30 marks
 2. *Nītiśataka* of Bhartṛhari (Verses 1-30) 30 marks
 3. *Viduranīti* (Ch.I Verse 20-60) 20 marks
- Units-I & II *Cāṅkyaṇīti* -Four Verses are to be explained - 7^{1/2}*4= 30 marks
- Units -III & IV *Nītiśataka* -Four Verses are to be explained - 7^{1/2}*4= 30 marks
- Unit-V *Viduranīti* Short Questions - 4 5*4= 20 marks

Books for References

1. *Cāṅkyaṇītidarpaṇa* (Ed.) Gunjeswar Choudhury, Choukhamba SurabharatiPrakashan, Varanasi
2. *Nītiśataka* (Ed.) M.R. Kale, MLBD, New Delhi(Text)
3. *Nītiśataka* (Ed.) Naresh Jha, Choukhamba Prakashan, New Delhi
4. *Viduranīti*, Gunjeswar Choudhury, Chawkhamba Surabharati Prakashan, Varanasi
5. *Viduranīti*, Gitapress, Gorakh Pur, *Bhartrhari Satakatrāyam*, B. S. Mishra, Vidyapuri, Cuttack.

Group- F**SCIENTIFIC LITERATURE IN SANSKRIT****80+20 = 100 Marks**

Unit- I	(i) <i>Bhūmidevyāḥkimivayaḥ</i> by A.R. Vasudevamurty (ii) <i>Bhāratasya vaijñāniketiḥāsaḥ</i> by M.M. Joshi <u>One</u> long Questions	15 marks
Unit-II	(iii) <i>Mahābhārata vaijñānikaḥamśaḥ</i> by A.R. Vasudevamurti (iv) <i>Vaidika-saṁskṛteḥ jagadvyāpyatvam</i> by M.R. Rao <u>One</u> long Questions	15 marks
Unit-III	(v) <i>Vṛkṣāyurvedaḥ -I</i> by Aurobindo Ghose (vi) <i>Vṛkṣāyurvedaḥ -I I</i> by V. Nagraj <u>One</u> long Questions	15 marks
Unit-IV	(vii) <i>Pūrvajaiḥparigaṇitam āsīt paramāṇoḥ parimāṇam</i> by A.R. Vasudevamurti (viii) <i>Prācīnaṁ rasāyanaśāstram</i> by K. Venkatesha Murty <u>One</u> long Questions	15 marks
Unit-V	<u>Four</u> short Questions s from the above four units -	5*4= 20 marks

Books for References

1. *Bhāratasya vaijñānika-paramparā*, V. Nagraj & others, Samskratabharati, MataManira Gali, Jhandewalan, New Delhi, 110055
2. *Ancient Indian Science and its Relevance to the Modern World*, (Eds.) K.E.Govindan & Others, Rashtriya Sanskrit Vidyapitha, Tirupati- 517507
3. *Scientific Knowledge in the Vedas*, P.V. Vartak, Dharam Hinduja International Centre of Indic Research, Delhi, Nag Publishers, 11 A/UA, Jawahar Nagar, Delhi-110007
4. *Science in Sanskrit*, Samskratabharati, Mata Manira Gali, Jhandewalan, New Delhi,110055
5. *Saṁskṛta-vijñāna-Dīpikā*, Nirmal Trikha, Eastern Book Linkers, 5825, NewChandrabala, Jawahar Nagar, Delhi- 110007

Group- G**GENERAL LINGISTICS AND PHILOLOGY****80+20 = 100 Marks**

Unit-I	Bhāṣā-lakṣaṇa, Bhāṣā-svarūpa, bhāṣā-prakārabheda, Bhaṣoṭpatti One long Questions	15 marks
Unit-II	Bhāṣā-vijñānasya mukhyāṅgāni, Gauṇāṅgāni, Dhvanivijñānam, Rūpavijñānam, Vākyavijñānam, Arthavijñānam One long Questions	15 marks
Unit-III	Dhvaniparivattanasya karaṇāni, Dhanivijñānasya prasiddha-niyamāḥ, Arthaparivarttanasya prakāraḥ, Arthaparivarttanasya karaṇāni One Long Questions	15 marks

Unit-IV Bhāṣāṇām vargīkaraṇam- Parivārika, Rūpagata, Vividha-bhāṣā-parivārāḥ One long Questions

15 marks

Unit-V Bharopīya-bhāṣāparivārānam sāmānya-paricayaḥ, Āryabhāṣā-parivārasya bhedadvayam- bhāratīya-īrānīyau, Vaidika-laukika-saṁskṛtam, Avesta

Four short Questions

5*4= 20 marks

Books for References

1. Elements of Science of Language, I.J.S. Taraporewalla, Samskrta Pustaka Bhandara, Kolkata
2. An Introduction to Comparative Philology, Chapters-I, II and III, P.D. Gune,
3. Bhāṣāvijñāna o bhāṣāsastra, Kapildev Dwivedi, Vishvavidyalaya Prakashan, Varanasi, Fourth Edn 1994
4. Linguistic Introduction to Sanskrit Chaps I, II & IV, B.K. Ghosh
5. Dhvanivijñāna, G.B. Dhal, The Odisha State Bureau of Text Book Preparation and Production, Bhubaneswar

DETAILS OF THE GENERIC ELECTIVE (G E) COURSES (80 Term - End + 20

Mid-Term) SEMESTER - I GE - I (A student has to opt one paper from group H & I)

Group: H Grammar, History of Sanskrit Literature, Drama & Prose - 100 Marks

(Mid Term 20 Marks + End Term 80 Marks)

Unit I-Śabdarūpa & Dhāturūpa-10 Marks

Śabda :Bālaka, Kavi, Bhānu, Piṭṛ, Latā, Mati, Nadī, Dhenū, Vadhū, Mātr, Phala, Karman, Vāri, Madhū, Marut, Ātman, Guṇin, Vāk, Sarit, Sarva, Tad, Etad, Yad, Idam, Jagat, Asmad and Yuṣmad.

Dhātu :Bhū, Paṭh, pac, Kṛ, As, Ad, Han, Śī Cur, Sev, Śī, Kri, Bhī, Dīś, Vad.

Form of 5 Śabda 5 Marks

Form of 5 Dhātu 5 Marks

Unit II- History of Sanskrit Literature (Rāmāyaṇa&Mahābhārata) - 20 Marks

One Long Questions 12 Marks

Two Short Questions 08 Marks

Unit III- Hitopadeśa Mitralābha 20 Marks

Hitopadeśa Mitralābha : Kathāmukha with the following Stories :

Vṛddhavyāghra pathika kathā, Mṛga kāka śṛgāla kathā, Gṛdhra mārjāra kathā,

Ati lobhi śṛgāla kathā, Hastī dhūrtta śṛgāla Kathā

One Long Questions 12 Marks

One Explanation

08 Marks

Unit IV & V - Abhijñānaśākuntalam (Act 1- 4) - 30 Marks

Unit IV - One Long Questions - 12 Marks

One Explanation - 06 Marks

Unit V - Two Short Questions 12

Marks

Books Recommended :

1. Vyākaraṇadarpaṇa, Published by Odisha State Bureau of Text Book Preparation and production, Pustak Bhavan, Bhubaneswar, 2013.
2. History of Indian Literature (Vol.III), M. Winternitz, MLBD, Delhi.
3. History of Classical Sanskrit Literature, M. Krishnamachariar, MLBD, Delhi.
4. Saṁskṛta Sāhitya kā Itihāsa, Baladev Upadhyaya, Sarada Niketan, Varanasi.
5. Saṁskṛta Sāhitya Itihāsa, Prof. Harekrushna Satapathy, Kitab Mahal, Cuttack.
6. Hitopadeśa of Nārāyaṇa, M.R. Kale, Motilal Banarsidass, Delhi.
7. Hitopadeśa Mitralābha, Kapil Dev Giri, Chowkhamba Publications, Varanasi, 1988.
8. Hitopadeśa Mitralābha, Dr. Braja Sundar Mishra, Vidyapuri, Cuttack.
9. Abhijñānaśākuntalam, M.R. Kale, MLBD, New Delhi.
10. Abhijñānaśākuntalam, R.M. Bose, Modern Book Agency Private Limited, Calcutta - 12, 1976.
11. Abhijñānaśākuntalam, Dr. Ganga Sagar Rai, Chowkhamba Sanskrit Bhawan, Varanasi, 2000.
11. Abhijñānaśākuntalam, Prof. Hare Krushna Satpathy, Kitab Mahal, Cuttack.

Group: I

Mastering Sanskrit Language - 100 Marks

(Mid Term 20 Marks + End Term 80 Marks)

Unit I : History of Sanskrit Literature (Mahākāvya & Gītikāvya)- 20 Marks

Origin and development of Sanskrit *Mahākāvyas* and *Gītikāvyas* with special reference to the following :

Mahākāvya: *Kumārasambhava, Raghuvamśa, Kirātārjunīya, Śīsupālavadhā* and *Naiṣadhīyacarita*.

Gītikāvya : *Meghadūta, Ṛtusamhāra, Nitiśataka, Śṛṅgāraśataka, Vairāgyaśataka, Caṇḍīśataka, Sūryaśataka, Amaruśataka, Mohamudgara* and *Gītagovinda*.

One Long Questions from <i>Mahākāvya</i> -	12 Marks
Two short Questions from <i>Gītikāvya</i> -	08 Marks
Unit II- Śukanāśopadeśa from Kādambarī-	20 Marks
One Long Questions -	12 Marks
One Explanation	08
Marks	
Unit III & IV - Abhijñānaśākuntalam (Act5- 7) - 30 Marks	
Unit III - One Long Questions	12 Marks
One Explanation	06 Marks
Unit IV - Two Short Questions	12 Marks
Unit V - Dramaturgy -	10 Marks
The following Portions to be studied from Sāhityadarpaṇa Chapter VI:	
<i>Nāṭaka , Prakaraṇa , Prastāvanā , Pūrvaraṅga , Nāndī and Pañca sandhi.</i>	
Two Short Notes -	2 X 5= 10 Marks

Books Recommended :

11. History of Indian Literature (Vol.III), M. Winternitz, MLBD, Delhi.
12. History of Classical Sanskrit Literature, M. Krishnamachariar, MLBD, Delhi.
13. Saṁskṛta Sāhitya kā Itihāsa, Baladev Upadhyaya, Sarada Niketan, Varanasi.
14. Saṁskṛta Sāhitya Itihāsa, Prof. Harekrushna Satapathy, Kitab Mahal, Cuttack.
15. Śukanāśopadeśaḥ, Mohandev Panth and Harishcandra Vidyalamkara, Motilal Banarsidass, Delhi, 2010.
16. Kādambarī - Śukanāśopadeśaḥ, Ramakanta Jha and Harihara Jha, Chowkhamba Vidya Bhavan, Varanasi, 2011.
17. Śukanāśopadeśaḥ, Dr. Nirmal Sundar Mishra, Kalyani Publishers, New Delhi.
18. Abhijñānaśākuntalam, M.R. Kale, MLBD, New Delhi.
19. Abhijñānaśākuntalam, R.M. Bose, Modern Book Agency Private Limited, Calcutta - 12, 1976.
20. Abhijñānaśākuntalam, Dr. Ganga Sagar Rai, Chowkhamba Sanskrit Bhawan, Varanasi, 2000.
21. Abhijñānaśākuntalam, Prof. Hare Krushna Satpathy, Kitab Mahal, Cuttack.
22. Sāhityadarpaṇa, Sheshraja Sharma Regmi, Chowkhamba Krishnadasa Academy, Varanasi.
23. Sāhityadarpaṇa, Odisha Sahitya Akademi, Bhubaneswar.

14. Sāhityadarpaṇa evaṁ Chanda, Dr. Braja Sundar Mishra, Satyanarayan BookStore, Binod Behari, Cuttack -2.

SEMESTER – II GE - 2 (A student has to opt one paper from group J & K)

Group: J Functional Sanskrit– 100 Marks

(Mid Term 20 Marks + End Term 80 Marks)

Unit I - Sanskrit conversation - 20 Marks

A Specific incident/ Occurrence will be given in the Questions Paper (in Sanskrit) and the students will be asked to present that in Sanskrit with Conversation style.

Unit II - General idea about Vācya. The divisions of Vācya like Karttṛvācya, Karma Vācya and Bhāvavācya. - 20 Marks

The students will be asked to change the voice (Vācya) of any 10 sentences as directed. 10 x 2 = 20 Marks

Unit III - Saṁjñā Prakaraṇam from Laghu Siddhānta kaumudī- 20 Marks

Four Sūtras. 4 x 5 = 20 Marks

Unit IV & V - Nītiśataka of Bhartṛhari (Verses 1 - 20) - 20

Marks Four Short Questions

4 x 5 = 20 Marks

Books Recommended :

1. Functional Sanskrit: Its Communicative Aspect, Dr. Narendra, Sri Aurovindo Ashram, Pondicherry.
2. Vyākaraṇadarpaṇa, Published by Odisha State Bureau of Text Book Preparation and production, Pustak Bhavan, Bhubaneswar, 2013.
3. Laghu Siddhānta Kaumudī , Sridharananda Sashtri , MLBD , New Delhi.
4. Laghu Siddhānta Kaumudī, Isvara Chandra, Samskrta Granthagara, New Delhi, 2007.
5. Laghu Siddhānta Kaumudī , Sadasiva Shastri, Chowkhamba Sanskrit Office, Varanasi.
6. The Nīti and Vairāgya Śataka of Bhartṛhari, M.R. Kale, MLBD, New Delhi.
7. Śatakatraya , Dr. Braja Sundar Mishra, Vidya puri, Cutack , 2010.

Group: K History of Sanskrit Literature, Poetry, Philosophy and Poetics. - 100 Marks

(Mid Term 20 Marks + End Term 80 Marks)

Unit I & II - History of Sanskrit Literature - 20 Marks

(Gadyakāvya, Fairy Tales & Fables, Campū)

Unit I - One Long Questions - 12 Marks

Unit II - Two Short Notes - 08 Marks

Unit III - Meghadūta :Pūrvamegha(Verses 1 - 39) - 20 Marks

One Long Questions - 12 Marks

Two Short Questions - 08 Marks

Unit IV - Śrīmad Bhagavad Gītā : (Chapter XV)- 20 Marks

One Long Questions - 12 Marks

Two Short Questions - 08 Marks

Unit V - Alamkāra (FromSāhityadarpaṇaCh -x) - 20 Marks

Anuprāsa, Yamaka, Śleṣa, Upamā, Rūpaka, Utprekṣā, Apahnuti, Samāsokti, Vyājastuti and Arthāntaranyāsa.

Lakṣa-lakṣaṇa-samanvaya of any four. 4x5 = 20 Marks

Books Recommended :

1. History of Indian Literature (Vol.III), M. Winternitz, MLBD, Delhi.
2. History of Classical Sanskrit Literature, M. Krishnamachariar, MLBD, Delhi.
3. Saṁskṛta Sāhitya kā Itihāsa, Baladev Upadhyaya, Sarada Niketan, Varanasi.
4. Saṁskṛta Sāhitya Itihāsa, Prof. Harekrushna Satapathy, Kitab Mahal, Cuttack.
5. Meghadūta of Kālidasa , M.R. Kale, MLBD, New Delhi.
6. Meghasandeśa, N. P. Unni, Bharatiya Vidya Prakashan, New Delhi.
7. Meghadūta, Dr. Braja Sundar Mishra, Vidyapuri, Cuttack.
8. Śrīmad Bhagavad Gītā (With Sāṅkara Bhāṣya), Gita Press, Gorakh Pur.
9. Sāhityadarpaṇa evaṁ Chanda, Dr. Braja Sundar Mishra, Satyanarayan Book Store, Binod Behari, Cuttack.
10. Sāhityadarpaṇa , P. V. Kane , MLBD , New Delhi.

SEMESTER - III GE - 3 (A student has to opt one paper from group L & M)

Group: L Poetry, Grammar and Composition - 10 Marks

(Mid Term 20 Marks + End Term 80 Marks)

Unit I -Kirātārjunīyam : Canto I- 20

Marks

One Long Questions - 12 Marks

One Explanation - 08 Marks

Unit II - Vibhaktyartha Prakaraṇa from Laghu Siddhāntakaumudī- 15Marks

Three *Sūtras*. 3 X 5 = 15 Marks

Unit III - Essay in Sanskrit - 20 Marks

Unit IV - Translation from Odia/ English to Sanskrit-15 Marks

Unit V - Retranslation from Sanskrit to Odia/ English - 10 Marks

Books Recommended :

1. Kirātārjunīyam (Canto - I- III), M.R.Kale, MLBD, Delhi.
2. Kirātārjunīyam (Canto - I) Kanta Bhatia and Amaldhari Singh, Bharatiya Vidya Prakashan, Delhi.
3. Kirātārjunīyam O Nātyatattava, Dr. Niranjan Pati, Kalyani Publishers, New Delhi.
4. Laghu Siddhānta Kaumudī , Sridharananda Sashtri , MLBD , New Delhi.
5. Laghu Siddhānta Kaumudī, Isvara Chandra, Samskrta Granthagara, New Delhi, 2007.
6. Laghu Siddhānta Kaumudī , Sadasiva Shastri, Chowkhamba Sanskrit Office, Varanasi.
7. Laghusiddhanta Kaumudi, Ghanashyama Dora, A.K.Mishra Agency, Cuttack.
8. Vyākaraṇadarpaṇa, Published by Odisha State Bureau of Text Book Preparation and production, Pustak Bhavan, Bhubaneswar, 2013.
9. Saṃskṛta nibandhaśatakam, Kapildev Dwivedi.

Group: M Darśana, Prosody and Poetics - 100 Marks

(Mid Term 20 Marks + End Term 80 Marks)

Unit I - Pātañjala Yogadarśana- 20 Marks

The following *sūtras* from *Samādhipāda* :

*Atha yogānusāsanam (1), Yogaścittavṛtti-nirodhaḥ (2), Pratyakṣānumānāgamāḥ
pramāṇāni (7), Anubhūtaṅgāyāsāṃpramoṣaḥ smṛtiḥ (11),
Abhyāsavairāgyābhyām tannirodhaḥ (12), dīpānuśravikaviśayavitrṣṇasya
vaśīkārasamjñā vairāgyam (15), tatparam puruṣakhyāter guṇavairṣṇyam (16) and
kleśakarmavipākāśayair aparāmitāḥ puruṣaviśeṣa īśvaraḥ (24).*

Four Sutras to be explained. 4 X 5 = 20 Marks

Unit II - Prosody - 20 Marks

The following Chandas from *Śrutabodha*.

*Āryā, Śloka, Indravajrā, Upendra vajrā, Upajāti, Varṣastha, Vasanta tilakā,
Mālinī, sikhariṇī and Mandākrāntā.*

4 Chandas to be explained with expmpals. 4 X 5 = 20 Marks

Unit III - General idea about *Kāvya prayojana, Kāvyalakṣaṇa,*

Kāvya hetu and Kāvya bheda from *Sāhityadarpaṇa* - 10 Marks

Two Short Notes - 2 X 5 = 10 Marks

Unit IV - General idea about *Abhidhā,*

Lakṣaṇā and Vyañjanā from *Sāhityadarpaṇa* -10

Marks

Two Short Notes - 2 X 5 = 10

Marks Unit V - Comprehension - 20 Marks

One Sanskrit passage will be given and the students will be asked to answer five Questions in Sanskrit that follow the passage. 5 X 4 = 20

Marks

Books Recommended :

- Pātañjala yogasutratīṭh, Vimala Karnataka, Krishnadas Academy, Varanasi.
- Siddhāntakaumudī, Dr. Minati Mishra, Vidyapuri, Cuttack.
- Siddhāntakaumudī, Dr. Gopal Krishna Dash & Dr. Kadambini Dash, A.K.Mishra Agency, Cuttack.
- Sāhityadarpaṇa, P.V.Kane, MLBD, New Delhi.
- Sāhityadarpaṇa evaṃ Chanda, Dr. Braja Sundar Mishra, Satyanarayan Book Store, Binod Behari, Cuttack.
- Vyākaraṇadarpaṇa, Published by Odisha State Bureau of Text Book Preparation and production, Pustak Bhavan, Bhubaneswar, 2013.

SEMESTER – IV GE - 4 (A student has to opt one paper from group N & O)

Group: N SOCIO-POLITICAL THOUGHT IN ANCIENT INDIA	80+20 = 100
1. <i>Yājñavalkyasmṛti</i> (Vyavahārādhyāya verses 1-65)	40 marks
2. <i>Manusmṛti</i> (Chap- VII Verses 1-60)	40 marks
Units- I & II - <i>Yājñavalkyasmṛti</i> Five Short Questions	7*5= 35 marks
Units III & IV - <i>Manusmṛti</i> Five Short Questions	7*5= 35 marks
Unit- V Translation of <u>Two</u> verses from the above Units	5*2= 10 marks

Books for References

- D. *Yājñavalkyasmṛti*, (Ed.) M.N. Dutta, Parimal Publications, New Delhi
- E. *Yājñavalkyasmṛti* (Vyavahārādhyāya), (Ed.) Kishore Chandra Mahapara, Jageswari lane, Balighat, Puri
- F. *Manusmṛti*, (Ed.) Braja Kishore Swain, Sadgrantha Niketana, Puri
- G. *Manu's Code of Law: A Critical Edition and Translation of the Mānava Dharmaśāstra*, (Ed.) Ollivele, Patrick, Oxford University Press

Group: O ETHICAL LITERATURE IN SANSKRIT

1. *Cāṇakyanīti* (Chaps- I, II and III from *Cāṇakyanītidarpaṇa*) 30 marks
 2. *Vairagyaśataka* of Bhartrhari (Verses 1-30) 30 marks
 3. *Viduranīti* (Ch.I Verse 20-60)
- Units-I & II *Cāṇakyanīti*-Four Verses are to be explained - $7^{1/2} \cdot 4 = 30$ marks Units –
- III & IV *Nītiśataka*-Four Verses are to be explained - $7^{1/2} \cdot 4 = 30$ marks Unit-V Short
- Questions - 4 5x4= 20 marks

Books for References

- M. *Cāṇakyanītidarpaṇa* (Ed.) Gunjeswar Choudhury, Choukhamba Surabharati Prakashan, Varanasi
- N. *Vairagyaśataka* (Ed.) M.R. Kale, MLBD, New Delhi (Text)
- O. *Viduranīti*, Gunjeswar Choudhury, Chawkhamba Surabharati Prakashan, Varanasi
- P. *Viduranīti*, Gitapress, Gorakh Pur
- Q. *Bhartrhari Satakātrayam* B.S. Mishra, Vidyapuri, Cuttack.

**SYLLABUS FOR B.A. (HONORS) SOCIOLOGY UNDER CHOICE
BASED CREDIT SYSTEM OF UTKAL UNIVERSITY,
BHUBANESWAR**

CORE PAPERS

(SOC-1) Introduction to Sociology

This introductory paper intends to acquaint the students with Sociology as a social science and the basic concepts used in the discipline. It also focuses on the social processes and the social institutions that man encounters as a member of the society.

Objectives: After studying these two papers, the student can

- Can get to know the convergence and divergence of Sociology with other social science disciplines in terms of the subject matter, nature and scope of the discipline and its approach.
- Develop knowledge about its historicity.
- Can get acquainted with the basic concepts used in the subject.
- Can generate ideas about the social processes and social institutions man encounters as a member of the society.

Learning Outcomes: This paper is expected to clarify and broaden the student's notion about the subject, the basic concepts used and some universal societal processes. This will provide a wholesome picture about what the subject is all about.

Unit-1: Sociology: Definition and Subject matter, Nature and Scope, Emergence of Sociology, Sociology and its relationship with Anthropology, Political Science, Economics, and History

Unit-2: Basic Concepts: Society, Culture, Community, Institutions, Association, Social Structure, Status and Role, Norms and Values, Folkways and Mores, Associative and Dissociative processes – Cooperation, Assimilation, Accommodation, Competition, and conflict

Unit-3 : Individual and Society : Individual and society, Socialization, Stages and Agencies of Socialization, Development of Self – Contributions of George Herbert Mead, C.H. Cooley's Looking Glass Self The Concept of Group : Types of Groups – Primary and Secondary groups, In-Group and Out-group, Reference Group

Unit-4: Social Stratification: Meaning and definition, Dimensions of Stratification, Theories of Stratification – Functionalist, Marxist, Weberian. Social mobility and its determinants.

Unit-5: Social Control: Meaning and types, Formal and Informal social control, Agencies of Social control

Essential readings:

1. Bottommore. T.B. 1972, Sociology: A guide to problems and literature. Bombay :George Allen and Unwin (India)
2. Harlambos, M.1998. Sociology: Themes and perspectives. New Delhi Oxford University Press
3. Inkeles, Alex, 1987. What is Skociology? New Delhi: Prentice-Hall of India
4. Jaaram, No. 1988 . What is Sociology .Madras:Macmillan, India :
5. Johnson, Harry M. 1995. Sociology: A Systematic Introduction. New Delhi , Allied Publishers
6. Schaefer, Richard T. and Robert P. Lamm. 1999 Sociology. New Delhi Tata-Mac Graw Hill.

(SOC-2) Indian Society

Every society has its own peculiar structure and there are some institutions universal to every society, but with their unique manifestations in each society. There are some change agents and initiatives that enable the society to change with the passage of time. This paper focuses on the structure of the Indian society and the changing aspects with the processes operating, change agents and initiatives.

Objectives: After studying these two papers on Indian society, the student can

- Get an impression about the basic composition of Indian society, its historical moorings, basic philosophical foundations of the society and the institutions.
- Learn about the changing institutions, the processes, the agents and the interventions that bring about change in the Indian society.

Learning Outcomes: This paper is expected to bring familiarity in a student about Indian society. It will present a comprehensive, integrated and empirically –based profile of Indian society. It is hoped that the structure and processes operative in the society, the change agents operating in Indian society presented in this course will also enable students to gain a better understanding of their own situation and region.

Unit-1 : Composition of Indian Society : Caste, Tribe, Religion, Language. Unity in Diversities, Threats to national integration

Unit-2 Hindu Social Organisation: Bases of Hindu Social Organization, Varna, Ashrama and Purushartha. Doctrine of Karma.

Unit-3 : Marriage and Family in India: Hindu marriage as Sacrament, Forms of Hindu Marriage. The Hindu joint family:Patriarchal and Matriarchal systems. Marriage and family among the Muslims. Changes in the institutions of Marriage and Family.

Unit-4 : The Caste system in India: Origin, Features and Functions. Caste and Class, The Dominant Caste,Changes in Caste system, Caste and Politics in India Constitutional and legal provisions for the Scheduled Castes, Scheduled Tribes.

Unit-5 : Social Change in Modern India : Sanskritization, Westernization, Secularization, and Modernization

Essential readings:

1. Bose, N.K. 1967, Culture and Society in India. Bombay : Asia Publishing House
2. Bose, N.K. 1975, Structure of Hindu Society. New Delhi
3. Dube, S.C. 1990, Society in India.(New Delhi: National Book Trust.)
4. Dube, S.C. 1995, Indian Village (London : Routledge)
5. Dube, S.C. 1958: India's changing Villages (London: Routledge and Kegan Paul).
6. Karve, Irawati, 1961 : Hindu Society : An Interpretation(Poona : Deccan-College) :: Lannoy,
7. Mandelbaum, D.G. 1970 : Society in India (Bombay: Popular Prakashan)
8. Srinivas, M.N. 1980 : India: Social Structure (New Delhi: Hindustan - Publishing Corporation)
9. Srinivas, M.N. 1963: Social Change in Modern India (California, Berkeley: University of California Press).
10. Singh, Yogendra, 1973: Modernization of Indian Tradition (Delhi: Thomson Press).

(SOC-3) Sociological Thought

Sociology originated as an intellectual response to the crisis confronting the mid nineteenth century European society. Its development over two centuries has been influenced by a variety of socio-economic and political conditions. It is now established as a multi-paradigmatic academic discipline, with its body of theoretical knowledge enriched and its methodological techniques and procedures systemized. This paper is intended to familiarize the students with the social, political, economic and intellectual contexts in which sociology emerged as a distinctive discipline. It deals with the contributions of the forerunners of the discipline and with the contributions of the founders who gave a systematic shape to the subject.

Objectives: After going through these two papers, the student can

- Gain an understanding of some of the classical contributions in Sociology, and their contemporary relevance.
- Learn about the methodological shift in the discipline over the years.

Learning Outcomes: This paper is expected to clarify and broaden the student's knowledge about the theoretical and methodological contributions of the classical contributors to the subject and the contemporary relevance of these theories.

Unit-1 : Auguste Comte : Law of the Three Stages, Hierarchy of Sciences, Positivism

Unit-2 : Herbert Spencer : Organismic Analogy, Theory of Social Evolution

Unit-3 : Karl Marx : Dialectical Materialism, Class struggle, Alienation, Sociology of Capitalism

Unit-4 : Emile Durkheim : Division of Labour in Society, Rules of Sociological Method, Theory of Suicide.

Unit-5 : Max Weber : Social Action, Protestant ethic and the spirit of capitalism, Ideal type, Bureaucracy, Authority

Essential readings:

1. Aron, Ramond. 1967(1982 reprint) Main currents in sociological thoughts (2 volumes). Harmondsworth, Middlesex: Penguin Books
2. Barnes, H.E. 1959. Introduction to the history to the sociology The University of Chicago press
3. Coser, Lewis A. 1979. Masters of Sociological Thought. New York : Harcourt Brance Jovanovich
4. Fletcher, Ronald. 1994.The Making of Sociology (2 volumes) Jaipur-Rawat
5. Morrison, Ken.1995 Marx, Durkheim, Weber: Formation of Modern Social Thought. London; sage
6. Ritzer, George. 1996. Sociological Theory New Delhi. Tata-McGraw Hill
7. Singh, Yogendra. 1986 Indian Sociology: social conditioning and emerging Trends. New Delhi: Vistaar
8. Zeitlin, Irving.1998 (Indian Edition). Rethiking Sociology: A critique of Contemporary Theory. Jiapur: Rawat.

(SOC-4) Social Change and Development

Change is the law of nature and every society is subject to change. Social change has always been a central concern of Sociological study. Change takes different forms. Change has its pattern which is spelt out by various theories. Change is often propelled by various factors. This paper is designed to provide some ideas to the student about such process, theories and factors.

Objectives: After going through this paper, the student can

- Derive knowledge about the meaning, nature, forms and patterns of change.
- Get an idea about the theories that explain change and their adequacy in explaining so.
- Get an impression about the factors that propel change in the society.

Learning Outcomes: This paper is expected to provide a wholesome idea to the students about the process of social change. They can relate their experience with the theoretical explanations.

Unit-1 : Social Change : Meaning and nature. Social Progress, Evolutuion and Development.

Unit-2 : Theories of Social Change : Evolutionary theory, Cyclical theory, Conflict Theory, Functionalist theory.

Unit-3 : Factors of Social Change: Cultural, Economic, Technological, Ideological, Demographic

Unit-4 : Economic Growth and Social Development : Indicators of Social Development, Human Development Index, Gender Development Index

Unit-5 : Models of Development : Capitalist, Socialist, and Gandhian.

Essential readings:

1. Moore, W.E. 1965 Social Change, Prentice-Hall of India. New Delhi
2. Gandhi M.K., Hind Swaraj
3. Schumacher, E.F., Small is Beautiful
4. Narain, Shreeman, Principles of Gandhian Planning
5. Mishra, B., Capitalism, Socialism and Planning.
6. UNDP, Human Development Report

(SOC-5) Research Methodology

Since the days of August Comte, a debate and a deliberate attempt has been initiated to provide a scientific character to social sciences. In this attempt empirical research has been introduced as an integral part of observing social reality and generalising it objectively without any subjective predisposition. Gradually, research methods have been developed and introduced in social sciences to bring it in par with scientific observations. The essence of this paper lies in introducing the students with these methods of research to ensure objectivity as far as practicable in social research.

Objectives: By going through this paper, the student can

- Get an understanding of the nature of scientific methods, nature of social Phenomena and the way of attaining value neutrality.
- Have a grip over the basic steps involved in social research and the types of social research with their applicability
- Develop an insight into the need and types of research design and the use of sampling method for attaining objectivity and scientific study.

Learning Outcomes: This paper is designed and incorporated to acquaint the students with the scientific ways of studying social phenomena. This provides them with a research insight that will enable them to capture the most relevant data in an objective manner. The market demand of this paper will be very high as the students well versed with this paper will be highly demanded in academics, fundamental research, and policy research undertaken both by Government and Non- Government agencies.

Unit-1 : Meaning and Significance of Social Research, Nature of scientific Method, Applicability of scientific method to the study of social phenomena, Major steps in social research.

Unit-2 : Research Design, Types of Research Design: Exploratory, Diagnostic, Descriptive, and Experimental research Design.

Unit-3 : Hypothesis: Meaning, Characteristics, Types and sources of Hypothesis, Role of Hypothesis in Social Research

Sampling: Meaning, and characteristics, Types: Probability and Non-Probability

Sampling. Role of Sampling in Social Research

Unit-4 : Qualitative social Research : Observation, Case Study, Content Analysis

Unit-5 : Quantitative methods in Social Research: Survey research, Questionnaires,

Recommended Readings:

1. Bajaj and Gupta 1972 Elements of Statistics. New Delhi: R.Chand and Co., New Delhi
2. Beteille, A. and T.N. Madan 1975 Encounter and experience: Personal Accounts of Fieldwork. Vikas Publishing House, New Delhi
3. Bryman, Alan 1988 Quality and Quantity in Social Research Unwin Hyman, London
4. Jayram, N. 1989. Sociology: Methods and Theory. Madras: MacMillan, Madras
5. Kothari, C.R. Research Methodology : Methods and Techniques, Bangalore, Wiley Eastern.
6. Punch, Keith. 1996. Introduction to Social Research, Sage, London
7. Shipman, Martin, 1988 The Limitations of Social Research Sage, London
8. Young, P.V. 1988 Scientific Social Survey and Research Prentice Hall, New Delhi

(SOC-6) Gender and Society

The biological basis to the differences between the sexes does not explain the inequalities faced by the sex groups in the society. In the society variations are marked in the roles, responsibilities, rights of and relations between sex groups depending on the social prescriptions relating to sex affiliations. The differences, inequalities and the division of labour between men and women are often simply treated as consequences of 'natural' differences between male and female humans. But, in reality the social norms, institutions, societal expectations play a significant role in deciding and dictating the behaviour of each sex group. This is the fundamental of the study of Gender and Society.

Objectives: After studying this paper, the student can

- Conceptualize what is "Gender" and what is "Sex" and draw a line of distinction between the two.
- Note the difference in gender roles, responsibilities, rights and relations.
- Trace out the evolution and institutionalization of the institution of "Patriarchy".
- Get to know the theories of Feminism that brought women issues and demands to the forefront.
- Assess the initiatives undertaken for gender development with the paradigm shift from time to time.

Learning Outcomes: This paper is expected to generate ideas and sensitivity about gender in a student which he/she can put into practice in daily life. This will lead to change the prevalent biases and gender practices and create a gender neutral social world where both men and women can enjoy their basic rights and cherish to achieve their dreams.

Unit-1 : Social Construction of Gender : Sex and Gender, Gender stereotyping and socialization, Gender Role and Identity. Gender stratification and Inequality, Gender discrimination and Patriarchy.

Unit-2 : Feminism: Meaning, origin and growth of Feminist Theories. Theories of Feminism : Liberal, Radical, Socialist, and Eco-Feminism.

Unit-3 : Gender and Development: History and Approaches, WID,WAD and GAD. Women Empowerment: Meaning and Dimensions. World Conference of Women, Mexico, Copenhagen, Nairobi and Beijing. Gender- Related Development Index (GDI) and Gender Empowerment Index (GEM).

Unit-4: Status of Women in India : Ancient and Medieval period, women in pre-independence India, Social Reform movements, The Nationalist movement, Women in Independent India.

Unit-5 : Major Challenges and Issues Affecting Women in India: Women and Education, Women and Health, Women and Work. Policy provisions for women.

Recommended Readings:

1. Bhasin, Kamla, 2003 Understanding Gender, Kali for Women
2. Bhasin, Kamala , 1986 Khanv, Said Nighat Some Questions on Feminism and Its Relevance in Sourth Asia, Kali for Women, New Delhi
3. Chaudhuri, Maitrayee 2004 Feminism in India: Issues in Contemporary Indian Feminism Kali for Women, New Delhi
4. Kabeer, Naila 1994 Reversed Realities: Gender Hierarchies in Development Thought: Gender Hierarchies in Development
5. Srivastava Gouri, 2005 Women Education in India Issues and Dimensions, Academic Excellence Publishers & Distributors
6. Agarwal, S.P 2001 Women's Education in India, Concept Publishing Company
7. **Satia, J, Misra, M, Arora, R, Neogi, S**, ed. Innovations in Maternal Health - Case studies from India. New Delhi, India: SAGE Publications Pvt. Ltd.
8. Dube, Leela 1990 Structures and Strategies –Women, Work and Family, SAGE Publications, New Delhi
9. Kalia, Anil 1998 “Women Workers: Invisible and Unprotected”, Social Welfare, Vol.45, No.1, April
10. Cahwala, Monioca 2006 Gender Justice: Women and Law in India, Deep and Deep Publications

(SOC-7) Rural Sociology

Rural Sociology is a specialized branch of Sociology describing the society of villages and rural areas. As the rural areas or the villages mark the beginning of human civilization, this paper is designed to bring out the distinct features of the rural society with their typologies and typicalities. In the present paper an attempt is made to introduce the student with the development of this branch overtime with its focus on the typicality of Indian villages, their structures, changing features and social problems faced by the rural people.

Objectives: After studying this paper, the student can

- Get an impression about the emergence of the sub discipline Rural Sociology and the forces contributing for its origin.

- Learn about the nature of this branch of knowledge, its subject matter and significance.
- Collect information and knowledge about the mooring of the sub discipline in the Indian context.
- Generate an idea about the typicalities of the rural society and the institutions operating therein and their dynamics.
- Derive ideas about rural social problems of the country.

LearningOutcomes: India thrives in her villages. By going through this paper, the student can have a grip on the grass roots of Indian society. This will enable the student to understand the society in a better manner, to note the heterogeneities in culture, institutions and their functions, changes, the contrasts found between the rural urban societies and the problems faced by the people.

Unit-1 : Origin and Scope of Rural Sociology., Nature and Importance of Rural Sociology.

Unit-2 : Rural social Structure: Village Community, Agrarian Economy, Caste System, Mobility and Migration. Rural-Urban Contrast and Continuum

Unit-3: Rural Social problems: Poverty, Unemployment, , Food Security, Landlessness, Indebtedness, Health care and Sanitation

Unit-4 : History and Evolution: Community Development Programme, Land Reforms, Green Revolution. Cooperative Movement, Panchayati Raj Institutions- Constitutional provisions and Structure. Role of Panchayats in Rural Development

Unit-5 Rural Development Programmes: MGNREGA, SGSY, Indira Awas Yojana, Livelihood Mission, Health Mission

Recommended Books:

1. Doshi S.L. & P.C. Jain 2002 Rural Sociology, Jaipur, Rawat
2. Desai A.R. Rural Sociology in India 1997 Bombay Popular Prakasan
3. Dhanagare D.N. 1988 Peasant movements in India, New Delhi, Oxford
4. Gupta D.N. 2001 Rural development System New Delhi Books India International
5. Dube, S.C. 1988 India's changing Village: Human Factor in Community Development Himalayan Publishing House, Bombay
6. Maheshwari, S.R. 1985 Rural Development In India, Sage Publication, New Delhi
7. Vivek, R. & Bhattacharya 1985 The New Strategies of Development in Village India, Metropolitan
8. Jain, Gopal Lal 1985 Rural development Mangaldeep Publication, Jaipur
9. Joshi R P., and S. Narawam 1985 Panchayat Raj in India : Emerging Trends across the States Rawat, Jaipur
10. Singh, Katar 1995 Rural development: Principle policies and Management Sage, New Delhi

(SOC-8) Globalization and Society

Globalisation is the dominant process of social change in the contemporary world. It has resulted in the sinking of time and space and collapse of borders. It is a new coinage for an old process. It has its own dimensions, distinct features and impacts on society. It has given birth to new role players. All these are the focal points of discussion of this paper.

Objectives: Bygoing through this paper, the student can

- Collect information about the meaning and nature of this process, its historical mooring.
- Amass knowledge about its dimensions and impacts, both positive and negative.
- Get introduced to the agencies that manage the process.

Expected Outcomes: This paper is expected to acquaint the student with an ongoing social process bringing tremendous changes in the nations.

Unit-1 : Meaning and characteristics of Globalization. Historical context, Liberalization, Privatization and Globalization.

Unit-2: Dimensions of Contemporary Globalization: Economic, Technological, Political and Cultural.

Unit-3: Consequences of Globalization: Rising Inequality, Environmental impact, Consumerism, Health and Security. Emergence of Anti-Globalization movements.

Unit-4 Globalisation and Indian Society: Understanding the concepts of liberalization, privatization and globalization in the Indian context; Growth of information technology and communication and its impact manifested in everyday life

Unit-5 Impact of globalisation on Religion, Culture, Education, Family, Marriage, Women, Tribes

Essential Readings:

1. Appadurai, Arjun 1996, Modernity at Large, University of Minnesota Press
2. Applebaum, R. and Robinson, W., 2005, Critical Global Studies, Routledge, New York.
3. Bremen, Yan, 1993, Footlose Labour, Cambridge University Press, Cambridge
4. Browning, Halcli, Webster(ed), 1996, Understanding contemporary society: Theories of the present, SAGE Publications, London
5. Cohen Robin and Shirin M.(ed), Global Social Movements, The Athlone Press, London
6. Dubhashi P.R., 2002, Peoples Movement against Global Capitalism : EPW Feb.9

7. Giddens, Anthony, 2000, Runaway World : How globalization is reshaping our lives, Routledge, New York.
8. Jha, Avinash, 2000, Background to Globalization, Centre for Education and Documentation, Mumbai
9. Chander Sekhran Bal krishnana - Impact of Globalization on developing countries and India.
10. C, Rangarajan, 2002 Globalization and its impact

(SOC-9) Marriage, Family and Kinship

This course provides a brief account of the classical approaches to the study of family and kinship. It exposes the students to the distinct aspects of these three interrelated institutions in the Indian context. Finally, it discusses some contemporary issues that pose a challenge to the normative model of these institutions.

Objectives:Bygoing through this paper, the student can

- Understand the three institutions that are the foundations of the society.
- Comprehend the theoretical perspectives on these institutions.
- Get to know the rules governing these institutions.
- Estimate the changes coming over these institutions with the process of social change.

Expected Outcomes:This paper is expected to instill knowledge about the foundational institutions, their governing principles and the continuity and change features of these institutions.

Unit-1: Theoretical Perspectives:Overview of theoretical developments Descent theory ,Alliance theory ,Recent theorizations and their implications

Unit-2: Marriage: Marriage as social Institutions, Functions of Marriage. Rules of Marriage: Endogamy, Exogamy; Monogamy and Polygamy; Levirate and Sororate; Hypogamy and Hypergamy. Dowry and Bride Price.

Unit-3: The Family: Types of Family on the basis of Rules of Authority, Descent and Residence. Functions of Family. Contemporary changes and problems: Divorce and Family Disintegration.

Unit-4:Contemporary Issues: Changing demographic patterns Migration, Diasporas and Impact on Family Implications of new reproductive technologies Domestic violence Challenges to the normative model of family

Unit-5 : The Kinship and Clan System: Meaning and Definition of Kinship and Clan. Types. Clan, Family, Lineage and Totemism and Taboos.

Essential Readings:

- 1.Fox Robin 1967 Kinship and Marriage: An Anthropological Perspective, Pelican.
- 2.Parkin, Robert 1997 Kinship: An Introduction to Basic Concepts, Blackwell, Oxford.
- 3.Parkin, Robert and Linda Stone(ed.) (2004) Kinship and Family : An

Anthropological Reader, Blackwell Publishing, USA.

4. Patel, Tulsi (ed.) (2005) The Family in India : Structure and Practice, Sage Publications, New Delhi.

5. Uberoi, Patricia(ed.) (1993) Family, Kinship and Marriage in India, Oxford University Press, Delhi

(SOC-10) Social Disorganization and Deviance

No society is fully organized in character. Disorganization is apt to occur from time to time. Disorganization is a manifestation of the deviant behavior found among some individuals. This deviance occurs when the individuals feel that the normative order of the society and its institutions are not need fulfilling in character. This present paper makes an attempt to provide an impression about the scenario of disorganization, its forms, causes and consequences with the theories explaining the situation.

Objectives: After going through this paper, the student can

- Understand the meaning, causes, consequences and forms of social disorganization.
- Learn about the theories explaining the disorganization situations.
- Comprehend the concept of crime and the existing theories of punishment.

Learning Outcomes: This paper is designed with an expectation to impress upon a student the concept of deviant behavior leading to social disorganization, forms, theoretical foundations and criminal activities which he encounters in real life situations.

Unit-1 : Social Disorganization: Meaning and Nature. Family Disorganization and Personality Disorganization Causes and Consequences.

Unit- 2: Theories of Deviant Behaviour : Contributions of Durkheim and Merton. Ecological theory, Delinquent Sub-Culture theory, Differential Association theory, Differential Opportunity theory.

Unit- 3 : Crime and Punishment : Concepts of Crime and Delinquency. Causes and consequences. Theories of Punishment: Retributive, Deterrant,Reformative.

Unit-4: Social Problems: Poverty, Unemployment, Alcholism, Indebtedness,Terrorism

Unit-5 Atrocities against women, Domestic violence, Dowry, Divorce

Essential Readings:

1. Mamoria, C.B.,1981 Social Problems and Social Disorganization in India
2. Carrabine;Eamonn,Iganski,Paul,Lee ,Maggy,Plummer Ken,South,Nigel(2004)[Criminology: A Sociological Introduction](#)
3. [Sutherland](#), Edwin Hardin Sutherland(1949) White Collar Crime, Dryden Press
4. Ahuja, Ram(2012) Social problems in India,Rawat
5. Chakraborty, Dipangshu(1999) Atrocities on Indian Women, APH

(SOC-11) Political Sociology

Polity constitutes a vital part of every society. It helps in the system of governance. But the social variables to a great extent determine the course of polity. They decide and detect the system of governance, distribution of power, political institutions like parties and pressure groups, nature of political participation, political socialization. In the same vein, the political institutions, political processes, political culture influence the society and the course of its progress. The present paper highlights the close nexus between society and polity and how dynamism in one brings dynamism in the other.

Objectives: After going through this paper, the student can

- Comprehend the existing forms of states and their relative merits and demerits.
- Differentiate between power, authority and influence which guide and govern the political processes.
- Get to know about the political processes, participation types and determinants and the political institutions.

Learning Outcomes: The very aim of this paper is to generate an insight in the student about the political institutions, political processes, political culture he/she encounters in his/her daily life as a member of the society.

Unit-1 State: Characteristics, Aristotle's classification of types of state: Theological, Monarchical, Aristocratic, Democratic and Totalitarian forms.

Unit-2 Influence, Power and Authority: Meaning and types of influence, characteristics of Power, distribution of power: the Constant sum and the Variable sum approach to power, theories of political elites, authority: Weberian classification of authority, different ways of acquiring legitimacy.

Unit-3 Political culture and political socialization: Meaning and dimensions of political culture, meaning and types of political socialization agencies of political socialization and their role.

Unit-4 Political participation: meaning and types of political participation, political apathy – reasons for political apathy, Determinants of political participation – psychological, social and political.

Unit-5 Political parties and pressure groups: Political parties – features and functions, structures of political parties; meaning of pressure groups and their relationship with political parties, types of pressure groups and their role.

Reference:

1. A.K. Mukhopadhyay 1980 Political Sociology, K.P. Begchi & Company. Calcutta, 1980
2. Ali Ashaf and Sharma B.N. 2001 Political Sociology, University Press, Hyderabad
3. Bhattacharya, D.C. Political Sociology
4. Baral, J.K. Political Sociology
5. T. Bottomore, Political Sociology, Blackie & Sons, Bombay, 1975
6. Lipset S.M. Modern Political Analysis, Printice Hall, New Delhi 1983
7. Dhal, Robert A, Who Governs

(SOC-12)Environment and Society

Environment and society are in constant interaction with each other. It is the environment which sustains life in society and it is the society that is responsible for the preservation and the degradation of the environment. In the recent years environmental challenges have posed a threat to the lives on the planet. Keeping this in view, the present paper tries to create awareness among the students about the major environmental issues and the efforts geared to tackle them.

Objectives: After going through this paper, the student can

- Derive knowledge about the close interaction between society and environment.
- Gain substantial idea about the environmental issues and their repercussions on humanity.
- Accumulate ideas about the ideological currents, issues that drive environment movements.
- Get aware about the global and national efforts to conserve environment.

Learning Outcomes:The very aim of this paper is to disseminate knowledge about the significance of environment for society, to change the practices that can protect and preserve the environment and to make the students participate in the mission to preserve, protect and promote the cause of environment.

UNIT – I Environment and its Concepts: Ecology, Eco-system, Environment and Society – their inter-relations; Eco-Feminism

UNIT – 2 Environmental Issues: Sustainable Development, Industrialization and Development, Urbanization and Development, Environmental Degradation

UNIT – 3 Environmental Movements: Chipko Movement, Narmada Bachao Andolan, Ganga Bachao Abhiyan; The Silent valley movement, Forest Rights.

UNIT – 4 Contemporary Environmental Problems: Problems of Water, Deforestation, Urban Wastes, Slums, Global-Warming and Climate Change.

Unit-5 Environment protection efforts at the global level and the national level in India.

Essential Readings:

1. Albrow, Martin & Elizabeth King (Ed.)1990, Globalisation, Knowledge and Society, Sage: London
2. Baviskar. Amita 1995, In the Valley of the River: Tribal Conflict over Development in the Narmada Valley, Delhi: OUP.
3. Bhatt, Anil 1989 Development and Social Justice: Micro Action by Weaker Section, Sage: New Delhi.
4. Chauhan, I.S 1998, Environmental Degradation, Delhi: Rawat Publications.
5. Desh Bandhu and Garg, R.K.(eds) 1986 Social Forestry and Tribal Development, Dehradun: Natraj Publishers.
6. Dubey, S.M. and Murdia, Ratno(ed)1980 Land Alienation and Restoration in Tribal Communities in India, Bombay: Himalaya Publishing House.
7. Gadgil, Madhav & Ram Chandra. Guha 1996 Ecology and Equity: The use and Abuse of Nature in contemporary India:: New Delhi: OUP.
8. Ghai, Dharam (ed) 1994 Development and Environment: Sustaining People

and Nature. UNRISD: Blackwell Publication.

9. Giddens, Anthony 1996 "Global Problems and Ecological Crisis", 2nd edition New York:W.W.Norton and Co.
10. Guha, Ramechandra 1995 The Unquiet Woods: Ecological Change and Peasant Resistance in the Himalaya, OUP: Delhi.
11. Mehta S.R. (ed) 1997 Poverty, Population and Sustainable Development, New Delhi: Rawat Publications.
12. Plumwood, Val 1992 Gender and Ecology: Feminism and Making of Nature, London: Routledge.

(SOC-13)Urban Sociology

Urbanisation is an important social process that changed the face of human civilization. It was initiated with the process of modernization, transport revolution, coming up of river valley civilizations, establishment of trade links and industrial revolution. Urbanisation has brought both prosperity and problems. It is one of the earnest tasks of Sociology to trace out the evolution of the process, social; problems associated with it and policy planning and measures undertaken to overcome these challenges. This paper Urban Sociology concentrates upon these tasks.

Objectives: After going through this paper, the student can

- Understand the specific traits of urban areas, its historical patterns of growth.
- Develop knowledge about urban social institutions and problems
- Gain insight into urban development plans, programmes and efforts.

Learning Outcomes:The very aim of this paper is to acquaint the students with the process of urbanization, to give an impression about the pattern of evolution of cities, urban institutions, their contrasts with rural institutions, urban problems and the responses developed to arrest them.

Unit-1 Meaning, Nature, Scope and importance of Urban Sociology, Rural Urban Differences: Specific traits of rural world vs. urban world- Socio-cultural differences ,urbanization,Urbanism as a way of life.

Unit-2 Theories of patterns of city growth: Concentric zone theory- Sector model- Multiple nuclei theory.

Unit-3 Social institutions of Indian urban communities: Family, marriage and kinships in urban India – Caste in urban India – Urban politics and urban economy

Unit-4 Urban social problems: Crime and Juvenile delinquency, Slums, Beggary , Prostitution

Unit-5 Urban development in Indian plans, Urban development programmes, Slum development programmes, Urban Basic Services

Essential readings:

1. Lin, Jan and Mele Christopher (edt.)2012The Urban Sociology Reader,

- Routledge
2. Flanagan, W.,1993 *Contemporary Urban Sociology* Cambridge: University of Cambridge
 3. Patel Sujata and Deb, Kushal(edt.) *Urban Studies*
 4. Rao,M.S.A.1992*Urban Sociology in India*
 5. Ramachandran,R 1997 Oxford University Press
 6. Jayapalan, N 2002 *Urban Sociology*,Atlantic Publishers
 7. Wilson, Robert,A Schultz,David, A1978 *Urban Sociology*, prentice Hall

(SOC-14)

Practical: Field Work and Dissertation

(Dissertation: 80 marks and Viva-voce: 20 marks)

- Dissertation may be written on any social institution, problem or may be an evaluative study.
- It should be based on empirical study.
- Size of the dissertation should be around 5000 words.
- Dissertation paper will be examined jointly by one Internal and one External Examiner to be appointed by the University. Marks will be awarded jointly by the Internal and External Examiners on the basis of the written Dissertation and Viva-voce.

(SOC-DSE-1)

Sociology of Movements

Movements reflect the voices raised against the prevailing practices of a society. Every society witnesses social movement in some form or the other. Movements bring social change and transformation. It is a collective effort that is driven by particular issues and brings forth changes. The present paper tries to provide a rudimentary impression to the students about the concept, nature and types of movements with a thrust on the movements witnessed by Indian society.

Objectives:

- To introduce to the students with the concept of social movements and their dynamics.
- To introduce the students to the role of social movements in social transformation .
- To help them understand the various approaches to the study of social movements.

Learning Outcomes:The very aim of this paper is to disseminate knowledge about the concept of social movements and its process and change making role in the society.

**Unit:1Social Movements:Nature, Definitions, Characteristics of social movement ,types: Revolutionary, Reform, Revival, Counter movements
Basis of social movements: Leadership, ideology, resource**

**Unit-2 Religious movements in India: The SNDP Movements in Kerala
The Brahmo Samaj and The Arya Samaj**

**Unit-3 Peasants Movements in India: The Champaran Satyagraha
(1917), The Kheda Peasant Struggle, The Bardoli Movement in Gujarat.
The Peasant Revolt in Telangana ,The Tebhaga Movement in Bengal.**

**Unit-4 Backward Class Movements in India: Mahar Movement in
Maharashtra, Dalit Movement in Tamil Nadu, The Non Brahmin
Movement in Tamil Nadu**

**Unit-5 Women's Movements in India: In the Pre independence era and
the post independence period**

Essential readings:

1. Foweraker Joe, 1995 Theorising Social Movements, Pluto Press, London,
2. Buechler, S. 1997 'New Social Movement Theories' in Buechler, S. and Cylke, F.K., Jr. (eds.) Social Movements: Perspectives and Issues. Mountain View: Mayfield Publishing Company
3. Rao, M.S.A. ed. 1979 Social Movements in India Vol. I and II, Manohar, New Delhi
4. Dhanagare, D.N. 1983 Peasant Movements in India 1920-1950, OUP, Delhi, 1983
5. Kaur, Manmohan, 1968 "Role of Women in the Freedom Movement 1857-1947", Sterling, New Delhi
6. Basu, Aparna, 1976 "Role of Women in the Freedom Movement", in B.R. Nanda, ed, Indian Women From Purdah to Modernity, Vikas, Delhi.
7. Chattopadhyaya, Kamaladevi, 1983 "Indian Women's Battle for Freedom", Abhinav Publications, New Delhi

(SOC-DSE-2)

Industrial Sociology

Industrialisation as a social process has changed the face of humanity over the years. Industrialisation in its wake has brought several social problems and changes in social institutions, practices. The aim of this paper is to analyse the structure and process of industrial organisations from the sociological perspective. It also deals with the social effects of industrialization on Indian Social Systems and institutions.

Objectives: After going through this paper, the student can

- Understand the nature and scope of industrial sociology as a branch of Sociology.
- The developmental stages of industry.
- The organizational structure of industries and employee and employer relations in the industry.

Learning Outcomes:The very aim of this paper is to impress upon the students of sociology the role they can play in creating effective industrial relations with their knowledge of sociology.

Unit-I Introduction:

Meaning and definition of Industrial sociology. Nature and scope of Industrial Sociology. Significance of Industrial Sociology in India.

Unit-2 Social – industrial Thought:

A. Classical Theories: Adam Smith, Karl Marx, Max Weber, Durkheim and Mayo

B. Sociological Theories: Likert, Herzberg, Maslow, McClelland.

Unit-3 The Development of Industry:

The Manorial system, the Guild system, Domestic system, the Factory system. Industrial evolution in India.

Unit-4 Industrial Organisation:

Formal Organisation: Its nature and features, problems build-in in the formal organization Informal Organisation: Origin and function of informal organization. Informal Organisation of Management.

Unit-5 Industrial and Labour Relations:

Industrial Relations, International Labour Organisation, Labour Legislation, Industrial Relations in India. Industrial Disputes/conflicts.

Workers' participation in Management (WPM): Industrial Democracy: Levels of participation of WPM: Objectives, WPM Models in India.

Reference:

1. Gisbert, Pascal, 1972 Fundamentals of Industrial Sociology, New Delhi, Tata McGraw Hill
2. Davis, Keith, 1984 Human Behaviour at work, New Delhi, McGraw Hill
3. Ramaswamy, E.A. 1978 Industrial Relations in India, Delhi, MacMillan
4. Schneider, Eugene 1971 Industrial Sociology, McGraw Hill- London

(SOC-DSE-3)

Population Studies

Demography is both an index and instrument of development and change. India as a country is plagued by population explosion which retards, the economy and blocks social progress. Irrespective of several positive attempts undertaken by the government, India has failed to control its population problem. This paper is designed to provide an idea to the students about population dynamics and its impact on society.

Objectives: After going through this paper, the student can

- Understand the various facets of population studies and the theories that depict population change.
- Develop specific idea on Indian population structure, policies adopted and programmes launched in the country to check population.
- Assess the role of various agencies in population control.

Learning Outcomes:The very aim of this paper is to acquaint the students with a perennial problem of the Indian society that is population growth and the measures introduced to control it.

Fertility, Mortality and Migration

UNIT – 2 Population Theories: Malthusian, Demographic Transition and Optimum

Population Theory

UNIT – 3 Population Compositions in India: Age Structure, Sex-Ratio, Rural-Urban Composition, Literacy in India

UNIT – 4 Population Planning and Policies: Needs and Objectives; Population Policy of India, National Rural Health Mission

Unit-5 Population Control: Role of technology, women's empowerment, voluntary organisations

Essential Readings:

1. Agarwal, S.N. 1989 Population Studies with Special Reference to India, New Delhi: Lok Surjeet Publication.
2. Bose, Ashish 1991 Demographic Diversity in India, Delhi: B.R.Publishing Corporation.
3. Banarjee, D. 1985 Health and Family Planning Services in India, New Delhi: Lok Parkshan.
4. Chandrasekhar, S. (ed.) 1974 Infant Mortality, Population Growth and Family Planning in India, London: George Alen and Unwin Ltd.
5. Dubey, Surendra Nath 2001 Population of India, Delhi: Authors Press.
6. Kohli, S. 1977 Family Planning in India, New Delhi.
7. Malthus, T.R. 1986 An Essay on the Principle of Population, London: William Pickering.
8. Premi, M.K. 2004 Social Demography, Delhi: Jawahar Publishers and Distributors.
9. Sharma, Rajendra 1997 Demography and Population Problems, New Delhi: Atlantic Publishers.
10. Srivastava, O.S. 1998 Demography and Population Studies, New Delhi: Vikas Publishing House.
11. National Rural Health Mission 2006 Govt. of India, New Delhi.

(SOC-DSE-4)

Sociology of Social Institutions

Social institutions play a significant role in the functioning of a society by regulating the activities of the individuals and fulfilling their needs. Though they are universal to every society, they are not uniform in their characteristics and in terms of the norms they prescribe. They vary from society to society and across cultures. The present paper is designed to introduce to the students the basic social institutions which are fundamental to the lives of the people and significant to the functioning of the society.

Objectives: After going through this paper, the student can

- Understand the basic institutions which are vital to the functioning of the society.
- Learn the variations in the structure and functioning of these institutions across time and societies.
- Get an idea about the emerging features of these institutions.

Learning Outcomes: The very aim of this paper is to impress upon the students the vital role played by the institutions in social life, their typologies and changing features and functions.

Unit-1 Community, Groups, Institutions and Organizations.

Unit-2 Family, Marriage and Kinship: Key concepts; Different forms of family and marriage; Changes in family pattern worldwide; Importance of Kinship.

Unit-3 Religion : Defining religion; Varieties of religion; Theories of religion.

Unit-4 Education : The development of literacy and schooling; Gender and the education system; Education and ethnicity; Theories of schooling; Education and cultural reproduction; Education and inequality

Unit-5 Economy : Importance of work; Organisation of work; Work and technology; Formal Economy and Informal Economy; Market and Society.

Polity: Modern State; Concepts of Power and Authority; Forms of social distribution of power : Marxist, Elitist, Pluralist

Essential readings:

1. Ken Browne : An Introduction to Sociology ,Polity, 3rd ed.
2. Anthony Giddens : Sociology (4th ed) : Human Societies
3. Bilton and others : Introductory Sociology ,Macmillan
4. G. Rocher : A General Introduction to Sociology
5. P. Worsely : New Introducing Sociology
6. Smelser, Neil.J Sociology
7. S.K.Pramanik & R.Ganguly(eds) : Globalization in India ,PHI Learning

(SOC-GE-1)

Introduction to Sociology

This introductory paper intends to acquaint the students with Sociology as a social science and the basic concepts used in the discipline. It also focuses on the social processes and the social institutions that man encounters as a member of the society.

Objectives: After studying these two papers, the student can

- Can get to know the convergence and divergence of Sociology with other social science disciplines in terms of the subject matter, nature and scope of the discipline and its approach.
- Develop knowledge about its historicity.
- Can get acquainted with the basic concepts used in the subject.
- Can generate ideas about the social processes and social institutions man encounters as a member of the society.

Learning Outcomes:This paper is expected to clarify and broaden the student's notion about the subject, the basic concepts used and some universal societal processes. This will provide a wholesome picture about what the subject is all about.

Unit-1: Sociology: Definition and Subject matter, Nature and Scope, Emergence of Sociology, Sociology and its relationship with Anthropology, Political Science, Economics, and History

Unit-2: Basic Concepts: Society, Culture, Community, Institutions, Association, Social Structure, Status and Role, Norms and Values, Folkways and Mores, Associative and Dissociative processes – Cooperation, Assimilation, Accommodation, Competition, and conflict

Unit-3 : Individual and Society : Individual and society, Socialization, Stages and Agencies of Socialization, Development of Self – Contributions of George Herbert Mead, C.H. Cooley's Looking Glass Self The Concept of Group : Types of Groups – Primary and Secondary groups, In-Group and Out-group, Reference Group

Unit-4: Social Stratification: Meaning and definition, Dimensions of Stratification, Theories of Stratification – Functionalist, Marxist, Weberian. Social mobility and its determinants.

Unit-5: Social Control: Meaning and types, Formal and Informal social control, Agencies of Social control

Essential readings:

1. Bottomore. T.B. 1972, Sociology: A guide to problems and literature. Bombay :George Allen and Unwin (India)
2. Harlambos, M.1998. Sociology: Themes and perspectives. New Delhi Oxford University Press
3. Inkeles, Alex, 1987. What is Sociology? New Delhi: Prentice-Hall of India
4. Jaikam, No. 1988 . What is Sociology .Madras:Macmillan, India :
5. Johnson, Harry M. 1995. Sociology: A Systematic Introduction. New Delhi , Allied Publishers
6. Schaefer, Richard T. and Robert P. Lamm. 1999 Sociology. New Delhi Tata-Mac Graw Hill.

(SOC-GE-2) **Indian Society**

Every society has its own peculiar structure and there are some institutions universal to every society, but with their unique manifestations in each society. There are some change agents and initiatives that enable the society to change with the passage of time. This paper focuses on the structure of the Indian society and the changing aspects with the processes operating, change agents and initiatives.

Objectives: After studying these two papers on Indian society, the student can

- Get an impression about the basic composition of Indian society, its historical moorings, basic philosophical foundations of the society and the institutions.
- Learn about the changing institutions, the processes, the agents and the interventions that bring about change in the Indian society.

Learning Outcomes: This paper is expected to bring familiarity in a student about Indian society. It will present a comprehensive, integrated and empirically –based profile of Indian society. It is hoped that the structure and processes operative in the society, the change agents operating in Indian society presented in this course will also enable students to gain a better understanding of their own situation and region.

Unit-1 : Composition of Indian Society : Caste, Tribe, Religion, Language. Unity in Diversities, Threats to national integration

Unit-2 Hindu Social Organisation: Bases of Hindu Social Organization, Varna, Ashrama and Purushartha. Doctrine of Karma.

Unit-3 : Marriage and Family in India: Hindu marriage as Sacrament, Forms of Hindu Marriage. The Hindu joint family: Patriarchal and Matriarchal systems. Marriage and family among the Muslims. Changes in the institutions of Marriage and Family.

Unit-4 : The Caste system in India: Origin, Features and Functions. Caste and Class, The Dominant Caste, Changes in Caste system, Caste and Politics in India Constitutional and legal provisions for the Scheduled Castes, Scheduled Tribes.

**Unit-5 : Social Change in Modern India :
Sanskritization, Westernization, Secularization,
and Modernization**

Essential readings:

11. Bose, N.K. 1967, Culture and Society in India. Bombay :

Asia Publishing House

12. Bose, N.K. 1975, Structure of Hindu Society. New Delhi
13. Dube, S.C. 1990, Society in India.(New Delhi: National Book Trust.)
14. Dube, S.C. 1995, Indian Village (London : Routledge)
15. Dube, S.C. 1958: India's changing Villages (London: Routledge and Kegan Paul).
16. Karve, Irawati, 1961 : Hindu Society : An Interpretation(Poona : Deccan- College) :: Lannoy,
17. Mandelbaum, D.G. 1970 : Society in India (Bombay: Popular Prakashan)
18. Srinivas, M.N. 1980 : India: Social Structure (New Delhi: Hindustan - Publishing Corporation)
19. Srinivas, M.N. 1963: Social Change in Modern India (California, Berkeley: University of California Press).
20. Singh, Yogendra, 1973: Modernization of Indian Tradition (Delhi: Thomson Press).

(SOC-GE-3)

Sociological Thought

Sociology originated as an intellectual response to the crisis confronting the mid nineteenth century European society. Its development over two centuries has been influenced by a variety of socio-economic and political conditions. It is now established as a multi-paradigmatic academic discipline, with its body of theoretical knowledge enriched and its methodological techniques and procedures systemized. This paper is intended to familiarize the students with the social, political, economic and intellectual contexts in which sociology emerged as a distinctive discipline. It deals with the contributions of the forerunners of the discipline and with the contributions of the founders who gave a systematic shape to the subject.

Objectives: After going through these two papers, the student can

- Gain an understanding of some of the classical contributions in Sociology, and their contemporary relevance.
- Learn about the methodological shift in the discipline over the years.

Learning Outcomes:This paper is expected to clarify and broaden the student's knowledge about the theoretical and methodological contributions of the classical contributors to the subject and the contemporary relevance of these theories.

Unit-1 : Auguste Comte : Law of the Three Stages, Hierarchy of

Sciences, Positivism Unit-2 : Herbert Spencer : Organismic

Analogy, Theory of Social Evolution

Unit-3 : Karl Marx : Dialectical Materialism, Class struggle, Alienation, Sociology of Capitalism

Unit-4 : Emile Durkheim : Division of Labour in Society, Rules of Sociological Method, Theory of Suicide.

Unit-5 : Max Weber : Social Action, Protestant ethic and the spirit of capitalism, Ideal type, Bureaucracy, Authority

Essential readings:

1. Aron, Ramond. 1967(1982 reprint) Main currents in sociological thoughts (2 volumes). Harmondsworth, Middlesex: Penguin Books
2. Barnes, H.E. 1959. Introduction to the history to the sociology The University of Chicago press
3. Coser, Lewis A. 1979. Masters of Sociological Thought. New York : Harcourt Brance Jovanovich
4. Fletcher, Ronald. 1994.The Making of Sociology (2 volumes) Jaipur-Rawat
5. Morrison, Ken.1995 Marx, Durkheim, Weber: Formation of Modern Social Thought. London; sage
6. Ritzer, George. 1996. Sociological Theory New Delhi. Tata-McGraw Hill
7. Singh, Yogendra. 1986 Indian Sociology: social conditioning and emerging Trends. New Delhi: Vistaar
8. Zeitlin, Irving.1998 (Indian Edition). Rethinking Sociology: A critique of Contemporary Theory. Jaipur: Rawat.

(SOC-GE-4)

Social Change and Development

Change is the law of nature and every society is subject to change. Social change has always been a central concern of Sociological study. Change takes different forms. Change has its pattern which is spelt out by various theories. Change is often propelled by various factors. This paper is designed to provide some ideas to the student about such process, theories and factors.

Objectives: After going through this paper, the student can

- Derive knowledge about the meaning, nature, forms and patterns of

change.

- Get an idea about the theories that explain change and their adequacy in explaining so.
- Get an impression about the factors that propel change in the society.

Learning Outcomes: This paper is expected to provide a wholesome idea to the students about the process of social change. They can relate their experience with the theoretical explanations.

Unit-1 : Social Change : Meaning and nature. Social Progress, Evolution and Development.

Unit-2 : Theories of Social Change : Evolutionary theory, Cyclical theory, Conflict Theory, Functionalist theory.

Unit-3 : Factors of Social Change: Cultural, Economic, Technological, Ideological, Demographic

Unit-4 : Economic Growth and Social Development : Indicators of Social Development, Human Development Index, Gender Development Index

Unit-5 : Models of Development : Capitalist, Socialist, and Gandhian.

Essential readings:

1. Moore, W.E. 1965 Social Change, Prentice-Hall of India. New Delhi
2. Gandhi M.K., Hind Swaraj
3. Schumacher, E.F., Small is Beautiful
4. Narain, Shreeman, Principles of Gandhian Planning
5. Mishra, B., Capitalism, Socialism and Planning.
6. UNDP, Human Development Report

 Skill Development
 Employability
 Entrepreneurship
 All the three
 Skill Development and Employability
 Skill Development and Entrepreneurship
 Employability and Entrepreneurship

UTKAL UNIVERSITY

REGULATIONS & SYLLABUS UNDER GRADUATE PROGRAMME IN BACHELOR OF SCIENCE

(HONOURS & PASS)- CBCS PATTERN Effective from Admission Batch: 2018 - 2019

(Applicable to Autonomous Colleges)

REGULATIONS

1. Eligibility

- 1.1 Higher Secondary/+2/ Senior Secondary or any other equivalent examination passed from any Board/Council established by the Govt. of India or any State Govt. or any other equivalent examination recognized by Central Board of Secondary Education/Council of Higher Secondary Education, Govt. of Odisha/Dept of Higher Education/Dept. of Industry or any other Dept of Govt. of Odisha or Utkal University. Those joining B.Sc. Programme must have passed the above examination under the faculty of Science/Technology/Engineering/Pharmacy etc. There shall be no such restriction for joining BA/ B.Com stream.
- 1.2 Students ordinarily may be selected for admission through Entrance Test, Group Discussion and Personal Interview and/or a combination of these with due weighage to career to bedecided by the Autonomous College or Director, Higher Education. DDCE would admit students on first come first serve basis. The Govt. of Odisha may lay down admission process forcolleges under its control.
- 1.3 Admission Policy would be decided by the Academic Council of the respective Autonomous Colleges and for affiliated colleges Government will decide the admission policy.
- 1.4. Directorate of Distance & Continuing Education would decide its own admission policy.

2. Duration

- 2.1 At least three years of six semesters in toto. In case of professional courses the duration may be more as per the direction of regulatory bodies established under Law.
- 2.2 Odd semester is from June to December (i.e., Sem.-I, Sem.-III & Sem.-V semester). The examination shall be held normally in the month of November - December.
- 2.3 Even semester is from January to June (i.e., Sem.-II, Sem.-IV & Sem.-VI semester). The examination shall be held normally in the month of May - June. However the FinalSemester shall be conducted in April and result shall be published by end of May.
- 2.4 A student would be required to complete the course within six academic years from the date of admission.
- 2.5 A student may opt for fast track of completing all the six semesters in two years provided she/he has at least 2(two) years industry/organizational experience after +2. Such permission would be granted at the discretion of the Principal of the Autonomous Colleges and DDCE. This clause shall not be applicable to affiliated, non autonomous colleges.

3. Compulsory Registration in Semester-I

- 3.1 Registration for Semester-I is compulsory. A candidate admitted to +3 Courses but not registered for 1st semester examination, his/her admission will be automaticallycancelled.
- 3.2 A candidate may take a blank Semester: A blank Semester has to be clubbed with next Odd or Even Semester as the case may be i.e. Sem.-II, Sem.-IV and Sem.-VI/Sem.-I, Sem.-III and Sem.-V. The Hostel policy for blank semester is to be decided by colleges as per their suitability. Hostel accommodation cannot be claimed as a right for a blank semester. (Blank semester is not to be confused as repetition due to failure).
- 3.3 75% attendance for non DDCE students is a requirement for being eligible to appear at

Examination Up to 15% waiver may be granted by the College Principal at discretion on Health Ground or participation in sports, cultural activities, NCC and NSS activities etc.

3.4 A student may clear backlog papers within 6 years. Improvement if any has to be completed within 4 years.

3.5 A student may register for extra credit i.e. register for additional papers under the same faculty or outside the faculty under an autonomous college or DDCE provided they are in a position to facilitate such teaching.

4. Weightage Distribution (Percentage) for Evaluation

• Theory Subjects

Mid Term Test-I	Mid Term Test-II	End Term Test	Total
10	10	80	100

• Subjects with Practical

Unit Test-I	Unit Test-II	End Term Test	Total
		A-Theory B-Practical	
10	10	A-50 B-30(20+10-Record)	100

• Dissertation/Project Work

Identification of problem	Review of Literature	Methodology	Findings	Analysis	Viva-Voce	Total
10	10	10	25	25	20	100

Note: For the DDCE unit tests, quizzes, presentation, seminar etc. may not be introduced immediately.

5. Grading System

5.1

<u>Grade</u>		<u>Marks secured out of 100</u>	<u>Grade points</u>
Outstanding	^J O ^J	90 – 100	10
Excellent	^J A ⁺ ^J	80 – 89	9
Very Good	^J A ^J	70 – 79	8
Good	^J B ⁺ ^J	60 – 69	7
Above average	<i>B</i>	50 – 59	6
Fair	^J C ^J	40 – 49	5
Pass	^J D ^J	30 – 39	4
Failed	^J F ^J	Below 30	0

NOTE:

- A Candidate has to secure 30% or above to pass in each of the Papers.

- The candidate obtaining Grade-*F* is considered failed and will be required to clear the back paper(s) in the subsequent examinations within the stipulated time.
- The candidate securing Grade-*B* and above in Core/Honours papers in aggregate will be awarded Honours.
- The candidate securing Grade-*B +* and above in aggregate in first appearance will be awarded Honours with Distinction/Distinction(for pass/regular course).
- Any candidate filling the forms for appearing in back papers/improvement shall not be awarded Distinction.

5.2 A transitory letter Grade-I (carrying points 2) shall be introduced for cases where the results are incomplete. This grade shall automatically be converted into appropriate grade(s) as and when the results are complete.

5.3 A student's level of competence shall be categorized by a **GRADE POINT AVERAGE**

to be specified as:

SGPA: Semester Grade Point Average CGPA:

Cumulative Grade Point Average

(a) **POINT:** Integer equivalent of each letter grade.

(b) **CREDIT:** Integer signifying the relative emphasis of individual course item(s) in a semester as indicated by the Course structure and syllabus.

CREDIT POINT: $(b) \times (a)$ for each course item.

CREDIT INDEX: \sum CREDIT POINT of course items.

$$\text{GRADE POINT AVERAGE: } \frac{\text{CREDIT INDEX}}{\sum \text{CREDIT}} \quad \frac{\text{CREDIT INDEX for a semester}}{\sum \text{CREDIT}}$$

SEMESTER GRADE POINT AVERAGE(SGPA)=

CUMULATIVE GRADE POINT AVERAGE(CGPA)

$$= \frac{\text{CREDIT INDEX of all previous Semester up to the 6th semester}}{\sum \text{CREDIT}}.$$

5.4 In addition to the points marks/ percentage would also be awarded and shall also be reflected in the Mark Sheet.

5.5 The details of grading system shall be printed on the backside of University Mark-sheet.

6. Repeat Examination

6.1 A student has to clear back papers (i.e., in the paper/papers one has failed) by appearing at subsequent semester examinations within six years from the date of admission.

6.2 A student may appear improvement (repeat) in any number of papers in the immediate subsequent examination. The higher marks shall be retained.

6.3 Improvement has to be completed with 4-yrs. from the date of admission.

7. Hard case Rule

7.1 2% of grace mark on the aggregate mark subject to maximum of 5(five) marks in single paper shall be given. This shall be applicable in each semester.

7.2 0.5(point five percent) grace mark can be given for award of B Grade in each semester provided grace mark under 7.1 has not been awarded.

8. Examination Question Pattern(Suggestive)

8.1 The end semester examination will be of three hours irrespective of marks.

8.2 **For subject without having practical** full marks are 100 per paper out of which 20 marks is allotted for Mid-Semester Examination (Internal) and 80 marks for end semester examination. The question papers shall be divided into two parts such as Group-A & Group-B. Group-A will carry 10 short questions of two marks each. The answer should be within two sentences.

There shall be 5 long type questions in Group-B with one alternative each have to be attempted and all questions shall be of equal value (12 marks ×5).

For subject with practical full marks are 100 per paper out of which 20 marks is allotted for Mid-Semester Examination, 50 is for End Semester Examination and 30 is for practical.

The question papers shall be divided into two parts such as Group-A & Group-B.

Group-A will carry 10 short questions of one mark each. The answer should be within two sentences.

There shall be 5 long-type questions with one alternative each have to be attempted for subjects having practical. The questions shall be of equal value (8 Marks ×5).

Practical will carry 30 marks out of which 10 will be for records.

8.3 Model answers for long questions should be between 700 – 1000 words.

9. Each Department shall have a designated Teacher in-charge of Examination to be decided by the Principal in addition to the Controller of Examinations of the College (applicable to autonomous colleges).
10. The Internal Evaluation would be the sole responsibility of Teacher offering the course.
11. Suitable modifications may be made by the Autonomous Colleges keeping in view the UGC guideline for Autonomous Colleges, University guidelines from time to time and State Govt. guidelines from time to time.

12. Broad Principles of Credit Transfer

There should be a small group to consider all cases of credit transfer. The group should consist of the following:

Chairman: Chairman P.G Council (for University affiliated colleges)/Director, DDCE for DDCE/Principals of the Autonomous College/Controller of Examinations, Utkal University.

Convener: Dy. Controller of Examinations for University affiliated colleges/Faculty member of DDCE for DDCE/Controller of Examinations of respective Autonomous colleges for Autonomous colleges.

Members: Four teachers to be nominated by the Chairman, P.G. Council/Director, DDCE/Principal of Autonomous Colleges as the case may be.

Waiver for courses covered under other colleges notwithstanding differences in detailed course can be granted. Papers which one has not studied even though they are prescribed for earlier semesters can be covered by the students.

Other Broad Principles: Student transferred after Semester-I examination cannot be given position or medal under autonomous colleges. Students who have failed/remained absent/appeared for improvement shall not be eligible for University Gold medal or Rank. Students who have been granted credit waiver under credit transfer system cannot be awarded Gold medal or position.

DETAILS OF COURSES UNDER BACHELOR OF SCIENCE(HONOURS)

Course	Theory+Practical	Theory + Tutorial
I. Core Course (6 Credits) (14 Papers)	$14 \times 4 = 56$	$14 \times 5 = 70$
Core Course Practical / Tutorial* (14 Papers)	$14 \times 2 = 28$	$14 \times 1 = 14$
II. Elective Course (6 Credits) (8 Papers)		
A.1. Discipline Specific Elective (4 Papers)	$4 \times 4 = 16$	$4 \times 5 = 20$
A.2. Discipline Specific Elective (4 Papers) Practical/ Tutorial*	$4 \times 2 = 8$	$4 \times 1 = 4$
Disciplinary (4 Papers) Tutorials*(4)		
B.1. Generic Elective/Interdis- Papers)	$4 \times 4 = 16$	$4 \times 5 = 20$
B.2. Generic Elective, Practical/	$4 \times 2 = 8$	$4 \times 1 = 4$
• Optional Dissertation or Project Work in place of one Discipline Specific elective paper (6 credits) in Semester-VI.		
III. Ability Enhancement Courses		
1. Ability Enhancement Compulsory Courses(AECC) (2 Papers of 4 credit each)	$2 \times 4 = 8$	$2 \times 4 = 8$
Environmental Science/English/ Hindi/MIL Communication		
2. Skill Enhancement Courses(SEC) (Min.2)(2 Papers of 4 credit each)	$2 \times 4 = 8$	$2 \times 4 = 8$
Total Credit	148	148

- Institute should evolve a system/policy about ECA/General Interest/Hobby/Sports NCC/NSS/related courses on its own.
- Wherever there is a practical there will be no tutorial and vice-versa.
- For Generic Elective, there shall be two subjects other than the Core subject having two papers each.

SCHEME FOR CHOICE BASED CREDIT SYSTEM BACHELOR OF SCIENCE(HONOURS)

Semester	Core Course(14)	Ability Enhancement Compulsory Course (AECC)(2)	Skill Enhancement Course (SEC)(2)	Discipline Specific Elective (DSE)(4)	Generic Elective (GE)(4)
I	C-1 C-2	Environmental Science			GE-1A
II	C-3 C-4	MIL Communication (Oriya/Hindi)			GE-2A
III	C-5 C-6 C-7		SEC-1(English Communication)		GE-1B
IV	C-8 C-9 C-10		SEC-2		GE-2B
V	C-11 C-12		DSE-1 DSE-2		
VI	C-13 C-14		DSE-3 DSE-4		

DETAILS OF COURSES UNDER BACHELOR OF SCIENCE(REGULAR/PASS)

Course	Theory+Practical	Theory + Tutorial
I. Core Course (6 Credits)		
(12 Papers)	$12 \times 4 = 48$	$12 \times 5 = 60$
(4 Courses from each of the 3 Disciplines of choice)		
Core Course Practical / Tutorial*		
(12 Practical/Tutorials*)	$12 \times 2 = 24$	$12 \times 1 = 12$
(4 Courses from each of the 3 Disciplines of choice)		
II. Elective Course (6 Credits)		
(6 Papers)	$6 \times 4 = 24$	$6 \times 5 = 30$
(Two papers from each discipline of choice including paper of interdisciplinary nature)		
Elective Course Practical/Tutorials*		
(6 Practical/Tutorials*)	$6 \times 2 = 12$	$6 \times 1 = 6$
(Two Papers from each Disciplines of choice including paper of interdisciplinary nature)		
<ul style="list-style-type: none"> • Optional Dissertation/Project Work in place of one Discipline elective paper (6 credits) in Semester-VI. 		
III. Ability Enhancement Courses		
1. Ability Enhancement Compulsory Courses(AECC)		
(2 Papers of 4 credit each)	$2 \times 4 = 8$	$2 \times 4 = 8$
Environmental Science/English/ Hindi/MIL Communication		
2. Skill Enhancement Courses(SEC)		
(4 Papers of 4 credit each)	$4 \times 4 = 16$	$4 \times 4 = 16$
<hr/>		
Total Credit	132	132

- Institute should evolve a system/policy about ECA/General Interest/Hobby/Sports NCC/NSS/related courses on its own.
- Wherever there is a practical, there will be no tutorial and vice-versa.

**SCHEME FOR CHOICE BASED CREDIT SYSTEM BACHELOR OF SCIENCE
(REGULAR/ PASS)**

Semester	Core Course(12)	Ability Enhancement Compulsory Course (AECC)(2)	Skill Enhancement Course (SEC)(2)	Discipline Specific Elective (DSE)(6)
I	DSC-1A DSC-2A DSC-3A	Environmental Science		
II	DSC-1B DSC-2B DSC-3B	MIL Communication (Oriya/Hindi)		
III	DSC-1C DSC-2C DSC-3C		SEC-1(English Communication)	
IV	DSC-1D DSC-2D DSC-3D		SEC-2	
V			SEC-3	DSE-1A DSE-2A DSE-3A
VI			SEC-4	DSE-1B DSE-2B DSE-3B

**COLOUR SCHEME OF MAPPING THE SYLLABI FOR ENTREPRENEURSHIP,
EMPLOYABILITY AND SKILL DEVELOPMENT**



Skill Development



Employability



Entrepreneurship



All the three



Skill Development and Employability



Skill Development and Entrepreneurship



Employability and Entrepreneurship

**ABILITY ENHANCEMENT COMPULSORY
COURSES (AECC)
(For all Subjects)**

SEMESTER-I

AECC-I: Environmental Science

Max. Marks:100 (End-Sem.:80 Marks, Mid-Sem.: 20 Marks)

UNIT-I

The Environment: The Atmosphere, Hydrosphere, Lithosphere, Biosphere, Ecology, Ecosystem, Biogeochemical Cycle (Carbon Cycle, Nitrogen Cycle).

UNIT-II

Environment Pollution: Air Pollution, Water Pollution, Soil Pollution, Noise Pollution, Thermal Pollution, Radiation Pollution, Natural Disasters and their Management.

UNIT-III

Population Ecology: Individuals, Species, Pollution, Community, Control Methods of Population, Urbanization and its effects on Society, Communicable Diseases and its Transmission, Non-Communicable Diseases.

UNIT-IV

Environmental Movements in India: Grassroot Environmental movements in India, Role of women, Environmental Movements in Odisha, State Pollution Control Board, Central Pollution Control Board.

UNIT-V

Natural Resources: Conservation of Natural Resources, Management and Conservation of Wildlife, Soil Erosion and Conservation, Environmental Laws: Water Act, 1974, Air Act, 1981, The Wildlife (Protection) Act, 1972, Environment Protection, 1986.

SEMESTER-II

AECC-II: MIL Communication (Odia/Sanskrit/Alt. Eng.)

Max. Marks:100 (End-Sem.:80 Marks, Mid-Sem.: 20 Marks)

(Detailed syllabus for this paper is available in MIL Odia/Sanskrit/Alt. Eng Communication syllabus).

BOTANY(HONOURS)

SEMESTER-I

C-I: MICROBIOLOGY & PHYCOLOGY

(Credits-6: Theory-4, Practical-2)-Max. Marks: 100

THEORY (Each class 1 hr.): Marks-70 PRACTICAL

(Each class 2 hrs.): Marks-30 Lectures: 60 (40

Theory + 20 Practical classes)

Unit-I

Introduction to microbial world, microbial nutrition, growth and metabolism. (2 lectures)

Unit-II

Bacteria: Discovery, general characteristics, types-archaebacteria, eubacteria, wall-less forms (mycoplasma and spheroplasts), cell structure, nutritional types, reproduction-vegetative, asexual and recombina-

tion (conjugation, transformation and transduction). Economic importance of bacteria with reference to their role in agriculture and industry (fermentation and medicine). (5 lectures)

Unit-III

Algae:- General characteristics; Ecology and distribution; range of thallus organization; Cell structure and components; cell wall, pigment system, reserve food (of only groups represented in the syllabus), flagella; and methods of reproduction, classification; criteria, system of Fritsch, and evolutionary classification of Lee (only upto groups); significant contributions of important phycologists (F.E. Fritsch, G.M. Smith, R.N. Singh, T.V. Desikachary, H.D. Kumar, M.O.P. Iyengar). Role of algae in the environment, agriculture, biotechnology and industry. (6 lectures)

Unit-IV

Cyanophyta:- Ecology and occurrence, range of thallus organization, cell structure, heterocyst, reproduction. economic importance; role in biotechnology. Morphology and life-cycle of Nostoc.(5 lectures)

Chlorophyta:- General characteristics, occurrence, range of thallus organization, cell structure and reproduction. Morphology and life-cycles of Chlamydomonas, Volvox, Oedogonium, Coleochaete. Evolutionary significance of Prochloron. (5 lectures)

Unit-V

Charophyta:- General characteristics; occurrence, morphology, cell structure and life-cycle of Chara; evolutionary significance.(2 lectures)

Xanthophyta:- General characteristics; range of thallus organization; Occurrence, morphology and life-cycle of Vaucheria.(3 lectures)

Phaeophyta:- Characteristics, occurrence, range of thallus organization, cell structure and reproduction. Morphology and life-cycles of Ectocarpus and Fucus.(3 lectures)

Rhodophyta:- General characteristics, occurrence, range of thallus organization, cell structure and reproduction. Morphology and life-cycle of Polysiphonia.(4 lectures)

PRACTICAL

Microbiology:

1. Electron micrographs/Models of viruses T-Phage and TMV, Line drawings/ Photographs of Lytic and Lysogenic Cycle.
2. Types of Bacteria to be observed from temporary/permanent slides/photographs. Electron micrographs of bacteria, binary fission, endospore, conjugation, root Nodule.
3. Gram staining.
4. Endospore staining with malachite green using the (endospores taken from soil bacteria).

Phycology:

Study of vegetative and reproductive structures of Nostoc, Chlamydomonas (electron micrographs), Volvox, Oedogonium, Coleochaete, Chara, Vaucheria, Ectocarpus, Fucus and Polysiphonia, Prochloron through electron micrographs, temporary preparations and permanent slides.

Suggested Readings:

1. Lee, R.E. (2008). Phycology, Cambridge University Press, Cambridge. 4th edition.
2. Prescott, L.M., Harley J.P., Klein D. A. (2005). Microbiology, McGraw Hill, India. 6th edition.
3. Kumar, H.D. (1999). Introductory Phycology. Affiliated East-West Press, Delhi.
4. Sahoo, D. (2000). Farming the ocean: seaweeds cultivation and utilization. Aravali International, New Delhi.
5. Campbell, N.A., Reece J.B., Urry L.A., Cain M.L., Wasserman S.A. Minorsky P.V., Jackson R.B. (2008). Biology, Pearson Benjamin Cummings, USA. 8th edition.
6. Pelczar, M.J. (2001) Microbiology, 5th edition, Tata McGraw-Hill Co, New Delhi.

C-2: BIOMOLECULES & CELL BIOLOGY

(Credits-6: Theory-4, Practical-2)-Max. Marks: 100

THEORY (Each class 1 hr.): Marks-70 PRACTICAL

(Each class 2 hrs.): Marks-30 Lectures: 60 (40

Theory + 20 Practical classes)

Unit-I

Biomolecules: Types and significance of chemical bonds; Structure and properties of water; pH and buffers. (2 lectures)

Carbohydrates: Nomenclature and classification; Role of monosaccharides (glucose, fructose, sugar alcohols mannitol and sorbitol); Disaccharides (sucrose, maltose, lactose), Oligosaccharides and polysaccharides (structural-cellulose, hemicelluloses, pectin, chitin, mucilage; storage, starch, insulin) (3 lectures)

Lipids: Definition and major classes of storage and structural lipids. Storage lipids. Fatty acids

structure and functions. Essential fatty acids. Triacyl glycerols structure, functions and properties. (2 lectures)

Proteins: Structure of amino acids; Peptide bonds; Levels of protein structure-primary, secondary, tertiary and quaternary; Isoelectric point; Protein denaturation and biological roles of proteins. (2 lectures)

Nucleic acids: Structure of nitrogenous bases; Structure and function of nucleotides; Types of nucleic acids; Structure of A, B, Z types of DNA; Types of RNA; Structure of tRNA. (4 lectures) **Unit-II**

Bioenergenetics: Laws of thermodynamics, concept of free energy, endergonic and exergonic reactions, coupled reactions, redox reactions. ATP: structure, its role as a energy currency molecule. (3 lectures)

Enzymes: Structure of enzyme: holoenzyme, apoenzyme, cofactors, coenzymes and prosthetic group; Classification of enzymes; Features of active site, substrate specificity, mechanism of action (activation energy, lock and key hypothesis, induced - fit theory), Michaelis Menten equation, enzyme inhibition and factors affecting enzyme activity. (4 lectures)

Unit-III

The cell: Cell as a unit of structure and function; Characteristics of prokaryotic and eukaryotic cells; Origin of eukaryotic cell (Endosymbiotic theory). (2 lectures)

Cell wall and plasma membrane: Chemistry, structure and function of Plant Cell Wall. Overview of membrane function; fluid mosaic model; Chemical composition of membranes; Membrane transport Passive, active and facilitated transport, endocytosis and exocytosis. (3 lectures)

Unit-IV

Cell organelles: Nucleus; Structure-nuclear envelope, nuclear pore complex, nuclear lamina, molecular organization of chromatin; nucleolus. (3 lectures)

Cytoskeleton: Role and structure of microtubules, microfilaments and intermediary filament. (2 lectures)

Chloroplast, mitochondria and peroxisomes: Structural organization; Function; Semiautonomous nature of mitochondria and chloroplast. (2 lectures)

Endoplasmic Reticulum, Golgi Apparatus, Lysosomes (2 lectures)

Unit-V

Cell division: Eukaryotic cell cycle, different stages of mitosis and meiosis. Cell cycle, Regulation of cell cycle. (6 lectures)

PRACTICAL

1. Qualitative tests for carbohydrates, reducing sugars, non-reducing sugars, lipids and proteins.
2. Study of plant cell structure with the help of epidermal peel mount of Onion/Rhoeo/Crinum.
3. Demonstration of the phenomenon of protoplasmic streaming in Hydrilla leaf.
4. Measurement of cell size by the technique of micrometry.
5. Counting the cells per unit volume with the help of haemocytometer. (Yeast/pollen grains).
6. Study of cell and its organelles with the help of electron micrographs.
7. Study the phenomenon of plasmolysis and deplasmolysis.
8. Study different stages of mitosis and meiosis using aceto carmine and aceto orcin method.

Suggested Readings:

1. Campbell, MK (2012) Biochemistry, 7th ed., Published by Cengage Learning.
2. Campbell, PN and Smith AD (2011) Biochemistry Illustrated, 4th ed., Published by Churchill

Livingstone.

3. Tymoczko JL, Berg JM and Stryer L (2012) Biochemistry: A short course, 2nd ed., W.H. Freeman
4. Berg JM, Tymoczko JL and Stryer L (2011) Biochemistry, W.H. Freeman and Company
5. Nelson DL and Cox MM (2008) Lehninger Principles of Biochemistry, 5th Edition., W.H. Freeman and Company.
6. Karp, G. (2010). Cell Biology, John Wiley & Sons, U.S.A. 6th edition.
7. Hardin, J., Becker, G., Skliensmith, L.J. (2012). Beckers World of the Cell, Pearson Education Inc. U.S.A. 8th edition.
8. Cooper, G.M. and Hausman, R.E. 2009 The Cell: A Molecular Approach. 5th edition. ASM Press & Sunderland, Washington, D.C.; Sinauer Associates, MA.
9. Becker, W.M., Kleinsmith, L.J., Hardin. J. and Bertoni, G. P. 2009 The World of the Cell. 7th edition. Pearson Benjamin Cummings Publishing, San Francisco

SEMESTER-II

C-3: MYCOLOGY & PHYTOPATHOLOGY

(Credits-6: Theory-4, Practical-2)-Max. Marks: 100

THEORY (Each class 1 hr.): Marks-70 PRACTICAL

(Each class 2 hrs.): Marks-30 Lectures: 60 (40

Theory + 20 Practical classes)

Unit-I

Introduction to true fungi: Definition, **General characteristics**; Affinities with plants and animals; Thallus organization; Cell wall composition; Nutrition; Classification.

Chytridiomycetes: **General account** (5 lectures)

Zygomycota: **General characteristics**; Ecology; Thallus organisation; Life cycle with reference to Rhizopus. (4 lectures)

Ascomycota: **General characteristics** (asexual and sexual fruiting bodies); Ecology; Life cycle, Heterokaryosis and parasexuality; life cycle and classification with reference to Saccharomyces, Aspergillus, Penicillium, Alternaria and Neurospora, Peziza. (5 lectures)

Unit-II

Basidiomycota: **General characteristics**; Ecology; Life cycle and Classification with reference to black stem rust on wheat Puccinia (Physiological Specialization), loose and covered smut (symptoms only), Agaricus; Bioluminescence, Fairy Rings and Mushroom Cultivation. (5 lectures)

Allied Fungi: **General characteristics**; Status of Slime molds, Classification; Occurrence; Types of plasmodia; Types of fruiting bodies. (3 lectures)

Oomycota: **General characteristic**; Ecology; Life cycle and classification with reference to Phytophthora, Albugo. (4 lectures)

Unit-III

Symbiotic associations: Lichen Occurrence; **General characteristics**; Growth forms and range of thallus organization; Nature of associations of algal and fungal partners; Reproduction. **Mycorrhiza-Ectomycorrhiza, Endomycorrhiza and their significance.** (4 lectures)

Unit-IV

Applied Mycology: **Role of fungi in biotechnology, Application of fungi in food industry (Flavour &**

texture, Fermentation, Baking, Organic acids, Enzymes, Mycoproteins); Secondary metabolites (Pharmaceutical preparations); Agriculture (Biofertilizers); Mycotoxins; Biological control (Mycofungicides, Mycoherbicides, Mycoinsecticides, Myconematicides); Medical mycology. (5 Lectures)

Unit-V

Phytopathology: Terms and concepts; General symptoms; Geographical distribution of diseases; etiology; symptomology; Host-Pathogen relationships; disease cycle and environmental relation; prevention and control of plant diseases, and role of quarantine. Bacterial diseases Citrus canker and angular leaf spot disease of Cotton. Viral diseases Tobacco Mosaic viruses, vein clearing. Fungal diseases Early blight of potato, Black stem rust of wheat, white rust of crucifers. (5 lectures)

PRACTICAL

1. Introduction to the world of fungi (Unicellular, coenocytic/septate mycelium, ascocarps & basidiocarps).
2. Rhizopus: study of asexual stage from temporary mounts and sexual structures through permanent slides.
3. Aspergillus and Penicillium: study of asexual stage from temporary mounts. Study of Sexual stage from permanent slides/photographs.
4. Peziza: sectioning through ascocarp.
5. Alternaria: Specimens/photographs and temporary mounts.
6. Puccinia: Herbarium specimens of Black Stem Rust of Wheat and infected Barberry leaves; sections/ mounts of spores on wheat and permanent slides of both the hosts.
7. Agaricus: Specimens of button stage and full grown mushroom; sectioning of gills of Agaricus, fairy rings and bioluminescent mushrooms to be shown.
8. Albugo: Study of symptoms of plants infected with Albugo; asexual phase study through section/temporary mounts and sexual structures through permanent slides.
9. Lichens: Study of growth forms of lichens (crustose, foliose and fruticose) on different substrates. Study of thallus and reproductive structures (soredia and apothecium) through permanent slides. Mycorrhizae: ectomycorrhiza and endo mycorrhiza (Photographs)
10. Phytopathology: Herbarium specimens of bacterial diseases; Citrus Canker; Viral diseases: TMV, Fungal diseases: Early blight of potato, and White rust of crucifers.

Suggested Readings:

1. Agrios, G.N. 1997 Plant Pathology, 4th edition, Academic Press, U.K.
2. Alexopoulos, C.J., Mims, C.W., Blackwell, M. (1996). Introductory Mycology, John Wiley & Sons (Asia) Singapore. 4th edition.
3. Webster, J. and Weber, R. (2007). Introduction to Fungi, Cambridge University Press, Cambridge. 3rd edition.
4. Sethi, I.K. and Walia, S.K. (2011). Text book of Fungi and Their Allies, Macmillan Publishers India Ltd.
5. Sharma, P.D. (2011). Plant Pathology, Rastogi Publication, Meerut, India.

C-4: ARCHEGONIATE

(Credits-6: Theory-4, Practical-2)-Max. Marks: 100

THEORY (Each class 1 hr.): Marks-70 PRACTICAL

(Each class 2 hrs.): Marks-30 Lectures: 60 (40

Theory + 20 Practical classes)

Unit-I

Introduction: **Unifying features of archegoniates**; Transition to land habit; Alternation of generations. (2 lectures)

Unit-II

Bryophytes: **General characteristics**; Adaptations to land habit; Classification; Range of thallus organization. Classification (up to family). Riccia, Marchantia, Pellia, Porella, Anthoceros, Sphagnum and Funaria; Reproduction and evolutionary trends in Riccia, Marchantia, Anthoceros and Funaria (developmental stages not included). **Ecological and economic importance of bryophytes with special reference to Sphagnum.** (12 lectures)

Unit-III

Pteridophytes: **General characteristics**, classification. Classification (up to family), morphology, anatomy and reproduction of Psilotum, Selaginella, Equisetum and Pteris. (Developmental details not to be included). Apogamy, and apospory, heterospory and seed habit, telome theory, stellar evolution. **Ecological and economic importance.** (10 lectures)

Unit-IV

Gymnosperms: **General characteristics**, classification (up to family), morphology, anatomy and reproduction of Cycas, Pinus, Ginkgo and Gnetum. (Developmental details not to be included). **Ecological and economic importance.** (8 lectures)

Unit-V

Fossils: Geographical time scale, fossils and fossilization process. **Morphology, anatomy and affinities of Rhynia, Calamites, Lepidodendron, Lyginopteris and Cycadeoidea.** (8 lectures)

PRACTICAL

1. Riccia Morphology of thallus.
2. Marchantia- Morphology of thallus, whole mount of rhizoids & Scales, vertical section of thallus through Gemma cup, whole mount of Gemmae (all temporary slides), vertical section of Antheridiophore, Archegoniophore, longitudinal section of Sporophyte (all permanent slides).
3. Anthoceros- Morphology of thallus, dissection of sporophyte (to show stomata, spores, pseudoelaters, columella) (temporary slide), vertical section of thallus (permanent slide).
4. Pellia, Porella- Permanent slides.
5. Sphagnum- Morphology of plant, whole mount of leaf (permanent slide only).
6. Funaria- Morphology, whole mount of leaf, rhizoids, operculum, peristome, annulus, spores (temporary slides); permanent slides showing antheridial and archegonial heads, longitudinal section of capsule and protonema.
7. Psilotum- Study of specimen, transverse section of synangium (permanent slide).
8. Selaginella- Morphology, whole mount of leaf with ligule, transverse section of stem, whole mount of strobilus, whole mount of microsporophyll and megasporophyll (temporary slides), longitudinal section of strobilus (permanent slide).

9. Equisetum- Morphology, transverse section of internode, longitudinal section of strobilus, transverse section of strobilus, whole mount of sporangiophore, whole mount of spores (wet and dry) (temporary slide), transverse section of rhizome (permanent slide).
10. Pteris- Morphology, transverse section of rachis, vertical section of sporophyll, whole mount of sporangium, whole mount of spores (temporary slides), transverse section of rhizome, whole mount of prothallus with sex organs and young sporophyte (permanent slide).
11. Cycas- Morphology (coralloid roots, bulbil, leaf), whole mount of microsporophyll, transverse section of coralloid root, transverse section of rachis, vertical section of leaflet, vertical section of microsporophyll, whole mount of spores (temporary slides), longitudinal section of ovule, transverse section of root (permanent slide).
12. Pinus- Morphology (long and dwarf shoots, whole mount of dwarf shoot, male and female cones), transverse section of Needle, transverse section of stem, longitudinal section of transverse section of male cone, whole mount of microsporophyll, whole mount of Microspores (temporary slides), longitudinal section of female cone, tangential longitudinal section & radial longitudinal sections stem (permanent slide).
13. Gnetum- Morphology (stem, male & female cones), transverse section of stem, vertical section of ovule (permanent slide)
14. Botanical excursion.

Suggested Readings:

1. Vashista, P.C., Sinha, A.K., Kumar, A. (2010). Pteridophyta. S. Chand. Delhi, India.
2. Bhatnagar, S.P. & Moitra, A. (1996). Gymnosperms. New Age International (P) Ltd Publishers, New Delhi, India.
3. Parihar, N.S. (1991). An introduction to Embryophyta: Vol. I. Bryophyta. Central Book Depot. Allahabad.
4. Raven, P.H., Johnson, G.B., Losos, J.B., Singer, S.R. (2005). Biology. Tata McGraw Hill, Delhi.
5. Vander-Poorteri 2009 Introduction to Bryophytes. COP.

SEMESTER-III

C-5: ANATOMY OF ANGIOSPERMS

(Credits-6: Theory-4, Practical-2)-Max. Marks: 100

THEORY (Each class 1 hr.): Marks-70 PRACTICAL

(Each class 2 hrs.): Marks-30 Lectures: 60 (40

Theory + 20 Practical classes)

Unit-I

Introduction and scope of Plant Anatomy: Applications in systematics, forensics and pharmacognosy. (2 Lectures)

Tissues: Classification of tissues; Simple and complex tissues (no phylogeny); cytodifferentiation of tracheary elements and sieve elements; Pits and plasmodesmata; Wall ingrowths and transfer cells, adcrustation and incrustation, Ergastic substances. (5 Lectures)

Unit-II

Stem: Organization of shoot apex (Apical cell theory, Histogen theory, Tunica Corpus theory, continuing meristematic residue, cytohistological zonation); Types of vascular bundles; Structure of dicot

and monocot stem. (5 Lectures)

Leaf: Structure of dicot and monocot leaf, Kranz anatomy. (4 Lectures)

Root: Organization of root apex (Apical cell theory, Histogen theory, Korper-Kappe theory); Quiescent centre; Root cap; Structure of dicot and monocot root; Endodermis, exodermis and origin of lateral root. (4 Lectures)

Unit-III

Vascular Cambium: Structure, function and seasonal activity of cambium; Secondary growth in root and stem. (4 Lectures)

Wood: Axially and radially oriented elements; Types of rays and axial parenchyma; Cyclic aspects and reaction wood; Sapwood and heartwood; Ring and diffuse porous wood; Early and late wood, tyloses; Dendrochronology. (5 Lectures)

Periderm: Development and composition of periderm, rhytidome and lenticels. (3 Lectures)

Unit-IV

Adaptive and Protective Systems Epidermal tissue system, cuticle, epicuticular waxes, trichomes (uni- and multicellular, glandular and nonglandular, two examples of each), stomata (classification); Adcrustation and incrustation; Anatomical adaptations of xerophytes and hydrophytes. (5 Lectures)

Unit-V

Secretory System: Hydathodes, cavities, lithocysts and laticifers. (3 Lectures)

PRACTICAL

1. Study of anatomical details through permanent slides/temporary stain mounts/macerations/museum specimens with the help of suitable examples.
2. Apical meristem of root, shoot and vascular cambium.
3. Distribution and types of parenchyma, collenchyma and sclerenchyma.
4. Xylem: Tracheary elements-tracheids, vessel elements; thickenings; perforation plates; xylem fibres.
5. Wood: ring porous; diffuse porous; tyloses; heart- and sapwood.
6. Phloem: Sieve tubes-sieve plates; companion cells; phloem fibres.
7. Epidermal system: cell types, stomata types; trichomes: non-glandular and glandular.
8. Root: monocot, dicot, secondary growth.
9. Stem: monocot, dicot - primary and secondary growth; periderm; lenticels.
10. Leaf: isobilateral, dorsiventral, C4 leaves (Kranz anatomy).
11. Adaptive Anatomy: xerophytes, hydrophytes.
12. Secretory tissues: cavities, lithocysts and laticifers.

Suggested Readings:

1. Dickison, W.C. (2000). Integrative Plant Anatomy. Harcourt Academic Press, USA.
2. Fahn, A. (1974). Plant Anatomy. Pergmon Press, USA.
3. Mauseth, J.D. (1988). Plant Anatomy. The Benjamin/Cummings Publisher, USA.
4. Esau, K. (1977). Anatomy of Seed Plants. John Wiley & Sons, Inc., Delhi.

C-6: ECONOMIC BOTANY

(Credits-6: Theory-4, Practical-2)-Max. Marks: 100

THEORY (Each class 1 hr.): Marks-70 PRACTICAL

(Each class 2 hrs.): Marks-30 Lectures: 60 (40

Theory + 20 Practical classes)

Unit-I

Origin of Cultivated Plants: Concept of Centres of Origin, their importance with reference to Vavilovs work. Examples of major plant introductions; Crop domestication and loss of genetic diversity; evolution of new crops/varieties, importance of germplasm diversity. (3 Lectures)

Unit-II

Cereals : Wheat and Rice (origin, morphology, processing & uses), brief account of millets. (3 lectures)

Legumes: General account, importance to man and ecosystem. (3 Lectures)

Sugars & Starches: Morphology and processing of sugarcane, products and by-products of sugarcane industry. Potato morphology, propagation & uses. (3 lectures)

Unit-III

Spices:Listing of important spices, their family and part used, economic importance with special reference to fennel, saffron, clove and black pepper (4 Lectures)

Beverages: Tea, Coffee (morphology, processing & uses)(4 lectures) Drug-yielding plants: Therapeutic and habit-forming drugs with special reference to Cinchona, Digitalis, Papaver and Cannabis. (4 Lectures)

Tobacco: Tobacco (Morphology, processing, uses and health hazards) (2Lectures)

Unit-IV

Oils & Fats: General description, classification, extraction, their uses and health implications groundnut, coconut, linseed and Brassica and Coconut (Botanical name, family & uses) (4 lectures) Essential

Oils: General account, extraction methods, comparison with fatty oils & their uses. (4 Lectures)

Unit-V

Natural Rubber: Para-rubber: tapping, processing and uses. (2 Lectures)

Timber plants: General account with special reference to teak and pine. (2 Lectures)

Fibres: Classification based on the origin of fibres, Cotton and Jute (morphology, extraction and uses). (2 Lectures)

PRACTICAL

1. Cereals: Rice (habit sketch, study of paddy and grain, starch grains, micro-chemical tests).
2. Legumes: Soya bean, Groundnut, (habit, fruit, seed structure, micro-chemical tests).
3. Sugars & Starches: Sugarcane (habit sketch; cane juice- micro-chemical tests), Potato(habit sketch, tuber morphology, T.S. tuber to show localization of starch grains, w.m. starch grains, micro-chemical tests).
4. Spices: Black pepper, Fennel and Clove (habit and sections).

5. Beverages: Tea (plant specimen, tea leaves), Coffee (plant specimen, beans).
6. Oils & Fats: Coconut- T.S. nut, Mustard plant specimen, seeds; tests for fats in crushed seeds.
7. Essential oil-yielding plants: Habit sketch of Rosa, Vetiveria, Santalum and Eucalyptus (specimens/photographs).
8. Rubber: specimen, photograph/model of tapping, samples of rubber products.
9. Drug-yielding plants: Specimens of Digitalis, Papaver and Cannabis.
10. Tobacco: specimen and products of Tobacco.
11. Woods: Tectona, Pinus: Specimen, Section of young stem.
12. Fibre-yielding plants: Cotton (specimen, whole mount of seed to show lint and fuzz; whole mount of fibre and test for cellulose), Jute (specimen, transverse section of stem, test for lignin on transverse section of stem and fibre).

Suggested Readings:

1. Kochhar, S.L. (2012). Economic Botany in Tropics, MacMillan & Co. New Delhi, India.
2. Wickens, G.E. (2001). Economic Botany: Principles & Practices. Kluwer Academic Publishers, The Netherlands.
3. Chrispeels, M.J. and Sadava, D.E. (2003). Plants, Genes and Agriculture. Jones & Bartlett Publishers.

C-7: GENETICS

(Credits-6: Theory-4, Practical-2)-Max. Marks: 100
 THEORY (Each class 1 hr.): Marks-70 PRACTICAL
 (Each class 2 hrs.): Marks-30 Lectures: 60 (40
 Theory + 20 Practical classes)

Unit-I

Mendelian genetics and its extension Mendelism: History; Principles of inheritance; Chromosome theory of inheritance; Autosomes and sex chromosomes; Probability and pedigree analysis; Incomplete dominance and codominance; Multiple alleles, Lethal alleles, Epistasis, Pleiotropy, Recessive and Dominant traits, Penetrance and Expressivity, Numericals; Polygenic inheritance. (16 lectures)

Unit-II

Extrachromosomal Inheritance: Chloroplast mutation: Variegation in Four o'clock plant; Mitochondrial mutations in yeast; Maternal effects-shell coiling in snail; Infective heredity- Kappa particles in Paramecium. (6 lectures)

Unit-III

Linkage, crossing over and chromosome mapping: Linkage and crossing over-Cytological basis of crossing over; Recombination frequency, two factor and three factor crosses; Interference and coincidence; Numericals based on gene mapping; Sex Linkage. (12 lectures)

Unit-IV

Variation in chromosome number and structure: Deletion, Duplication, Inversion, Translocation, Position effect, Euploidy and Aneuploidy (8 lectures)

Gene mutations: Types of mutations; Molecular basis of Mutations; Mutagens physical and chemical (Base analogs, deaminating, alkylating and intercalating agents); Detection of mutations: CIB method. Role of Transposons in mutation. DNA repair mechanisms. (6 lectures)

Unit-V

Fine structure of gene: Classical vs molecular concepts of gene; Cis-Trans complementation test for functional allelism; Structure of Phage T4, rII Locus. (6 lectures)

Population and Evolutionary Genetics: Allele frequencies, Genotype frequencies, Hardy-Weinberg Law, role of natural selection, mutation, genetic drift. Genetic variation and Speciation. (6 lectures)

PRACTICAL

1. Meiosis through temporary squash preparation.
2. Mendel's laws through seed ratios. Laboratory exercises in probability and chi-square analysis.
3. Chromosome mapping using test cross data.
4. Pedigree analysis for dominant and recessive autosomal and sex linked traits with floral chart.
5. Incomplete dominance and gene interaction through seed ratios (9:7, 9:6:1, 13:3, 15:1, 12:3:1, 9:3:4).
6. Blood Typing: ABO groups & Rh factor.
7. Study of aneuploidy: Down's, Klinefelter's and Turner's syndromes.
8. Photographs/Permanent Slides showing Translocation Ring, Laggard's and Inversion Bridge.

Suggested Readings:

1. Gardner, E.J., Simmons, M.J., Snustad, D.P. (1991). Principles of Genetics, John Wiley & sons, India. 8th edition.
2. Snustad, D.P. and Simmons, M.J. (2010). Principles of Genetics, John Wiley & Sons Inc., India. 5th edition.
3. Klug, W.S., Cummings, M.R., Spencer, C.A. (2012). Concepts of Genetics. Benjamin Cummings, U.S.A. 10th edition.
4. Griffiths, A.J.F., Wessler, S.R., Carroll, S.B., Doebley, J. (2010). Introduction to Genetic Analysis. W. H. Freeman and Co., U.S.A. 10th edition.

SEMESTER-IV

C-8: MOLECULAR BIOLOGY

(Credits-6: Theory-4, Practical-2)-Max. Marks: 100

THEORY (Each class 1 hr.): Marks-70 PRACTICAL

(Each class 2 hrs.): Marks-30 Lectures: 60 (40

Theory + 20 Practical classes)

Unit-I

Nucleic acids : Carriers of genetic information: Historical perspective; DNA as the carrier of genetic information (Griffiths, Hershey & Chase, Avery, McLeod & McCarty, Fraenkel-Conrats experiment. (4 lectures)

Unit-II

The Structures of DNA and RNA / Genetic Material: DNA Structure: Miescher to Watson and Crick-historic perspective, DNA structure, Salient features of double helix, Types of DNA, Types of genetic material, denaturation and renaturation, cot curves; Organization of DNA Prokaryotes, Viruses, Eukaryotes. RNA Structure- Organelle DNA - mitochondria and chloroplast DNA. The Nucleosome - Chromatin structure- Euchromatin, Heterochromatin- Constitutive and Facultative heterochromatin. (8 lectures)

The replication of DNA: Chemistry of DNA synthesis (Kornbergs discovery); General principles bidirectional, semi-conservative and semi discontinuous replication, RNA priming; Various models of DNA replication, including rolling circle, (theta) mode of replication, replication of linear ds-DNA, replication of the 5' end of linear chromosome; Enzymes involved in DNA replication. (6 lectures)

Unit-III

Central dogma and genetic code: Key experiments establishing-The Central Dogma (Adaptor hypothesis and discovery of mRNA template), Genetic code (deciphering & salient features) (2 lectures)

Mechanism of Transcription: Transcription in prokaryotes; Transcription in eukaryotes (4 lectures)

Processing and modification of RNA: Split genes-concept of introns and exons, removal of introns, spliceosome machinery, splicing pathways, group I & group II intron splicing, alternative splicing eukaryotic mRNA processing(5' cap, 3' polyA tail); Ribozymes, exon shuffling; RNA editing and mRNA transport. (5 lectures)

Unit-IV

Translation (Prokaryotes and eukaryotes): Ribosome structure and assembly, mRNA; Charging of tRNA, aminoacyl tRNA synthetases; Various steps in protein synthesis, proteins involved in initiation, elongation and termination of polypeptides; Fidelity of translation; Inhibitors of protein synthesis; Post-translational modifications of proteins. (6 lectures)

Unit-V

Regulation of transcription in prokaryotes and eukaryotes: Principles of transcriptional regulation; Prokaryotes: Regulation of lactose metabolism and tryptophan synthesis in E.coli. Eukaryotes: transcription factors, heat shock proteins, steroids and peptide hormones; Gene silencing. (5 lectures)

PRACTICAL

1. Preparation of LB medium and raising E.Coli.
2. Isolation of genomic DNA from E.Coli.

3. DNA isolation and RNA estimation by orcinol method.

4. DNA estimation by diphenylamine reagent/UV Spectrophotometry.

5. Study of DNA replication mechanisms through photographs (Rolling circle, Theta replication and semi-discontinuous replication).

6. Study of structures of prokaryotic RNA polymerase and eukaryotic RNA polymerase II through photographs.

7. Photographs establishing nucleic acid as genetic material (Messelson and Stahl's, Avery et al, Griffiths, Hershey & Chases and Fraenkel & Conrats experiments)

8. Study of the following through photographs: Assembly of Spliceosome machinery; Splicing mechanism in group I & group II introns; Ribozyme and Alternative splicing.

Suggested Readings:

1. Watson J.D., Baker, T.A., Bell, S.P., Gann, A., Levine, M., Losick, R. (2007). Molecular Biology of the Gene, Pearson Benjamin Cummings, CSHL Press, New York, U.S.A. 6th edition.

2. Snustad, D.P. and Simmons, M.J. (2010). Principles of Genetics. John Wiley and Sons Inc., U.S.A. 5th edition.

3. Klug, W.S., Cummings, M.R., Spencer, C.A. (2009). Concepts of Genetics. Benjamin Cummings. U.S.A. 9th edition.

4. Russell, P.J. (2010). iGenetics- A Molecular Approach. Benjamin Cummings, U.S.A. 3rd edition.

5. Griffiths, A.J.F., Wessler, S.R., Carroll, S.B., Doebley, J. (2010). Introduction to Genetic Analysis. W. H. Freeman and Co., U.S.A. 10th edition.

C-9: PLANT ECOLOGY & PHYTOGEOGRAPHY

(Credits-6: Theory-4, Practical-2)-Max. Marks: 100

THEORY (Each class 1 hr.): Marks-70 PRACTICAL

(Each class 2 hrs.): Marks-30 Lectures: 60 (40

Theory + 20 Practical classes)

Unit-I

Introduction Concept of ecology, Autoecology, Synecology, system ecology, Levels of organization. Inter-relationships between the living world and the environment, the components of environmental, concept of hydrosphere and lithosphere and dynamism, homeostasis. (2 lectures)

Unit-II

Soil: Importance; Origin; Formation; Composition; Physical; Chemical and Biological components; Soil profile; Role of climate in soil development. (5 lectures)

Water: Importance: States of water in the environment; Atmospheric moisture; Precipitation types (rain, fog, snow, hail, dew); Hydrological Cycle; Water in soil; Water table. (2 lectures)

Light, temperature, wind and fire: Variations; adaptations of plants to their variation. (4 lectures)

Unit-III

Biotic interactions: 2 lectures Population ecology: Characteristics and Dynamics .Ecological Speciation 4 lectures Plant communities: Concept of ecological amplitude; Habitat and niche; Characters: analytical and synthetic; Ecotone and edge effect; Dynamics: succession processes, types; climax concepts. (4 lectures)

Unit-IV

Ecological pyramids. (4 lectures)

Functional aspects of ecosystem: Principles and models of energy flow; Production and productivity; Ecological efficiencies; Biogeochemical cycles; Cycling of Carbon, Nitrogen and Phosphorus.(5 lectures)

Unit-V

Phytogeography: Principles; Continental drift; Theory of tolerance; Endemism; Brief description of major terrestrial biomes (one each from tropical, temperate & tundra); Phytogeographical division of India; Local Vegetation. (8 lectures)

PRACTICAL

1. Study of instruments used to measure microclimatic variables: Soil thermometer, maximum and minimum thermometer, anemometer, psychrometer/hygrometer, rain gauge and luxmeter.
2. Determination of pH of various soil and water samples (pH meter, universal indicator/Lovibond comparator and pH paper)
3. Analysis for carbonates, chlorides, nitrates, sulphates, organic matter and base deficiency from two soil samples by rapid field tests.
4. Determination of organic matter of different soil samples by Walkley & Black rapid titration method.
5. Comparison of bulk density, porosity and rate of infiltration of water in soils of three habitats.
6. Determination of dissolved oxygen of water samples from polluted and unpolluted sources.
7. (a) Study of morphological adaptations of hydrophytes and xerophytes (four each). (b) Study of biotic interactions of the following: Stem parasite (Cuscuta), Root parasite (Orobanchae) Epiphytes, Predation (Insectivorous plants).
8. Determination of minimal quadrat size for the study of herbaceous vegetation in the college campus, by species area curve method (species to be listed).
9. Quantitative analysis of herbaceous vegetation in the college campus for frequency and comparison with Raunkiaers frequency distribution law.
10. Quantitative analysis of herbaceous vegetation for density and abundance in the college campus.

11. Field visit to familiarise students with ecology of different sites.

Suggested Readings:

1. Odum, E.P. (2005). Fundamentals of ecology. Cengage Learning India Pvt. Ltd., New Delhi. 5th edition.
2. Singh, J.S., Singh, S.P., Gupta, S. (2006). Ecology Environment and Resource Conservation. Anamaya Publications, New Delhi, India.
3. Sharma, P.D. (2010). Ecology and Environment. Rastogi Publications, Meerut, India. 8th edition.
4. Wilkinson, D.M. (2007). Fundamental Processes in Ecology: An Earth Systems Approach. Oxford University Press. U.S.A.
5. Kormondy, E.J. (1996). Concepts of ecology. PHI Learning Pvt. Ltd., Delhi, India. 4th edition.

C-10: PLANT SYSTEMATICS

(Credits-6: Theory-4, Practical-2)-Max. Marks: 100
THEORY (Each class 1 hr.): Marks-70 PRACTICAL
(Each class 2 hrs.): Marks-30 Lectures: 60 (40
Theory + 20 Practical classes)

Unit-I

Plant identification, Classification, Nomenclature; Biosystematics. (2 lectures)

Identification: Field inventory; Functions of Herbarium; Important herbaria and botanical gardens of the world and India; Virtual herbarium; E-flora; Documentation: Flora, Monographs, Journals; Keys: Single access and Multi-access. (5 lectures)

Unit-II

Taxonomic hierarchy: Concept of taxa (family, genus, species); Categories and taxonomic hierarchy; Species concept (taxonomic, biological, evolutionary). (5 lectures)

Botanical nomenclature: Principles and rules (ICN); Ranks and names; Typification, author citation, valid publication, rejection of names, principle of priority and its limitations; Names of hybrids. (5 lectures)

Unit-III

Systematics-an interdisciplinary science: Evidence from palynology, cytology, phytochemistry and molecular data. (6 lectures)

Systems of classification: Major contributions of Theophrastus, Bauhin, Tournefort, Linnaeus, Adanson, de Candolle, Bessey, Hutchinson, Takhtajan and Cronquist; Classification systems of Bentham and Hooker (upto series) and Engler and Prantl (upto series); Brief reference of Angiosperm Phylogeny Group (APG III) classification. (6 lectures)

Unit-IV

Biometrics, numerical taxonomy and cladistics: Characters; Variations; OTUs, character weighting and coding; cluster analysis; Phenograms, cladograms (definitions and differences). (4 lectures)

Unit-V

Phylogeny of Angiosperms: Terms and concepts (primitive and advanced, homology and analogy, parallelism and convergence, monophyly, Paraphyly, polyphyly and clades). origin & evolution of angiosperms; coevolution of angiosperms and animals; methods of illustrating evolutionary relationship (phylogenetic tree, cladogram). (7 lectures)

PRACTICAL

1. **Study of vegetative and floral characters of the following families** (Description, V.S. flower, section of ovary, floral diagram/s, floral formula/e and systematic position according to Bentham & Hookers system of classification):
Ranunculaceae - Ranunculus, Delphinium
Brassicaceae - Brassica, Alyssum / Iberis
Myrtaceae - Eucalyptus, Callistemon
Umbelliferae - Coriandrum /Anethum / Foeniculum
Asteraceae - Sonchus/Launaea, Vernonia/Ageratum, Eclipta/Tridax
Solanaceae - Solanum nigrum/Withania
Lamiaceae - Salvia/Ocimum
Euphorbiaceae - Euphorbia hirta/E.milii, Jatropha
Liliaceae - Asphodelus/Lilium/Allium
Poaceae - Triticum/Hordeum/Avena
2. **Field visit** (local) Subject to grant of funds from the university.
3. Mounting of a properly dried and pressed specimen of any wild plant with herbarium label (to be submitted in the record book)

Suggested Readings:

1. Singh, G. (2012). Plant Systematics: Theory and Practice. Oxford & IBH Pvt. Ltd., New Delhi. 3rd edition.
2. Jeffrey, C. (1982). An Introduction to Plant Taxonomy. Cambridge University Press, Cambridge.
3. Judd, W.S., Campbell, C.S., Kellogg, E.A., Stevens, P.F. (2002). Plant Systematics-A Phylogenetic Approach. Sinauer Associates Inc., U.S.A. 2nd edition.
4. Maheshwari, J.K. (1963). Flora of Delhi. CSIR, New Delhi.
5. Radford, A.E. (1986). Fundamentals of Plant Systematics. Harper and Row, New York.

SEMESTER-V

C-11: REPRODUCTIVE BIOLOGY OF ANGIOSPERMS

(Credits-6: Theory-4, Practical-2)-Max. Marks: 100

THEORY (Each class 1 hr.): Marks-70 PRACTICAL

(Each class 2 hrs.): Marks-30 Lectures: 60 (40

Theory + 20 Practical classes)

Unit-I

Introduction: History (contributions of G.B. Amici, W. Hofmeister, E. Strasburger, S.G. Nawaschin, P. Maheshwari, B.M. Johri, W.A. Jensen, J. Heslop-Harrison) and scope. (2 lectures)

Unit-II

Anther: Anther wall: Structure and functions, microsporogenesis, callose deposition and its significance. (2 lectures)

Pollen biology: Microgametogenesis; Pollen wall structure, MGU (male germ unit) structure, NPC system; Palynology and scope (a brief account); Pollen wall proteins; Pollen viability, storage and germination; Abnormal features: Pseudomonads, polyads, massulae, pollinia. (5 lectures)

Unit-III

Ovule: Structure; Types; Special structures: endothelium, obturator, aril, caruncle and hypostase; Female gametophyte megasporogenesis (monosporic, bisporic and tetrasporic) and megagametogenesis (details of Polygonum type); Organization and ultrastructure of mature embryo sac. (5 lectures)

Endosperm: Types, development, structure and functions.(3 lectures)

Embryo: Six types of embryogeny; General pattern of development of dicot and monocot embryo; Suspensor: structure and functions; Embryoendosperm relationship; Nutrition of embryo; Unusual features; Embryo development in Paeonia. (6 lectures)

Unit-IV

Pollination and fertilization: Pollination types and significance; adaptations; structure of stigma and style; path of pollen tube in pistil; double fertilization. (4 lectures)

Self incompatibility: Basic concepts (interspecific, intraspecific, homomorphic, heteromorphic, GSI and SSI); Methods to overcome selfincompatibility: mixed pollination, bud pollination, stub pollination; Intraovarian and in vitro pollination; Modification of stigma surface, parasexual hybridization; Cybrids, in vitro fertilization. (5 lectures)

Unit-V

Seed: Structure, importance and dispersal mechanisms (3 lectures)

Polyembryony and apomixes: Introduction; Classification; Causes and applications. (4 lectures)

Germline transformation: Pollen grain and ovules through pollen tube pathway method/ Agrobacterium/ electrofusion/floral dip/biolistic. (4 lectures)

PRACTICAL

1. Anther: Wall and its ontogeny; Tapetum (amoeboid and glandular); MMC, spore tetrads, uninucleate, bicelled and dehisced anther stages through slides/micrographs, male germ unit (MGU) through photographs and schematic representation.
2. Pollen grains: Fresh and acetolyzed showing ornamentation and aperture, pseudomonads, polyads, pollinia (slides/photographs, fresh material), ultrastructure of pollen wall(micrograph); Pollen viability: Tetrazolium test.germination: Calculation of percentage germination in different media using hanging drop method.
3. Ovule: Types-anatropous, orthotropous, amphitropous/campylotropous, circinotropous, unitegmic,

bitegmic; Tenuinucellate and crassinucellate; Special structures: Endothelium, obturator, hypostase, caruncle and aril (permanent slides/specimens/photographs).

4. Female gametophyte through permanent slides/ photographs: Types, ultrastructure of mature egg apparatus.
5. Intra-ovarian pollination; Test tube pollination through photographs.
6. Endosperm: Dissections of developing seeds for endosperm with free-nuclear haustoria.
7. Embryogenesis: Study of development of dicot embryo through permanent slides; dissection of developing seeds for embryos at various developmental stages; Study of suspensor through electron micrographs.

Suggested Readings:

1. Bhojwani, S.S. and Bhatnagar, S.P. (2011). The Embryology of Angiosperms, Vikas Publishing House. Delhi. 5th edition.
2. Shivanna, K.R. (2003). Pollen Biology and Biotechnology. Oxford and IBH Publishing Co. Pvt. Ltd. Delhi.
3. Raghavan, V. (2000). Developmental Biology of Flowering plants, Springer, Netherlands.
4. Johri, B.M. I (1984). Embryology of Angiosperms, Springer-Verlag, Netherlands.

C-12: PLANT PHYSIOLOGY

(Credits-6: Theory-4, Practical-2)-Max. Marks: 100
THEORY (Each class 1 hr.): Marks-70 PRACTICAL
(Each class 2 hrs.): Marks-30 Lectures: 60 (40
Theory + 20 Practical classes)

Unit-I

Plant water relationship: Water Potential and its components, water absorption by roots, aquaporins, pathway of water movement, symplast, apoplast, transmembrane pathways, root pressure, guttation. Ascent of sap cohesion-tension theory. Transpiration and factors affecting transpiration, antitranspirants, mechanism of stomatal movement. (6 lectures)

Translocation in the phloem: Experimental evidence in support of phloem as the site of sugar translocation. Pressure Flow Model; Phloem loading and unloading; Source-sink relationship. (5 lectures)

Unit-II

Mineral nutrition: Essential and beneficial elements, macro and micronutrients, methods of study and use of nutrient solutions, criteria for essentiality, mineral deficiency symptoms, roles of essential elements, chelating agents. (5 lectures)

Unit-III

Nutrient Uptake: Soil as a nutrient reservoir, transport of ions across cell membrane, passive absorption, electrochemical gradient, facilitated diffusion, active absorption, role of ATP, carrier systems, proton ATPase pump and ion flux, uniport, co-transport, symport, antiport. (5 lectures)

Unit-IV

Plant growth regulators: Discovery, chemical nature (basic structure), bioassay and physiological roles of Auxin, Gibberellins, Cytokinin, Abscisic acid, Ethylene, Brassinosteroids and Jasmonic acid. (10 lectures)

Unit-V

Physiology of flowering: Photoperiodism, flowering stimulus, florigen concept, vernalization, seed dormancy. (4 lectures)

Phytochrome: Discovery, chemical nature, role of phytochrome in photomorphogenesis, low energy responses (LER) and high irradiance responses (HIR), mode of action. (5 lectures)

PRACTICAL

1. Determination of osmotic potential of plant cell sap by plasmolytic method.
2. Determination of water potential of given tissue (potato tuber) by weight method.
3. Study of the effect of wind velocity and light on the rate of transpiration in excised twig/leaf.
4. Calculation of stomatal index and stomatal frequency from the two surfaces of leaves of a mesophyte and xerophyte.
5. To calculate the area of an open stoma and percentage of leaf area open through stomata in a mesophyte and xerophyte (both surfaces).
6. To study the phenomenon of seed germination (effect of light).
7. To study the induction of amylase activity in germinating barley grains.

Demonstration experiments:

(a) To demonstrate suction due to transpiration. (b) Fruit ripening/Rooting from cuttings (Demonstration). (c) Bolting experiment/Avena coleptile bioassay (demonstration).

Suggested Readings:

1. Hopkins, W.G. and Huner, A. (2008). Introduction to Plant Physiology. John Wiley and Sons. U.S.A. 4th edition.
2. Taiz, L., Zeiger, E., Mller, I.M. and Murphy, A (2015). Plant Physiology and Development. Sinauer Associates Inc. USA. 6th edition.
3. Bajracharya D. (1999). Experiments in Plant Physiology-A Laboratory Manual. Narosa Publishing House, New Delhi.

SEMESTER-VI

C-13: PLANT METABOLISM

(Credits-6: Theory-4, Practical-2)-Max. Marks: 100
THEORY (Each class 1 hr.): Marks-70 PRACTICAL
(Each class 2 hrs.): Marks-30 Lectures: 60 (40
Theory + 20 Practical classes)

Unit-I

Concept of metabolism: Introduction, anabolic and catabolic pathways, regulation of metabolism, role of regulatory enzymes (allosteric, covalent modulation and Isozymes). (5 lectures) Carbohydrate metabolism: Synthesis and catabolism of sucrose and starch. (1 lectures)

Unit-II

Carbon assimilation: Historical background, photosynthetic pigments, role of photosynthetic pigments (chlorophylls and accessory pigments), antenna molecules and reaction centres, photochemical reactions, photosynthetic electron transport, PSI, PSII, Q cycle, CO_2 reduction, photorespiration, C4 pathways; Crassulacean acid metabolism; Factors affecting CO_2 reduction. (10 lectures)

Unit-III

Carbon Oxidation: Glycolysis, fate of pyruvate, regulation of glycolysis, oxidative pentose phosphate pathway, oxidative decarboxylation of pyruvate, regulation of PDH, NADH shuttle; TCA cycle, amphibolic role, anaplerotic reactions, regulation of the cycle, mitochondrial electron transport, oxidative phosphorylation, cyanide resistant respiration, factors affecting respiration. (6 lectures)

ATP-Synthesis: Mechanism of ATP synthesis, substrate level phosphorylation, chemiosmotic mechanism (oxidative and photophosphorylation), ATP synthase, Boyers conformational model, Racker's experiment, Jagendorf's experiment; role of uncouplers. (4 lectures)

Unit-IV

Lipid metabolism: Synthesis and breakdown of triglycerides, β -oxidation, glyoxylate cycle, gluconeogenesis and its role in mobilisation of lipids during seed germination, α oxidation. (5 lectures)

Unit-V

Nitrogen metabolism: Nitrate assimilation, biological nitrogen fixation (examples of legumes and non-legumes); Physiology and biochemistry of nitrogen fixation; Ammonia assimilation and transamination. (5 lectures)

Mechanisms of signal transduction: Calcium, phospholipids, cGMP, NO. (4 lectures)

PRACTICAL

1. Chemical separation of photosynthetic pigments.
2. Experimental demonstration of Hill's reaction.
3. To study the effect of light intensity on the rate of photosynthesis.
4. Effect of carbon dioxide on the rate of photosynthesis.
5. To compare the rate of respiration in different parts of a plant.
6. To demonstrate activity of Nitrate Reductase in germinating leaves of different plant sources.
7. To study the activity of lipases in germinating oilseeds and demonstrate mobilization of lipids during germination.
8. Demonstration of fluorescence by isolated chlorophyll pigments.
9. Demonstration of absorption spectrum of photosynthetic pigments.

Suggested Readings:

1. Hopkins, W.G. and Huner, A. (2008). Introduction to Plant Physiology. John Wiley and Sons. U.S.A. 4th edition.
2. Taiz, L., Zeiger, E., Miller, I.M. and Murphy, A (2015). Plant Physiology and Development. Sinauer Associates Inc. USA. 6th edition.
3. Harborne, J.B. (1973). Phytochemical Methods. John Wiley & Sons. New York.

C-14: PLANT BIO-TECHNOLOGY

(Credits-6: Theory-4, Practical-2)-Max. Marks: 100

THEORY (Each class 1 hr.): Marks-70 PRACTICAL

(Each class 2 hrs.): Marks-30 Lectures: 60 (40

Theory + 20 Practical classes)

Unit-I

Plant Tissue Culture: Historical perspective; Aseptic tissue culture techniques, Composition of media; Nutrient and hormone requirements (role of vitamins and hormones). (3 lectures)

Unit-II

Totipotency; Organogenesis; Embryogenesis (somatic and zygotic); Protoplast isolation, culture and fusion; Tissue culture applications (micropropagation, androgenesis, virus elimination, secondary metabolite production, haploids, triploids and hybrids; Cryopreservation; Germplasm Conservation). (7 lectures)

Unit-III

Recombinant DNA technology-I: Restriction Endonucleases (History, Types I-IV, biological role and application); Restriction Mapping (Linear and Circular); Cloning Vectors: Prokaryotic (pUC 18 and pUC19, pBR322, Ti plasmid, BAC); Lambda phage, M13 phagemid, Cosmid, Shuttle vector; Eukaryotic Vectors (YAC and briefly PAC, MAC, HAC). Gene Cloning (Recombinant DNA, Bacterial Transformation and selection of recombinant clones, PCR-mediated gene cloning). (10 lectures) **Unit-IV**

Recombinant DNA technology-II: Gene Construct; construction of genomic and cDNA libraries, screening DNA libraries to obtain gene of interest by genetic selection; complementation, colony hybridization; Probes-oligonucleotide, heterologous, PCR; Methods of gene transfer-Agrobacterium-mediated, Direct gene transfer by Electroporation, Microinjection, Microprojectile bombardment; Selection of transgenics selectable marker and reporter genes (Luciferase, GUS, GFP). (10 lectures)

Unit-V

Applications of Biotechnology: Pest resistant (Bt-cotton); herbicide resistant plants (RoundUp Ready soybean); Transgenic crops with improved quality traits (Flavr Savr tomato, Golden rice); Improved horticultural varieties (Moondust carnations); Role of transgenics in bioremediation (Su-perbug); edible vaccines; Industrial enzymes (Aspergillase, Protease, Lipase); Genetically Engineered Products Human Growth Hormone; Humulin; Biosafety concerns. (10 lectures)

PRACTICAL

1. (a) Preparation of MS medium.
(b) Demonstration of in vitro sterilization and inoculation methods using leaf and nodal explants of tobacco, Datura, Brassica etc.
2. Study of anther, embryo and endosperm culture, micropropagation, somatic embryogenesis & artificial seeds through photographs.
3. Isolation of protoplasts.
4. Construction of restriction map of circular and linear DNA from the data provided.

5. Study of methods of gene transfer through photographs: Agrobacterium-mediated, direct gene transfer by electroporation, microinjection, microprojectile bombardment.
6. Study of steps of genetic engineering for production of Bt cotton, Golden rice, Flavr Savr tomato through photographs.
7. Isolation of plasmid DNA.
8. Restriction digestion and gel electrophoresis of plasmid DNA.

Suggested Readings:

1. Bhojwani, S.S. and Razdan, M.K., (1996). Plant Tissue Culture: Theory and Practice. Elsevier Science Amsterdam. The Netherlands.
2. Glick, B.R., Pasternak, J.J. (2003). Molecular Biotechnology- Principles and Applications of recombinant DNA. ASM Press, Washington.
3. Bhojwani, S.S. and Bhatnagar, S.P. (2011). The Embryology of Angiosperms. Vikas Publication House Pvt. Ltd., New Delhi. 5th edition.
4. Snustad, D.P. and Simmons, M.J. (2010). Principles of Genetics. John Wiley and Sons, U.K. 5th edition.
5. Stewart, C.N. Jr. (2008). Plant Biotechnology & Genetics: Principles, Techniques and Applications. John Wiley & Sons Inc. U.S.A.
6. Chawla, H.S. (2010). Introduction to Plant Biotechnology. Oxford & IBH Publishing Co. Pvt. Ltd., New Delhi.
7. Singh, B. D. (2010) Biotechnology: Expanding Horizon. Kalyani Publishers. New Delhi.

DISCIPLINE SPECIFIC ELECTIVE COURSES

DSE-1A: ANALYTICAL TECHNIQUES IN PLANT SCIENCES

(Credits-6: Theory-4, Practical-2)-Max. Marks: 100

THEORY (Each class 1 hr.): Marks-70 PRACTICAL

(Each class 2 hrs.): Marks-30 Lectures: 60 (40

Theory + 20 Practical classes)

UNIT-I: Imaging and related techniques: Principles of microscopy; Light microscopy; Fluorescence microscopy; Confocal microscopy; Use of fluorochromes: (a) Flow cytometry (FACS); (b) Applications of fluorescence microscopy: Chromosome banding, FISH, chromosome painting; Transmission and Scanning electron microscopy sample preparation for electron microscopy, cryofixation, negative staining, shadow casting, freeze fracture, freeze etching. (10 lectures)

UNIT-II: Cell fractionation: Centrifugation: Differential and density gradient centrifugation, sucrose density gradient, CsCl₂ gradient, analytical centrifugation, ultracentrifugation, marker enzymes. (5 lectures)

UNIT-III: Radioisotopes: Use in biological research, auto-radiography, pulse chase experiment. (3 lectures)

Spectrophotometry: Principle and its application in biological research. 3 lectures Chromatography: Principle; Paper chromatography; Column chromatography, TLC, GLC, HPLC, Ion-exchange chromatography; Molecular sieve chromatography; Affinity chromatography. (6 lectures)

UNIT-IV: Characterization of proteins and nucleic acids: Mass spectrometry; X-ray diffraction; X-ray crystallography; Characterization of proteins and nucleic acids; Electrophoresis: AGE, PAGE, SDS-PAGE (5 lectures)

UNIT-V: Biostatistics: Statistics, data, population, samples, parameters; Representation of Data: Tabular, Graphical; Measures of central tendency: Arithmetic mean, mode, median; Measures of dispersion: Range, mean deviation, variation, standard deviation; Chi-square test for goodness of fit. (8 lectures)

PRACTICAL

1. Study of Blotting techniques: Southern, Northern and Western, DNA fingerprinting, DNA sequencing, PCR through photographs.
2. Demonstration of ELISA.
3. To separate nitrogenous bases by paper chromatography.
4. To separate sugars by thin layer chromatography.
5. Isolation of chloroplasts by differential centrifugation.
6. To separate chloroplast pigments by column chromatography.
7. To estimate protein concentration through Lowry's methods.

8. To separate proteins using PAGE.
9. To separation DNA (marker) using AGE.
10. Study of different microscopic techniques using photographs/micrographs (freeze fracture, freeze etching, negative staining, positive staining, fluorescence and FISH).
11. Preparation of permanent slides (double staining).
12. Estimation of plant pigments.

Suggested Readings:

1. Plummer, D.T. (1996). An Introduction to Practical Biochemistry. Tata McGraw-Hill Publishing Co. Ltd. New Delhi. 3rd edition.
2. Ruzin, S.E. (1999). Plant Microtechnique and Microscopy, Oxford University Press, New York. U.S.A.
3. Ausubel, F., Brent, R., Kingston, R. E., Moore, D.D., Seidman, J.G., Smith, J.A., Struhl, K. (1995). Short Protocols in Molecular Biology. John Wiley & Sons. 3rd edition.
4. Zar, J.H. (2012). Biostatistical Analysis. Pearson Publication. U.S.A. 4th ed

DSE-1B: BIO-INFORMATICS

(Credits-6: Theory-4, Practical-2)-Max. Marks: 100

THEORY (Each class 1 hr.): Marks-70 PRACTICAL

(Each class 2 hrs.): Marks-30 Lectures: 60 (40

Theory + 20 Practical classes)

UNIT-I: Introduction to Bioinformatics: Introduction, Branches of Bioinformatics, Aim, Scope and Research areas of Bioinformatics. (3 Lectures)

Databases in Bioinformatics: Introduction, Biological Databases, Classification format of Biological Databases, Biological Database Retrieval System. (4 Lectures)

UNIT-II: Biological Sequence Databases: National Center for Biotechnology Information (NCBI): Tools and Databases of NCBI, Database Retrieval Tool, Sequence Submission to NCBI, Basic local alignment search tool (BLAST), Nucleotide Database, Protein Database, Gene Expression Database. EMBL Nucleotide Sequence Database (EMBL-Bank): Introduction, Sequence Retrieval, Sequence Submission to EMBL, Sequence analysis tools. DNA Data Bank of Japan (DDBJ): Introduction, Resources at DDBJ, Data Submission at DDBJ. Protein Information Resource (PIR): About PIR, Resources of PIR, Databases of PIR, Data Retrieval in PIR. Swiss-Prot: Introduction and Salient Features. (15 Lectures)

UNIT-III: Sequence Alignments: Introduction, Concept of Alignment, Multiple Sequence Alignment (MSA), MSA by CLUSTALW, Scoring Matrices, Percent Accepted Mutation (PAM), Blocks of Amino Acid Substitution Matrix (BLOSUM). (8 Lectures)

UNIT-IV: Molecular Phylogeny: Methods of Phylogeny, Software for Phylogenetic Analyses, Consistency of Molecular Phylogenetic Prediction. (5 Lectures)

UNIT-V: Applications of Bioinformatics: Structural Bioinformatics in Drug Discovery, Quantitative structure-activity relationship (QSAR) techniques in Drug Design, Microbial genome applications, Crop improvement. (5 Lectures)

PRACTICAL

1. Nucleic acid and protein databases.
2. Sequence retrieval from databases.

3. Sequence alignment.
4. Sequence homology and Gene annotation.
5. Construction of phylogenetic tree.

Suggested Readings:

1. Ghosh Z. and Bibekanand M. (2008) Bioinformatics: Principles and Applications. Oxford University Press.
2. Pevsner J. (2009) Bioinformatics and Functional Genomics. II Edition. Wiley-Blackwell.
3. Campbell A. M., Heyer L. J. (2006) Discovering Genomics, Proteomics and Bioinformatics-II Edition. Benjamin Cummings.

DSE-2A: PLANT BREEDING

(Credits-6: Theory-4, Practical-2)-Max. Marks: 100
 THEORY (Each class 1 hr.): Marks-70 PRACTICAL
 (Each class 2 hrs.): Marks-30 Lectures: 60 (40
 Theory + 20 Practical classes)

UNIT-I: Plant Breeding: Introduction and objectives. Breeding systems: modes of reproduction in crop plants. Important achievements and undesirable consequences of plant breeding. (6 lectures)

UNIT-II; Methods of crop improvement: Introduction: Centres of origin and domestication of crop plants, plant genetic resources; Acclimatization; Selection methods: For self pollinated, cross pollinated and vegetatively propagated plants; Hybridization: For self, cross and vegetatively propagated plants Procedure, advantages and limitations. (15 lectures)

UNIT-III: Quantitative inheritance: Concept, mechanism, examples of inheritance of Kernel colour in wheat, Skin colour in human beings. Monogenic vs polygenic Inheritance. (6 lectures)

UNIT-IV: Inbreeding depression and heterosis: History, genetic basis of inbreeding depression and heterosis; Applications. (6 lectures)

UNIT-V: Crop improvement and breeding: Role of mutations; Polyploidy; Distant hybridization and role of biotechnology in crop improvement. (7 lectures)

PRACTICAL

Practical related to theory.

Suggested Readings:

1. Singh, B.D. (2005). Plant Breeding: Principles and Methods. Kalyani Publishers. 7th edition.
2. Chaudhari, H.K. (1984). Elementary Principles of Plant Breeding. Oxford IBH. 2nd edition.
3. Acquaah, G. (2007). Principles of Plant Genetics & Breeding. Blackwell Publishers.

DSE-2B: NATURAL RESOURCE MANAGEMENT

(Credits-6: Theory-4, Practical-2)-Max. Marks: 100
 THEORY (Each class 1 hr.): Marks-70 PRACTICAL
 (Each class 2 hrs.): Marks-30 Lectures: 60 (40
 Theory + 20 Practical classes)

UNIT-I: Natural resources: Definition and types. 2 lectures Sustainable utilization: Concept, approaches (economic, ecological and socio-cultural). (5 lectures)

UNIT-II: Land: Utilization (agricultural, pastoral, horticultural, silvicultural); Soil degradation and management. (5 lectures)

Water: Fresh water (rivers, lakes, groundwater, aquifers, watershed); Marine; Estuarine; Wetlands; Threats and management strategies. (4 lectures)

UNIT-III: Biological Resources: Biodiversity-definition and types; Significance; Threats; Management strategies; Bioprospecting; IPR; CBD; National Biodiversity Action Plan). (8 lectures) Forests: Definition, Cover and its significance (with special reference to India); Major and minor forest products; Depletion; Management. (4 lectures)

UNIT-IV: Energy: Renewable and non-renewable sources of energy 4 lectures Contemporary practices in resource management: EIA, GIS, Participatory Resource Appraisal, Ecological Footprint with emphasis on carbon footprint. (6 lectures)

UNIT-V: Resource Accounting; Waste management. National and international efforts in resource management and conservation (4 lectures)

PRACTICAL

1. Estimation of solid waste generated by a domestic system (biodegradable and nonbiodegradable) and its impact on land degradation.
2. Collection of data on forest cover of specific area.
3. Measurement of dominance of woody species by DBH (diameter at breast height) method.
4. Calculation and analysis of ecological footprint.
5. Ecological modeling.

Suggested Readings:

1. Vasudevan, N. (2006). Essentials of Environmental Science. Narosa Publishing House, New Delhi.
2. Singh, J. S., Singh, S.P. and Gupta, S. (2006). Ecology, Environment and Resource Conservation. Anamaya Publications, New Delhi.
3. Rogers, P.P., Jalal, K.F. and Boyd, J.A. (2008). An Introduction to Sustainable Development. Prentice Hall of India Private Limited, New Delhi.

DSE-2C: BIO-STATISTICS

(Credits-6: Theory-4, Practical-2)-Max. Marks: 100

THEORY (Each class 1 hr.): Marks-70 PRACTICAL

(Each class 2 hrs.): Marks-30 Lectures: 60 (40

Theory + 20 Practical classes)

UNIT-I: Biostatistics - definition - statistical methods - basic principles. Variables - measurements, functions, limitations and uses of statistics. (8 lectures)

Unit-II: Collection of data primary and secondary - types and methods of data collection procedures - merits and demerits. Classification - tabulation and presentation of data sampling methods. (8 lectures)

Unit-III: Measures of central tendency - mean, median, mode, geometric mean - merits & demerits. Measures of dispersion - range, standard deviation, mean deviation, quartile deviation - merits and demerits; Co-efficient of variations. (10 lectures)

Unit-IV: Correlation - types and methods of correlation, regression, simple regression equation, fitting prediction, similarities and dissimilarities of correlation and regression. (8 lectures)

Unit-V: Statistical inference - hypothesis - simple hypothesis - student 't' test - chi square test. (6 lectures)

PRACTICAL

1. Calculation of mean, standard deviation and standard error
2. Calculation of correlation coefficient values and finding out the probability
3. Calculation of F value and finding out the probability value for the Fvalue.

Suggested Readings:

1. Biostatistic, Danniell, W.W., 1987. New York, John Wiley Sons.
2. An introduction to Biostatistics, 3rd edition, Sundarrao, P.S.S and Richards, J. Christian Medical College, Vellore
3. Statistical Analysis of epidemiological data, Selvin, S., 1991. New York University Press.
4. Statistics for Biology, Boston, Bishop, O.N. Houghton, Mifflin.
5. The Principles of scientific research, Freedman, P. New York, Pergamon Press.
6. Statistics for Biologists, Campbell, R.C., 1998. Cambridge University Press.

DSE-3A: STRESS BIOLOGY

(Credits-6: Theory-4, Practical-2)-Max. Marks: 100
THEORY (Each class 1 hr.): Marks-70 PRACTICAL
(Each class 2 hrs.): Marks-30 Lectures: 60 (40
Theory + 20 Practical classes)

UNIT-I: Defining plant stress: Acclimation and adaptation. (2 lectures)

UNIT-II: Environmental factors: Water stress; Salinity stress, High light stress; Temperature stress; Hypersensitive reaction; Pathogenesis related (PR) proteins; Systemic acquired resistance; Mediation of insect and disease resistance by jasmonates. (12 lectures)

UNIT-III: Stress sensing mechanisms in plants: Role of nitric oxide. Calcium modulation, Phospholipid signaling (12 lectures)

UNIT-IV: Developmental and physiological mechanisms that protect plants against environmental stress: Adaptation in plants; Changes in root: shoot ratio; Aerenchyna development; Osmotic adjustment; Compatible solute production. (10 lectures)

UNIT-V: Reactive oxygen species Production and scavenging mechanisms. (4 lectures)

PRACTICAL

1. Quantitative estimation of peroxidase activity in the seedlings in the absence and presence of salt stress.
2. Superoxide activity in seedlings in the absence and presence of salt stress.
3. Assay of Ascorbate
4. Assay of peroxidase.

5. Assay of superoxide dismutase activity.
6. Quantitative estimation and analysis of catalase.

Suggested Readings:

1. Hopkins, W.G. and Huner, A. (2008). Introduction to Plant Physiology. John Wiley and Sons. U.S.A. 4th edition.
2. Taiz, L., Zeiger, E., Miller, I.M. and Murphy, A (2015). Plant Physiology and Development. Sinauer Associates Inc. USA. 6th edition.

DSE-3B: HORTICULTURAL PRACTICES & POST-HARVEST TECHNOLOGY

(Credits-6: Theory-4, Practical-2)-Max. Marks: 100

THEORY (Each class 1 hr.): Marks-70 PRACTICAL

(Each class 2 hrs.): Marks-30 Lectures: 60 (40

Theory + 20 Practical classes)

UNIT-I: Introduction: Scope and importance, Branches of horticulture; Role in rural economy and employment generation; Importance in food and nutritional security; Urban horticulture and ecotourism. (2 lectures)

Ornamental plants: Types, classification (annuals, perennials, climbers and trees); Identification and salient features of some ornamental plants [rose, marigold, gladiolus, carnations, orchids, poppies, gerberas, tuberose, sages, cacti and succulents (opuntia, agave and spurges)] Ornamental flowering trees (Indian laburnum, gulmohar, Jacaranda, Lagerstroemia, fishtail and areca palms, semul, Coral tree). (3 lectures)

UNIT-II: Fruit and vegetable crops: Production, origin and distribution; Description of plants and their economic products; Management and marketing of vegetable and fruit crops; Identification of some fruits and vegetable varieties (citrus, banana, mango, chillies and cucurbits). (4 lectures) Horticultural techniques: Application of manure, fertilizers, nutrients and PGRs; Weed control; Biofertilizers, biopesticides; Irrigation methods (drip irrigation, surface irrigation, furrow and border irrigation); Hydroponics; Propagation Methods: asexual (grafting, cutting, layering, budding), sexual (seed propagation), Scope and limitations. (6 lectures)

UNIT-III: Landscaping and garden design : Planning and layout (parks and avenues); gardening traditions - Ancient Indian, European, Mughal and Japanese Gardens; Urban forestry; policies and practices. (4 lectures)

Floriculture: Cut flowers, bonsai, commerce (market demand and supply); Importance of flower shows and exhibitions. (4 lectures)

UNIT-IV: Post-harvest technology: Importance of post harvest technology in horticultural crops; Evaluation of quality traits; Harvesting and handling of fruits, vegetables and cut flowers; Principles, methods of preservation and processing; Methods of minimizing losses during storage and transportation; Food irradiation - advantages and disadvantages; food safety. (6 lectures)

Disease control and management : Field and post-harvest diseases; Identification of deficiency symptoms; remedial measures and nutritional management practices; Crop sanitation; IPM strategies (genetic, biological and chemical methods for pest control); Quarantine practices; Identification of common diseases and pests of ornamentals, fruits and vegetable crops. (5 lectures)

UNIT-V: Horticultural crops - conservation and management: Documentation and conservation of germplasm; Role of micropropagation and tissue culture techniques; Varieties and cultivars of various horticultural crops; IPR issues; National, international and professional societies and sources of information on horticulture. (6 lectures)

Field Trip: Field visits to gardens, standing crop sites, nurseries, vegetable gardens and horticultural fields at IARI or other suitable locations.

PRACTICAL

Practical related to theory.

Suggested Readings:

1. Singh, D. & Manivannan, S. (2009). Genetic Resources of Horticultural Crops. Ridhi International, Delhi, India.
2. Swaminathan, M.S. and Kochhar, S.L. (2007). Groves of Beauty and Plenty: An Atlas of Major Flowering Trees in India. Macmillan Publishers, India.
3. NIIR Board (2005). Cultivation of Fruits, Vegetables and Floriculture. National Institute of Industrial Research Board, Delhi.
4. Kader, A.A. (2002). Post-Harvest Technology of Horticultural Crops. UCANR Publications, USA.
5. Capon, B. (2010). Botany for Gardeners. 3rd Edition. Timber Press, Portland, Oregon.

DSE-3C: RESEARCH METHODOLOGY

(Credits-6: Theory-4, Practical-2)-Max. Marks: 100

THEORY (Each class 1 hr.): Marks-70 PRACTICAL

(Each class 2 hrs.): Marks-30 Lectures: 60 (40

Theory + 20 Practical classes)

UNIT-I: Basic concepts of research :Research-definition and types of research (Descriptive vs analytical; applied vs fundamental; quantitative vs qualitative; conceptual vs empirical).Research methods vs methodology.Literature-review and its consolidation; Library research; field research; laboratory research. (6 lectures) General laboratory practices: Common calculations in botany laboratories. Understanding the details on the label of reagent bottles. Molarity and normality of common acids and bases.Preparation of solutions. Dilutions. Percentage solutions. Molar, molal and normal solutions.Technique of handling micropipettes; Knowledge about common toxic chemicals and safety measures in their handling. (8 lectures)

UNIT-II: Data collection and documentation of observations: Maintaining a laboratory record; Tabulation and generation of graphs. Imaging of tissuespecimens and application of scale bars. The art of field photography. (4 lectures)

Overview of Biological Problems : History; Key biology research areas, Model organisms in biology (A Brief overview): Genetics, Physiology, Biochemistry, Molecular Biology, Cell Biology,Genomics, Proteomics- Transcriptional regulatory network. (4 lectures)

UNIT-III: Methods to study plant cell/tissue structure: Whole mounts, peel mounts, squash preparations, clearing, maceration and sectioning; Tissue preparation: living vs fixed, physical vs chemical fixation, coagulating fixatives, noncoagulant fixatives; tissue dehydration using graded solvent series; Paraffin and plastic infiltration; Preparation of thin and ultrathin sections. (4 lectures)

UNIT-IV: Plant microtechniques : Staining procedures, classification and chemistry of stains. Staining equipment. Reactive dyes and fluorochromes (including genetically engineered protein labeling with GFP and other tags). Cytogenetic techniques with squashed plant materials. (8 lectures)

UNIT-V: The art of scientific writing and its presentation : Numbers, units, abbreviations and nomenclature used in scientific writing. Writing references. Power point presentation. Poster pre-

sentation. Scientific writing and ethics, Introduction to copyright-academic misconduct/plagiarism. (6 lectures)

PRACTICAL

1. Experiments based on chemical calculations.
2. Plant microtechnique experiments.
3. The art of imaging of samples through microphotography and field photography.
4. Poster presentation on defined topics.
5. Technical writing on topics assigned.

Suggested Readings:

1. Dawson, C. (2002). Practical research methods. UBS Publishers, New Delhi.
2. Stapleton, P., Yondeowei, A., Mukanyange, J., Houten, H. (1995). Scientific writing for agricultural research scientists a training reference manual. West Africa Rice Development Association, Hong Kong.
3. Ruzin, S.E. (1999). Plant microtechnique and microscopy. Oxford University Press, New York, U.S.

DSE-3D: INDUSTRIAL & ENVIRONMENTAL MICROBIOLOGY

(Credits-6: Theory-4, Practical-2)-Max. Marks: 100

THEORY (Each class 1 hr.): Marks-70 PRACTICAL

(Each class 2 hrs.): Marks-30 Lectures: 60 (40

Theory + 20 Practical classes)

UNIT-I: Scope of microbes in industry and environment: (2 lectures)

Bioreactors/Fermenters and fermentation processes: Solid-state and liquid-state (stationary and submerged) fermentations; Batch and continuous fermentations. Components of a typical bioreactor, Types of bioreactors laboratory, pilot scale and production fermenters; Constantly stirred tank fermenter, tower fermenter, fixed bed and fluidized bed bioreactors and airlift fermenter. A visit to any educational institute/ industry to see an industrial fermenter, and other downstream processing operations. (8 lectures)

UNIT-II: Microbial production of industrial products: Microorganisms involved, media, fermentation conditions, downstream processing and uses; Filtration, centrifugation, cell disruption, solvent extraction, precipitation and ultrafiltration, lyophilization, spray drying; Hands on microbial fermentations for the production and estimation (qualitative and quantitative) of Enzyme: amylase or lipase activity, Organic acid (citric acid or glutamic acid), alcohol (Ethanol) and antibiotic (Penicillin) (8 lectures)

Microbial enzymes of industrial interest and enzyme immobilization: Microorganisms for industrial applications and hands on screening microorganisms for casein hydrolysis; starch hydrolysis; cellulose hydrolysis. Methods of immobilization, advantages and applications of immobilization, large scale applications of immobilized enzymes (glucose isomerase and penicillin acylase). (6 lectures)

UNIT-III: Microbes and quality of environment: Distribution of microbes in air; Isolation of microorganisms from soil, air and water. (4 lectures)

UNIT-IV: Microbial flora of water: Water pollution, role of microbes in sewage and domestic waste

water treatment systems. Determination of BOD, COD, TDS and TOC of water samples; Microorganisms as indicators of water quality, check coliform and fecal coliform in water samples. (6 lectures)

UNIT-V: Microbes in agriculture and remediation of contaminated soils: Biological fixation; Mycorrhizae; Bioremediation of contaminated soils. Isolation of root nodulating bacteria, arbuscular mycorrhizal colonization in plant roots. (6 lectures)

PRACTICAL

1. Principles and functioning of instruments in microbiology laboratory
2. Hands on sterilization techniques and preparation of culture media.

Suggested Readings:

1. Pelzar, M.J. Jr., Chen E.C. S., Krieg, N.R. (2010). Microbiology: An application based approach. Tata McGraw Hill Education Pvt. Ltd., Delhi.
2. Tortora, G.J., Funke, B.R., Case. C.L. (2007). Microbiology. Pearson Benjamin Cummings, San Francisco, U.S.A. 9th edition.

GENERIC ELECTIVE COURSES

GE-1A: BIODIVERSITY

(Credits-6: Theory-4, Practical-2)-Max. Marks: 100
THEORY (Each class 1 hr.): Marks-70 PRACTICAL
(Each class 2 hrs.): Marks-30 Lectures: 60 (40
Theory + 20 Practical classes)

UNIT-I: Microbes : Viruses Discovery, general structure, replication (general account), DNA virus (T-phage); Lytic and lysogenic cycle, RNA virus (TMV); **Economic importance**; Bacteria Discovery, General characteristics and cell structure; Reproduction vegetative, asexual and recombination (conjugation, transformation and transduction); **Economic importance**. (8 lectures)

UNIT-II: Algae: General characteristics; Ecology and distribution; Range of thallus organization and reproduction; Classification of algae; Morphology and lifecycles of the following: *Nostoc*, *Chlamydomonas*, *Oedogonium*, *Vaucheria*, *Fucus*, *Polysiphonia*. **Economic importance of algae**. (10 lectures)

Fungi : Introduction- General characteristics, **ecology and significance**, range of thallus organization, cell wall composition, nutrition, reproduction and classification; True Fungi- General characteristics, **ecology and significance**, life cycle of *Rhizopus* (Zygomycota) *Penicillium*, *Alternaria* (Ascomycota), *Puccinia*, *Agaricus* (Basidiomycota); Symbiotic Associations-**Lichens**: (6 lectures)

UNIT-III: Introduction to Archegoniate : Unifying features of archegoniates, Transition to land habit, Alternation of generations. (2 lectures)

Bryophytes : General characteristics, adaptations to land habit, Classification, Range of thallus organization. Classification (up to family), morphology, anatomy and reproduction of *Marchantia* and *Funaria*. (Developmental details not to be included). **Ecology and economic importance of bryophytes with special mention of Sphagnum**. (6 lectures)

UNIT-IV: Pteridophytes : General characteristics, classification, Early land plants (*Cooksonia* and

Rhynia). Classification (up to family), morphology, anatomy and reproduction of Selaginella, Equisetum and Pteris. (Developmental details not to be included). Heterospory and seed habit, stellar evolution. **Ecological and economical importance of Pteridophytes**. (5 lectures)

UNIT-V: Gymnosperms: General characteristics, classification. Classification (up to family), morphology, anatomy and reproduction of Cycas and Pinus. (Developmental details not to be included). **Ecological and economical importance**. (6 lectures)

PRACTICAL

1. EMs/Models of viruses T-Phage and TMV, Line drawing/Photograph of Lytic and Lysogenic Cycle.
2. Types of Bacteria from temporary/permanent slides/photographs; EM bacterium; Binary Fission; Conjugation; Structure of root nodule.
3. Gram staining.
4. Study of vegetative and reproductive structures of Nostoc, Chlamydomonas (electron micrographs), Oedogonium, Vaucheria, Fucus* and Polysiphonia through temporary preparations and permanent slides. (*: Fucus - Specimen and permanent slides)
5. Rhizopus and Penicillium: Asexual stage from temporary mounts and sexual structures through permanent slides.
6. Alternaria: Specimens/photographs and tease mounts.
7. Puccinia: Herbarium specimens of Black Stem Rust of Wheat and infected Barberry leaves; section/tease mounts of spores on Wheat and permanent slides of both the hosts.
8. Agaricus: Specimens of button stage and full grown mushroom; Sectioning of gills of Agaricus.
9. Lichens: Study of growth forms of lichens (crustose, foliose and fruticose)
10. Mycorrhiza: ecto mycorrhiza and endo mycorrhiza (Photographs)
11. Marchantia- morphology of thallus, w.m. rhizoids and scales, v.s. thallus through gemma cup, w.m. gemmae (all temporary slides), v.s. antheridiophore, archegoniophore, l.s. sporophyte (all permanent slides).
12. Funaria- morphology, w.m. leaf, rhizoids, operculum, peristome, annulus, spores (temporary slides); permanent slides showing antheridial and archegonial heads, l.s. capsule and protonema.
13. Selaginella- morphology, w.m. leaf with ligule, t.s. stem, w.m. strobilus, w.m. microsporophyll and megasporophyll (temporary slides), l.s. strobilus (permanent slide).
14. Equisetum- morphology, t.s. internode, l.s. strobilus, t.s. strobilus, w.m. sporangiophore, w.m. spores (wet and dry) (temporary slides); t.s. rhizome (permanent slide).
15. Pteris- morphology, t.s. rachis, v.s. sporophyll, w.m. sporangium, w.m. spores (temporary slides), t.s. rhizome, w.m. prothallus with sex organs and young sporophyte (permanent slide).
16. Cycas- morphology (coralloid roots, bulbil, leaf), t.s. coralloid root, t.s. rachis, v.s. leaflet, v.s. microsporophyll, w.m. spores (temporary slides), l.s. ovule, t.s. root (permanent slide).
17. Pinus- morphology (long and dwarf shoots, w.m. dwarf shoot, male and female), w.m. dwarf

shoot, t.s. needle, t.s. stem, , l.s./t.s. male cone, w.m. microsporophyll, w.m. microspores (temporary slides), l.s. female cone, t.l.s. & r.l.s. stem (permanent slide).

Suggested Readings:

1. Kumar, H.D. (1999). Introductory Phycology. Affiliated East-West. Press Pvt. Ltd. Delhi. 2nd edition.
2. Tortora, G.J., Funke, B.R., Case, C.L. (2010). Microbiology: An Introduction, Pearson Benjamin Cummings, U.S.A. 10th edition.
3. . Sethi, I.K. and Walia, S.K. (2011). Text book of Fungi & Their Allies, MacMillan Publishers Pvt. Ltd., Delhi.
4. Alexopoulos, C.J., Mims, C.W., Blackwell, M. (1996). Introductory Mycology, John Wiley and Sons (Asia), Singapore. 4th edition.
5. Raven, P.H., Johnson, G.B., Losos, J.B., Singer, S.R., (2005). Biology. Tata McGraw Hill, Delhi, India.
6. Vashishta, P.C., Sinha, A.K., Kumar, A., (2010). Pteridophyta, S. Chand. Delhi, India.
7. Bhatnagar, S.P. and Moitra, A. (1996). Gymnosperms. New Age International (P) Ltd Publishers, New Delhi, India.
8. Parihar, N.S. (1991). An introduction to Embryophyta. Vol. I. Bryophyta. Central Book Depot, Allahabad.

GE-1B: PLANT ECOLOGY & TAXONOMY

(Credits-6: Theory-4, Practical-2)-Max. Marks: 100

THEORY (Each class 1 hr.): Marks-70 PRACTICAL

(Each class 2 hrs.): Marks-30 Lectures: 60 (40

Theory + 20 Practical classes)

UNIT-I: Introduction: (2 lectures)

Ecological factors : Soil: Origin, formation, composition, soil profile. Water: States of water in the environment, precipitation types. Light and temperature: Variation Optimal and limiting factors; Shelford law of tolerance. Adaptation of hydrophytes and xerophytes (6 lectures)

Plant communities : Characters; Ecotone and edge effect; Succession; Processes and types (3 lectures)

UNIT-II: Ecosystem : Structure; Biotic and abiotic components, energy flow trophic organisation; Food chains and food webs, Ecological pyramids production and productivity; Biogeochemical cycling; Cycling of carbon, nitrogen and Phosphorous (6 lectures)

Phytogeography : Principle biogeographical zones; Endemism (2 lectures)

UNIT-III: Introduction to plant taxonomy: Identification, Classification, Nomenclature. (2 lectures)

Identification : Functions of Herbarium, important herbaria and botanical gardens of the world and India; Documentation: Flora, Keys: single access and multi-access (3 lectures)

UNIT-IV: Taxonomic evidences from palynology, cytology, phytochemistry and molecular Data: (4 lectures)

Taxonomic hierarchy: Ranks, categories and taxonomic groups 2 lectures Biometrics, numerical taxonomy and cladistics: Characters; variations; OTUs, character weighting and coding; cluster analysis; phenograms, cladograms (definitions and differences). (5 lectures)

UNIT-V: Botanical nomenclature: Principles and rules (ICN); ranks and names; binominal system, typification, author citation, valid publication, rejection of names, principle of priority and its limitations. (4 lectures)

Classification: Types of classification-artificial, natural and phylogenetic. Bentham and Hooker (upto series), Engler and Prantl (upto series). (5 lectures)

PRACTICAL

1. Study of instruments used to measure microclimatic variables: Soil thermometer, maximum and minimum thermometer, anemometer, psychrometer/hygrometer, rain gauge and luxmeter.
2. Determination of pH, and analysis of two soil samples for carbonates, chlorides, nitrates, sulphates, organic matter and base deficiency by rapid field test.
3. Comparison of bulk density, porosity and rate of infiltration of water in soil of three habitats.
4. (a) Study of morphological adaptations of hydrophytes and xerophytes (four each). (b) Study of biotic interactions of the following: Stem parasite (*Cuscuta*), Root parasite (*Orobancha*), Epiphytes, Predation (Insectivorous plants).
5. Determination of minimal quadrat size for the study of herbaceous vegetation in the college campus by species area curve method. (species to be listed)
6. Quantitative analysis of herbaceous vegetation in the college campus for frequency and comparison with Raunkiaers frequency distribution law
7. Study of vegetative and floral characters of the following families (Description, V.S. flower, section of ovary, floral diagram/s, floral formula/e and systematic position according to Bentham & Hookers system of classification): Brassicaceae - Brassica, Alyssum / Iberis; Asteraceae - Sonchus/Launaea, Vernonia/Ageratum, Eclipta/Tridax; Solanaceae - Solanum nigrum, Withania; Lamiaceae - Salvia, Ocimum; Liliaceae - Asphodelus / Liliium / Allium.
8. Mounting of a properly dried and pressed specimen of any wild plant with herbarium label (to be submitted in the record book).

Suggested Readings:

1. Kormondy, E.J. (1996). Concepts of Ecology. Prentice Hall, U.S.A. 4th edition.
2. Sharma, P.D. (2010) Ecology and Environment. Rastogi Publications, Meerut, India. 8th edition.
3. Simpson, M.G. (2006). Plant Systematics. Elsevier Academic Press, San Diego, CA, U.S.A.

4. Singh, G. (2012). Plant Systematics: Theory and Practice. Oxford & IBH Pvt. Ltd., New Delhi. 3rd edition.

GE-2: ECONOMIC PLANT ANATOMY & EMBRYOLOGY

(Credits-6: Theory-4, Practical-2)-Max. Marks: 100

THEORY (Each class 1 hr.): Marks-70 PRACTICAL

(Each class 2 hrs.): Marks-30 Lectures: 60 (40

Theory + 20 Practical classes)

UNIT-I: Introduction: (2 lectures)

Meristematic and permanent tissues: Root and shoot apical meristems; Simple and complex tissues (5 lectures)

Organs: Structure of dicot and monocot root stem and leaf. (3 lectures)

UNIT-II: Secondary Growth: Vascular cambium structure and function, seasonal activity. Secondary growth in root and stem, Wood (heartwood and sapwood) (6 lectures)

Adaptive and protective systems: Epidermis, cuticle, stomata; General account of adaptations in xerophytes and hydrophytes. (5 lectures)

UNIT-III: Structural organization of flower: Structure of anther and pollen; Structure and types of ovules; Types of embryo sacs, organization and ultrastructure of mature embryo sac. (5 lectures)

Pollination and fertilization: Pollination mechanisms and adaptations; Double fertilization; Seed-structure appendages and dispersal mechanisms. (6 lectures)

UNIT-IV: Embryo and endosperm: Endosperm types, structure and functions; Dicot and monocot embryo; Embryo endosperm relationship (5 lectures)

UNIT-V: Apomixis and polyembryony: Definition, types and Practical applications. (5 lectures)

PRACTICAL

1. Study of meristems through permanent slides and photographs.
2. Tissues (parenchyma, collenchyma and sclerenchyma); Macerated xylary elements, Phloem (Permanent slides, photographs)
3. Stem: Monocot: Zea mays; Dicot: Helianthus; Secondary: Helianthus (only Permanent slides).
4. Root: Monocot: Zea mays; Dicot: Helianthus; Secondary: Helianthus (only Permanent slides).
5. Leaf: Dicot and Monocot leaf (only Permanent slides).
6. Adaptive anatomy: Xerophyte (Nerium leaf); Hydrophyte (Hydrilla stem).
7. Structure of anther (young and mature), tapetum (amoeboid and secretory) (Permanent slides).
8. Types of ovules: anatropous, orthotropous, circinotropous, amphitropous/ campylotropous.
9. Female gametophyte: Polygonum (monosporic) type of Embryo sac Development (Permanent slides/photographs).
10. Ultrastructure of mature egg apparatus cells through electron micrographs.
11. Pollination types and seed dispersal mechanisms (including appendages, aril, caruncle) (Photographs and specimens).
12. Dissection of embryo/endosperm from developing seeds.

13. Calculation of percentage of germinated pollen in a given medium.

Suggested Readings:

1. Bhojwani, S.S. & Bhatnagar, S.P. (2011). Embryology of Angiosperms. Vikas Publication House Pvt. Ltd. New Delhi. 5th edition.
2. Mauseth, J.D. (1988). Plant Anatomy. The Benjamin/Cummings Publisher, USA.

GE-4A: PLANT PHYSIOLOGY & METABOLISM

(Credits-6: Theory-4, Practical-2)-Max. Marks: 100

THEORY (Each class 1 hr.): Marks-70 PRACTICAL

(Each class 2 hrs.): Marks-30 Lectures: 60 (40

Theory + 20 Practical classes)

UNIT-I: Plant-water relations: Importance of water, water potential and its components; Transpiration and its significance; Factors affecting transpiration; Root pressure and guttation. (4 lectures)
Mineral nutrition: Essential elements, macro and micronutrients; Criteria of essentiality of elements; Role of essential elements; Transport of ions across cell membrane, active and passive transport, carriers, channels and pumps. (4 lectures)

Translocation in phloem.: Composition of phloem sap, girdling experiment; Pressure flow model; Phloem loading and unloading (4 lectures)

UNIT-II: Photosynthesis: Photosynthetic Pigments (Chl a, b, xanthophylls, carotene); Photo- system I and II, reaction center, antenna molecules; Electron transport and mechanism of ATP synthesis; C₃, C₄ and CAM pathways of carbon fixation; Photorespiration. (8 lectures)

UNIT-III: Respiration : Glycolysis, anaerobic respiration, TCA cycle; Oxidative phosphorylation, Glyoxylate, Oxidative Pentose Phosphate Pathway. (4 lectures)

UNIT-IV: Enzymes: Structure and properties; Mechanism of enzyme catalysis and enzyme inhibition. (3 lectures)

Nitrogen metabolism : Biological nitrogen fixation; Nitrate and ammonia assimilation. (3 lectures)

UNIT-V: Plant growth regulators :Discovery and physiological roles of auxins, gibberellins, cytokinins, ABA, ethylene. (5 lectures)

Plant response to light and temperature: Photoperiodism (SDP, LDP, Day neutral plants); **Phytochrome** (discovery and structure), red and far red light responses on photomorphogenesis; Vernalization. (5 lectures)

PRACTICAL

1. Determination of osmotic potential of plant cell sap by plasmolytic method.
2. To study the effect of two environmental factors (light and wind) on transpiration by excised twig.
3. Calculation of stomatal index and stomatal frequency of a mesophyte and a xerophyte.
4. Demonstration of Hill reaction.
5. Demonstrate the activity of catalase and study the effect of pH and enzyme concentration.
6. To study the effect of light intensity and bicarbonate concentration on O₂ evolution in photosynthesis.

7. Comparison of the rate of respiration in any two parts of a plant.
8. Separation of amino acids by paper chromatography.

Demonstration experiments (any four): (a) Bolting.

- (b) Effect of auxins on rooting.
- (c) Suction due to transpiration.
- (d) R.Q. (e) Respiration in roots.

Suggested Readings:

1. Taiz, L., Zeiger, E., Mller, I.M. and Murphy, A (2015). Plant Physiology and Development. Sinauer Associates Inc. USA. 6th edition.
2. Hopkins, W.G., Huner, N.P., (2009). Introduction to Plant Physiology. John Wiley & Sons, U.S.A. 4th Edition.
3. Bajracharya, D., (1999). Experiments in Plant Physiology- A Laboratory Manual. Narosa Publishing House, New Delhi.

GE-4B: BOTANY & PLANT BIO-TECHNOLOGY

(Credits-6: Theory-4, Practical-2)-Max. Marks: 100

THEORY (Each class 1 hr.): Marks-70 PRACTICAL

(Each class 2 hrs.): Marks-30 Lectures: 60 (40 Theory + 20 Practical classes)

UNIT-I: Origin of Cultivated Plants: Concept of centres of origin, their importance with reference to Vavilovs work. (3lectures)

UNIT-II: Cereals: Wheat -Origin, morphology, uses 3 lectures Legumes: General account with special reference to Gram and soybean (4 lectures)

UNIT-III: Spices: General account with special reference to clove and black pepper (Botanical name, family, part used, morphology and uses) (4 lectures)

Beverages: Tea (morphology, processing, uses) (3 lectures)

UNIT-IV: Oils and Fats: General description with special reference to groundnut 3 lectures Fibre Yielding Plants: General description with special reference to Cotton (Botanical name, family, part used, morphology and uses) (3 lectures)

UNIT-V: Introduction to biotechnology (2 lectures)

Plant tissue culture: Micropropagation; haploid production through androgenesis and gynogenesis; brief account of embryo and endosperm culture with their applications, Gene cloning by recombinant DNA technology, transgenic plants. (6 lectures)

Molecular Techniques: Blotting techniques: Northern, Southern and Western Blotting, DNA Fingerprinting; Molecular DNA markers i.e. RAPD, RFLP, SNPs; DNA sequencing, PCR and Reverse Transcriptase-PCR. Hybridoma and monoclonal antibodies, ELISA and Immunodetection. Molecular diagnosis of human disease, Human gene Therapy. (9lectures)

PRACTICAL

1. Study of economically important plants: Wheat, Gram, Soybean, Black pepper, Clove Tea, Cotton, Groundnut through specimens, sections and microchemical tests

2. Familiarization with basic equipments in tissue culture.
3. Study through photographs: Anther culture, somatic embryogenesis, endosperm and embryo culture; micropropagation.
4. Study of molecular techniques: PCR, Blotting techniques, AGE and PAGE.

Suggested Readings:

1. Kochhar, S.L. (2011). Economic Botany in the Tropics, MacMillan Publishers India Ltd., New Delhi. 4th edition.
2. Bhojwani, S.S. and Razdan, M.K., (1996). Plant Tissue Culture: Theory and Practice. Elsevier Science Amsterdam. The Netherlands.
3. Glick, B.R., Pasternak, J.J. (2003). Molecular Biotechnology- Principles and Applications of recombinant DNA. ASM Press, Washington.

GE-V: ENVIRONMENTAL BIO-TECHNOLOGY

(Credits-6: Theory-4, Practical-2)-Max. Marks: 100

THEORY (Each class 1 hr.): Marks-70 PRACTICAL

(Each class 2 hrs.): Marks-30 Lectures: 60 (40
Theory + 20 Practical classes)

UNIT-I: Environment - basic concepts and issues, global environmental problems ozone depletion, UV-B, greenhouse effect and acid rain due to anthropogenic activities, their impact and biotechnological approaches for management. (4 lectures)

An overview of atmosphere, hydrosphere, lithosphere and anthrosphere - environmental problems. Environmental pollution - types of pollution, sources of pollution, measurement of pollution, Bio-concentration, bio/geomagnification. (4 lectures)

UNIT-II: Microbiology of waste water treatment, aerobic process - activated sludge, oxidation ponds, trickling filter, towers, rotating discs, rotating drums, oxidation ditch. Anaerobic process - anaerobic digestion, anaerobic filters, up-flow anaerobic sludge blanket reactors. Treatment schemes for waste waters of dairy, distillery, tannery, sugar and antibiotic industries. (6 lectures)

UNIT-III: Xenobiotic compounds - organic (chlorinated hydrocarbons, substituted simple aromatic compounds, poly-aromatic hydrocarbons, pesticides, surfactants) and inorganic (metals, radionuclides, phosphates, nitrates). Bio-remediation of xenobiotics in environment - ecological consideration, decay behavior and degradative plasmids, molecular techniques in bio-remediation. (6 lectures)

Role of immobilized cells/enzymes in treatment of toxic compounds. Bio-pesticides, bio-reactors, bio-leaching, bio-mining, bio-sensors, bio-techniques for air pollution abatement and odour control. (4 lectures)

UNIT-IV: Sustainable Development: Economics and Environment: Economic growth, Gross National Productivity and the quality of life, Tragedy of Commons, Economics of Pollution control, Cost-benefit and cost effectiveness analysis, WTO and Environment, Corporate Social Responsibility, Environmental awareness and Education; Environmental Ethics. (6 lectures)

UNIT-V: International Legislations, Policies for Environmental Protection: Stockholm Conference (1972) and its declaration, WCED (1983) and Brundtland Report (1987), Rio Earth Summit-UNCED (1992) and its declaration, Montreal Protocol - 1987, Basel Convention (1989), Kyoto Protocol- 1997, Ramsar Convention 1971. (3 lectures)

National Legislations, Policies for Pollution Management: Salient features of Wild life protection act

1972, Water Pollution (Prevention and Control) Act- 1974, Forest conservation act 1980, Air Pollution (Prevention and Control) Act-1981, National Environmental Policy-2006, Central and State Pollution Control Boards: Constitution and power. (3 lectures)

Public Participation for Environmental Protection: Environmental movement and peoples participation with special references to Gandhamardan, Chilika and Narmada Bachao Andolan, Chipko and Silent valley Movement; Women and Environmental Protection, Role of NGO in bringing environmental awareness and education in the society. (4lectures)

PRACTICAL

1. Water/Soil analysis-DO, salinity, pH, chloride, total hardness, alkalinity, acidity, nitrate, calcium, Magnesium and phosphorus.
2. Gravimetric analysis-Total solid, dissolved solid, suspended solid in an effluent
3. Microbial assessment of air (open plate and air sample) and water.

Suggested Readings:

1. Waste water engineering-treatment, disposal and reuse, Metcalf and Eddy Inc., Tata McGraw Hill, New Delhi.
2. Environmental Chemistry, AK. De, Wiley Eastern Ltd, New Delhi.
3. Introduction to Bio-deterioration, D.Allsopp and K.J. Seal, ELBS / Edward Arnold.
4. Bioremediation, Baaker, KH and Herson D.S., 1994. Mc.GrawHill Inc, NewYork.
5. Industrial and Environmental Biotechnology - Nuzhat Ahmed, Fouad M. Qureshi and Obaid Y. Khan, 2006. Horizon Press.
6. Environmental Molecular Biology, Paul. A, Rochelle, 2001.Horizon Press.
7. Environmental Protection and Laws by Jadhav and Bhosale, V.M.Himalaya publ. House 13. Biodiversity Assessment and Conservation by PC Trivedi, Agrobios publ.

SKILL ENHANCEMENT COURSES (SEC)

SEC-I: BIO-FERTILIZERS

(Credits-2: Lectures: 30)

THEORY (Each class 1 hr.)-Marks: 50.

Unit-I: General account about the microbes used as biofertilizer Rhizobium isolation, identification, mass multiplication, carrier based inoculants, Actinorrhizal symbiosis. (4 lectures)

Unit-II: Azospirillum: isolation and mass multiplication carrier based inoculant, associative effect of different microorganisms. Azotobacter: classification, characteristics crop response to Azotobacter inoculum, maintenance and mass multiplication. (8 lectures)

Unit-III: Cyanobacteria (blue green algae), Azolla and Anabaena azollae association, nitrogen fixation, factors affecting growth, blue green algae and Azolla in rice cultivation. (4 lectures)

Unit-IV: Mycorrhizal association, types of mycorrhizal association, taxonomy, occurrence and distribution, phosphorus nutrition, growth and yield colonization of VAM isolation and inoculum production of VAM, and its influence on growth and yield of crop plants. (8 lectures)

Unit-V: Organic farming Green manuring and organic fertilizers, Recycling of biodegradable municipal, agricultural and Industrial wastes bio-compost making methods, types and method of vermicomposting field Application. (6 lectures)

Suggested Readings:

1. Dubey, R.C., 2005 A Text book of Biotechnology S.Chand & Co, New Delhi.
2. Kumaresan, V. 2005, Biotechnology, Saras Publications, New Delhi.
3. John Jothi Prakash, E. 2004. Outlines of Plant Biotechnology. Emkay, Publication, New Delhi.
4. Sathe, T.V. 2004 Vermiculture and Organic Farming. Daya publishers.
5. Subha Rao, N.S. 2000, Soil Microbiology, Oxford & IBH Publishers, New Delhi.
6. Vayas,S.C, Vayas, S. and Modi, H.A. 1998 Bio-fertilizers and organic, Farming Akta Prakashan, Nadiad

SEC-II: HERBAL TECHNOLOGY

(Credits-2: Lectures: 30)

THEORY (Each class 1 hr.)-Marks: 50.

Unit-I: Herbal medicines: history and scope - definition of medical terms - role of medicinal plants in Siddha systems of medicine; cultivation - harvesting - processing - storage - marketing and utilization of medicinal plants. (6 lectures)

Unit-II: Pharmacognosy - systematic position m edicinal uses of the following herbs in curing various ailments; Tulsi, Ginger, Fenugreek, Indian Goose berry and Ashoka. (6 lectures)

Unit-III: Phytochemistry - active principles and methods of their testing - identification and utilization of the medicinal herbs; Catharanthus roseus (cardiotonic), Withania somnifera (drugs acting on nervous system), Clerodendron phlomoides (anti-rheumatic) and Centella asiatica (memory booster). (6 lectures)

Unit-IV: Analytical pharmacognosy: Drug adulteration - types, methods of drug evaluation - Biological testing of herbal drugs - Phytochemical screening tests for secondary metabolites (alkaloids, flavonoids, steroids, triterpenoids, phenolic compounds) (8 lectures)

Unit-V: Medicinal plant banks micro propagation of important species (Withania somnifera, neem and tulsi- Herbal foods-future of pharmacognosy) (4 lectures)

Suggested Readings:

1. Glossary of Indian medicinal plants, R.N.Chopra, S.L.Nayar and I.C.Chopra, 1956. C.S.I.R, New Delhi.
2. The indigenous drugs of India, Kanny, Lall, Dey and Raj Bahadur, 1984. International Book Distributors.
3. Herbal plants and Drugs Agnes Arber, 1999. Mangal Deep Publications.
4. Ayurvedic drugs and their plant source. V.V. Sivarajan and Balachandran Indra 1994. Oxford IBH publishing Co.
5. Ayurveda and Aromatherapy. Miller, Light and Miller, Bryan, 1998. Banarsidass, Delhi.
6. Principles of Ayurveda, Anne Green, 2000. Thomsons, London.

7. Pharmacognosy, Dr.C.K.Kokate et al. 1999. Nirali Prakashan.

SEC-III: NURSERY & GARDENING

(Credits-2: Lectures: 30)

THEORY (Each class 1 hr.)-Marks: 50.

Unit-I: Nursery: definition, objectives and scope and building up of infrastructure for nursery, planning and seasonal activities - Planting - direct seeding and transplants. (4 lectures)

Unit-II: Seed: Structure and types - Seed dormancy; causes and methods of breaking dormancy - Seed storage: Seed banks, factors affecting seed viability, genetic erosion Seed production technology - seed testing and certification. (6 lectures)

Unit-III: Vegetative propagation: air-layering, cutting, selection of cutting, collecting season, treatment of cutting, rooting medium and planting of cuttings - Hardening of plants green house-mist chamber, shed root, shade house and glass house. (6 lectures)

Unit-IV: Gardening: definition, objectives and scope - different types of gardening landscape and home gardening - parks and its components - plant materials and design computer applications in landscaping - Gardening operations: soil laying, manuring, watering, management of pests and diseases and harvesting. (8 lectures)

Unit-V: Sowing/raising of seeds and seedlings - Transplanting of seedlings - Study of cultivation of different vegetables: cabbage, brinjal, lady's finger, onion, garlic, tomatoes, and carrots - Storage and marketing procedures. (6 lectures)

Suggested Readings:

1. Bose T.K. & Mukherjee, D., 1972, Gardening in India, Oxford & IBH Publishing Co., New Delhi.
2. Sandhu, M.K., 1989, Plant Propagation, Wile Eastern Ltd., Bangalore, Madras.
3. Kumar, N., 1997, Introduction to Horticulture, Rajalakshmi Publications, Nagercoil.
4. Edmond Musser & Andres, Fundamentals of Horticulture, McGraw Hill Book Co., New Delhi.
5. Agrawal, P.K. 1993, Hand Book of Seed Technology, Dept. of Agriculture and Cooperation, National Seed Corporation Ltd., New Delhi.
6. Janick Jules. 1979. Horticultural Science. (3rd Ed.), W.H. Freeman and Co., San Francisco, USA.

SEC-IV: FLORICULTURE

(Credits-2: Lectures: 30)

THEORY (Each class 1 hr.)-Marks: 50.

Unit-I: Introduction: History of gardening; Importance and scope of floriculture and landscape gardening. (2 lectures)

Unit-II: Nursery Management and Routine Garden Operations: Sexual and vegetative methods of propagation; Soil sterilization; Seed sowing; Pricking; Planting and transplanting; Shading; Stopping or pinching; Defoliation; Wintering; Mulching; Topiary; Role of plant growth regulators. (8 lectures)

Unit-III: Ornamental Plants: Flowering annuals; Herbaceous perennials; Divine vines; Shade and ornamental trees; Ornamental bulbous and foliage plants; Cacti and succulents; Palms and Cycads; Ferns and Selaginellas; Cultivation of plants in pots; Indoor gardening; Bonsai. (4 lectures)

Unit-IV: Principles of Garden Designs: English, Italian, French, Persian, Mughal and Japanese gardens; Features of a garden (Garden wall, Fencing, Steps, Hedge, Edging, Lawn, Flower beds,

Shrubbery, Borders, Water garden. Some Famous gardens of India (4 lectures)
Landscaping Places of Public Importance: Landscaping highways and Educational institutions. (4 lectures)

Unit-V: Commercial Floriculture: Factors affecting flower production; Production and packaging of cut flowers; Flower arrangements; Methods to prolong vase life; Cultivation of Important cut flowers (Carnation, Aster, Chrysanthemum, Dahlia, Gerbera, Gladiolous, Marigold, Rose, Liliium, Orchids). (6 lectures)

Diseases and Pests of Ornamental Plants. (2 lectures)

Suggested Readings:

Randhawa, G.S. and Mukhopadhyay, A. 1986. Floriculture in India. Allied Publishers.

SEC-V: MEDICAL BOTANY

(Credits-2: Lectures: 30)

THEORY (Each class 1 hr.)-Marks: 50.

Unit-I: History, Scope and Importance of Medicinal Plants. Indigenous Medicinal Sciences; Definition and Scope-Ayurveda: History, origin, panchamahabhutas, saptadhatu and tridosha concepts, Rasayana, plants used in ayurvedic treatments. (5 lectures)

Unit-II: Siddha: Origin of Siddha medicinal systems, Basis of Siddha system, plants used in Siddha medicine. Unani: History, concept: Umoor-e- tabiya, tumors treatments/ therapy, polyherbal formulations. (5 lectures)

Unit-III: Conservation of endangered and endemic medicinal plants. Definition: endemic and endangered medicinal plants, Red list criteria; In situ conservation: Biosphere reserves, sacred groves, National Parks; Ex situ conservation: Botanic Gardens, Ethno medicinal plant Gardens. (6 lectures)

Unit-IV: Propagation of Medicinal Plants: Objectives of the nursery, its classification, important components of a nursery, sowing, pricking, use of green house for nursery production, propagation through cuttings, layering, grafting and budding. (6 lectures)

Unit-V: Ethnobotany and Folk medicines. Definition; Ethnobotany in India: Methods to study ethnobotany; Applications of Ethnobotany: National interacts, Palaeo-ethnobotany. Folk medicines of ethnobotany, ethno medicine, ethno ecology, ethnic communities of India. Application of natural products to certain diseases- Jaundice, cardiac, infertility, diabetics, Blood pressure and skin diseases. (8 lectures)

Suggested Readings:

1. Trivedi P C, 2006. Medicinal Plants: Ethno botanical Approach, Agro-bios, India.
2. Purohit and Vyas, 2008. Medicinal Plant Cultivation: A Scientific Approach, 2nd Edn. Agro- bios, India.

SEC-VI: PLANT DIVERSITY & HUMAN WELFARE

(Credits-2: Lectures: 30)

THEORY (Each class 1 hr.)-Marks: 50.

Unit-I: Plant diversity and its scope- Genetic diversity, Species diversity, Plant diversity at the ecosystem level, Agro-bio-diversity and cultivated plant taxa, wild taxa. Values and uses of Biodiversity: Ethical and aesthetic values, Precautionary principle, Methodologies for valuation, Uses of plants, Uses of microbes. (6 lectures)

Unit-II: Loss of Bio-diversity: Loss of genetic diversity, Loss of species diversity, Loss of ecosystem diversity, Loss of agro-bio-diversity, Projected scenario for biodiversity loss, (6 lectures)

Unit-III: Management of Plant Bio-diversity: Organizations associated with bio-diversity management- Methodology for execution-IUCN, UNEP, UNESCO, WWF, NBPGR; Bio-diversity legislation and conservations, Bio-diversity information management and communication. (6 lectures)

Unit-IV: Conservation of Bio-diversity: Conservation of genetic diversity, species diversity and ecosystem diversity, In situ and ex situ conservation, Social approaches to conservation, Bio-diversity awareness programmes, Sustainable development. (6 lectures)

Unit-V: Role of plants in relation to Human Welfare: (a) Importance of forestry their utilization and commercial aspects (b) Avenue trees. (c) Ornamental plants of India. (d) Alcoholic beverages through ages. Fruits and nuts: Important fruit crops their commercial importance. Wood and its uses. (6 lectures)

Suggested Readings:

Krishnamurthy, K.V. (2004). An Advanced Text Book of Biodiversity - Principles and Practices. Oxford and IBH Publications Co. Pvt. Ltd. New Delhi

SEC-VII: ETHNOBOTANY

(Credits-2: Lectures: 30)

THEORY (Each class 1 hr.)-Marks: 50.

Unit-I: Introduction, concept, scope and objectives; Ethnobotany as an interdisciplinary science. The relevance of ethnobotany in the present context; Major and minor ethnic groups or Tribals of India, and their life styles. Plants used by the tribals: (a) Food plants. (b) intoxicants and beverages
c) Resins and oils and miscellaneous uses. (6 lectures)

Unit-II: Methodology of Ethnobotanical studies: (a) Field work. (b) Herbarium. (c) Ancient Literature. (d) Archaeological findings. (e) Temples and sacred places. (6 lectures)

Unit-III: Role of ethnobotany in modern Medicine Medico-ethnobotanical sources in India; Significance of the following plants in ethno botanical practices (along with their habitat and morphology) (a) Azadiractha indica. (b) Ocimum sanctum. (c) Vitex negundo. (d) Gloriosa superba e) Tribulus terrestris. (f) Pongamia pinnata. (g) Cassia auriculata. (h) Indigofera tinctoria. Role of ethnobotany in modern medicine with special example Rauvolfia sepentina, Trichopus zeylanicus, Artemisia, Withania. (8 lectures)

Unit-IV: Role of ethnic groups in conservation of plant genetic resources. Endangered taxa and forest management (participatory forest management). (4 lectures)

Unit-V: Ethnobotany and legal aspects Ethnobotany as a tool to protect interests of ethnic groups. Sharing of wealth concept with few examples from India. Biopiracy, Intellectual Property Rights and Traditional Knowledge. (6 lectures)

Suggested Readings:

1. S.K. Jain, Manual of Ethnobotany, Scientific Publishers, Jodhpur, 1995.
2. S.K. Jain (ed.) Glimpses of Indian. Ethnobotny, Oxford and I B H, New Delhi 1981
3. Lone et al., Palaeoethnobotany

4. S.K. Jain (ed.) 1989. Methods and approaches in ethnobotany. Society of ethnobotanists, Lucknow, India.
5. S.K. Jain, 1990. Contributions of Indian ethnobotny. Scientific publishers, Jodhpur.
6. Colton C.M. 1997. Ethnobotany Principles and applications. John Wiley and sons Chichester
7. Rama Ro, N and A.N. Henry (1996). The Ethnobotany of Eastern Ghats in Andhra Pradesh, India. Botanical Survey of India. Howrah.
8. Rajiv K. Sinha Ethnobotany The Renaissance of Traditional Herbal Medicine INA SHREE Publishers, Jaipur-1996
9. Faulks, P.J. 1958. An introduction to Ethnobotany, Moredale pub. Ltd.

SEC-VIII: MUSHROOM CULTURE TECHNOLOGY

(Credits-2: Lectures: 30)

THEORY (Each class 1 hr.)-Marks: 50.

Unit-I: Introduction, history. Nutritional and medicinal value of edible mushrooms; Poisonous mushrooms. Types of edible mushrooms available in India - *Volvariella volvacea*, *Pleurotus citrinopileatus*, *Agaricus bisporus*. (5 lectures)

Unit-II: Cultivation Technology : Infrastructure: substrates (locally available) Polythene bag, vessels, Inoculation hook, inoculation loop, low cost stove, sieves, culture rack, mushroom unit (Thatched house) water sprayer, tray, small polythene bag. (6 Lectures)

Unit-III: Pure culture: Medium, sterilization, preparation of spawn, multiplication. Mushroom bed preparation - paddy straw, sugarcane trash, maize straw, banana leaves. Factors affecting the mushroom bed preparation - Low cost technology, Composting technology in mushroom production. (6 lectures)

Unit-IV: Storage and nutrition : Short-term storage (Refrigeration - upto 24 hours) Long term Storage (canning, pickles, papads), drying, storage in salt solutions. Nutrition - Proteins - amino acids, mineral elements nutrition - Carbohydrates, Crude fibre content - Vitamins. (8 lectures)

Unit-V: Food Preparation: Types of foods prepared from mushroom. Research Centres - National level and Regional level. Cost benefit ratio - Marketing in India and abroad, Export Value. (5 lectures)

Suggested Readings:

1. Marimuthu, T. Krishnamoorthy, A.S. Sivaprakasam, K. and Jayarajan. R (1991) Oyster Mushrooms, Department of Plant Pathology, Tamil Nadu Agricultural University, Coimbatore.
2. Swaminathan, M. (1990) Food and Nutrition. Bappco, The Bangalore Printing and Publishing Co. Ltd., No. 88, Mysore Road, Bangalore - 560018.
3. Tewari, Pankaj Kapoor, S.C., (1988). Mushroom cultivation, Mittal Publications, Delhi.

4. Nita Bahl (1984-1988) Hand book of Mushrooms, II Edition, Vol. I & Vol. II.

SEC-IX: INTELLECTUAL PROPERTY RIGHTS

(Credits-2: Lectures: 30)

THEORY (Each class 1 hr.)-Marks: 50.

Unit-I: Introduction to intellectual property right (IPR) : Concept and kinds. Economic importance. IPR in India and world: Genesis and scope, some important examples. IPR and WTO (TRIPS, WIPO). (2 lectures)

Patents: Objectives, Rights, Patent Act 1970 and its amendments. Procedure of obtaining patents, Working of patents. Infringement. (3 Lectures)

Copyrights: Introduction, Works protected under copyright law, Rights, Transfer of Copyright, Infringement. (3 Lectures)

Unit-II: Trademarks: Objectives, Types, Rights, Protection of goodwill, Infringement, Passing off, Defences, Domain name. (3 Lectures)

Geographical Indications : Objectives, Justification, International Position, Multilateral Treaties, National Level, Indian Position. (3 Lectures)

Unit-III: Protection of Traditional Knowledge : Objective, Concept of Traditional Knowledge, Holders, Issues concerning, Bio-Prospecting and Bio-Piracy, Alternative ways, Protectability, need for a Sui-Generis regime, Traditional Knowledge on the International Arena, at WTO, at National level, Traditional Knowledge Digital Library. (4 Lectures)

Unit-IV: Protection of Plant Varieties : Plant Varieties Protection-Objectives, Justification, International Position, Plant varieties protection in India. Rights of farmers, Breeders and Researchers. National gene bank, Benefit sharing. Protection of Plant Varieties and Farmers Rights Act, 2001. (2 Lectures)

Unit-V: Industrial Designs: Objectives, Rights, Assignments, Infringements, Defences of Design Infringement (2 Lectures)

CHEMISTRY(HONOURS)

SEMESTER-I

C-1: INORGANIC CHEMISTRY-I

(Credits-6: Theory-4, Practical-2)-Max. Marks: 100
THEORY (Each class 1 hr.): Marks-70 PRACTICAL
(Each class 2 hrs.): Marks-30 Lectures: 60 (40 Theory
+ 20 Practical classes)

Unit-I: Atomic structure

Bohrs theory, its limitations and atomic spectrum of hydrogen atom. Wave mechanics: de Broglie equation, Heisenbergs Uncertainty Principle and its significance, Schrdingers wave equation, significance of ψ and ψ^2 . Quantum numbers and their significance. Normalized and orthogonal wave functions. Sign of wave functions. Radial and angular wave functions for hydrogen atom. Radial and angular distribution curves. Shapes of s, p, d and f orbitals. Paulis Exclusion Principle, Hunds rule of maximum multiplicity, Aufbaus principle and its limitations. (14 Lectures)

Unit-II: Periodicity of elements

Periodicity of elements Periodicity of Elements: s, p, d, f block elements, the long form of periodic table. Detailed discussion of the following properties of the elements, with reference to s & p-block. (a) Effective nuclear charge, shielding or screening effect, Slater rules, variation of effective nuclear charge in periodic table. (b) Atomic radii (van der Waals) (c) Ionic and crystal radii. (d) Covalent radii (octahedral and tetrahedral) (e) Ionization enthalpy, Successive ionization enthalpies and factors affecting ionization energy. Applications of ionization enthalpy. (f) Electron gain enthalpy, trends of electron gain enthalpy. (g) Electronegativity, Paulings/ Mullikens electronegativity scales. Variation of electronegativity with bond order, partial charge, hybridization, group electronegativity. Sandersons electron density ratio. (16 Lectures)

Unit-III: Chemical bonding-I

Ionic bond: General characteristics, types of ions, size effects, radius ratio rule and its limitations. Packing of ions in crystals. Born-Land equation with derivation. Madelung constant, Born-Haber cycle and its application, Solvation energy. (ii) Covalent bond: Lewis structure, Valence Bond theory (Heitler-London approach). Energetics of hybridization, equivalent and non-equivalent hybrid orbitals, Resonance and resonance energy, Molecular orbital theory. Molecular orbital diagrams of diatomic and simple polyatomic molecules N_2 , O_2 , C_2 , B_2 , F_2 , CO , NO , and their ions; Valence shell electron pair repulsion theory (VSEPR), shapes of simple molecules and ions containing lone pairs and bond pairs of electrons, multiple bonding (σ and π bond approach) and bond lengths. Covalent character in ionic compounds, polarizing power and polarizability. Fajans rules and consequences of polarization. Ionic character in covalent compounds: Bond moment and dipole moment. Percentage ionic character from dipole moment and electronegativity difference. (16 Lectures)

Unit-IV: Chemical Bonding-II

(i) Metallic Bond: Qualitative idea of valence bond and band theories. Semiconductors and insulators. (ii) Weak Chemical Forces: van der Waals forces, ion-dipole forces, dipole-dipole interactions,

induced dipole interactions, Instantaneous dipole-induced dipole interactions. Repulsive forces, Hydrogen bonding (theories of hydrogen bonding, valence bond treatment) Effects of chemical force, melting and boiling points, solubility energetics of dissolution process. (10 Lectures)

Oxidation-reduction Redox equations, standard electrode potential and its application to inorganic reactions. Principles involved in some volumetric analyses (iron, copper and manganese). (4 Lectures)

Reference Books:

- Lee, J.D. Concise Inorganic Chemistry, ELBS, 1991.
- Douglas, B.E. and Mc Daniel, D.H., Concepts & Models of Inorganic Chemistry, Oxford, 1970.
- Atkins, P.W. & Paula, J. Physical Chemistry, Oxford Press, 2006.
- Day, M.C. and Selbin, J. Theoretical Inorganic Chemistry, ACS Publications 1962.

PRACTICAL: C-1 LAB.

(A) Titrimetric Analysis:

(i) Calibration and use of apparatus. (ii) Preparation of solutions of different Molarity/Normality of titrants.

(B) Acid-Base Titrations:

(i) Estimation of carbonate and hydroxide present together in mixture. (ii) Estimation of carbonate and bicarbonate present together in a mixture. (iii) Estimation of free alkali present in different soaps/detergents.

(C) Oxidation-Reduction Titrimetry:

(i) Estimation of Fe(II) and oxalic acid using standardized KMnO_4 solution. (ii) Estimation of oxalic acid and sodium oxalate in a given mixture. (iii) Estimation of Fe(II) with $\text{K}_2\text{Cr}_2\text{O}_7$ using internal (diphenylamine, anthranilic acid) and external indicator.

Reference text:

Vogel, A.I. A Textbook of Quantitative Inorganic Analysis, ELBS.

C-2: PHYSICAL CHEMISTRY

(Credits-6: Theory-4, Practical-2)-Max. Marks: 100
THEORY (Each class 1 hr.): Marks-70 PRACTICAL
(Each class 2 hrs.): Marks-30 Lectures: 60 (40 Theory
+ 20 Practical classes)

Unit-I: Gaseous state

Kinetic molecular model of a gas: postulates and derivation of the kinetic gas equation; collision frequency; collision diameter; mean free path and viscosity of gases, including their temperature and pressure dependence, relation between mean free path and coefficient of viscosity, calculation of σ from η ; variation of viscosity with temperature and pressure. Maxwell distribution and its use in evaluating molecular velocities (average, root mean square and most probable) and average kinetic energy, law of equipartition of energy, degrees of freedom and molecular basis of heat capacities. Behaviour of real gases: Deviations from ideal gas behaviour, compressibility factor, Z, and its variation with pressure for different gases. Causes of deviation from ideal behaviour. van der Waals

equation of state, its derivation and application in explaining real gas behaviour. Isotherms of real gases and their comparison with van der Waals isotherms, continuity of states, critical state, relation between critical constants and van der Waals constants, law of corresponding states. (18 Lectures)

Unit-II: Liquid state

(i) Qualitative treatment of the structure of the liquid state; physical properties of liquids; vapour pressure, surface tension and coefficient of viscosity, and their determination. Effect of addition of various solutes on surface tension and viscosity. Explanation of cleansing action of detergents. Temperature variation of viscosity of liquids and comparison with that of gases. Qualitative discussion of structure of water. (6 Lectures)

Ionic equilibria- I

(ii) Strong, moderate and weak electrolytes, degree of ionization, factors affecting degree of ionization, ionization constant and ionic product of water. Ionization of weak acids and bases, pH scale, common ion effect; dissociation constants of mono- and diprotic acids. (6 Lectures)

Unit- III: Solid state

Nature of the solid state, law of constancy of interfacial angles, law of rational indices, Miller indices, elementary ideas of symmetry, symmetry elements and symmetry operations, seven crystal systems and fourteen Bravais lattices; X-ray diffraction, Bragg's law, a simple account of rotating crystal method and powder pattern method. Analysis of powder diffraction patterns of NaCl, CsCl and KCl. Defects in crystals. Glasses and liquid crystals. (16 Lectures)

Unit-IV: Ionic equilibria - II

Salt hydrolysis-calculation of hydrolysis constant, degree of hydrolysis and pH for different salts. Buffer solutions; derivation of Henderson equation and its applications; buffer capacity, buffer range, buffer action and applications of buffers in analytical chemistry and biochemical processes in the human body. Solubility and solubility product of sparingly soluble salts applications of solubility product principle. Qualitative treatment of acid base titration curves (calculation of pH at various stages). Theory of acidbase indicators; selection of indicators and their limitations. Multistage equilibria in polyelectrolyte systems; hydrolysis and hydrolysis constants. (14 Lectures)

Reference Books:

- Atkins, P. W. & Paula, J. de Atkins Physical Chemistry Ed., Oxford University Press (2006).
- Ball, D. W. Physical Chemistry Thomson Press, India (2007).
- Castellan, G. W. Physical Chemistry 4th Ed. Narosa (2004).
- Mortimer, R. G. Physical Chemistry 3rd Ed. Elsevier: NOIDA, UP (2009).
- Principles of Physical Chemistry, Puri, Sharma, Pathania, Vishal Pub. Co.

PRACTICAL: C-2 LAB.

Surface tension measurements.

- (a) Determine the surface tension by (i) drop number (ii) drop weight method.
- (b) Study the variation of surface tension of detergent solutions with concentration.

Viscosity measurement using Ostwalds viscometer.

- (a) Determination of viscosity of aqueous solutions of (i) polymer, (ii) ethanol, and (iii) sugar at room temperature.

(b) Study the variation of viscosity of sucrose solution with the concentration of solute.

pH metry.

(a) Study the effect on pH of addition of HCl/NaOH to solutions of acetic acid, sodium acetate and their mixtures.

(b) Preparation of buffer solutions of different pH (i) Sodium acetate-acetic acid, (ii) Ammonium chloride-ammonium hydroxide.

(c) pH metric titration of (i) strong acid vs. strong base, (ii) weak acid vs. strong base.

(d) Determination of dissociation constant of a weak acid.

Reference Books:

- Khosla, B. D.; Garg, V. C. & Gulati, A. Senior Practical Physical Chemistry, R. Chand & Co., New Delhi (2011).
- Garland, C. W., Nibler, J. W. & Shoemaker, D. P. Experiments in Physical Chemistry 8th Ed.; McGraw-Hill, New York (2003).
- Halpern, A. M. & McBane, G. C. Experimental Physical Chemistry 3rd Ed.; W.H. Freeman & Co., New York (2003).

SEMESTER-II

C-3: ORGANIC CHEMISTRY I

(Credits-6: Theory-4, Practical-2)-Max. Marks: 100

THEORY (Each class 1 hr.): Marks-70 PRACTICAL

(Each class 2 hrs.): Marks-30 Lectures: 60 (40 Theory

+ 20 Practical classes)

Unit-I: BASICS OF ORGANIC CHEMISTRY

Electronic Displacements: Inductive, electromeric, resonance and mesomeric effects, hyperconjugation and their applications; Dipole moment; Organic acids and bases; their relative strength. Homolytic and Heterolytic fission with suitable examples. Curly arrow rules; Electrophiles and Nucleophiles; Nucleophilicity and basicity; Types, shape and their relative stability of carbocations, carbanions, free radicals and carbenes. Introduction to types of organic reactions and their mechanism: Addition, Elimination and Substitution reactions.

CARBON-CARBON SIGMA BONDS

Chemistry of alkanes: Formation of alkanes, Wurtz Reaction, Wurtz-Fittig Reactions, Free radical substitutions: Halogenation -relative reactivity and selectivity. (12 Lectures)

Unit-II: STEREOCHEMISTRY

Fischer Projection, Newmann and Sawhorse Projection formulae; Geometrical isomerism: cis-trans and, syn-anti isomerism E/Z notations with C.I.P rules. Optical Isomerism: Optical Activity, Specific Rotation, Chirality/Asymmetry, Enantiomers, Molecules with one and two chiral-centres, Diastereoisomers, meso structures, Racemic mixture and resolution. Relative and absolute configuration: D/L and R/S designations. (18 Lectures)

Unit-III: CHEMISTRY OF ALIPHATIC HYDROCARBONS

A. Carbon-Carbon pi bonds:

Formation of alkenes and alkynes by elimination reactions, Mechanism of E1, E2, E1cb reactions. Saytzeff and Hofmann eliminations. Reactions of alkenes: Electrophilic additions their mechanisms (Markownikoff/ Anti Markownikoff addition), mechanism of oxymercuration-demercuration, hydroborationoxidation, ozonolysis, reduction (catalytic and chemical), syn and anti-hydroxylation(oxidation). 1,2- and 1,4-addition reactions in conjugated dienes and, Diels-Alder reaction; Allylic and benzylic bromination and mechanism, e.g. propene, 1-butene, toluene, ethyl benzene. Reactions of alkynes: Acidity, Electrophilic and Nucleophilic additions. Hydration to form carbonyl compounds, Alkylation of terminal alkynes. **B. Cycloalkanes and Conformational Analysis**

Types of cycloalkanes and their relative stability, Baeyer strain theory, Conformation analysis of alkanes (ethane and n-butane): Relative stability with energy diagrams. Energy diagrams of cyclohexane: Chair, Boat and Twist boat forms. (18 Lectures)

Unit-IV: AROMATIC HYDROCARBONS

Aromaticity: Hckels rule, aromatic character of arenes, cyclic carbocations/carbanions and heterocyclic compounds with suitable examples. Electrophilic aromatic substitution: halogenation, nitration, sulphonation and Friedel-Crafts alkylation/acylation with their mechanism. Directing effects of the groups. (12 Lectures)

Reference Books:

- Morrison, R. N. & Boyd, R. N. Organic Chemistry, Dorling Kindersley (India) Pvt. Ltd. (Pearson Education).
- Finar, I. L. Organic Chemistry (Volume 1), Dorling Kindersley (India) Pvt. Ltd. (Pearson Education).
- Finar, I. L. Organic Chemistry (Volume 2): Stereochemistry and the Chemistry of Natural Products, Dorling Kindersley (India) Pvt. Ltd. (Pearson Education).
- Eliel, E. L. & Wilen, S. H. Stereochemistry of Organic Compounds; Wiley: London, 1994.
- Kalsi, P. S. Stereochemistry Conformation and Mechanism; New Age International, 2005.

PRACTICAL: C-3 LAB.

1. Checking the calibration of the thermometer.
2. Purification of organic compounds by crystallization using the following solvents: • Water
 - Alcohol
 - Alcohol-Water
3. Determination of the melting points of above compounds and unknown organic compounds (Kjeldahl method and electrically heated melting point apparatus).
4. Effect of impurities on the melting point mixed melting point of two unknown organic compounds.
5. Determination of boiling point of liquid compounds. (boiling point lower than and more than 100C by distillation and capillary method)

6. Chromatography

- Separation of a mixture of two amino acids by ascending and horizontal paper chromatography.
- Separation of a mixture of two sugars by ascending paper chromatography.
- Separation of a mixture of o- and p-nitrophenol or o- and p-aminophenol by thin layer chromatography (TLC).

Reference Books:

- Mann, F.G. & Saunders, B.C. Practical Organic Chemistry, Pearson Education (2009).
- Furniss, B.S., Hannaford, A.J.; Smith, P.W.G.; Tatchell, A.R. Practical Organic Chemistry, 5th Ed., Pearson (2012).

C-4: PHYSICAL CHEMISTRY-II

(Credits-6: Theory-4, Practical-2)-Max. Marks: 100
THEORY (Each class 1 hr.): Marks-70 PRACTICAL
(Each class 2 hrs.): Marks-30 Lectures: 60 (40 Theory
+ 20 Practical classes)

Unit-I: Chemical thermodynamics

Intensive and extensive variables; state and path functions; isolated, closed and open systems; zeroth law of thermodynamics. First law: Concept of heat, q , work, w , internal energy, U , and statement of first law; enthalpy, H , relation between heat capacities, calculations of q , w , U and H for reversible, irreversible and free expansion of gases (ideal and van der Waals) under isothermal and adiabatic conditions. Thermochemistry: Heats of reactions: standard states; enthalpy of formation of molecules and ions and enthalpy of combustion and its applications; calculation of bond energy, bond dissociation energy and resonance energy from thermochemical data, effect of temperature (Kirchhoffs equations) and pressure on enthalpy of reactions. (14 Lectures)

Unit-II: Second Law: Concept of entropy; thermodynamic scale of temperature, statement of the second law of thermodynamics; molecular and statistical interpretation of entropy. Calculation of entropy change for reversible and irreversible processes. Third Law: Statement of third law, concept of residual entropy, calculation of absolute entropy of molecules. Free Energy Functions: Gibbs and Helmholtz energy; variation of S , G , A with T , V , P ; Free energy change and spontaneity. Relation between Joule-Thomson coefficient and other thermodynamic parameters; inversion temperature; Gibbs-Helmholtz equation; Maxwell 17 relations; thermodynamic equation of state. (14 Lectures)

Unit-III: Systems of variable composition

Partial molar quantities, dependence of thermodynamic parameters on composition; Gibbs Duhem equation, chemical potential of ideal mixtures, change in thermodynamic functions in mixing of ideal gases. Chemical equilibrium, Criteria of thermodynamic equilibrium, degree of advancement of reaction, chemical equilibria in ideal gases, concept of fugacity. Thermodynamic derivation of relation between Gibbs free energy of reaction and reaction quotient (van Hoff's reaction). Equilibrium constants and their quantitative dependence on temperature, pressure and concentration. Free energy of mixing and spontaneity; thermodynamic derivation of relations between the various equilibrium

constants K_p , K_c and K_x . Le Chatelier principle (quantitative treatment) and its applications. (18 Lectures)

Unit-IV: Solutions and Colligative Properties

Dilute solutions; lowering of vapour pressure, Raoult's and Henry's Laws and their applications. Thermodynamic derivation using chemical potential to derive relations between the four colligative properties [(i) relative lowering of vapour pressure, (ii) elevation of boiling point, (iii) Depression of freezing point, (iv) osmotic pressure] and amount of solute. Applications in calculating molar masses of normal, dissociated and associated solutes in solution. (14 Lectures)

Reference Books:

- Peter, A. & Paula, J. de. Physical Chemistry 9th Ed., Oxford University Press (2011).
- Castellan, G. W. Physical Chemistry 4th Ed., Narosa (2004).
- Engel, T. & Reid, P. Physical Chemistry 3rd Ed., Prentice-Hall (2012).
- McQuarrie, D. A. & Simon, J. D. Molecular Thermodynamics Viva Books Pvt. Ltd.: New Delhi (2004).
- Assael, M. J.; Goodwin, A. R. H.; Stamatoudis, M.; Wakeham, W. A. & Will, S. Commonly Asked Questions in Thermodynamics. CRC Press: NY (2011).
- Levine, I. N. Physical Chemistry 6th Ed., Tata Mc Graw Hill (2010).
- Metz, C.R. 2000 solved problems in chemistry, Schaum Series (2006).

PRACTICAL: C-4 LAB.

THERMOCHEMISTRY

- (a) Determination of heat capacity of a calorimeter for different volumes using change of enthalpy data of a known system (method of back calculation of heat capacity of calorimeter from known enthalpy of solution or enthalpy of neutralization).
- (b) Determination of heat capacity of the calorimeter and enthalpy of neutralization of hydrochloric acid with sodium hydroxide.
- (c) Calculation of the enthalpy of ionization of ethanoic acid.
- (d) Determination of heat capacity of the calorimeter and integral enthalpy (endothermic and exothermic) solution of salts.
- (e) Determination of basicity/proticity of a polyprotic acid by the thermochemical method in terms of the changes of temperatures observed in the graph of temperature versus time for different additions of a base. Also calculate the enthalpy of neutralization of the first step.
- (f) Determination of enthalpy of hydration of copper sulphate.
- (g) Study of the solubility of benzoic acid in water and determination of H .

Reference Books;

- Khosla, B. D.; Garg, V. C. & Gulati, A., Senior Practical Physical Chemistry, R. Chand & Co.: New Delhi (2011).
- Athawale, V. D. & Mathur, P. Experimental Physical Chemistry New Age International: New Delhi (2001).

SEMESTER-III

C-5: INORGANIC CHEMISTRY-II

(Credits-6: Theory-4, Practical-2)-Max. Marks: 100
THEORY (Each class 1 hr.): Marks-70 PRACTICAL
(Each class 2 hrs.): Marks-30 Lectures: 60 (40 Theory
+ 20 Practical classes)

UNIT-I: General Principles of Metallurgy

Chief modes of occurrence of metals based on standard electrode potentials. Ellingham diagrams for reduction of metal oxides using carbon and carbon monoxide as reducing agent. Electrolytic Reduction, Hydrometallurgy. Methods of purification of metals: Electrolytic process, Parting process, van Arkel-de Boer process and Mond's process, Zone refining. (8 Lectures)

Acids and Bases

Bronsted-Lowry concept of acid-base reactions, solvated proton, relative strength of acids, types of acid-base reactions, Lewis acid-base concept, Classification of Lewis acids, Hard and Soft Acids and Bases (HSAB) Application of HSAB principle. (8 Lectures)

UNIT-II: Chemistry of s and p Block Elements-I

Inert pair effect, Relative stability of different oxidation states, diagonal relationship and anomalous behaviour of first member of each group. Allotropy and catenation. Complex formation tendency of s and p block elements. Hydrides and their classification ionic, covalent and interstitial. Basic beryllium acetate and nitrate. (14 Lectures)

UNIT-III: Chemistry of s and p Block Elements-II

Study of the following compounds with emphasis on structure, bonding, preparation, properties and uses. Boric acid and borates, boron nitrides, borohydrides (diborane) carboranes and graphitic compounds, silanes. Oxides and oxoacids of nitrogen, Phosphorus and chlorine. Peroxo acids of sulphur, interhalogen compounds, polyhalide ions, pseudohalogens and basic properties of halogens. (14 Lectures)

UNIT-IV: Noble Gases

Occurrence and uses, rationalization of inertness of noble gases, Clathrates; preparation and properties of XeF_2 , XeF_4 and XeF_6 ; Nature of bonding in noble gas compounds (Valence bond treatment and MO treatment for XeF_2). Molecular shapes of noble gas compounds (VSEPR theory). (8 Lectures)

Inorganic Polymers:

Types of inorganic polymers, comparison with organic polymers, synthesis, structural aspects and applications of silicones and siloxanes. Borazines, silicates and phosphazenes, and polysulphates. (8 Lectures)

Reference Books:

- Lee, J.D. Concise Inorganic Chemistry, ELBS, 1991.
- Douglas, B.E; Mc Daniel, D.H. & Alexander, J.J. Concepts & Models of Inorganic Chemistry 3rd Ed., John Wiley Sons, N.Y. 1994.
- Greenwood, N.N. & Earnshaw. Chemistry of the Elements, Butterworth-Heinemann. 1997.

- Cotton, F.A. & Wilkinson, G. Advanced Inorganic Chemistry, Wiley, VCH, 1999.
- Miessler, G. L. & Donald, A. Tarr. Inorganic Chemistry 4th Ed., Pearson, 2010.
- Shriver & Atkins, Inorganic Chemistry 5th Ed.

PRACTICAL: C-5 LAB.

(A) Iodo / Iodimetric Titrations

- Estimation of Cu(II) and $K_2Cr_2O_7$ using sodium thiosulphate solution (Iodimetrically).
- Estimation of available chlorine in bleaching powder iodometrically.

(B) Inorganic preparations

- Cuprous chloride, Cu_2Cl_2 .
- Preparation of manganese(III) phosphate, $MnPO_4.H_2O$.
- Preparation of aluminium potassium sulphate $K_2SO_4.Al_2(SO_4)_2.24H_2O$ (Potashalum).

Reference Books:

- Vogel, A.I. A Textbook of Quantitative Inorganic Analysis, ELBS. 1978

C-6: ORGANIC CHEMISTRY-II

(Credits-6: Theory-4, Practical-2)-Max. Marks: 100
 THEORY (Each class 1 hr.): Marks-70 PRACTICAL
 (Each class 2 hrs.): Marks-30 Lectures: 60 (40 Theory
 + 20 Practical classes)

UNIT-I: Chemistry of Halogenated Hydrocarbons

Alkyl halides: Methods of preparation, nucleophilic substitution reactions SN_1 , SN_2 and SN_i mechanisms with stereochemical aspects and effect of solvent etc.; nucleophilic substitution vs. elimination. Aryl halides: Preparation, including preparation from diazonium salts, nucleophilic aromatic substitution; SN_{Ar} , Benzyne mechanism. Relative reactivity of alkyl, allyl/benzyl, vinyl and aryl halides towards nucleophilic substitution reactions. Organometallic compounds of Mg and Li Use in synthesis of organic compounds. (16 Lectures)

UNIT-II: Alcohols, Phenols, Ethers and Epoxides

Alcohols: preparation, properties and relative reactivity of 1, 2, 3 alcohols, Bouvaelt-Blanc Reduction; Preparation and properties of glycols: Oxidation by periodic acid and lead tetraacetate, Pinacol-Pinacolone rearrangement; Phenols: Preparation and properties; Acidity and factors affecting it, Ring substitution reactions, ReimerTiemann and KolbesSchmidt Reactions, Fries and Claisen rearrangements with mechanism; Ethers and Epoxides: Preparation and reactions with acids. Reactions of epoxides with alcohols, ammonia derivatives and $LiAlH_4$ (16 Lectures)

UNIT-III: Carbonyl Compounds

Structure, reactivity and preparation: Nucleophilic additions, Nucleophilic addition-elimination reactions with ammonia derivatives with mechanism; Mechanisms of Aldol and Benzoin condensation, Knoevenagel condensation, Perkin, Cannizzaro and Wittig reaction, Beckmann rearrangements, haloform reaction and Baeyer Villiger oxidation, - substitution reactions, oxidations and reductions (Clemmensen, Wolff-Kishner, $LiAlH_4$, $NaBH_4$, MPV.; Addition reactions of unsaturated carbonyl compounds: Michael addition. Active methylene compounds: Keto-enol tautomerism. Preparation and synthetic applications of diethyl malonate and ethyl acetoacetate. (14 Lectures)

UNIT-IV: Carboxylic Acids and their Derivatives

Preparation, physical properties and reactions of monocarboxylic acids: Typical reactions of dicar-

boxylic acids, hydroxy acids and unsaturated acids: succinic, lactic, malic, tartaric, citric, maleic and fumaric acids; Preparation and reactions of acid chlorides, anhydrides, esters and amides; Comparative study of nucleophilic substitution at acyl group -Mechanism of acidic and alkaline hydrolysis of esters, Claisen condensation, Dieckmann and Reformatsky reactions, Hofmann-bromamide degradation and Curtius rearrangement. (10 Lectures)

Sulphur containing compounds

Preparation and reactions of thiols, thioethers. (4 Lectures)

Reference Books:

- Morrison, R. T. & Boyd, R. N. Organic Chemistry, Dorling Kindersley (India) Pvt. Ltd. (Pearson Education).
- Graham Solomons, T.W. Organic Chemistry, John Wiley & Sons, Inc.

PRACTICAL: C-6 LAB.

1. Functional group tests for alcohols, phenols, carbonyl and carboxylic acid group.
2. Organic preparations:
 - (i) Acetylation of one of the following compounds: amines (aniline, o-, m-, p-toluidines and o-, m-, p-anisidine) and phenols (-naphthol, vanillin, salicylic acid) by any one method:
 - (a) Using conventional method.
 - (b) Using green approach.
 - (ii) Benzoylation of one of the following amines (aniline, o-, m-, p-toluidines and o-, m-, p-anisidine) and one of the following phenols (-naphthol, resorcinol, p-cresol) by Schotten-Baumann reaction.
 - (iii) Bromination of any one of the following:
 - (a) Acetanilide by conventional methods.
 - (b) Acetanilide using green approach (Bromate-bromide method).
 - (iv) Nitration of any one of the following:
 - (a) Acetanilide/nitrobenzene by conventional method.
 - (b) Salicylic acid by green approach (using ceric ammonium nitrate).

The above derivatives should be prepared using 0.5-1gm. of the organic compound. The solid samples must be collected and may be used for recrystallization, melting point and TLC. **Reference**

Books:

- Mann, F.G. & Saunders, B.C. Practical Organic Chemistry, Pearson Education (2009).
- Furniss, B.S.; Hannaford, A.J.; Smith, P.W.G.; Tatchell, A.R. Practical Organic Chemistry, 5th Ed., Pearson (2012).
- Ahluwalia, V.K. & Aggarwal, R. Comprehensive Practical Organic Chemistry: Preparation and Quantitative Analysis, University Press (2000).
- Ahluwalia, V.K. & Dhingra, S. Comprehensive Practical Organic Chemistry: Qualitative Analysis, University Press (2000).

C-7: PHYSICAL CHEMISTRY-III

(Credits-6: Theory-4, Practical-2)-Max. Marks: 100
THEORY (Each class 1 hr.): Marks-70 PRACTICAL
(Each class 2 hrs.): Marks-30 Lectures: 60 (40 Theory
+ 20 Practical classes))

UNIT-I: Phase Equilibria-I

Concept of phases, components and degrees of freedom, derivation of Gibbs Phase Rule for non-reactive and reactive systems; Clausius-Clapeyron equation and its applications to solid-liquid, liquid-vapour and solid-vapour equilibria, phase diagram for one component systems, with applications

(H_2O and sulphur system). Phase diagrams for systems of solid-liquid equilibria involving eutectic, congruent and incongruent melting points, solid solutions (Pb-Ag system, desilverisation of lead) (14 Lectures)

UNIT-II: Phase Equilibria-II

Three component systems, water-chloroform-acetic acid system, triangular plots. Binary solutions: Gibbs-Duhem-Margules equation, its derivation and applications to fractional distillation of binary miscible liquids (ideal and non-ideal), azeotropes, partial miscibility of liquids, CST, miscible pairs, steam distillation. Nernst distribution law: its derivation and applications. (14 Lectures)

UNIT-III: Chemical Kinetics

Order and molecularity of a reaction, rate laws in terms of the advancement of a reaction, differential and integrated form of rate expressions up to second order reactions, experimental methods of the determination of orders, kinetics of complex reactions (integrated rate expressions up to first order only): (i) Opposing reactions (ii) parallel reactions and (iii) consecutive reactions and their differential rate equations (steady-state approximation in reaction mechanisms) (iv) chain reactions. Temperature dependence of reaction rates; Arrhenius equation; activation energy. Collision theory of reaction rates, qualitative treatment of the theory of absolute reaction rates. (18 Lectures)

UNIT-IV: Catalysis

Types of catalyst, specificity and selectivity, mechanisms of catalyzed reactions at solid surfaces; effect of particle size and efficiency of nanoparticles as catalysts. Enzyme catalysis, Michaelis-Menten mechanism, acid-base catalysis. (8 Lectures)

Surface chemistry

Physical adsorption, chemisorption, adsorption isotherms (Langmuir, Freundlich and Gibbs isotherms), nature of adsorbed state. (6 Lectures)

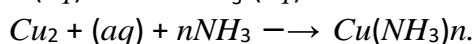
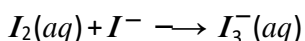
Reference Books:

- Peter Atkins & Julio De Paula, Physical Chemistry 9th Ed., Oxford University Press(2010).
- Castellan, G. W. Physical Chemistry, 4th Ed., Narosa (2004).
- McQuarrie, D. A. & Simon, J. D., Molecular Thermodynamics, Viva Books Pvt. Ltd.: New Delhi (2004).
- Engel, T. & Reid, P. Physical Chemistry 3rd Ed., Prentice-Hall (2012).
- Assael, M. J.; Goodwin, A. R. H.; Stamatoudis, M.; Wakeham, W. A. & Will, S.
- Commonly Asked Questions in Thermodynamics. CRC Press: NY (2011).
- Zundhal, S.S. Chemistry concepts and applications Cengage India(2011).
- Ball, D. W. Physical Chemistry Cengage India (2012).
- Mortimer, R. G. Physical Chemistry 3rd Ed., Elsevier: NOIDA, UP (2009).
- Levine, I. N. Physical Chemistry 6th Ed., Tata McGraw-Hill(2011).
- Metz, C. R. Physical Chemistry 2nd Ed., Tata McGraw-Hill(2009).

PRACTICAL: C-7 LAB.

I. Distribution of acetic/ benzoic acid between water and cyclohexane.

II. Study the equilibrium of at least one of the following reactions by the distribution method:



III. Study the kinetics of the following reactions.

(1) Integrated rate method:

- a. Acid hydrolysis of methyl acetate with hydrochloric acid.
- b. Saponification of ethyl acetate.

(2) Compare the strengths of HCl and H₂SO₄ by studying kinetics of hydrolysis of methylacetate.

Adsorption

Verify the Freundlich and Langmuir isotherms for adsorption of acetic acid on activated charcoal.

Reference Books:

- Khosla, B. D.; Garg, V. C. & Gulati, A. Senior Practical Physical Chemistry, R. Chand & Co.: New Delhi (2011).
- Garland, C. W.; Nibler, J. W. & Shoemaker, D. P. Experiments in Physical Chemistry 8th Ed.; McGraw-Hill: New York (2003).
- Halpern, A. M. & McBane, G. C. Experimental Physical Chemistry 3rd Ed.; W.H. Freeman & Co.: New York (2003).

SEMESTER- IV

C-8: INORGANIC CHEMISTRY-III

(Credits-6: Theory-4, Practical-2)-Max. Marks: 100
THEORY (Each class 1 hr.): Marks-70 PRACTICAL
(Each class 2 hrs.): Marks-30 Lectures: 60 (40 Theory
+ 20 Practical classes)

UNIT-I: Coordination Chemistry

Werners theory, valence bond theory (inner and outer orbital complexes), electroneutrality principle and back bonding. Crystal field theory, measurement of CFSE weak and strong fields, pairing energies, factors affecting the magnitude of $10 Dq$ in octahedral vs. tetrahedral coordination, tetragonal distortions from octahedral geometry, Jahn-Teller theorem, square planar geometry. Qualitative aspect of ligand field and MO Theory. IUPAC nomenclature of coordination compounds, isomerism in coordination compounds. Stereochemistry of complexes with 4 and 6 coordination numbers. Chelate effect, Labile and inert complexes. (20 Lectures)

UNIT-II: Transition Elements-I

General group trends with special reference to electronic configuration, colour, variable valency, magnetic and catalytic properties, ability to form complexes. Stability of various oxidation states and e.m.f. (Latimer & Bsworth diagrams). Difference between the first, second and third transition series. (12 Lectures)

UNIT-III: Transition Elements-II

Chemistry of Ti, V, Cr Mn, Fe and Co in various oxidation states (excluding their metallurgy). (12 Lectures)

UNIT-IV: Lanthanoids and Actinoids

Electronic configuration, oxidation states, colour, spectral and magnetic properties, lanthanide contraction, separation of lanthanides (ion-exchange method only). General features of actinoids, separation of Np, Pm, Am from U. (6 Lectures)

Bioinorganic Chemistry

Metal ions present in biological systems, classification of elements according to their action in biological system. Na/K-pump, carbonic anhydrase and carboxypeptidase. Excess and deficiency of some trace metals. Toxicity of metal ions (Hg, Pb, Cd and As), reasons for toxicity, Use of chelating agents in medicine. Iron and its application in bio-systems, Haemoglobin; Storage and transfer of iron. (10 Lectures)

Reference Books:

- Purcell, K.F & Kotz, J.C. Inorganic Chemistry W.B. Saunders Co, 1977.
- Huheey, J.E., Inorganic Chemistry, Prentice Hall, 1993.
- Lippard, S.J. & Berg, J.M. Principles of Bioinorganic Chemistry Panima Publishing Company 1994.
- Cotton, F.A. & Wilkinson, G, Advanced Inorganic Chemistry. Wiley-VCH, 1999.
- Basolo, F, and Pearson, R.C., Mechanisms of Inorganic Chemistry, John Wiley & Sons, NY, 1967.
- Greenwood, N.N. & Earnshaw A., Chemistry of the Elements, Butterworth-Heinemann, 1997.

PRACTICAL: C-8 LAB.

Gravimetric Analysis:

- i. Estimation of nickel(II) using Dimethylglyoxime (DMG).
- ii. Estimation of copper as CuSCN.
- iii. Estimation of iron as Fe_2O_3 by precipitating iron as $Fe(OH)_3$.
- iv. Estimation of Al(III) by precipitating with oxine and weighing as Al(oxine)₃ (aluminium oxinate).

Chromatography of metal ions

Principles involved in chromatographic separations. Paper chromatographic separation of following metal ions:

- i. Ni(II) and Co(II)
- ii. Fe(III) and Al(III)

Reference Book:

- Vogel, A.I. A text book of Quantitative Analysis, ELBS 1986.

C-9: ORGANIC CHEMISTRY-III

(Credits-6: Theory-4, Practical-2)-Max. Marks: 100

THEORY (Each class 1 hr.): Marks-70 PRACTICAL

(Each class 2 hrs.): Marks-30 Lectures: 60 (40 Theory

+ 20 Practical classes)

UNIT-I: Nitrogen Containing Functional Groups

Preparation and important reactions of nitro and compounds, nitriles. Amines: Effect of substituent and solvent on basicity; Preparation and properties: Gabriel phthalimide synthesis, Carbylamine reaction, Mannich reaction, Hoffmanns exhaustive methylation, Hofmann-elimination reaction; Distinction between 1, 2 and 3 amines with Hinsberg reagent and nitrous acid. (14 Lectures)

UNIT-II: Diazonium Salts

Preparation and their synthetic applications.

Polynuclear Hydrocarbons

Reactions of naphthalene and anthracene Structure, Preparation and structure elucidation and important derivatives of naphthalene and anthracene. Polynuclear hydrocarbons. (12 Lectures)

UNIT-III: Heterocyclic Compounds

Classification and nomenclature, Structure, aromaticity in 5-numbered and 6-membered rings containing one heteroatom; Synthesis, reactions and mechanism of substitution reactions of: Furan,

Pyrrrole (Paal-Knorr synthesis, Knorr pyrrole synthesis, Hantzsch synthesis), Thiophene, Pyridine (Hantzsch synthesis), Pyrimidine. Fischer indole synthesis and Madelung synthesis, structure of quinoline and isoquinoline. Derivatives of furan: Furfural and furoic acid (preparation only). (18 Lectures)

UNIT-IV: Alkaloids

Natural occurrence, General structural features, Isolation and their physiological action Hoffmann's exhaustive methylation, Emde's modification, Structure elucidation and synthesis of Hygrine and Nicotine. Medicinal importance of Nicotine, Hygrine, Quinine, Morphine, Cocaine, and Reserpine. (8 Lectures) Terpenes Occurrence, classification, isoprene rule; Elucidation of structure and synthesis of Citral, Neral and -terpineol. (8 Lectures)

Reference Books:

- Morrison, R. T. & Boyd, R. N. Organic Chemistry, Dorling Kindersley (India) Pvt. Ltd. (Pearson Education).
- Finar, I. L. Organic Chemistry (Volume 1), Dorling Kindersley (India) Pvt. Ltd. (Pearson Education).
- Finar, I. L. Organic Chemistry (Volume 2: Stereochemistry and the Chemistry of Natural Products), Dorling Kindersley (India) Pvt. Ltd. (Pearson Education).
- Acheson, R.M. Introduction to the Chemistry of Heterocyclic compounds, John Wiley & Sons (1976).
- Graham Solomons, T.W. Organic Chemistry, John Wiley & Sons, Inc.
- Kalsi, P. S. Textbook of Organic Chemistry 1st Ed., New Age International (P) Ltd. Pub.
- Clayden, J.; Greeves, N.; Warren, S.; Wothers, P.; Organic Chemistry, Oxford University Press.
- Singh, J.; Ali, S.M. & Singh, J. Natural Product Chemistry, Prajati Parakashan (2010).

PRACTICAL: C-9 LAB.

1. Detection of extra elements (N, X, S).
2. Functional group test for nitro, amine and amide groups.
3. Qualitative analysis of unknown organic compounds containing simple functional groups (alcohols, carboxylic acids, phenols and carbonyl compounds).

Reference Books:

- Mann, F.G. & Saunders, B.C. Practical Organic Chemistry, Pearson Education (2009).
- Furniss, B.S.; Hannaford, A.J.; Smith, P.W.G.; Tatchell, A.R. Practical Organic Chemistry, 5th Ed., Pearson (2012).
- Ahluwalia, V.K. & Aggarwal, R. Comprehensive Practical Organic Chemistry: Preparation and Quantitative Analysis, University Press (2000).
- Ahluwalia, V.K. & Dhingra, S. Comprehensive Practical Organic Chemistry: Qualitative Analysis, University Press (2000).

C-10: PHYSICAL CHEMISTRY-IV

(Credits-6: Theory-4, Practical-2)-Max. Marks: 100

THEORY (Each class 1 hr.): Marks-70 PRACTICAL

(Each class 2 hrs.): Marks-30 Lectures: 60 (40

Theory + 20 Practical classes)

UNIT-I: Conductance-I

Arrhenius theory of electrolytic dissociation. Conductivity, equivalent and molar conductivity and their variation with dilution for weak and strong electrolytes. Molar conductivity at infinite dilution. Kohlrausch law of independent migration of ions. Debye-Hckel-Onsager equation, Wien effect, Debye-Falkenhagen effect, Waldens rules. (12 Lectures)

UNIT-II: Conductance-II

Ionic velocities, mobilities and their determinations, transference numbers and their relation to ionic mobilities, determination of transference numbers using Hittorf and Moving Boundary methods. Applications of conductance measurement: (i) degree of dissociation of weak electrolytes, (ii) ionic product of water (iii) solubility and solubility product of sparingly soluble salts, (iv) conductometric titrations, and (v) hydrolysis constants of salts. (16 Lectures)

UNIT-III: Electrochemistry-I

Quantitative aspects of Faradays laws of electrolysis, rules of oxidation/reduction of ions based on half-cell potentials, applications of electrolysis in metallurgy and industry. Chemical cells, reversible and irreversible cells with examples. Electromotive force of a cell and its measurement, Nernst equation; Standard electrode (reduction) potential and its application to different kinds of half-cells. Application of EMF measurements in determining free energy, enthalpy and entropy of a cell reaction, (ii) equilibrium constants, and (iii) pH values, using hydrogen, quinone-hydroquinone, glass electrodes. (18 Lectures)

UNIT-IV: Electrochemistry-II

Concentration cells with and without transference, liquid junction potential; determination of activity coefficients and transference numbers. Qualitative discussion of potentiometric titrations (acid-base, redox, precipitation). Electrical properties of atoms and molecules Basic ideas of electrostatics, Electrostatics of dielectric media. Clausius-Mosotti equation and Lorenz-Laurentz equation (no derivation), Dipole moment and molecular polarizabilities and their measurements. (14 Lectures)

Reference Books:

- Atkins, P.W & Paula, J.D. Physical Chemistry, 9th Ed., Oxford University Press (2011).
- Castellan, G. W. Physical Chemistry 4th Ed., Narosa (2004).
- Mortimer, R. G. Physical Chemistry 3rd Ed., Elsevier: NOIDA, UP (2009).
- Barrow, G. M., Physical Chemistry 5th Ed., Tata McGraw Hill: New Delhi (2006).
- Engel, T. & Reid, P. Physical Chemistry 3rd Ed., Prentice-Hall (2012).
- Rogers, D. W. Concise Physical Chemistry Wiley (2010).
- Silbey, R. J.; Alberty, R. A. & Bawendi, M. G. Physical Chemistry 4th Ed., John Wiley & Sons, Inc. (2005).

PRACTICAL: C-10 LAB.

Conductometry

- I. Determination of cell constant.
- II. Determination of equivalent conductance, degree of dissociation and dissociation constant of a weak acid.
- III. Perform the following conductometric titrations:
 - i. Strong acid vs. strong base
 - ii. Weak acid vs. strong base
 - iii. Strong acid vs. weak base

Potentiometry

- I. Perform the following potentiometric titrations:
 - i. Strong acid vs. strong base
 - ii. Weak acid vs. strong base
 - iii. Dibasic acid vs. strong base

Reference Books:

- Khosla, B. D.; Garg, V. C. & Gulati, A. Senior Practical Physical Chemistry, R. Chand & Co.: New Delhi (2011).
- Garland, C. W.; Nibler, J. W. & Shoemaker, D. P. Experiments in Physical Chemistry 8th Ed.; McGraw-Hill: New York (2003).
- Halpern, A. M. & McBane, G. C. Experimental Physical Chemistry 3rd Ed.; W.H. Freeman & Co.: New York (2003).

SEMESTER- V

C-11: ORGANIC CHEMISTRY-IV

(Credits-6: Theory-4, Practical-2)-Max. Marks: 100
THEORY (Each class 1 hr.): Marks-70 PRACTICAL
(Each class 2 hrs.): Marks-30 Lectures: 60 (40 Theory
+ 20 Practical classes)

UNIT-I: Nucleic Acids

Components of nucleic acids, Nucleosides and nucleotides; Structure, synthesis and reactions of: Adenine, Guanine, Cytosine, Uracil and Thymine; Structure of polynucleotides. (9 Lectures) **Enzymes** Introduction, classification and characteristics of enzymes. Salient features of active site of enzymes. Mechanism of enzyme action (taking trypsin as example), factors affecting enzyme action, coenzymes and cofactors and their role in biological reactions, specificity of enzyme action (including stereospecificity), enzyme inhibitors and their importance, phenomenon of inhibition (competitive, uncompetitive and non-competitive inhibition including allosteric inhibition). (8 Lectures)

UNIT-II: Amino Acids, Peptides and Proteins

Amino acids, peptides and their classification. -Amino acids - Synthesis, ionic properties and reactions. Zwitterions, pKa values, isoelectric point and electrophoresis. Study of peptides: determination of their primary structures-end group analysis, methods of peptide synthesis. Synthesis

of peptides using N-protecting, C-protecting and C-activating groups -Solid-phase synthesis (16 Lectures)

UNIT-III: Lipids

Introduction to oils and fats; common fatty acids present in oils and fats, Hydrogenation of fats and oils, Saponification value, acid value, iodine number. Reversion and rancidity. (8 Lectures) **Concept of Energy in Biosystems**

Cells obtain energy by the oxidation of foodstuff (organic molecules). Introduction to metabolism (catabolism and anabolism). Overview of catabolic pathways of fat and protein. Interrelationship in the metabolic pathways of protein, fat and carbohydrate. Caloric value of food, standard caloric content of food types. (7 Lectures)

UNIT-IV: Pharmaceutical Compounds: Structure and Importance

Classification, structure and therapeutic uses of antipyretics: Paracetamol (with synthesis), Analgesics: Ibuprofen (with synthesis), Antimalarials: Chloroquine (with synthesis). An elementary treatment of Antibiotics and detailed study of chloramphenicol, Medicinal values of curcumin (haldi), azadirachtin (neem), vitamin C and antacid (ranitidine). (12 Lectures)

Reference Books:

- Berg, J.M., Tymoczko, J.L. and Stryer, L. (2006) Biochemistry. VIth Edition. W.H. Freeman and Co.
- Nelson, D.L., Cox, M.M. and Lehninger, A.L. (2009) Principles of Biochemistry. IV Edition. W.H. Freeman and Co.
- Murray, R.K., Granner, D.K., Mayes, P.A. and Rodwell, V.W. (2009) Harpers Illustrated Biochemistry. XXVIII edition. Lange Medical Books/McGraw-Hill.

PRACTICAL: C-11 LAB.

1. Preparations of the following compounds:
 - i. Aspirine, ii. Phenacetin, iii. Milk of magnesia, iv. Aluminium hydroxide gel, v. Divol.
2. Saponification value of an oil or a fat.
3. Determination of Iodine number of an oil/ fat.

Reference Books:

- Manual of Biochemistry Workshop, 2012, Department of Chemistry, University of Delhi.
- Arthur, I. Vogel, Quantitative Organic Analysis, Pearson.

C-12: PHYSICAL CHEMISTRY-V

(Credits-6: Theory-4, Practical-2)-Max. Marks: 100
THEORY (Each class 1 hr.): Marks-70 PRACTICAL
(Each class 2 hrs.): Marks-30 Lectures: 60 (40 Theory
+ 20 Practical classes)

UNIT-I: Quantum Chemistry

Postulates of quantum mechanics, quantum mechanical operators, Schrödinger equation and its application to free particle and particle-in-a-box (rigorous treatment), quantization of energy levels,

zero-point energy and Heisenberg Uncertainty principle; wave functions, probability distribution functions, nodal properties. Extension to three dimensional boxes, separation of variables, degeneracy. Qualitative treatment of simple harmonic oscillator model of vibrational motion: Setting up of Schrödinger equation and discussion of solution and wave functions. Vibrational energy of diatomic molecules and zero-point energy. Angular momentum: Commutation rules, quantization of square of total angular momentum and z-component. Rigid rotator model of rotation of diatomic molecule. Schrödinger equation, transformation to spherical polar coordinates. Separation of variables (Preliminary treatment). Qualitative treatment of hydrogen atom and hydrogen-like ions: setting up of Schrödinger equation in spherical polar coordinates, radial part, quantization of energy (only final energy expression). Average and most probable distances of electron from nucleus. (18 Lectures)

UNIT-II: Chemical Bonding

Chemical bonding: Covalent bonding, valence bond and molecular orbital approaches, LCAO-MO treatment of H^+ . Bonding and antibonding orbitals. Qualitative extension to H_2 . Comparison of LCAO-MO and VB treatments of H_2 (only wavefunctions, detailed solution not required) and their limitations. Qualitative description of LCAO-MO treatment of homonuclear and heteronuclear diatomic molecules (HF, LiH). Localised and non-localised molecular orbitals treatment of triatomic (BeH_2 , H_2O) molecules. Qualitative MO theory and its application to AH_2 type molecules. (12 Lectures)

UNIT-III: Molecular Spectroscopy-I

Interaction of electromagnetic radiation with molecules and various types of spectra; Born-Oppenheimer approximation. Rotation spectroscopy: Selection rules, intensities of spectral lines, determination of bond lengths of diatomic and linear triatomic molecules, isotopic substitution.

Vibrational spectroscopy: Classical equation of vibration, computation of force constant, amplitude of diatomic molecular vibrations, anharmonicity, Morse potential, dissociation energies, fundamental frequencies, overtones, hot bands, degrees of freedom for polyatomic molecules, modes of vibration.

Vibration-rotation spectroscopy: diatomic vibrating rotator, P, Q, R branches.

Raman spectroscopy: Qualitative treatment of Rotational Raman effect; Effect of nuclear spin, Vibrational Raman spectra, Stokes and anti-Stokes lines; their intensity difference, rule of mutual exclusion. (16 Lectures)

UNIT-IV: Molecular Spectroscopy-II

Electronic spectroscopy: Franck-Condon principle, electronic transitions, singlet and triplet states, fluorescence and phosphorescence, dissociation and predissociation. (6 Lectures) **Photochemistry**

Characteristics of electromagnetic radiation, Lambert-Beers law and its limitations, physical significance of absorption coefficients. Laws of photochemistry, quantum yield, actinometry, examples of low and high quantum yields, photochemical equilibrium and the differential rate of photochemical reactions, photosensitised reactions, quenching. Role of photochemical reactions in biochemical processes, photostationary states, chemiluminescence. (8 Lectures)

Reference Books:

- Banwell, C. N. & McCash, E. M. Fundamentals of Molecular Spectroscopy 4th Ed. Tata McGraw-

Hill: New Delhi (2006).

- Chandra, A. K. Introductory Quantum Chemistry Tata McGraw-Hill (2001).
- House, J. E. Fundamentals of Quantum Chemistry 2nd Ed. Elsevier: USA (2004).
- Lowe, J. P. & Peterson, K. Quantum Chemistry, Academic Press (2005).
- Kakkar, R. Atomic & Molecular Spectroscopy, Cambridge University Press (2015).

PRACTICAL: C-12 LAB.

Colourimetry

1. Determine the concentration of HCl against 0.1 N NaOH spectrophotometrically.
2. To find the strength of given ferric ammonium sulfate solution of (0.05 M) by using EDTA spectrophotometrically.
3. To find out the strength of CuSO₄ solution by titrating with EDTA spectrophotometrically.
4. To determine the concentration of Cu(II) and Fe(III) solution photometrically by titrating with EDTA.

Reference Books:

- Khosla, B. D.; Garg, V. C. & Gulati, A., Senior Practical Physical Chemistry, R. Chand & Co.: New Delhi (2011).
- Garland, C. W.; Nibler, J. W. & Shoemaker, D. P. Experiments in Physical Chemistry 8th Ed.; McGraw-Hill: New York (2003).
- Halpern, A. M. & McBane, G. C. Experimental Physical Chemistry 3rd Ed.; W.H. Freeman & Co.: New York (2003).
- Experimental Physical Chemistry by J. N. Gurtu, R. Kapoor.

SEMESTER- VI

C-13: INORGANIC CHEMISTRY-IV

(Credits-6: Theory-4, Practical-2)-Max. Marks: 100
THEORY (Each class 1 hr.): Marks-70 PRACTICAL
(Each class 2 hrs.): Marks-30 Lectures: 60 (40 Theory
+ 20 Practical classes)

UNIT-I: Organometallic Compounds-I

Definition and classification of organometallic compounds on the basis of bond type. Concept of hapticity of organic ligands. Metal carbonyls: 18 electron rule, electron count of mononuclear, polynuclear and substituted metal carbonyls of 3d series. General methods of preparation (direct combination, reductive carbonylation, thermal and photochemical decomposition) of mono and binuclear carbonyls of 3d series. Structures of mononuclear and binuclear carbonyls of Cr, Mn, Fe, Co and Ni using VBT. π -acceptor behaviour of CO (MO diagram of CO to be discussed), synergic effect and use of IR data to explain extent of back bonding. Zeise's salt: Preparation and structure, evidences of synergic effect and comparison of synergic effect with that in carbonyls. (14 Lectures)

UNIT-II: Organometallic Compounds-II

Metal Alkyls: Important structural features of methyl lithium (tetramer) and trialkyl aluminium

(dimer), concept of multicentre bonding in these compounds. Role of triethylaluminium in polymerisation of ethene (Ziegler Natta Catalyst). Species present in ether solution of Grignard reagent and their structures. Ferrocene: Preparation and reactions (acetylation, alkylation, metallation, Mannich Condensation), structure and aromaticity, comparison of aromaticity and reactivity with that of benzene. (14 Lectures)

UNIT-III: Theoretical Principles in Qualitative Analysis (H_2S Scheme)

Basic principles involved in analysis of cations and anions and solubility products, common ion effect. Principles involved in separation of cations into groups and choice of group reagents. Interfering anions (fluoride, borate, oxalate and phosphate) and need to remove them after Group II. (10 Lectures)

Catalysis by Organometallic Compounds

Study of the following industrial processes and their mechanism:

1. Alkene hydrogenation (Wilkinson's Catalyst).
2. Hydroformylation (Co salts).
3. Wacker Process.
4. Synthetic gasoline (Fischer Tropsch reaction). (8 Lectures)

UNIT-IV: Reaction Kinetics and Mechanism

Introduction to inorganic reaction mechanisms. Substitution reactions in square planar complexes, Trans-effect and its applications, theories of trans effect, Mechanism of nucleophilic substitution in square planar complexes. Thermodynamic and kinetic stability, Kinetics of octahedral substitution (classification of metal ions based on water exchange rate), General mechanism of substitution in octahedral complexes (D, I, Id, Ia). (14 Lectures)

Reference Books:

- Vogel, A.I. Qualitative Inorganic Analysis, Longman, 1972.
- Svehla, G. Vogel's Qualitative Inorganic Analysis, 7th Edition, Prentice Hall, 1996-03-07.
- Huheey, J. E.; Keiter, E.A. & Keiter, R.L. Inorganic Chemistry, Principles of Structure and Reactivity 4th Ed., Harper Collins 1993, Pearson, 2006.
- Sharpe, A.G. Inorganic Chemistry, 4th Indian Reprint (Pearson Education) 2005.
- Douglas, B. E.; McDaniel, D.H. & Alexander, J.J. Concepts and Models in Inorganic Chemistry, 3rd Ed., John Wiley and Sons, NY, 1994.
- Greenwood, N.N. & Earnshaw, A. Chemistry of the Elements, Elsevier 2nd Ed, 1997 (Ziegler Natta Catalyst and Equilibria in Grignard Solution).
- Lee, J.D. Concise Inorganic Chemistry 5th Ed., John Wiley and sons 2008.
- Powell, P. Principles of Organometallic Chemistry, Chapman and Hall, 1988.
- Shriver, D.D. & P. Atkins, Inorganic Chemistry 2nd Ed., Oxford University Press, 1994.
- Basolo, F. & Person, R. Mechanisms of Inorganic Reactions: Study of Metal Complexes in Solution 2nd Ed., John Wiley & Sons Inc; NY.
- Purcell, K.F. & Kotz, J.C., Inorganic Chemistry, W.B. Saunders Co. 1977.
- Miessler, G. L. & Donald, A. Tarr, Inorganic Chemistry 4th Ed., Pearson, 2010.
- Collman, James P. et al. Principles and Applications of Organotransition Metal Chemistry. Mill Valley, CA: University Science Books, 1987.

- Crabtree, Robert H. The Organometallic Chemistry of the Transition Metals, New York, NY: John Wiley, 2000.
- Spessard, Gary O., & Gary L. Miessler. Organometallic Chemistry. Upper Saddle River, NJ: Prentice-Hall, 1996.
- Mehrotra R.C. and Singh, A. Organometallic Chemistry, New Age International Publishers, 2nd Edn, 2000.

PRACTICAL: C-13 LAB.

Qualitative semimicro analysis of mixtures containing 3 anions and 3 cations. Emphasis should be given to the understanding of the chemistry of different reactions. The following radicals are suggested:

CO_3^{2-} , NO_2^- , S^{2-} , SO_3^{2-} , $S_2O_3^{2-}$, CH_3COO^- , F^- , Cl^- , Br^- , I^- , NO_3^- , BO_3^{3-} , $C_2O_4^{2-}$, PO_4^{3-} , NH_4^+ , K^+ , Pb^{2+} , Cu^{2+} , Cd^{2+} , Bi^{3+} , Sn^{2+} , Sb^{3+} , Fe^{3+} , Al^{3+} , Cr^{3+} , Zn^{2+} , Mn^{2+} , Co^{2+} , Ni^{2+} , Ba^{2+} , Sr^{2+} , Ca^{2+} , Mg^{2+} .

Mixtures should preferably contain one interfering anion, or insoluble component ($BaSO_4$, $SrSO_4$, $PbSO_4$, CaF_2 or Al_2O_3) or combination of anions e.g. CO_3^{2-} and SO_3^{2-} , NO_2^- and NO_3^- , Cl^- and Br^- , Cl^- and I^- , Br^- and I^- , NO_3^- and Br^- , NO_3^- and I^- .

Spot tests should be done whenever possible.

Reference Books:

- Vogels Qualitative Inorganic Analysis, Revised by G.Svehla.
- Marr & Rockett Inorganic Preparations.

C-14: ORGANIC CHEMISTRY-IV

(Credits-6: Theory-4, Practical-2)-Max. Marks: 100

THEORY (Each class 1 hr.): Marks-70 PRACTICAL

(Each class 2 hrs.): Marks-30

Lectures: 60 (40 Theory + 20 Practical classes)

UNIT-I: Organic Spectroscopy-I

UV Spectroscopy: Types of electronic transitions, max, Chromophores and Auxochromes, Bathochromic and Hypsochromic shifts, Intensity of absorption; Application of Woodward rules for calculation of max for the following systems: the unsaturated aldehydes: ketones, carboxylic acids and esters; Conjugated dienes: alicyclic, homoannular and heteroannular; Extended conjugated systems (aldehydes, ketones and dienes); distinction between cis and trans isomers.

IR Spectroscopy: Fundamental and non-fundamental molecular vibrations; IR absorption positions of O, N and S containing functional groups; Effect of H-bonding, conjugation, resonance and ring size on IR absorptions; Fingerprint region and its significance; application in functional group analysis. (18 Lectures)

UNIT-II: Organic Spectroscopy-II

NMR Spectroscopy: Basic principles of Proton Magnetic Resonance, chemical shift and factors influencing it; Spin-spin coupling and coupling constant; Anisotropic effects in alkene, alkyne, aldehydes and aromatics; Interpretation of NMR spectra of simple compounds. Mass Spectroscopy-Basic principle, Fragmentation pattern, Instrumentation, Determination of m/e ratio. Application of Mass Spectroscopy on CH₄, C₂H₆, n-butane and neo-pentane. Applications of IR, UV and NMR for identification of simple organic molecules. (12 Lectures)

UNIT-III: Carbohydrates

Occurrence, classification and their biological importance. Monosaccharides: Constitution and absolute configuration of glucose and fructose, epimers and anomers, mutarotation, determination of ring size of glucose and fructose, Haworth projections and conformational structures; Interconversions of aldoses and ketoses; Killiani-Fischer synthesis and Ruff degradation; Disaccharides Structure elucidation of maltose. Polysaccharides Elementary treatment of starch, cellulose. (8 Lectures) **Dyes** Classification, colour and constitution; Mordant and Vat dyes; Chemistry of dyeing. Synthesis and applications of: Azo dyes Methyl orange and Congo red (mechanism of Diazo Coupling); Triphenyl methane dyes - Malachite Green, and crystal violet; Phthalein dyes Phenolphthalein and Fluorescein; Natural dyes Alizarin and Indigo; Edible dyes with examples. (8 Lectures)

UNIT-IV: Polymers

Introduction and classification including di-block, tri-block and amphiphilic polymers; Number average molecular weight, Weight average molecular weight, Degree of polymerization, Polydispersity Index. Polymerisation reactions -Addition and condensation -Mechanism of cationic, anionic and free radical addition polymerization; Metallocene-based Ziegler-Natta polymerisation of alkenes; Preparation and applications of plastics thermosetting (phenol-formaldehyde, Polyurethanes) and thermosoftening (PVC, polythene); Fabrics natural and synthetic (acrylic, polyamido, polyester); Rubbers natural and synthetic: Buna-S and Neoprene; Vulcanization; Polymer additives; Biodegradable and conducting polymers with examples. (14 Lectures)

Reference Books:

- Kalsi, P. S. Textbook of Organic Chemistry 1st Ed., New Age International (P) Ltd. Pub.
- Morrison, R. T. & Boyd, R. N. Organic Chemistry, Dorling Kindersley (India) Pvt. Ltd. (Pearson Education).
- Billmeyer, F. W. Textbook of Polymer Science, John Wiley & Sons, Inc.
- Gowariker, V. R.; Viswanathan, N. V. & Sreedhar, J. Polymer Science, New Age International (P) Ltd.

Pub.

- Finar, I. L. Organic Chemistry (Volume 2: Stereochemistry and the Chemistry of Natural Products), Dorling Kindersley (India) Pvt. Ltd. (Pearson Education).
- Graham Solomons, T.W. Organic Chemistry, John Wiley & Sons, Inc.
- Clayden, J.; Greeves, N.; Warren, S.; Wothers, P.; Organic Chemistry, Oxford University Press.
- Singh, J.; Ali, S.M. & Singh, J. Natural Product Chemistry, Pragati Prakashan (2010).
- Kemp, W. Organic Spectroscopy, Palgrave.

PRACTICAL: C-14 LAB.

1. Extraction of caffeine from tea leaves.
2. Preparation of sodium polyacrylate.
3. Preparation of urea formaldehyde.
4. Analysis of Carbohydrate: aldoses and ketoses, reducing and non-reducing sugars.
5. Qualitative analysis of unknown organic compounds containing mono-functional groups (carbohydrates, aryl halides, aromatic hydrocarbons, nitro compounds, amines and amides) and simple bifunctional groups, for e.g. salicylic acid, cinnamic acid, nitrophenols etc.

Reference Books:

- Vogel, A.I. Quantitative Organic Analysis, Part 3, Pearson (2012).
- Mann, F.G. & Saunders, B.C. Practical Organic Chemistry, Pearson Education (2009).
- Furniss, B.S., Hannaford, A.J.; Smith, P.W.G.; Tatchell, A.R. Practical Organic Chemistry, 5th Ed., Pearson (2012).
- Ahluwalia, V.K. & Aggarwal, R. Comprehensive Practical Organic Chemistry: Preparation and Quantitative Analysis, University Press (2000).
- Ahluwalia, V.K. & Dhingra, S. Comprehensive Practical Organic Chemistry: Qualitative Analysis, University Press (2000).

DISCIPLINE SPECIFIC ELECTIVE(DSE)

SEMESTER-V

DSE-1: POLYMER CHEMISTRY

(Credits-6: Theory-4, Practical-2)-Max. Marks: 100
THEORY (Each class 1 hr.): Marks-70 PRACTICAL
(Each class 2 hrs.): Marks-30 Lectures: 60 (40 Theory
+ 20 Practical classes)

UNIT-I: Introduction and history of polymeric materials:

Different schemes of classification of polymers, Polymer nomenclature, Molecular forces and chemical bonding in polymers, Texture of Polymers. (4 Lectures)

Functionality and its importance:

Criteria for synthetic polymer formation, classification of polymerization processes, Relationships between functionality, extent of reaction and degree of polymerization. Bi-functional systems, Poly-functional systems. (8 Lectures)

UNIT-II: Kinetics of Polymerization:

Mechanism and kinetics of step growth, radical chain growth, ionic chain (both cationic and anionic) and coordination polymerizations, Mechanism and kinetics of copolymerization, polymerization techniques. (8 lectures)

Crystallization and crystallinity:

Determination of crystalline melting point and degree of crystallinity, Morphology of crystalline polymers, Factors affecting crystalline melting point. (4 Lectures)

Nature and structure of polymers-Structure property relationships. (2 Lectures)

UNIT-III: Determination of molecular weight of polymers

(Mn, Mw, etc.) by end group analysis, viscometry, light scattering and osmotic pressure methods. Molecular weight distribution and its significance. Polydispersity index. (8 Lectures)

Glass transition temperature (T_g) and determination of T_g

WLF equation, Factors affecting glass transition temperature (T_g). (8 Lectures)

UNIT-IV: Polymer Solution

Criteria for polymer solubility, Solubility parameter, Thermodynamics of polymer solutions, entropy, enthalpy, and free energy change of mixing of polymers solutions. (8 Lectures)

Properties of Polymers

(Physical, thermal & mechanical properties). Brief introduction to preparation, structure, properties and application of the following polymers: polyolefins, polystyrene and styrene copolymers, poly(vinyl chloride) poly(vinyl acetate), polyacrylamide, fluoro polymers (Teflon), polyamides (nylon- 6 and nylon 6,6). Phenol formaldehyde resins (Bakelite, Novalac), polyurethanes, silicone polymers (polysiloxane), Polycarbonates, Conducting Polymers, (polyacetylene, polyaniline). (10 Lectures)

Reference Books:

- Seymours Polymer Chemistry, Marcel Dekker, Inc.

- G. Odian: Principles of Polymerization, John Wiley.
- F.W. Billmeyer: Text Book of Polymer Science, John Wiley.
- P. Ghosh: Polymer Science & Technology, Tata Mcgraw-Hill.
- R.W. Lenz: Organic Chemistry of Synthetic High Polymers.

PRACTICAL: DSE-1 LAB.

Polymer synthesis

1. Free radical solution polymerization of styrene (St) / Methyl Methacrylate (MMA) / Methyl Acrylate (MA) / Acrylic acid (AA).
 - (a) Purification of monomer.
 - (b) Polymerization using benzoyl peroxide (BPO) / 2,2-azo-bis-isobutyronitrile (AIBN).
2. Preparation of nylon 66/6.
3. Interfacial polymerization, preparation of polyester from isophthaloyl chloride (IPC) and phenolphthalein.
 - (a) Preparation of IPC.
 - (b) Purification of IPC.
 - (c) Interfacial polymerization.
4. Redox polymerization of acrylamide.
5. Precipitation polymerization of acrylonitrile.
6. Preparation of urea-formaldehyde resin.
7. Preparations of novalac resin/resold resin.
8. Microscale Emulsion Polymerization of poly(methylacrylate).

Polymer characterization

1. Determination of molecular weight by viscometry:
 - (a) Polyacrylamide-aq. NaNO₂ solution
 - (b) (Poly vinyl propylidene (PVP) in water
2. Determination of the viscosity-average molecular weight of poly(vinyl alcohol) (PVOH) and the fraction of head-to-head monomer linkages in the polymer.
3. Determination of molecular wt. by end group analysis: Polyethylene glycol (PEG) (OH group).
4. Determination of hydroxyl number of a polymer using colorimetric method.

Polymer analysis

1. Estimation of the amount of HCHO in the given solution by sodium sulphite method
2. Instrumental Techniques
3. IR studies of polymers

*at least 5 experiments to be carried out.

Reference Books:

- Malcolm P. Stevens, Polymer Chemistry: An Introduction, 3rd Ed.
- Harry R. Allcock, Frederick W. Lampe and James E. Mark, Contemporary Polymer Chemistry, 3rd ed. Prentice-Hall (2003).
- Fred W. Billmeyer, Textbook of Polymer Science, 3rd ed. Wiley-Interscience (1984).
- Joel R. Fried, Polymer Science and Technology, 2nd ed. Prentice-Hall (2003).
- Petr Munk and Tejraj M. Aminabhavi, Introduction to Macromolecular Science, 2nd ed. John

Wiley & Sons (2002).

- L.H. Sperling, Introduction to Physical Polymer Science, 4th ed. John Wiley & Sons (2005).
- Malcolm P. Stevens, Polymer Chemistry: An Introduction, 3rd ed. Oxford University Press (2005).
- Seymour/ Carraher's Polymer Chemistry, 9th ed. by Charles E. Carraher, Jr. (2013).

DSE-2: GREEN CHEMISTRY

(Credits-6: Theory-4, Practical-2)-Max. Marks: 100
THEORY (Each class 1 hr.): Marks-70 PRACTICAL
(Each class 2 hrs.): Marks-30 Lectures: 60 (40 Theory
+ 20 Practical classes)

UNIT-I: Introduction to Green Chemistry

What is Green Chemistry? Need for Green Chemistry. Goals of Green Chemistry. Limitations/Obstacles in the pursuit of the goals of Green Chemistry. (4 Lectures)

Principles of Green Chemistry and Designing a Chemical synthesis-I

Twelve principles of Green Chemistry with their explanations and examples with special emphasis on: Designing a Green Synthesis using these principles; Prevention of Waste/ byproducts; maximum incorporation of the materials used in the process into the final products, Atom Economy, calculation of atom economy of the rearrangement, addition, substitution and elimination reactions. Prevention/minimization of hazardous/ toxic products reducing toxicity. risk = (function) hazard exposure; waste or pollution prevention hierarchy. Green solvents supercritical fluids, water as a solvent for organic reactions, ionic liquids, fluorinated biphasic solvent, PEG, solventless processes, immobilized solvents and how to compare greenness of solvents. (12 Lectures)

UNIT-II: Principles of Green Chemistry and Designing a Chemical synthesis-II

Explanation of principles with special emphasis on: Energy requirements for reactions alternative sources of energy: use of microwaves and ultrasonic energy. Selection of starting materials; avoidance of unnecessary derivatization careful use of blocking/protecting groups. Use of catalytic reagents (wherever possible) in preference to stoichiometric reagents; catalysis and green chemistry, comparison of heterogeneous and homogeneous catalysis, biocatalysis, asymmetric catalysis and photocatalysis. Prevention of chemical accidents designing greener processes, inherent safer design, principle of ISD What you don't have cannot harm you, greener alternative to Bhopal Gas Tragedy (safer route to carbonyl) and Flixborough accident (safer route to cyclohexanol) subdivision of ISD, minimization, simplification, substitution, moderation and limitation. Strengthening/development of analytical techniques to prevent and minimize the generation of hazardous substances in chemical processes. (14 Lectures)

UNIT-III: Examples of Green Synthesis/ Reactions and some real world cases-I Green Synthesis of the following compounds: adipic acid, catechol, disodium iminodiacetate (alternative to Strecker synthesis) Microwave assisted reactions in water: Hofmann Elimination, methyl benzoate to benzoic acid, oxidation of toluene and alcohols; microwave assisted reactions in organic solvents: Diels-Alder reaction and Decarboxylation reaction. Ultrasound assisted reactions: sonochemical Simmons-Smith Reaction (Ultrasonic alternative to Iodine). Surfactants for carbon dioxide replacing smog producing and ozone depleting solvents with CO₂ for precision cleaning and dry cleaning of garments. Designing of Environmentally safe marine antifoulant. (14 Lectures)

UNIT-IV: Examples of Green Synthesis/ Reactions and some real world cases-II Rightfit pigment: synthetic azo pigments to replace toxic organic and inorganic pigments. An efficient, green synthesis of a compostable and widely applicable plastic (poly lactic acid) made from corn. Healthier Fats and oil by Green Chemistry: Enzymatic Inter esterification for production of

no Trans-Fats and Oils Development of Fully Recyclable Carpet: Cradle to Cradle Carpeting (6 Lectures)

Future Trends in Green Chemistry

Oxidation reagents and catalysts; Biomimetic, multifunctional reagents; Combinatorial green chemistry; Proliferation of solventless reactions; co crystal controlled solid state synthesis (C2S3); Green chemistry in sustainable development. (10 Lectures)

Reference Books:

- V.K. Ahluwalia & M.R. Kidwai: New Trends in Green Chemistry, • Anamalaya Publishers (2005).
- P.T. Anastas & J.K. Warner: Oxford Green Chemistry- Theory and Practical, University Press (1998).
- A.S. Matlack: Introduction to Green Chemistry, Marcel Dekker (2001).
- M.C. Cann & M.E. Connely: Real-World cases in Green Chemistry, American Chemical Society, Washington (2000).
- M.A. Ryan & M. Tinneland, Introduction to Green Chemistry, American Chemical Society, Washington (2002).

PRACTICAL: DSE-2

1. Safer starting materials.

- The Vitamin C clock reaction using Vitamin C tablets, tincture of iodine, hydrogen peroxide and liquid laundry starch.
- Effect of concentration on clock reaction.
- Preparation and characterization of nanoparticles (Ag, Au) using plant extract.

2. Using renewable resources

- Preparation of biodiesel from vegetable oil.

3. Avoiding waste

- Principle of atom economy.
- Use of molecular model kit to simulate the reaction to investigate how the atom economy can illustrate Green Chemistry.
- Preparation of propene by two methods can be studied.

(I) Triethylamine ion + OH⁻ $\xrightarrow{H_2SO_4/O}$ propene + trimethylpropene + water

(II) 1-propanol $\xrightarrow{\text{water}}$ propene + water

- The other types of reactions, like addition, elimination, substitution and rearrangement should also be studied for the calculation of atom economy.

4. Use of enzymes as catalysts

- Benzoin condensation using Thiamine Hydrochloride as a catalyst instead of cyanide

5. Alternative Green solvents

Diels Alder reaction in water

- Reaction between furan and maleic acid in water and at room temperature rather than in benzene and reflux.
- Extraction of D-limonene from orange peel using liquid CO₂ prepared from dry ice.
- Mechanochemical solvent free synthesis of azomethines

4. Alternative sources of energy

- Solvent free, microwave assisted one pot synthesis of phthalocyanine complex of Cu(II).

- Photoreduction of benzophenone to benzopinacol in the presence of sunlight.

Reference Books:

- Anastas, P.T & Warner, J.C. Green Chemistry: Theory and Practice, Oxford University Press (1998).
- Kirchoff, M. & Ryan, M.A. Greener approaches to undergraduate chemistry experiment. American Chemical Society, Washington DC (2002).
- Ryan, M.A. Introduction to Green Chemistry, Tinnesand; (Ed), American Chemical Society, Washington DC (2002).
- Sharma, R.K.; Sidhwani, I.T. & Chaudhari, M.K. I.K. Green Chemistry Experiment: A monograph International Publishing House Pvt Ltd. New Delhi. Bangalore CISBN 978-93-81141-55-7 (2013).
- Cann, M.C. & Connelly, M. E. Real world cases in Green Chemistry, American Chemical Society (2008).
- Cann, M. C. & Thomas, P. Real world cases in Green Chemistry, American Chemical Society (2008).

DSE-3: INDUSTRIAL CHEMICALS AND ENVIRONMENT

(Credits-6: Theory-4, Practical-2)-Max. Marks: 100

THEORY (Each class 1 hr.): Marks-70 PRACTICAL

(Each class 2 hrs.): Marks-30 Lectures: 60 (40 Theory + 20 Practical classes)

UNIT-I: Industrial Gases and Inorganic Chemicals

Industrial Gases: Large scale production, uses, storage and hazards in handling of the following gases: oxygen, nitrogen, argon, neon, helium, hydrogen, acetylene, carbon monoxide, chlorine, sulphur dioxide. Inorganic Chemicals: Manufacture, application and hazards in handling the following chemicals: hydrochloric acid, nitric acid, sulphuric acid, caustic soda, common salt, bleaching powder, sodium thiosulphate, hydrogen peroxide, potash alum, potassium dichromate and potassium permanganate. (10 Lectures)

Industrial Metallurgy

Preparation of metals (ferrous and nonferrous) and ultrapure metals for semiconductor technology. (4 Lectures)

UNIT-II: Environment and its segments

Ecosystems. Biogeochemical cycles of carbon, nitrogen and sulphur. Air Pollution: Major regions of atmosphere. Chemical and photochemical reactions in atmosphere. Air pollutants: types, sources, particle size and chemical nature; Photochemical smog: its constituents and photochemistry. Environmental effects of ozone. Major sources of air pollution. Pollution by SO_2 , CO_2 , CO , NO_x , and H_2S and control procedures. Effects of air pollution on living organisms and vegetation. Greenhouse effect and global warming, Ozone depletion by oxides of nitrogen, chlorofluorocarbons and halogens, removal of sulphur from coal. (14 Lectures)

UNIT-III: Water Pollution: Hydrological cycle, water resources, aquatic ecosystems, Sources and nature of water pollutants, Techniques for measuring water pollution, Impacts of water pollution on hydrological and ecosystems. Water purification methods. Effluent treatment plants (primary, sec-

ondary and tertiary treatment). Industrial effluents from the following industries and their treatment: electroplating, textile, tannery, dairy, petroleum and petrochemicals, fertilizer. Sludge disposal. Industrial waste management, incineration of waste. Water treatment and purification (reverse osmosis, ion exchange). Water quality parameters for waste water, industrial water and domestic water. (16 Lectures)

UNIT-IV: Energy & Environment

Sources of energy: Coal, petrol and natural gas. Nuclear fusion/fission, solar energy, hydrogen, geothermal, tidal and hydel. Nuclear Pollution: Disposal of nuclear waste, nuclear disaster and its management. (10 Lectures)

Biocatalysis: Introduction to biocatalysis: Importance in green chemistry and chemical industry. (6 Lectures)

Reference Books:

- E. Stocchi: Industrial Chemistry, Vol-I, Ellis Horwood Ltd. UK.
- R.M. Felder, R.W. Rousseau: Elementary Principles of Chemical Processes, Wiley Publishers, New Delhi.
- A. Kent: Riegels Handbook of Industrial Chemistry, CBS Publishers, New Delhi.
- S. S. Dara: A Textbook of Engineering Chemistry, S. Chand & Company Ltd. New Delhi.
- De, Environmental Chemistry: New Age International Pvt., Ltd, New Delhi.
- S. M. Khopkar, Environmental Pollution Analysis: Wiley Eastern Ltd, New Delhi.
- S.E. Manahan, Environmental Chemistry, CRC Press (2005).
- G.T. Miller, Environmental Science 11th edition. Brooks/ Cole (2006).
- Mishra, Environmental Studies. Selective and Scientific Books, New Delhi (2005).

PRACTICAL: DSE-3

1. Determination of dissolved oxygen in water.
2. Determination of Chemical Oxygen Demand (COD).
3. Determination of Biological Oxygen Demand (BOD).
4. Percentage of available chlorine in bleaching powder.
5. Measurement of chloride, sulphate and salinity of water samples by simple titration method ($AgNO_3$ and potassium chromate).
6. Estimation of total alkalinity of water samples (CO_3^{2-} , HCO_3^-) using double titration method.
7. Measurement of dissolved CO_2 .
8. Study of some of the common bio-indicators of pollution.
9. Estimation of SPM in air samples.
10. Preparation of borax/ boric acid.

Reference Books:

- E. Stocchi: Industrial Chemistry, Vol-I, Ellis Horwood Ltd. UK.
- R.M. Felder, R.W. Rousseau: Elementary Principles of Chemical Processes, Wiley Publishers, New Delhi.
- A. Kent: Riegels Handbook of Industrial Chemistry, CBS Publishers, New Delhi.
- S. S. Dara: A Textbook of Engineering Chemistry, S. Chand & Company Ltd. New Delhi.
- De, Environmental Chemistry: New Age International Pvt., Ltd, New Delhi.
- S. M. Khopkar, Environmental Pollution Analysis: Wiley Eastern Ltd, New Delhi.

DSE-4: DISSERTATION/PROJECT WORK

Marks:100

SKILL ENHANCEMENT COURSES (SEC)

SEMESTER- III

SEC-I: PESTICIDE CHEMISTRY

(Credits: 02)- Max. Marks: 50

30 Lectures(Each Lecture 1 hr.)

General introduction to pesticides (natural and synthetic), benefits and adverse effects, changing concepts of pesticides, structure activity relationship, synthesis and technical manufacture and uses of representative pesticides in the following classes: Organochlorines (DDT, Gammexene,); Organophosphates (Malathion, Parathion); Carbamates (Carbofuran and carbaryl); Quinones (Chloranil), Anilides (Alachlor and Butachlor).

Practical

- To calculate acidity/alkalinity in given sample of pesticide formulations as per BIS specifications.
- Preparation of simple organophosphates, phosphonates and thiophosphates.

Reference Book:

- R. Cremlyn: Pesticides, John Wiley.

SEMESTER- IV

SEC-II: FUEL CHEMISTRY

(Credits: 02)- Max. Marks: 50

30 Lectures(Each Lecture 1 hr.)

Review of energy sources (renewable and non-renewable). Classification of fuels and their calorific value Coal: Uses of coal (fuel and non-fuel) in various industries, its composition, carbonization of coal. Coal gas, producer gas and water gas composition and uses. Fractionation of coal tar, uses of coal tar bases chemicals, requisites of a good metallurgical coke, Coal gasification (Hydro gasification and Catalytic gasification), Coal liquefaction and Solvent Refining.

Petroleum and Petrochemical Industry: Composition of crude petroleum, Refining and different types of petroleum products and their applications. Fractional Distillation (Principle and process), Cracking (Thermal and catalytic cracking), Reforming Petroleum and non-petroleum fuels (LPG, CNG, LNG, bio-gas, fuels derived from biomass), fuel from waste, synthetic fuels (gaseous and liquids), clean fuels. Petrochemicals: Vinyl acetate, Propylene oxide, Isoprene, Butadiene, Toluene and its derivatives Xylene.

Lubricants: Classification of lubricants, lubricating oils (conducting and non-conducting) Solid and semisolid lubricants, synthetic lubricants. Properties of lubricants (viscosity index, cloud point, pore point) and their determination.

large Reference Books:

- E. Stocchi: Industrial Chemistry, Vol -I, Ellis Horwood Ltd. UK.
- P.C. Jain, M. Jain: Engineering Chemistry, Dhanpat Rai & Sons, Delhi.
- B.K. Sharma: Industrial Chemistry, Goel Publishing House, Meerut.

GENERIC ELECTIVE(GE)

B. Sc.(Hons.) Students other than Chemistry Honours will opt four Chemistry GE Papers.

SEMESTER-I

GE-I: ATOMIC STRUCTURE, BONDING, GENERAL ORGANIC CHEMISTRY & ALIPHATIC HYDROCARBONS

(Credits-6: Theory-4, Practical-2)-Max. Marks: 100
THEORY (Each class 1 hr.): Marks-70 PRACTICAL
(Each class 2 hrs.): Marks-30 Lectures: 60 (40 Theory
+ 20 Practical classes)

SECTION A: INORGANIC CHEMISTRY-1 (30 Periods)

Unit-I: Atomic Structure

Review of: Bohrs theory and its limitations, dual behaviour of matter and radiation, de-Broglies relation, Heisenberg Uncertainty principle. Hydrogen atom spectra.

What is Quantum mechanics ? Time independent Schrodinger equation and meaning of various terms in it. Significance of ψ and ψ^2 , Schrodinger equation for hydrogen atom. Radial and angular parts of the hydrogenic wave functions (atomic orbitals) and their variations for 1s, 2s, 2p, 3s, 3p and 3d orbitals (Only graphical representation). Significance of quantum numbers, orbital angular momentum and quantum numbers m_l and m_s . Shapes of s, p and d atomic orbitals, nodal planes. Discovery of spin, spin quantum number (s) and magnetic spin quantum number (m_s). Rules for filling electrons in various orbitals, Electronic configurations of the atoms. Stability of half-filled and completely filled orbitals, concept of exchange energy. Relative energies of atomic orbitals, Anomalous electronic configurations. (14 Lectures)

Unit-II: Chemical Bonding and Molecular Structure

Ionic Bonding: General characteristics of ionic bonding. Energy considerations in ionic bonding, lattice energy and solvation energy and their importance in the context of stability and solubility of ionic compounds. Statement of Born-Land equation for calculation of lattice energy, Born-Haber cycle and its applications, polarizing power and polarizability. Fajans rules, ionic character in covalent compounds, bond moment, dipole moment and percentage ionic character.

Covalent bonding: VB Approach: Shapes of some inorganic molecules and ions on the basis of VSEPR and hybridization with suitable examples of linear, trigonal planar, square planar, tetrahedral, trigonal bipyramidal and octahedral arrangements. Concept of resonance and resonating structures in various inorganic and organic compounds.

MO Approach: Rules for the LCAO method, bonding and antibonding MOs and their characteristics for s-s, s-p and p-p combinations of atomic orbitals, nonbonding combination of orbitals, MO treatment of homonuclear diatomic molecules (N_2 , O_2) and heteronuclear diatomic molecules (CO, NO). Comparison of VB and MO approaches. (16 Lectures)

Section B: Organic Chemistry-1 (30 Periods) Unit- III: Fundamentals of Organic Chemistry

Physical Effects, Electronic Displacements: Inductive Effect, Electromeric Effect, Resonance and Hyperconjugation. Cleavage of Bonds: Homolysis and Heterolysis.

Structure, shape and reactivity of organic molecules: Nucleophiles and electrophiles. Reactive Intermediates: Carbocations, Carbanions and free radicals. Strength of organic acids and bases: Comparative study with emphasis on factors affecting pK values. Aromaticity: Hckels rule. (8 Lectures)

Stereochemistry

Conformations with respect to ethane, butane and cyclohexane. Interconversion of Wedge Formula, Newmann, Sawhorse and Fischer representations. Concept of chirality (upto two carbon atoms). Configuration: Geometrical and Optical isomerism; Enantiomerism, Diastereomerism and Meso compounds). D and L; cis-trans nomenclature; CIP Rules: R/S (for one chiral carbon atoms) and E/Z Nomenclature (for up to two C=C systems). (10 Lectures)

Unit- IV: Aliphatic Hydrocarbons

Functional group approach for the following reactions (preparations & reactions) to be studied in context to their structure. Alkanes: (Upto 5 Carbons). Preparation: Catalytic hydrogenation, Wurtz reaction, Kolbes synthesis, from Grignard reagent. Reactions: Free radical Substitution: Halogenation.

Alkenes: (Upto 5 Carbons) Preparation: Elimination reactions: Dehydration of alkenes and dehydrohalogenation of alkyl halides (Saytzeffs rule); cis alkenes (Partial catalytic hydrogenation) and trans alkenes (Birch reduction). Reactions: cis-addition (alk. $KMnO_4$) and trans-addition (bromine), Addition of HX (Markownikoffs and anti-Markownikoffs addition), Hydration, Ozonolysis, Alkynes: (Upto 5 Carbons) Preparation: Acetylene from CaC_2 and conversion into higher alkynes; by dehalogenation of tetra halides and dehydrohalogenation of vicinal-dihalides.

Reactions: formation of metal acetylides, addition of bromine and alkaline $KMnO_4$, ozonolysis. (12 Lectures)

Reference Books:

- J. D. Lee: A new Concise Inorganic Chemistry, E L. B. S.
- F. A. Cotton & G. Wilkinson: Basic Inorganic Chemistry, John Wiley.
- Douglas, McDaniel and Alexander: Concepts and Models in Inorganic Chemistry, John Wiley.
- T. W. Graham Solomon: Organic Chemistry, John Wiley and Sons.
- Peter Sykes: A Guide Book to Mechanism in Organic Chemistry, Orient Longman.
- E. L. Eliel: Stereochemistry of Carbon Compounds, Tata McGraw Hill. I. L. Finar: Organic Chemistry (Vol. I & II), E. L. B. S.
- R. T. Morrison & R. N. Boyd: Organic Chemistry, Prentice Hall.
- Arun Bahl and B. S. Bahl: Advanced Organic Chemistry, S. Chand.

PRACTICAL: GE-I LAB.

Section A: Inorganic Chemistry-Volumetric Analysis

1. Estimation of sodium carbonate and sodium hydrogen carbonate present in a mixture.
2. Estimation of oxalic acid by titrating it with $KMnO_4$.
3. Estimation of water of crystallization in Mohrs salt by titrating with $KMnO_4$.

4. Estimation of Fe (II) ions by titrating it with $K_2Cr_2O_7$ using internal indicator.
5. Estimation of Cu (II) ions iodometrically using $Na_2S_2O_3$.

Section B: Organic Chemistry

1. Detection of extra elements (N, S, Cl, Br, I) in organic compounds (containing upto two extra elements).
2. Separation of mixtures by Chromatography: Measure the Rf value in each case (combination of two compounds to be given).
 - (a) Identify and separate the components of a given mixture of 2 amino acids (glycine, aspartic acid, glutamic acid, tyrosine or any other amino acid) by paper chromatography.
 - (b) Identify and separate the sugars present in the given mixture by paper chromatography.

large Reference Books:

- Vogels Qualitative Inorganic Analysis, A.I. Vogel, Prentice Hall, 7th Edition.
- Vogels Quantitative Chemical Analysis, A.I. Vogel, Prentice Hall, 6th Edition.
- Textbook of Practical Organic Chemistry, A.I. Vogel, Prentice Hall, 5th edition.
- Practical Organic Chemistry, F. G. Mann. & B. C. Saunders, Orient Longman, 1960.

SEMESTER-II

GE-II: CHEMICAL ENERGETICS, EQUILIBRIA & FUNCTIONAL ORGANIC CHEMISTRY-I

(Credits-6: Theory-4, Practical-2)-Max. Marks: 100
THEORY (Each class 1 hr.): Marks-70 PRACTICAL
(Each class 2 hrs.): Marks-30 Lectures: 60 (40 Theory
+ 20 Practical classes)

Section A: Physical Chemistry-1 (30 Lectures) Unit-I:

Chemical Energetics

Review of thermodynamics and the Laws of Thermodynamics. Important principles and definitions of thermochemistry. Concept of standard state and standard enthalpies of formations, integral and differential enthalpies of solution and dilution. Calculation of bond energy, bond dissociation energy and resonance energy from thermochemical data. Variation of enthalpy of a reaction with temperature Kirchhoffs equation. Statement of Third Law of thermodynamics (10 Lectures)

Chemical Equilibrium:

Free energy change in a chemical reaction. Thermodynamic derivation of the law of chemical equilibrium. Distinction between G and G_0 , Le Chateliers principle. Relationships between K_p , K_c and K_x for reactions involving ideal gases. (8 Lectures)

Unit- II: Ionic Equilibria

Strong, moderate and weak electrolytes, degree of ionization, factors affecting degree of ionization, ionization constant and ionic product of water. Ionization of weak acids and bases, pH scale, common ion effect. Salt hydrolysis-calculation of hydrolysis constant, degree of hydrolysis and pH for different

salts. Buffer solutions. Solubility and solubility product of sparingly soluble salts applications of solubility product principle. (12 Lectures)

Section B: Organic Chemistry-2 (30 Lectures) Unit- III:

Functional group approach for the following reactions (preparations & reactions) to be studied in context to their structure. Aromatic hydrocarbons: Preparation (Case benzene): from phenol, by decarboxylation, from acetylene, from benzene sulphonic acid. Reactions: (Case benzene): Electrophilic substitution: nitration, halogenation and sulphonation. Friedel-Crafts reaction (alkylation and acylation) (upto 4 carbons on benzene). Side chain oxidation of alkyl benzenes (up to 4 carbons on benzene). (8 Lectures)

Alkyl and Aryl Halides

Alkyl Halides (Up to 5 Carbons) Types of Nucleophilic Substitution (SN_1 , SN_2 and SN_i) reactions. Preparation: from alkenes and alcohols.

Reactions: hydrolysis, nitrite & nitro formation, nitrile & isonitrile formation. Williamsons ether synthesis: Elimination vs substitution.

Aryl Halides Preparation: (Chloro, bromo and iodo-benzene case): from phenol, Sandmeyer & Gattermann reactions. Reactions (Chlorobenzene): Aromatic nucleophilic substitution (replacement by OH group) and effect of nitro substituent. Benzyne Mechanism: KNH_2/NH_3 (or $NaNH_2/NH_3$). (8 Lectures)

Unit- IV: Alcohols, Phenols and Ethers (Upto 5 Carbons)

Alcohols: Preparation: Preparation of 1, 2 and 3 alcohols: using Grignard reagent, Esterhydrolysis, Reduction of aldehydes and ketones, carboxylic acid and esters.

Reactions: With sodium, HX (Lucas test), esterification, oxidation (with PCC, alk. $KMnO_4$, acidic dichromate, conc. HNO_3). Oppeneauer oxidation Diols: (Upto 6 Carbons) oxidation of diols. Pinacol-Pinacolone rearrangement.

Phenols: (Phenol case) Preparation: Cumene hydroperoxide method, from diazonium salts. Reactions: Electrophilic substitution: Nitration, halogenation and sulphonation. ReimerTiemann Reaction, Gattermann-Koch Reaction,

Ethers (aliphatic and aromatic): Cleavage of ethers with HI.

Aldehydes and ketones (aliphatic and aromatic): Formaldehyde, acetaldehyde, acetone and benzaldehyde

Preparation: from acid chlorides and from nitriles.

Reactions Reaction with HCN, ROH, $NaHSO_3$, $NH_2 - G$ derivatives. Iodoform test. Aldol Condensation, Cannizzaros reaction, Benzoin condensation. Clemensen reduction and Wolff Kishner reduction. (14 Lectures)

Reference Books:

- T. W. Graham Solomons: Organic Chemistry, John Wiley and Sons.
- Peter Sykes: A Guide Book to Mechanism in Organic Chemistry, Orient Longman.
- I.L. Finar: Organic Chemistry (Vol. I & II), E. L. B. S.
- R. T. Morrison & R. N. Boyd: Organic Chemistry, Prentice Hall.
- Arun Bahl and B. S. Bahl: Advanced Organic Chemistry, S. Chand.

- G. M. Barrow: Physical Chemistry Tata McGraw-Hill(2007).
- G. W. Castellan: Physical Chemistry 4th Edn. Narosa (2004).
- C. Kotz, P. M. Treichel & J. R. Townsend: General Chemistry Cengage Lening India Pvt. Ltd., New Delhi (2009).
- H. Mahan: University Chemistry 3rd Ed. Narosa (1998).
- R. H. Petrucci: General Chemistry 5th Ed. Macmillan Publishing Co.: New York (1985).

PRACTICAL: GE-II LAB.

Section A: Physical Chemistry Thermochemistry

1. Determination of heat capacity of calorimeter for different volumes.
2. Determination of enthalpy of neutralization of hydrochloric acid with sodium hydroxide.
3. Determination of enthalpy of ionization of acetic acid.
4. Determination of integral enthalpy of solution of salts (KNO₃, NH₄Cl).
5. Determination of enthalpy of hydration of copper sulphate.
6. Study of the solubility of benzoic acid in water and determination of H. **Ionic equilibria**
pH measurements a) Measurement of pH of different solutions like aerated drinks, fruit juices, shampoos and soaps (use dilute solutions of soaps and shampoos to prevent damage to the glass electrode) using pH-meter.
b) Preparation of buffer solutions:
(i) Sodium acetate-acetic acid.
(ii) Ammonium chloride-ammonium hydroxide.
Measurement of the pH of buffer solutions and comparison of the values with theoretical values.

Section B: Organic Chemistry

1. Purification of organic compounds by crystallization (from water and alcohol) and distillation.
2. Criteria of Purity: Determination of melting and boiling points.
3. Preparations: Mechanism of various reactions involved to be discussed. Recrystallisation, determination of melting point and calculation of quantitative yields to be done.
(a) Bromination of Phenol/Aniline.
(b) Benzoylation of amines/phenols.
(c) Oxime and 2,4 dinitrophenylhydrazone of aldehyde/ketone.

Reference Books:

- A.I. Vogel: Textbook of Practical Organic Chemistry, 5th edition, Prentice-Hall.
- F. G. Mann & B. C. Saunders, Practical Organic Chemistry, Orient Longman (1960).
- B.D. Khosla, Senior Practical Physical Chemistry, R. Chand & Co.

SEMESTER-III

GE-III: CHEMISTRY OF S- AND P-BLOCK ELEMENTS, STATES OF MATTER & CHEMICAL KINETICS

(Credits-6: Theory-4, Practical-2)-Max. Marks: 100

THEORY (Each class 1 hr.): Marks-70

PRACTICAL (Each class 2 hrs.): Marks-30

Lectures: 60 (40 Theory + 20 Practical classes)

UNIT-I: General Principles of Metallurgy

Chief modes of occurrence of metals based on standard electrode potentials. Ellingham diagrams for reduction of metal oxides using carbon as reducing agent. Hydrometallurgy, Methods of purification of metals (Al, Pb, Fe, Cu, Ni, Zn): electrolytic, oxidative refining, Parting process, van Arkel-de Boer process and Mond's process. (4 Lectures)

s- and p-Block Elements

Periodicity in s- and p-block elements with respect to electronic configuration, atomic and ionic size, ionization enthalpy, electronegativity (Pauling & Mulliken scales). Allotropy in C, S, and P. Oxidation states with reference to elements in unusual and rare oxidation states like carbides and nitrides), inert pair effect, diagonal relationship and anomalous behaviour of first member of each group. (11 Lectures)

UNIT-II: Compounds of s- and p-Block Elements

Hydrides and their classification (ionic, covalent and interstitial), structure and properties with respect to stability of hydrides of p- block elements. Concept of multicentre bonding (diborane).

Structure, bonding and their important properties like oxidation/reduction, acidic/basic nature of the following compounds and their applications in industrial, organic and environmental chemistry.

Hydrides of nitrogen (NH_3 , N_2H_4 , N_3H , NH_2OH)

Oxoacids of P, S and Cl.

Halides and oxohalides: PCl_3 , PCl_5 , $SOCl_2$. (15 Lectures)

Section B: Physical Chemistry-3 (30 Lectures) UNIT-III:

Kinetic Theory of Gases

Postulates of Kinetic Theory of Gases and derivation of the kinetic gas equation. Deviation of real gases from ideal behaviour, compressibility factor, causes of deviation. van der Waals equation of state for real gases. Boyle temperature (derivation not required). Critical phenomena, critical constants and their calculation from van der Waals equation. Maxwell Boltzmann distribution laws of molecular velocities and molecular energies (graphic representation derivation not required) and their importance.

Temperature dependence of these distributions. Most probable, average and root mean square velocities (no derivation). Collision cross section, collision number, collision frequency, collision diameter and mean free path of molecules. Viscosity of gases and effect of temperature and pressure on coefficient of viscosity (qualitative treatment only). (10 Lectures)

Liquids

Surface tension and its determination using stalagmometer. Viscosity of a liquid and determination of coefficient of viscosity using Ostwald viscometer. Effect of temperature on surface tension and coefficient of viscosity of a liquid (qualitative treatment only). (5 Lectures)

UNIT-IV: Solids

Forms of solids. Symmetry elements, unit cells, crystal systems, Bravais lattice types and identification of lattice planes. Laws of Crystallography - Law of constancy of interfacial angles, Law of

rational indices. Miller indices. XRay diffraction by crystals, Bragg's law. Structures of NaCl, and CsCl (qualitative treatment only). Defects in crystals. (7 Lectures)

Chemical Kinetics

The concept of reaction rates. Effect of temperature, pressure, catalyst and other factors on reaction rates. Order and molecularity of a reaction. Derivation of integrated rate equations for zero, first and second order reactions (both for equal and unequal concentrations of reactants). Half-life of a reaction. General methods for determination of order of a reaction. Concept of activation energy and its calculation from Arrhenius equation. Theories of Reaction Rates: Collision theory and Activated Complex theory of bimolecular reactions. Comparison of the two theories (qualitative treatment only). (8 Lectures)

Reference Books:

- G. M. Barrow: Physical Chemistry Tata McGraw-Hill(2007).
- G. W. Castellan: Physical Chemistry 4th Edn. Narosa (2004).
- C. Kotz, P. M. Treichel & J. R. Townsend: General Chemistry Cengage Learning India Pvt. Ltd., New Delhi (2009).
- H. Mahan: University Chemistry 3rd Ed. Narosa (1998).
- R. H. Petrucci: General Chemistry 5th Ed. Macmillan Publishing Co.: New York (1985).
- D. Lee: A New Concise Inorganic Chemistry, E.L.B.S.
- F.A. Cotton & G. Wilkinson: Basic Inorganic Chemistry, John Wiley.
- F. Shriver and P. W. Atkins: Inorganic Chemistry, Oxford University Press.
- Gary Wulfsberg: Inorganic Chemistry, Viva Books Pvt. Ltd.

PRACTICAL: GE-III LAB.

Section A: Inorganic Chemistry

Semi-micro qualitative analysis using H_2S of mixtures- not more than four ionic species (two anions and two cations and excluding insoluble salts) out of the following:

Cations : NH_4^+ , Pb^{2+} , Ag^+ , Bi^{3+} , Cu^{2+} , Cd^{2+} , Sn^{2+} , Fe^{3+} , Al^{3+} , Co , Cr^{3+} ,

Ni^{2+} , Mn^{2+} , Zn^{2+} , Ba^{2+} , Sr^{2+} , Ca^{2+} , K^+

Anions: CO_3^{2-} , S^{2-} , SO_3^{2-} , NO_3^- , Cl^- , Br^- , I^- , NO_2^- , SO_4^{2-} , PO_4^{3-} , F^- (Spot tests should be carried out

wherever feasible)

Section B: Physical Chemistry Chemical Kinetics

Study the kinetics of the following reactions.

3. Initial rate method: Iodide-persulphate reaction.
4. Integrated rate method:
 - a) Acid hydrolysis of methyl acetate with hydrochloric acid.
 - b) Saponification of ethyl acetate.
 - c) Compare the strengths of HCl and H_2SO_4 by studying kinetics of hydrolysis of methyl acetate.

Reference Books:

- A.I. Vogel, Qualitative Inorganic Analysis, Prentice Hall, 7th Edn
- A.I. Vogel, Quantitative Chemical Analysis, Prentice Hall, 6th Edn.
- B.D. Khosla, Senior Practical Physical Chemistry, R. Chand & Co.

SEMESTER- IV

GE:IV ORGANOMETALLICS, BIOINORGANIC CHEMISTRY, POLYNUCLEAR HYDROCARBONS AND UV, IR SPECTROSCOPY

(Credits-6: Theory-4, Practical-2)-Max. Marks: 100
THEORY (Each class 1 hr.): Marks-70 PRACTICAL
(Each class 2 hrs.): Marks-30 Lectures: 60 (40 Theory
+ 20 Practical classes)

Section A: Inorganic Chemistry-4 (30 Lectures) UNIT-

I: Chemistry of 3d metals

Oxidation states displayed by Cr, Fe, Co, Ni and Cu. A study of the following compounds (including preparation and important properties); Peroxo compounds of Cr, $K_2Cr_2O_7$, $KMnO_4$, $K_4[Fe(CN)_6]$, sodium nitroprusside, $[Co(NH_3)_6]Cl_3$, $Na_3[Co(NO_2)_6]$. (6 Lectures)

Organometallic Compounds Definition and Classification with appropriate examples based on nature of metal-carbon bond (ionic, s, p and multicentre bonds). Structures of methyl lithium, Zeiss salt and ferrocene. EAN rule as applied to carbonyls. Preparation, structure, bonding and properties of mononuclear and polynuclear carbonyls of 3d metals. π -acceptor behaviour of carbon monoxide. Synergic effects (VB approach). (12 Lectures)

UNIT-II: Bio-Inorganic Chemistry

A brief introduction to bio-inorganic chemistry. Role of metal ions present in biological systems with special reference to Na^+ , K^+ and Mg^{2+} ions: Na/K pump; Role of Mg^{2+} ions in energy production and chlorophyll. Role of Ca^{2+} in blood clotting, stabilization of protein structures and structural role (bones). (12 Lectures)

Section B: Organic Chemistry-4 (30 Lectures)

UNIT-III: Polynuclear and heteronuclear aromatic compounds

Properties of the following compounds with reference to electrophilic and nucleophilic substitution: Naphthalene, Anthracene, Furan, Pyrrole, Thiophene, and Pyridine. (6 Lectures)

Active methylene compounds

Preparation: Claisen ester condensation. Keto-enol tautomerism. Reactions: Synthetic uses of ethylacetoacetate (preparation of non-heteromolecules having upto 6 carbon). (6 Lectures)

UNIT-IV: Application of Spectroscopy to Simple Organic Molecules

Applications of visible, ultraviolet and Infrared spectroscopy in organic molecules. Electromagnetic radiations, electronic transitions, λ_{max} and ϵ_{max} , chromophore, auxochrome, bathochromic and hypsochromic shifts. Application of electronic spectroscopy and Woodward rules for calculating λ_{max} of conjugated dienes and α , β -unsaturated compounds. Infrared radiation and types of molecular vibrations, functional group and fingerprint region. IR spectra of alkanes, alkenes and simple alcohols (inter and intramolecular hydrogen bonding), aldehydes, ketones, carboxylic acids and their derivatives (effect of substitution on $>C=O$ stretching absorptions). (18 Lectures)

Reference Books:

- James E. Huheey, Ellen Keiter & Richard Keiter: Inorganic Chemistry: Principles of Structure and

Reactivity, Pearson Publication.

- G.L. Miessler & Donald A. Tarr: Inorganic Chemistry, Pearson Publication.
- J.D. Lee: A New Concise Inorganic Chemistry, E.L.B.S.
- F.A. Cotton & G. Wilkinson: Basic Inorganic Chemistry, John Wiley & Sons.
- I.L. Finar: Organic Chemistry (Vol. I & II), E.L.B.S.
- John R. Dyer: Applications of Absorption Spectroscopy of Organic Compounds, • Prentice Hall.
- R.M. Silverstein, G.C. Bassler & T.C. Morrill: Spectroscopic Identification of Organic Compounds, John Wiley & Sons.
- R.T. Morrison & R.N. Boyd: Organic Chemistry, Prentice Hall.
- Peter Sykes: A Guide Book to Mechanism in Organic Chemistry, Orient Longman.
- Arun Bahl and B. S. Bahl: Advanced Organic Chemistry, S. Chand.

PRACTICAL: GE-IV LAB.

Section A: Inorganic Chemistry

1. Separation of mixtures by chromatography: Measure the R_f value in each case. (Combination of two ions to be given).

Paper chromatographic separation of Fe^{3+} , Al^{3+} and Cr^{3+} or Paper chromatographic separation of Ni^{2+} , Co^{2+} , Mn^{2+} and Zn^{2+}

Section B: Organic Chemistry

Systematic Qualitative Organic Analysis of Organic Compounds possessing mono-functional groups (-COOH, phenolic, aldehydic, ketonic, amide, nitro, amines) and preparation of one derivative.

Reference Books:

- A.I. Vogel: Qualitative Inorganic Analysis, Prentice Hall, 7th Edn.
- A.I. Vogel: Quantitative Chemical Analysis, Prentice Hall, 6th Edn.
- A.I. Vogel: Textbook of Practical Organic Chemistry, Prentice Hall, 5th Edn.
- F. G. Mann & B. C. Saunders: Practical Organic Chemistry, Orient Longman (1960).

SEMESTER- IV (CBZ Students)

GE:IV- MOLECULES OF LIFE

(Credits-6: Theory-4, Practical-2)-Max. Marks: 100
THEORY (Each class 1 hr.): Marks-70 PRACTICAL
(Each class 2 hrs.): Marks-30 Lectures: 60 (40 Theory
+ 20 Practical classes)

UNIT-I: Carbohydrates

Classification of carbohydrates, reducing and non reducing sugars, General Properties of Glucose and Fructose, their open chain structure. Epimers, mutarotation and anomers. Determination of configuration of Glucose (Fischer proof). Cyclic structure of glucose. Haworth projections. Cyclic structure of fructose. Linkage between monosachharides, structure of disacharrides (sucrose, maltose, lactose) and polysacharrides (starch and cellulose) excluding their structure elucidation. (12 Periods)

UNIT-II Amino Acids, Peptides and Proteins

Classification of Amino Acids, Zwitterion structure and Isoelectric point. Overview of Primary, Secondary, Tertiary and Quaternary structure of proteins. Determination of primary structure of peptides, determination of N-terminal amino acid (by DNFB and Edman method) and C-terminal amino acid (by thiohydantoin and with carboxypeptidase enzyme). Synthesis of simple peptides (upto dipeptides) by N-protection (t-butyloxycarbonyl and phthaloyl) & C-activating groups and Merrifield solid phase synthesis. (12 Periods)

UNIT-III: Enzymes and correlation with drug action

Mechanism of enzyme action, factors affecting enzyme action, Coenzymes and cofactors and their role in biological reactions, Specificity of enzyme action (Including stereospecificity), Enzyme inhibitors and their importance, phenomenon of inhibition (Competitive and Non competitive inhibition including allosteric inhibition). Drug action-receptor theory. Structure activity relationships of drug molecules, binding role of OH group, $-NH_2$ group, double bond and aromatic ring, (10 Periods)

Nucleic Acids

Components of Nucleic acids: Adenine, guanine, thymine and Cytosine (Structure only), other components of nucleic acids, Nucleosides and nucleotides (nomenclature), Structure of polynucleotides; Structure of DNA (Watson-Crick model) and RNA (types of RNA), Genetic Code, Biological roles of DNA and RNA: Replication, Transcription and Translation. (8 Periods)

UNIT-IV: Lipids

Introduction to lipids, classification. Oils and fats: Common fatty acids present in oils and fats, Omega fatty acids, Trans fats, Hydrogenation, Saponification value, Iodine number. Biological importance of triglycerides, phospholipids, glycolipids, and steroids (cholesterol). (8 Periods)

Concept of Energy in Biosystems

Calorific value of food. Standard caloric content of carbohydrates, proteins and fats. Oxidation of foodstuff (organic molecules) as a source of energy for cells. Introduction to Metabolism (catabolism, anabolism), ATP: the universal currency of cellular energy, ATP hydrolysis and free energy change. Conversion of food into energy. Outline of catabolic pathways of Carbohydrate- Glycolysis, Fermentation, Krebs Cycle. Overview of catabolic pathways of Fats and Proteins. Interrelationships in the metabolic pathways of Proteins, Fats and Carbohydrates. (10 Lectures)

Recommended Texts:

- Morrison, R. T. & Boyd, R. N. Organic Chemistry, Dorling Kindersley (India) Pvt. Ltd. (Pearson Education).
- Finar, I. L. Organic Chemistry (Volume 1), Dorling Kindersley (India) Pvt. Ltd. (Pearson Education).
- Finar, I. L. Organic Chemistry (Volume 2), Dorling Kindersley (India) Pvt. Ltd. (Pearson Education).
- Nelson, D. L. & Cox, M. M. Lehningers Principles of Biochemistry 7th Ed., W. H. Freeman.
- Berg, J. M., Tymoczko, J. L. & Stryer, L. Biochemistry 7th Ed., W. H. Freeman.

PRACTICAL: GE-IV(CBZ) LAB.

1. Separation of amino acids by paper chromatography.

2. To determine the concentration of glycine solution by formylation method.
3. Study of titration curve of glycine.
4. Action of salivary amylase on starch.
5. Effect of temperature on the action of salivary amylase on starch.
6. To determine the saponification value of an oil/fat.
7. To determine the iodine value of an oil/fat.
8. Differentiate between a reducing/ nonreducing sugar.
9. Extraction of DNA from onion/cauliflower.
10. To synthesise aspirin by acetylation of salicylic acid and compare it with the ingredient of an aspirin tablet by TLC.

Recommended Texts:

- Furniss, B.S.; Hannaford, A.J.; Rogers, V.; Smith, P.W.G.; Tatchell, A.R. *Vogels Textbook of Practical Organic Chemistry*, ELBS.
- Ahluwalia, V.K. & Aggarwal, R. *Comprehensive Practical Organic Chemistry*, Universities Press.

COMPUTER SCIENCE(HONOURS)

SEMESTER-I

C:1-PROGRAMMING USING C (Credit:6, Theory:4, Practical: 2)

UNIT- I

Introduction to Programming Language, Introduction to C Programming , Character Set, C Tokens, Keywords & Identifiers, Constants, Variables, Data Types, Variables , Storage Classes, Operators (Arithmetic, Relational, Logical , Assignment, Increment & Decrement, Conditional , Bitwise), Expressions , Input and Output Operations.

UNIT- II

Decision Making and Branching: Simple IF Statement, IF.. ELSE Statement, Nesting IF. ELSE Statement, ELSE IF Ladder, Switch Statement, Operator, GOTO Statement. Decision Making and Looping: The WHILE Statement, The DO Statement, The FOR Statement, Jumps in LOOPS. Arrays, Character Arrays and Strings.

UNIT- III

User-defined Functions: Need, Elements & Definition, Function Calls, Function Definition, Category of Functions, Recursion. Structures and Unions: Defining, Declaring, Accessing, Initialization Structure, Arrays of Structures, Arrays within Structures, Structures and Functions, Unions.

UNIT- IV

Pointers: Accessing the Address of a Variable, Declaring Pointer Variables, Initializations of Pointer Variable, Accessing a Variable through its Pointer, Chain of Pointers, Pointer Expressions, Pointer Increments and Scale Factor, Pointers and Arrays,, Pointers and Character Strings, Array of Pointers, Pointers as Function Arguments, Functions Returning Pointers, Pointers to Functions, Pointers to Structures, Troubles with Pointers.

UNIT- V

File Management in C: Defining and Opening a File, Closing a File, Input/ Output Operations on Files, Error Handling During I/O Operations, Random Access to Files, Command Line Arguments, Dynamic Memory Allocation.

Recommended Books:

1. E. Balaguruswamy, Programming in ANSI C,4/e, (TMH).
2. Paul Deitel, Harvey Deitel, C: How to Program, 8/e, Prentice Hall.
3. J. R. Hanly, Problem Solving & Program Design in C, 7/e, Pearson.
4. B. Kernighan & D.M. Ritchie, The C Programming Language, 2/e PHI.

C: 2-COMPUTER ORGANIZATION

(Credit:6, Theory:4, Practical: 2)

UNIT-I

Character Codes, Decimal System, Binary System, Decimal to Binary Conversion, Hexadecimal Notation, Boolean Algebra, Basic Logic Functions: Electronic Logic Gates, Synthesis of Logic Functions, Minimization of Logic Expressions, Minimization using Karnaugh Maps, Synthesis with NAND and NOR Gates.

UNIT-II

Flip-Flops, Gated Latches, Master-Slave Flip-Flops, Edge-Triggering, T Flip-Flops, JK Flip-Flops. Registers and Shift Registers, Counters, Decoders, Multiplexers, Programmable Logic Devices (PLDs), Programmable Array Logic (PAL), Complex Programmable Logic Devices (CPLDs), Field-Programmable Gate Array (FPGA), Sequential Circuits, Timing Diagrams, The Finite State Machine Model, Synthesis of Finite State Machines.

UNIT-III

Basic Structure of Computers: Computer Types, Functional Units, Input Unit, Memory Unit, Arithmetic and Logic Unit, Output Unit, Control Unit, Basic Operational Concepts, Bus Structures, Software. Machine Instructions and Programs: Numbers, Arithmetic Operations, and Characters: Number Representation, Addition of Positive Numbers, Addition and Subtraction of Signed Numbers, Overflow of Integer Arithmetic, Characters, Memory Locations and Addresses, Byte Addressability, Word Alignment, Accessing Numbers, Characters, and Character Strings, Memory Operations, Instructions and Instruction Sequencing, Register Transfer Notation, Basic Instruction Types, Instruction Execution and Straight-Line Sequencing, Branching, Condition Codes, Generating Memory Addresses, Addressing Modes, Implementation of Variables and Constants, Indirection and Pointers, Indexing and Arrays, Relative Addressing.

UNIT-IV

THE ARM EXAMPLE: Registers, Memory Access, and Data Transfer, Register Structure, Memory Access Instructions and Addressing Modes, Register Move Instructions, Arithmetic and Logic Instructions: Arithmetic Instructions, Logic Instructions, Branch Instructions, Setting Condition Codes, Assembly Language, Pseudo-Instructions, I/O Operations, Subroutines, Vector Dot Product Program, Byte-Sorting Program, Linked-List Insertion and Deletion Subroutines. Basic Input-Output Operations, Stacks and Queues, Subroutines. PowerPC Example: Basic PowerPC Processor Organization, Load and Store Instructions, Arithmetic and Logic Instructions, Flow Control Instructions, Compare Instructions, Logic Instructions, Subroutines.

UNIT-V

Memory System: Semiconductor RAM Memories, Internal Organization of Memory Chips, Static Memories, Asynchronous DRAMS, Synchronous DRAMS, Structure of Large Memories, Memory System Considerations, RAMBUS Memory. Read-Only Memories: ROM, PROM, EPROM, EEPROM, Flash Memory, Speed, Size, and Cost of Memory. Secondary Storage: Magnetic Hard Disks, Optical Disks, Magnetic Tape Systems.

Recommended Books:

1. Carl Hamacher, Z. Vranesic, S. Zaky: Computer Organization, 5/e (TMH)
2. William Stallings: Computer Organization and Architecture (Design for Performance), 9/e
3. S. Brown, & Z. Vranesic, Fundamentals of Digital Logic Design with VHDL, 2/e, McGraw-Hill
4. J. P. Uyemura, A First Course in Digital System Design, An Integrated Approach, Cengage Learning.

GE:1-PROBABILITY AND STATISTICS

Credits;4

UNIT-I

Probability and Probability Distribution: Events and the Sample Space, Calculating Probabilities using Simple events, Useful counting rules, Probability rules: Addition rule, Conditional probability and multiplication rule, Bayes rule.

UNIT-II

Probability Distributions: Random Variable, Discrete random variable, Mean and Standard deviation of discrete random variable, Discrete Probability Distributions: Binomial, Poisson and Hypergeometric probability distribution, Continuous Probability distribution: Normal distribution.

UNIT-III

Sampling Distribution: sampling plans and experimental designs, Sampling distribution of a statistic, Central Limit theorem, Sampling distribution of the Sample mean and Proportion. Large Sample Estimation: Point estimation, Interval estimation, Confidence interval of population mean, Population proportion, difference between two population means, difference between two population proportions.

UNIT-IV

Large Sample Tests of Hypothesis: Test of a Population mean, Test of difference of two population means, Test of hypothesis for a binomial proportion, Test of hypothesis for the difference between two binomial proportions. Inference from Small Samples: Students t Distribution, Small Sample inferences concerning a population mean and difference between two population means, Inferences concerning a population variance and difference between two population variances.

UNIT-V

Analysis of Variance: One-way classification, Two-way classification. Linear regression and Correlation: Method of least squares, Analysis of variance for linear regression, Testing the usefulness of the linear regression model, Estimation and Prediction using the fitted line. Carl Pearsons coefficient of Correlation, Test of hypothesis concerning the Correlation coefficient.

Recommended Books: 1. William Mendenhall, Robert J. Beaver, Barbara M. Beaver, Probability and Statistics 14/e, CENGAGE Learning. 2. W. W. Hines, D.C. Montgomery, D.M. Goldsman, & C.M. Borror, Probability & Statistics in Engineering”.

C: 3-PROGRAMMING USING C++

(Credit:6, Theory:4, Practical: 2)

UNIT-I

Principles of Object-Oriented Programming: Object-Oriented Programming (OOP) Paradigm, Basic Concepts of OOP, Benefits of OOP, Object Oriented Languages, Applications of OOP. Beginning with C++: Applications of C++, C++ statements, Example with Class, Structure of C++ Program, Creating the Source File, Compiling and Linking. Tokens, Expressions and Control Structures: Tokens, Keywords, Identifiers & Constants, Basic Data Types, User-Defined Data Types, Derived Data Types, Symbolic Constants, Type Compatibility, Declaration of Variables, Dynamic Initialization of Variables, Reference Variables, Operators in C++, Scope Resolution Operator, Member Deferencing Operators, Memory Management Operators, Manipulators, Type Cast Operators, Expressions and

their Types, Special Assignment Expressions, Implicit Conversions, Operator Overloading, Operator Precedence, Control Structures.

UNIT- II

Functions in C++: The Main Function, Function Prototyping, Call By Reference, Return by Reference, Inline Functions, Default Arguments, Const. Arguments, Function Overloading, Friend & Virtual Functions, Math. Library Functions. **Classes and Objects**: Specifying a Class, Defining Member Functions, Making an outside Function Inline, Nested Member Functions, Private Member Functions, Arrays within a Class, Memory Allocation for Objects, Static Data Members, Static Member Functions, Arrays of Objects, Objects as Function Arguments, Friendly Functions, Returning Objects, Const. Member Functions, Pointer to Members, Local Classes.

UNIT- III

Constructors & Destructors: Constructors, Parameterized Constructors, Multiple Constructors in a Class, Constructors with Default Arguments, Dynamic Initialization of Objects, Copy Constructor, Dynamic Constructors, Constructing Two-Dimensional Arrays, Const. Objects, Destructors. **Operator Overloading and Type Conversions**: Defining Operator Overloading, Overloading Unary Operators, Overloading Binary Operators, Overloading Binary Operators using Friends, Manipulation of Strings using Operators, Rules for Overloading Operators, Type Conversions.

UNIT- IV

Inheritance : Defining Derived Classes, Single Inheritance, Making a Private Member Inheritance, Multilevel Inheritance, Multiple Inheritance, Hierarchical Inheritance, Hybrid Inheritance, Virtual Base Classes, Abstract Classes, Constructors in Derived Classes, Member Classes, Nesting of Classes. Pointers, Virtual Functions and Polymorphism: Pointers, Pointers to Objects, this Pointer, Pointers to Derived Classes, Virtual Functions, Pure Virtual Functions.

UNIT- V

Managing Console I/O Operations: **C++ Streams**, C++ Stream Classes, Unformatted I/O Operations, Formatted Console I/O Operations, Managing Output with Manipulators. **Files**: Classes for File Stream Operations, Opening and Closing a File, Detecting end-of-file, File Modes, File Pointers and their Manipulations, Sequential Input and Output Operations, Updating a File: Random Access, Error Handling During File Operations, Command-line Arguments.

Recommended Books:

1. E. Balgurusamy, Object Oriented Programming with C++ :, 4/e (TMH).
2. Paul Deitel, Harvey Deitel, "C++: How to Program",9/e. Prentice Hall.
3. J. Farrell, Object-Oriented Programming, Cengage Learning.
4. Bjarne Stroustrup, "Programming – Principles and Practice using C++", 2/e, Addison-Wesley 2014.

C: 4-DATA STRUCTURES (Credit:6, Theory:4, Practical: 2)

UNIT-I

Introduction and Overview: Definitions, Concept of Data Structures, Overview of Data Structures, Implementation of Data Structures. Arrays: Terminology, One-Dimensional Array, Multi-Dimensional Arrays, Pointer Arrays.

UNIT-II

Linked Lists: Single Linked List, Circular Linked List, Double Linked List, Circular Double Linked List, Application of Linked Lists, Memory Representation, Boundary Tag System, De-allocation Strategy, Buddy System, Compaction.

UNIT-III

Stacks: Definition, Representation of Stack (Array, Linked List), Operations on Stacks, Applications of Stack (Evaluation of Arithmetic Expressions, Code Generation, Implementation of Recursion, Factorial Calculation, Quick Sort, Tower of Hanoi, Activation Record Management).

UNITIV

Queues: Definition, Representation of Queues (Array, Linked List), Circular Queue, Deque, Priority Queue, Application of Queues (Simulation, CPU Scheduling in Multiprogramming Environment, Round Robin Algorithm).

UNITV

Tree: Binary Trees, Properties of Binary Tree, Linear Representation of Binary a Binary Tree, Linked Representation of a Binary Tree, Physical Implementation of Binary Tree in Memory, Operations on Binary Tree (Insertion, Deletion, Traversal, Merging of two Binary Trees), Types of Binary Trees (Expression Tree, Binary Search Tree, Heap Tree, Threaded Binary Trees, Height Balanced Binary Tree, Weighted Binary Tree, Decision Trees).

Recommended Books:

1. D. Samanta, Classic Data Structures:, 2/e (PHI).
2. D.S Malik, Data Structure using C++, 2/e, Cengage Learning, 2010.
3. Adam Drozdek, "Data Structures and algorithm in C++", 3/e, Cengage Learning, 2012.
4. Robert L. Kruse, "Data Structures and Program Design in C++", Pearson.

GE: 2-NUMERICAL TECHNIQUES

Credits;4

UNIT-I

Introduction: Numbers and their accuracy, Chopping and Rounding off, Errors: Absolute and Relative errors, Floating point representations of numbers, Loss of significance. Solution of Algebraic and Transcendental Equations: Bisection Method, Newton-Raphson Method, Secant Method, Method of false position, Rate of convergence and comparison of iterative methods.

UNIT-II

Interpolation and Numerical Differentiation: Polynomial Interpolation, Interpolating polynomial: Lagrange form, Newton form, Nested form, Divided difference Interpolation, Inverse Interpolation, Errors in polynomial Interpolation. First derivative and second derivative via Taylor Series, Richardson Extrapolation.

UNIT-III

Numerical Integration: Trapezoidal Rule, Composite Trapezoidal rule, Simpsons 1/3 rule, Simpsons 3/8 rule, Gaussian Quadrature formulae (1-point, 2-point, 3-point)

UNIT-IV

Solution of System of Linear Equations: Gaussian Elimination method and Pivoting, LU factorization method, ill Conditioning, Iterative Methods: Jacobi iterative method, Gauss Seidel iterative method. Eigen Values and Eigen Vectors: Eigen value properties, Computation Eigen values by Power method.

UNIT-V

Solution of Ordinary Differential Equations: Taylor Series method, Runge-Kutta method of order 2 and order 4, Predictor-Corrector method: Adams-Bashforth-Moulton method. Smoothing of Data and the Method of Least Squares: Linear and non-linear least square method.

Recommended Books:

1. E. Ward Cheney and David R. Kincaid, Numerical Methods and Applications CENGAGE Learning India Private Ltd., New Delhi.
2. S.R.K. Iyengar, R.K. Jain, & M.K. Jain, Numerical Methods for Scientific & Engineering Computation, 6/e, New Age Int. Pub.
3. S.S. Sastry, Introductory Methods of Numerical Analysis, 5/e, EEE
4. Steven C. Chapra, Applied Numerical Methods with MATLAB, 2/e, McGraw-Hill.

SEMESTER-III

C: 5-OPERATING SYSTEMS (Credit:6, Theory:4, Practical: 2)

UNIT-I

Operating System, Computer-System Organization, Computer-System Architecture, Operating-System Structure, Operating-System Operations, Process Management, Memory Management, Storage Management, Protection and Security, Distributed Systems, Special Purpose Systems, Computing Environments, Open-Source Operating Systems. Operating System Services, User Operating System Interface, System Calls, Types of System Calls, System Programs, Operating-System Design and Implementation, Operating System Structure, Virtual Machines, Operating System Debugging, Operating System Generations. System Boot.

UNIT-II

Process: Process Concept, Process Scheduling, Operations on Processes, Inter-Process Communication, Examples of IPC Systems, Communication in Client-Server Systems. Multithreaded Programming: Multithreading Models, Thread Libraries, Threading Issues, Operating-System Examples.

UNIT-III

Process Scheduling: Basic Concepts, Scheduling Criteria, Scheduling Algorithms, Thread Scheduling. Multiple Process Scheduling. Synchronization: The Critical Section Problem, Petersons Solution, Synchronization Hardware, Semaphores, Classical Problems of Synchronization, Monitors, Synchronization Examples, Atomic Transactions.

UNIT-IV

Deadlocks: System Model, Deadlock Characterization, Methods of Handling Deadlocks, Deadlock Prevention, Deadlock avoidance, Deadlock Detection, Recovery from Deadlock. Memory Management Strategies: Swapping, Contiguous Memory Allocation, Paging, Structure of the Page Table, Segmentation, Example: The Intel Pentium.

UNIT-V

Virtual-Memory Management: Demand Paging, Copy-on-Write, Page Replacement, Allocation of Frames, Thrashing, Memory-Mapped Files, Allocating Kernel Memory. File System: File Concept, Access Methods, Directory and Disk Structure, File-System Mounting, File Sharing, Protection.

Recommended Books:

1. A Silberschatz, P.B. Galvin, G. Gagne, Operating Systems Concepts, 8/e, John Wiley Publications 2008.
2. A.S. Tanenbaum, Modern Operating Systems, 3/e, Pearson Education 2007.
3. W. Stallings, Operating Systems, Internals & Design Principles, 5/e, Prentice Hall of India. 2008.
4. G. Nutt, Operating Systems: A Modern Perspective, 2/e, Pearson Education 1997.

C: 6-DATABASE MANAGEMENT SYSTEM**(Credit:6, Theory:4, Practical: 2)****UNIT-I**

Databases and Database Users, Database System Concepts and Architecture, Data Modelling using the Entity-Relationship (ER) Model, The Enhanced Entity-Relationship (EER) Model.

UNIT-II

Relational Model: The Relational Data Model and Relational Database Constraints, The Relational Algebra and Relational Calculus.

UNIT-III

Relational Database Design by ER- and EER-to-Relational Mapping, SQL-99: Schema Definition, Constraints, Queries, and Views, Introduction to SQL Programming Techniques.

UNIT-IV

Functional Dependencies and Normalization for Relational Databases, Relational Database Algorithms and Further Dependencies, Practical Database Design Methodology and use of UML Diagrams.

UNIT-V

Disk Storage, Basic File Structures, and Hashing, Indexing Structures for Files, Algorithms for Query Processing and Optimization, Physical Database Design and Tuning.

Recommended Books:

1. R. Elmasri, S.B. Navathe, Fundamentals of Database Systems, 6/e, Pearson Education, 2010.
2. A. Silberschatz, H.F. Korth, S. Sudarshan, Database System Concepts 6/e, McGraw Hill, 2010.
3. R. Ramakrishanan, J. Gehrke, Database Management Systems, McGraw-Hill.
4. C. Coronel, S. Morris, & P. Rob, Database Principles (Fundamentals of Design, Implementation, and Management), 9/e, Cengage Learning.

C: 7-DISCRETE STRUCTURES**(Credit:6, Theory:4, Practical: 2)**

UNIT-I Logic and Proofs: Propositional Logic, Propositional Equivalences, Predicates and Quantifiers, Nested Quantifiers, Rules of Inference, Introduction to Proofs, Normal Forms, Proof Methods and Strategy, Mathematical Induction, Strong Induction and Well-Ordering, Recursive Definitions and Structural Induction, Recursive Algorithms.

UNIT-II

Basic Structures: Sets, Set Operations, Functions, Recursive Functions, Sequences and Summations. **Relations:** Relations and their Properties, n-ary Relations and their Applications, Representing Relations, Closures of Relations, Equivalence Relations, Partial Ordering. Boolean.

UNIT-III

Algebra: Boolean Functions, Representing Boolean Functions, Logic Gates, Minimization of Circuits. Algebraic Structures & Coding Theory: The Structure of Algebras, Semi-groups, Monoids and Groups, Homomorphism, Normal Subgroups, and Congruence Relations, Rings, Integral Domains and Fields, Quotient and Product Algebras, Coding Theory. Polynomial Rings and Polynomial Codes.

UNIT-IV

Counting: Basics of Counting, The Pigeonhole Principle, Permutations and Combinations, Binomial Coefficients, Generalized Permutations and Combinations, Generating Permutations and Combinations. Advanced Counting Techniques, Applications of Inclusion-Exclusion, Discrete probability, Conditional probability, Bayes Theorem.

UNIT-V

Graphs: Graphs and Graph Models, Graph Terminology and Special Types of Graphs, Havel-Hakimi Theorem, Representing Graphs and Graph Isomorphism, Connectivity, Cut-Sets, Euler and Hamiltonian Paths, Shortest-Path Problem, Planar Graphs, Graph Coloring, Network Flows.

Recommended Books:

1. Kenneth H Rosen, Discrete Mathematics & Its Applications, McGraw-Hill. 7/e.
2. J. L. Hein, Discrete Structures, Logic, and Computability, 3rd Edition, Jones and Bartlett Publishers, 2009
3. C.L. Liu, D.P. Mahopatra, Elements of Discrete mathematics, 2nd Edition, Tata McGraw Hill, 1985
4. M. O. Albertson and J. P. Hutchinson, Discrete Mathematics with Algorithms, John Wiley Publication, 1988

GE:3-ELECTRICITY & MAGNETISM

(Credit: 06, Theory:04, Practical:02)

UNIT-I

Electric Field and Electric Potential: Electric field: Electric field lines. Electric flux. Gauss Law with applications to charge distributions with spherical, cylindrical and planar symmetry. Conservative nature of Electrostatic Field. Electrostatic Potential. Laplace and Poisson, equations. The Uniqueness Theorem. Potential and Electric Field of a dipole. Force and Torque on a dipole.

UNIT-II

Electrostatic energy of system of charges. Electrostatic energy of a charged sphere. Conductors in an electrostatic Field. Surface charge and force on a conductor. Capacitance of a system of charged conductors. Parallel-plate capacitor. Capacitance of an isolated conductor. Method of Images and its application to: (1) Plane Infinite Sheet, and (2) Sphere.

UNIT-III

Dielectric Properties of Matter: Electric Field in matter. Polarization, Polarization Charges. Electrical Susceptibility and Dielectric Constant. Capacitor (parallel plate, spherical, cylindrical) filled with dielectric. Displacement vector D. Relations between E, P and D. Gauss Law in dielectrics.

UNIT-IV

Magnetic Field: Magnetic force between current elements and definition of Magnetic Field B. Biot-Savarts Law and its simple applications: straight wire and circular loop. Current Loop as a Magnetic

Dipole and its Dipole Moment (Analogy with Electric Dipole). Amperes Circuital Law and its application to (1) Solenoid and (2) Toroid. Properties of B: curl and divergence. Vector Potential. Magnetic Force on (1) point charge (2) current carrying wire (3) between current elements. Torque on a current loop in a uniform Magnetic Field.

UNIT-V

Magnetic Properties of Matter: Magnetization vector (M). Magnetic Intensity(H). Magnetic Susceptibility and permeability. Relation between B, H, M. Ferromagnetism. B-H curve and hysteresis. Electromagnetic Induction: Faradays Law. Lenzs Law. Self Inductance and Mutual Inductance. Reciprocity Theorem. Energy stored in a Magnetic Field. Introduction to Maxwells Equations. Charge Conservation and Displacement current. Electrical Circuits: AC Circuits: Kirchhoffs laws for AC circuits. Complex Reactance and Impedance. Series LCR Circuit: (1) Resonance, (2) Power Dissipation and (3) Quality Factor, and (4) Band Width. Parallel LCR Circuit. Network theorems: Ideal Constant-voltage and Constant-current Sources. Network Theorems: Thevenin theorem, Norton theorem, Superposition theorem, Reciprocity theorem, Maximum Power Transfer theorem. Applications to dc circuits.

Recommended Books:

1. S. Mahajan & Choudhury, Electricity, Magnetism & Electromagnetic Theory, 2012, Tata McGraw Hill
2. Edward M. Purcell, Electricity and Magnetism, 1986 McGraw-Hill Education
3. M.N.O. Sadiku, Elements of Electromagnetics, 2010, Oxford University Press.
4. J.H.Fewkes & J.Yarwood , Electricity and Magnetism,. Vol. I, 1991, Oxford Univ. Press

SEMESTER-IV

C: 8-JAVA PROGRAMMING

(Credit:6, Theory:4, Practical: 2)

UNIT-I

Introduction to Java: Java Architecture and Features, Understanding the semantic and syntax differences between C++ and Java, Compiling and Executing a Java Program, Variables, Constants, Keywords **Data Types**, Operators (Arithmetic, Logical and Bitwise) and Expressions, Comments, Doing Basic Program Output, Decision Making Constructs (conditional statements and loops)and Nesting, Java Methods (Defining, Scope, Passing and Returning Arguments, Type Conversion and Type and Checking, Built-in Java Class Methods).

UNIT-II

Arrays, Strings and I/O: Creating & Using Arrays (One Dimension and Multi-dimensional), Referencing Arrays Dynamically, Java Strings: The Java String class, Creating & Using String Objects, Manipulating Strings, String Immutability & Equality, Passing Strings To & From Methods, String Buffer Classes. Simple I/O using System.out and the Scanner class, Byte and Character streams, Reading/Writing from console and files. Object-Oriented Programming Overview: Principles of Object-Oriented Programming, Defining & Using Classes, Controlling Access to Class Members, Class Constructors, Method Overloading, Class Variables & Methods, Objects as parameters, final classes, Object class, Garbage Collection.

UNIT-III

Inheritance, Interfaces, Packages, Enumerations, Autoboxing and Metadata: Inheritance: (Single Level and Multilevel, Method Overriding, Dynamic Method Dispatch, Abstract Classes), Interfaces and Packages, Extending interfaces and packages, Package and Class Visibility, Using Standard Java Packages (util, lang, io, net), **Wrapper Classes**, Autoboxing/Unboxing, Enumerations and Metadata.

UNIT-IV

Exception Handling, Threading, Networking and Database Connectivity: Exception types, uncaught exceptions, throw, built-in exceptions, Creating your own exceptions; Multi-threading: The Thread class and Runnable interface, creating single and multiple threads, Thread prioritization, synchronization and communication, suspending/resuming threads. Using java.net package, Overview of TCP/IP and Datagram programming. Accessing and manipulating databases using JDBC.

UNIT-V

Applets and Event Handling: Java Applets: Introduction to Applets, Writing Java Applets, Working with Graphics, Incorporating Images & Sounds. Event Handling Mechanisms, Listener Interfaces, Adapter and Inner Classes. The design and Implementation of GUIs using the AWT controls, Swing components of Java Foundation Classes such as labels, buttons, text fields, layout managers, menus, events and listeners; Graphic objects for drawing figures such as lines, rectangles, ovals, using different fonts. Overview of servlets.

Recommended Books:

1. E. Balagurusamy, Programming with Java, 4/e, TMH
2. Bruce Eckel, "Thinking Java", 8/e, Pearson India, 2010.
3. John R. Hubbard, "Programming with JAVA", Schaum's Series, 2/e, 2004.
4. Cay S. Horstmann, Gary Cornell, "Core Java 2 Volume 1", 9/e, Printice Hall, 2012.

C: 9-COMPUTER NETWORK (Credit:6, Theory:4, Practical: 2)

UNIT-I

Introduction: Data Communications, Networks, The Internet, Protocols and Standards. Network Models: Layered Tasks, The OSI Model, **Layers in the OSI Model**, **TCP/ IP Protocol Suite**, **Ad- dressing**.

UNIT-II

Data and Signals: Analog and Digital, Periodic Analog Signals, Digital Signals, Transmission Impairment, Data Rate Limits, Performance. **Digital Transmission: Digital-To-Digital Conversion, Analog-To-Digital Conversion, Transmission Modes. Analog Transmission: Digital-To-Analog Conversion, Analog-To-Analog Conversion.**

UNIT-III

Multiplexing and Spreading: Multiplexing, Spread Spectrum. **Transmission Media: Guided Media, Unguided Media (Wireless).** Switching: Circuit Switched, Datagrams, Virtual Circuit Networks, Structure of a Switch. Telephone Network, Dial-Up MODEMS, Digital Subscriber Line (DSL), Cable TV Networks, Cable TV for Data Transfer.

UNIT-IV

Error Detection and Correction: Introduction, Block Coding, Linear Block Codes, Cyclic Codes,

Checksum. Data Link Control: Framing, Flow and Error Control, Protocols, Noiseless Channels, Noisy Channels, HDLC, Point-To-Point Protocol. Multiple Access: Random Access, Controlled Access, Channelization. Wired LANs: IEEE Standards, Standard Ethernet, Changes in the Standard, Fast Ethernet, Gigabit Ethernet: Wireless LANs: IEEE 802.11, Bluetooth.

UNIT-V

Connecting LANs: Connecting Devices, Backbone Networks, Virtual LANs. Wireless LANs: Cellular Telephony, Satellite Networks. SONET: Architecture, SONET Layers, SONET Frames, STS Multiplexing, SONET Networks, Virtual Tributaries. Virtual-Circuit Networks. Frame Relay, ATM, ATM LANs,

Recommended Books:

1. B. A. Forouzan, Data Communications and Networking, 4/e, THM, 2007
2. A. S. Tanenbaum, & David J. Wetherall, Computer Networks, 5/e, Pearson

C: 10-COMPUTER GRAPHICS

(Credit:6, Theory:4, Practical: 2)

UNIT-I

Computer Graphics: A Survey of Computer graphics, Overview of Graphics System: Video Display Devices, Raster-Scan Systems, Input Devices, Hard-Copy Devices, Graphics Software, Introduction to OpenGL. Graphics Output Primitives: Point and Lines, Algorithms for line, circle & ellipse generation, Filled-Area Primitives. Attributes of Graphics Primitives: Point, line, curve attributes, fill area attributes, fill methods for areas with irregular boundaries, Antialiasing.

UNIT-II

Geometric Transformations (both 2-D & 3-D): Basic Geometric Transformations, Matrix Representation and Homogeneous Coordinates, Composite Transformations, Inverse Transformations, Other Transformations (Reflection, shear), Transformation between coordinate systems, Affine Transformations. Two Dimensional Viewing: Viewing pipeline, Clipping Window, Normalization & Viewport coordinate Transformations, Clipping Algorithms: Point clipping, Line clipping and Polygon clipping. Three Dimensional Viewing: 3-dimensional Viewing Concepts, Viewing pipeline, Projection Transformations (Orthogonal, Oblique parallel, Perspective), Clipping Algorithms.

UNIT-III

Three Dimensional Object Representations: Curved Surfaces, Quadratic Surfaces, Spline Representations, Bezier Spline Curves and Surfaces, B-Spline Curves and Surfaces, Octrees, BSP Trees, Fractal Geometry Methods, Gamma correction.

UNIT-IV

Visible Surface Detection Methods: Classification of Visible-Surface Detection Algorithms, Back-Face Detection, Depth-Buffer method, A-Buffer Method, Scan line and Depth Sorting, Area subdivision Method, Ray Casting Method.

UNIT-V

Illumination Models: Basic Illumination Models, Displaying light Intensities, Halftone Patterns and Dithering techniques, Polygon-Rendering Methods (Gouraud Shading, Phong Shading), Ray-Tracing Methods (Basic Ray-Tracing Algorithm, Ray-Surface Intersection Calculations). Computer Animation, Hierarchical Modeling (introductory idea only).

Recommended Books:

1. Donald Hearn & M. Pauline Baker, Computer Graphics with OpenGL, Pearson Education.
2. A.V. Dan, F.H. Jones, J.D. Foley, S.K. Feiner, Computer Graphics Principles & Practices in C, 2/e, Pearson.
3. D. F. Rogers, Procedural Elements for Computer Graphics, McGraw Hill.
4. D. F. Rogers, & J. A. Adams, Mathematical Elements for Computer Graphics, 2/e, McGraw Hill.

SEC: II-ANDROID PROGRAMMING**(Credit:02)****UNIT-I**

Introduction: History of Android, Introduction to Android Operating Systems, Android Development Tools, Android Architecture. Overview of object oriented programming using Java: OOPs Concepts: Inheritance, Polymorphism, Interfaces, Abstract class, Threads, Overloading and Overriding, Java Virtual Machine.

UNIT-II

Development Tools: Installing and using Eclipse with ADT plug-in, Installing Virtual machine for Android sandwich/Jelly bean (Emulator), configuring the installed tools, creating a androidproject , Hello Word, run on emulator, Deploy it on USB-connected Android device.

UNIT-III

User Interface Architecture: Application context, intents, Activity life cycle, multiple screen sizes.

UNIT-IV

User Interface Design: Form widgets, Text Fields, Layouts, Button control, toggle buttons, Spinners (Combo boxes), Images, Menu, Dialog.

UNIT-V

Database: Understanding of SQLite database, connecting with the database.

Recommended Books:

1. James C. Sheusi, Android application Development for Java Programmers, Cengage Learning, 2013.
2. M. Burton, & D. Felker, Android Application Development for Dummies, 2/e, Wiley India.

GE:IV-ELECTRONICS**(Credit: 06, Theory:04, Practical:02)****UNIT-I**

Semiconductor Diodes: P and N type semiconductors. Energy Level Diagram. Conductivity and Mobility, Concept of Drift velocity. PN Junction Fabrication (Simple Idea). Barrier Formation in PN Junction Diode. Static and Dynamic Resistance. Current. Flow Mechanism in Forward and Reverse Biased Diode. Drift Velocity. Derivation for Barrier Potential, Barrier Width and Current for Step Junction. Current Flow Mechanism in Forward and Reverse Biased Diode.

UNIT-II

Two-terminal Devices and their Applications: (1) Rectifier Diode: Half-wave Rectifiers. Centre-tapped and Bridge Full-wave Rectifiers, Calculation of Ripple Factor and Rectification Efficiency, C-filter (2) Zener Diode and Voltage Regulation. Principle and structure of (1) LEDs, (2) Photodiode

and (3) Solar Cell. Bipolar Junction Transistors: n-p-n and p-n-p Transistors. Characteristics of CB, CE and CC Configurations. Current gains α and β Relations between α and β . Load Line analysis of Transistors. DC Load line and Q-point. Physical Mechanism of Current Flow. Active, Cutoff and Saturation Regions.

UNIT-III

Amplifiers: Transistor Biasing and Stabilization Circuits. Fixed Bias and Voltage Divider Bias. Transistor as 2-port Network. h-parameter Equivalent Circuit. Analysis of a single-stage CE amplifier using Hybrid Model. Input and Output Impedance. Current, Voltage and Power Gains. Classification of Class A, B & C Amplifiers.

UNIT-IV

Coupled Amplifier: Two stage RC-coupled amplifier and its frequency response. Feedback in Amplifiers: Effects of Positive and Negative Feedback on Input Impedance, Output Impedance, Gain, Stability, Distortion and Noise. Sinusoidal Oscillators: Barkhausen's Criterion for self-sustained oscillations. RC Phase shift oscillator, determination of Frequency. Hartley & Colpitts oscillators. Operational Amplifiers (Black Box approach): Characteristics of an Ideal and Practical Op-Amp. (IC 741) Open-loop and Closed-loop Gain. Frequency Response. CMRR. Slew Rate and concept of Virtual ground.

UNIT-V

Applications of Op-Amps: (1) Inverting and non-inverting amplifiers, (2) Adder, (3) Subtractor, (4) Differentiator, (5) Integrator, (6) Log amplifier, (7) Zero crossing detector (8) Wein bridge oscillator. Conversion: Resistive network (Weighted and R-2R Ladder). Accuracy and Resolution. A/D Conversion (successive approximation)

Recommended Books:

1. J. Millman and C.C. Halkias, Integrated Electronics, 1991, Tata Mc-GrawHill.
2. J.D. Ryder, Electronics: Fundamentals and Applications, 2004, Prentice Hall.
3. B. G. Streetman & S. K. Banerjee, Solid State Electronic Devices, 6/e, 2009, PHI Learning.
4. S. Salivahanan & N. S. Kumar, Electronic Devices & Circuits, 3/e, 2012, Tata Mc-GrawHill.
5. R. A. Gayakwad, OP-Amps and Linear Integrated Circuit, 4/e, 2000, Prentice Hall.

SEMESTER-V

C: 11-INTERNET TECHNOLOGY

(Credit: 06, Theory:04, Practical:02)

UNIT-I

Java: Use of Objects, Array and Array List class

UNIT-II

JavaScript: Data types, operators, functions, control structures, events and event handling.

UNIT-III

JDBC: JDBC Fundamentals, Establishing Connectivity and working with connection interface, Working with statements, Creating and Executing SQL Statements, Working with Result Set Objects. **UNIT-IV**

JSP: Introduction to Java Server Pages, HTTP and Servlet Basics, The Problem with Servlets, The

Anatomy of a JSP Page, JSP Processing, JSP Application Design with MVC, Setting Up the JSP Environment, Implicit JSP Objects, Conditional Processing, Displaying Values, Using an expression to Set an Attribute, Declaring Variables and Methods, Error Handling and Debugging, Sharing Data Between JSP Pages, Requests, and Users, Database Access.

UNIT-V

Java Beans: Java Beans Fundamentals, JAR files, Introspection, Developing a simple Bean, Connecting to DB

Recommended Books:

1. Ivan Bayross, Web Enabled Commercial Application Development Using HTML, DHTML, Javascript, Perl CGI , BPB Publications, 2009.
2. Cay Horstmann, BIG Java, Wiley Publication , 3/e, 2009.
3. Herbert Schildt , Java 7, The Complete Reference, , 8/e, 2009.
4. Jim Keogh ,The Complete Reference J2EE, TMH, , 2002.

C: 12-SOFTWARE ENGINEERING

(Credit: 06, Theory:04, Practical:02)

UNIT-I

Professional Software Development, Software Engineering Ethics, Software Processes, Software Process Models, Process Activities, Coping with Change, The Rational Unified Process, Agile Software Development, Agile Methods, Plan-Driven and Agile Development, Extreme Programming, Agile Project Management, Scaling Agile Methods.

UNIT-II

Requirements Engineering, Functional and Non-Functional Requirements, The Software Requirements Document, Requirements Specification, Requirements Engineering Processes, Requirements Elicitation and Analysis, Requirements Validation, Requirements Management, System Modelling, Context Models, Interaction Models, Structural Models, Behavioural Models, Model-Driven, Engineering, Architectural Design, Architectural Design Decisions, Architectural Views, Architectural Patterns, Application Architectures.

UNIT-III

Design and Implementation: Object-Oriented Design using the UML, Design Patterns, Implementation Issues, Open Source Development, Software Testing: Development Testing, Test-Driven Development, Release Testing, User Testing, Software Evolution: Evolution Processes, Program Evolution Dynamics, Software Maintenance, Legacy System Management, Dependability and Security.

UNIT-IV

Socio-technical Systems: Complex Systems, Systems Engineering, System Procurement, System Development, System Operation. Dependability and Security: Dependability Properties, Availability and Reliability, Safety, Security. Dependability and Security Specification: Risk-Driven Requirements, Specification, Safety Specification, Reliability Specification, Security, Specification, Formal Specification.

UNIT-V

Dependability Engineering: Redundancy and Diversity, Dependable Processes, Dependable Systems Architectures, Dependable Programming. Security Engineering: Security Risk Management, Design

for Security, System Survivability. Dependability and Security Assurance: Static Analysis, Reliability Testing, Security Testing, Process Assurance, Safety and Dependability Cases.

Recommended Books:

1. I. Sommerville, Software Engineering, 9/e, Addison Wesley.
2. R. Mall, Fundamentals of Software Engineering, 3/e, PHI.
3. R.S. Pressman, Software Engineering, A Practitioners Approach, 7/e, McGraw-Hill, 2009.
4. K.K. Aggarwal and Y. Singh, Software Engineering, 2/e, New Age International Publishers, 2008.

**DSE:1-Information Security (Credit: 06,
Theory:04, Practical:02)**

UNIT-I

Introduction: Security, Attacks, Computer Criminals, Security Services, Security Mechanisms. Cryptography: Substitution ciphers, Transpositions Cipher, Confusion, diffusion, Symmetric, Asymmetric Encryption. DES Modes of DES, Uses of Encryption, Hash function, key exchange, Digital Signatures, Digital Certificates.

UNIT-II

Program Security: Secure programs, Non malicious Program errors, Malicious codes virus, Trap doors, Salami attacks, Covert channels, Control against program.

UNIT-III

Threats: Protection in OS: Memory and Address Protection, Access control, File Protection, User Authentication. Database Security: Requirements, Reliability, Integrity, Sensitive data, Inference, Multilevel Security.

UNIT-IV

Security in Networks: Threats in Networks, Security Controls, firewalls, Intrusion detection systems, Secure e-mails.

UNIT-V

Administrating Security: Security Planning, Risk Analysis, Organisational Security Policy, Physical Security. Ethical issues in Security: Protecting Programs and data. Information and law.

Recommended Books:

1. C. P. Pfleeger, S. L. Pfleeger; Security in Computing, PHI, 2006.
2. W. Stallings; Network Security Essentials: Applications and Standards, 4/E, 2010.

**DSE: 2-MICROPROCESSOR
(Credit: 06, Theory:04, Practical:02)**

UNIT-I

An Introduction to Processor Design: Processor architecture and organization, Abstraction in hardware design, MUO - a simple processor, Instruction set design, Processor design trade-offs, The Reduced Instruction Set Computer, Design for low power consumption. The ARM Architecture: The Acorn RISC Machine, Architectural inheritance, The ARM programmer's model, ARM development tools.

UNIT-II ARM Assembly Language Programming: Data processing instructions, Data transfer instructions, Control flow instructions, Writing simple assembly language programs. ARM Organization and Implementation: Pipeline, Types, 3-stage pipeline ARM organization, 5-stage pipeline

ARM organization, ARM instruction execution, ARM implementation, The ARM coprocessor interface.

UNIT-IIIThe ARM Instruction Set: Introduction, Exceptions, Conditional execution, Branch and Branch with Link (B, BL), Branch, Branch with Link and exchange (BX, BLX), Software Interrupt (SWI), Data processing instructions, Multiply instructions, Single word and unsigned byte data transfer instructions, Half-word and signed byte data transfer instructions, Multiple register transfer instructions, Status register to general register transfer instructions, General register to status register transfer instructions, Coprocessor instructions. Coprocessor data operations, Coprocessor data transfers, Coprocessor register transfers, Breakpoint instruction (BRK - architecture v5T only), Unused instruction space, Memory faults, ARM architecture variants.

UNIT-IV

Architectural Support for High-Level Languages: Abstraction in software design, Data types, Floating-point data types, The ARM floating-point architecture, Expressions, Conditional statements, Loops, Functions and procedures, Use of memory, Run-time environment, Examples and exercises.

UNIT-V

Thumb Instruction Set: The Thumb bit in the CPSR, The Thumb programmer's model, Thumb branch instructions, Thumb software interrupt instruction, Thumb data processing instructions, Thumb single register data transfer instructions, Thumb multiple register data transfer instructions, Thumb breakpoint instruction, Thumb implementation, Thumb applications. Architectural Support for System Development: The ARM memory interface, The Advanced Microcontroller Bus Architecture (AMBA), The ARM reference peripheral specification, Hardware system prototyping tools, The ARMulator.

Recommended Books:

Steve Furber :ARM System-On-Chip Architecture.

SEMESTER-VI

C: 13-ARTIFICIAL INTELLIGENCE (Credit: 06, Theory:04, Practical:02)

UNIT-I

Intelligent Agents, Solving problems by searching, Uninformed search strategies (BFS, DFS, DLS, IDS, BD and Uniform cost search), Informed search and exploration (Greedy Best first, A* and its variations) Constraint satisfaction Problems, Adversarial search (Alpha-beta pruning).

UNIT-II

Knowledge and reasoning, logical agent (Wumpus world), Propositional logic, First order logic, Inference in first order logic (Forward chaining, backward chaining, Resolution), Knowledge representation.

UNIT-III

Planning, Partial-Order planning, Planning Graphs, Planning and acting in the real world, Uncertain knowledge and reasoning.

UNIT-IV

Learning from Observations, Decision trees, Neural network (Multilayer), Reinforcement Learning.

UNIT-V

NLP, Communication, A formal grammar for a fragment of English, Syntactic analysis (chat parsing), semantic Interpretation, Ambiguity of grammar, Machine Translation.

Recommended Books:

1. Stuart Russell and Peter Norvig, ARTIFICIAL INTELLIGENCE A MODERN APPROACH, 2/e, PHI.
2. D.W. Patterson, Introduction to A.I and Expert Systems, PHI, 2007.

3. Rich & Knight, Artificial Intelligence, 2/e, Tata McGraw Hill, 1991.

C:14-DESIGN AND ANALYSIS OF ALGORITHMS

(Credit: 06, Theory:04, Practical:02)

UNIT-I

Analysis and Design of Algorithm (Case study insertion sort and merge sort) Asymptotic Analysis, Divide and Conquer, Recurrence Relations, Strassen's Matrix Multiplication.

UNIT-II

Sorting: Quick sort, heap sort, Counting sort, lower bound for sorting, Randomized quicksort, Order Statistics.

UNIT-III

Amortized Analysis (Aggregate analysis, Accounting analysis, Potential analysis), 2-3-4 tree Advanced Data structure: Fibonacci heap, Red black tree, hashing, data structure on disjoint set, Scicinet Data Structure.

UNIT-IV

Dynamic Programming: Matrix Chain multiplication, LCS, TSP, Branch and Bound. Greedy Algorithm: MST: Kruskal, Prim's, Dijkstra Algorithm, Huffman Coding, Maxflow matching, Computational geometry: Convex Hull, 0-1-knapsack, fractional knapsack, Backtracking (4-Queen Prob.) **UNIT-V** Complexity Class: P, PSPACE, NP, NP-Hard, NP Complete, Satisfiability, Chequer, Vertex Cover, Independent set, Exact cover, Graph Coloring, Hamiltonian, Cycle Matching. Approximation Algorithm: Vertex Cover, TSP, Independent Set, Sum of subset.

Recommended Books:

1. T.H. Cormen, Charles E. Leiserson, Ronald L. Rivest, Clifford Stein Introduction to Algorithms, PHI, 3/e, 2009.
2. Sarabasse & A.V. Gelder Computer Algorithm, Introduction to Design and Analysis, Pearson 3/e, 1999.
3. E. Horowitz, S. Sahni, & S. Rajasekaran, Fundamentals of Computer Algorithms, 2/e, University Press.
4. A.V. Aho, J.E. Hopcroft, & J.D. Ullman, The Design and Analysis of Computer Algorithm, Pearson.

DSE:3-CLOUD COMPUTING
(Credit: 06, Theory:04, Practical:02)

Unit - I

Overview of Computing Paradigm: Recent trends in Computing: Grid Computing, Cluster Computing, Distributed Computing, Utility Computing, Cloud Computing. Introduction to Cloud Computing: Introduction to Cloud Computing, History of Cloud Computing, Cloud service providers, Benefits and limitations of Cloud Computing.

UNIT-II

Cloud Computing Architecture: Comparison with traditional computing architecture (client/server), Services provided at various levels, Service Models- Infrastructure as a Service (IaaS), Platform as a Service (PaaS), Software as a Service (SaaS), How Cloud Computing Works, Deployment, Models- Public cloud, Private cloud, Hybrid cloud, Community cloud, Case study of NIST architecture.

UNIT-III

Case Studies: Case Study of Service, Model using Google App Engine, Microsoft Azure, Amazon EC2, Eucalyptus.

UNIT-IV

Service Management in Cloud Computing, Service Level Agreements (SLAs), Billing & Accounting, Comparing Scaling Hardware: Traditional vs. Cloud, Economics of Scaling.

UNIT-V

Cloud Security: Infrastructure Security- Network level security, Host level security, Application level security, Data security and Storage- Data privacy and security Issues, Jurisdictional issues raised by Data location, Authentication in Cloud Computing.

Recommended Books:

1. Barrie Sosinsky, Cloud Computing Bible, Wiley-India, 2010.
2. Rajkumar Buyya, James Broberg, Andrzej, M. Goscinski, Cloud Computing Principles & Paradigms, Wiley-2011.
3. Nikos Antonopoulos, Lee Gillam, Cloud Computing: Principles, Systems and Applications, Springer, 2012.
4. Ronald L. Krutz, Russell Dean Vines, Cloud Security: A Comprehensive Guide to Secure Cloud Computing, Wiley-India, 2010.
5. Toby Velte, Anthony Velte, Robert Elsenpeter, Cloud Computing, A Practical Approach, Mc- Graw Hills, 2010.
6. Dimitris N. Chorafas, Cloud Computing Strategies, CRC Press, 2010.

DSE:4-PROJECT WORK(Credit: 06)

ELECTRONICS

CC 1: Basic Circuit Theory and Network Analysis (Credits: Theory-04, Practicals-02)

Theory Lectures 60

Unit- 1 (13 Lectures)

Basic Circuit Concepts: Voltage and Current Sources, Resistors: Fixed and Variable resistors, Construction and Characteristics, Color coding of resistors, resistors in series and parallel. Inductors: Fixed and Variable inductors, Self and mutual inductance, Faraday's law and Lenz's law of electromagnetic induction, Energy stored in an inductor, Inductance in series and parallel, Testing of resistance and inductance using multimeter. Capacitors: Principles of capacitance, Parallel plate capacitor, Permittivity, Definition of Dielectric Constant, Dielectric strength, Energy stored in a capacitor, Air, Paper, Mica, Teflon, Ceramic, Plastic and Electrolytic capacitor, Construction and application, capacitors in series and parallel, factors governing the value of capacitors, testing of capacitors using multimeter.

Unit- 2 (13 Lectures)

Circuit Analysis: Kirchhoff's Current Law (KCL), Kirchhoff's Voltage Law (KVL), Node Analysis, Mesh Analysis, Star-Delta Conversion. **DC Transient Analysis:** RC Circuit- Charging and discharging with initial charge, RL Circuit with Initial Current, Time Constant, RL and RC Circuits With Sources, DC Response of Series RLC Circuits.

Unit-3 (18 Lectures)

AC Circuit Analysis: Sinusoidal Voltage and Current, Definition of Instantaneous, Peak, Peak to Peak, Root Mean Square and Average Values. Voltage-Current relationship in Resistor, Inductor and Capacitor, Phasor, Complex Impedance, Power in AC Circuits: Instantaneous Power, Average Power, Reactive Power, Power Factor. Sinusoidal Circuit Analysis for RL, RC and RLC Circuits. Resonance in Series and Parallel RLC Circuits, Frequency Response of Series and Parallel RLC Circuits, Quality (Q) Factor and Bandwidth. Passive Filters: Low Pass, High Pass, Band Pass and Band Stop.

Unit-4 (16 Lectures)

Network Theorems: Principal of Duality, Superposition Theorem, Thevenin's Theorem, Norton's Theorem, Reciprocity Theorem, Millman's Theorem, Maximum Power Transfer Theorem. AC circuit analysis using Network theorems. Two Port Networks: Impedance (Z) Parameters, Admittance (Y) Parameters, Transmission (ABCD) Parameters.

Suggested books:

1. S. A. Nasar, Electric Circuits, Schaum's outline series, Tata McGraw Hill (2004)
2. Electrical Circuits, M. Nahvi and J. Edminister, Schaum's Outline Series, Tata McGraw-Hill.(2005)
3. Robert L. Boylestad,

Essentials of Circuit Analysis, Pearson Education (2004) 4. W. H. Hayt, J. E. Kemmerly, S. M. Durbin, Engineering Circuit Analysis, Tata McGraw Hill(2005) 5. Alexander and M. Sadiku, Fundamentals of Electric Circuits, McGraw Hill (2008)

Basic Circuit Theory and Network Analysis Lab (Hardware and Circuit Simulation Software) 60 Lectures

1. Familiarization with a) Resistance in series, parallel and series – Parallel. b) Capacitors & Inductors in series & Parallel. c) Multimeter – Checking of components. d) Voltage sources in series, parallel and series – Parallel e) Voltage and Current dividers
2. Measurement of Amplitude, Frequency & Phase difference using CRO. 3. Verification of Kirchoff's Law. 4. Verification of Norton's theorem. 5. Verification of Thevenin's Theorem. 6. Verification of Superposition Theorem. 7. Verification of the Maximum Power Transfer Theorem. 8. RC Circuits: Time Constant, Differentiator, Integrator. 9. Designing of a Low Pass RC Filter and study of its Frequency Response. 10. Designing of a High Pass RC Filter and study of its Frequency Response. 11. Study of the Frequency Response of a Series LCR Circuit and determination of its (a) Resonant Frequency (b) Impedance at Resonance (c) Quality Factor Q (d) Band Width.

CC 2: Mathematics Foundation for Electronics (Credits: Theory-04, Practicals-02)

Theory Lectures
60

Unit-1 (16 Lectures)

Ordinary Differential Equations: First Order Ordinary Differential Equations, Basic Concepts, Separable Ordinary Differential Equations, Exact Ordinary Differential Equations, Linear Ordinary Differential Equations. Second Order homogeneous and non-homogeneous Differential Equations. **Series solution of differential equations and special functions:** Power series method, Legendre Polynomials, Frobenius Method, Bessel's equations and Bessel's functions of first and second kind. Error functions and gamma function.

Unit-2 (14 Lectures)

Matrices: Introduction to Matrices, System of Linear Algebraic Equations, Gaussian Elimination Method, Gauss-Seidel Method, LU decomposition, Solution of Linear System by LU decomposition. Eigen Values and Eigen Vectors, Linear Transformation, Properties of Eigen Values and Eigen Vectors, Cayley-Hamilton Theorem, Diagonalization, Powers of a Matrix. Real and Complex Matrices, Symmetric, Skew Symmetric, Orthogonal Quadratic Form, Hermitian, Skew Hermitian, Unitary Matrices.

Unit-3 (14 Lectures)

Sequences and series: Sequences, Limit of a sequence, Convergence, Divergence and Oscillation of a sequence, Infinite series, Necessary condition for Convergence, Cauchy's Integral Test, D'Alembert's Ratio Test, Cauchy's nth Root Test, Alternating Series, Leibnitz's Theorem, Absolute Convergence and Conditional Convergence, Power Series.

Unit-4 (16 Lectures)

Complex Variables and Functions: Complex Variable, Complex Function, Continuity, Differentiability, Analyticity. Cauchy-Riemann (C- R) Equations, Harmonic and Conjugate Harmonic Functions, Exponential Function, Trigonometric Functions, Hyperbolic Functions. Line Integral in Complex Plane, Cauchy's Integral Theorem, Cauchy's Integral Formula, Derivative of Analytic Functions. Sequences, Series and Power Series, Taylor's Series, Laurent Series, Zeroes and Poles. Residue integration method, Residue integration of real Integrals.

Suggested Books

1. E. Kreyszig, advanced engineering mathematics, Wiley India (2008)
2. Murray Spiegel, Seymour Lipschutz, John Schiller, Outline of Complex Variables, Schaum Outline Series, Tata McGraw Hill (2007)
3. R. K. Jain, and S.R.K. Iyengar, Advanced Engineering Mathematics, Narosa Publishing House (2007)
4. C .R. Wylie and L. C. Barrett, Advanced Engineering Mathematics, Tata McGraw-Hill (2004) 5. B. V. Ramana, Higher Engineering Mathematics, Tata McGraw Hill Publishing Company Limited (2007)

Mathematics Foundation for Electronics Lab (Scilab/MATLAB/ any other Mathematical Simulation software) 60 Lectures

1. Solution of First Order Differential Equations
2. Solution of Second Order homogeneous Differential Equations
3. Solution of Second Order non-homogeneous Differential Equations
4. Convergence of a given series.
5. Divergence of a given series.
6. Solution of linear system of equations using Gauss Elimination method.
7. Solution of linear system of equations using Gauss – Seidel method.
8. Solution of linear system of equations using L-U decomposition method.

CC 3: Semiconductor Devices (Credits: Theory-04, Practicals-02)

Theory

Lectures 60 Unit 1 (14 Lectures)

Semiconductor Basics: Introduction to Semiconductor Materials, Crystal Structure, Planes and Miller Indices, Energy Band in Solids, Concept of Effective Mass, Density of States, Carrier Concentration at Normal Equilibrium in Intrinsic Semiconductors, Derivation of Fermi Level for Intrinsic & Extrinsic Semiconductors, Donors, Acceptors, Dependence of Fermi Level on Temperature and Doping Concentration,

Temperature Dependence of Carrier Concentrations. Carrier Transport Phenomena: Carrier Drift, Mobility, Resistivity, Hall Effect, Diffusion Process, Einstein Relation, Current Density Equation, Carrier Injection, Generation And Recombination Processes, Continuity Equation.

Unit 2 (14 Lectures)

P-N Junction Diode: Formation of Depletion Layer, Space Charge at a Junction, Derivation of Electrostatic Potential Difference at Thermal Equilibrium, Depletion Width and Depletion Capacitance of an Abrupt Junction. Concept of Linearly Graded Junction, Derivation of Diode Equation and I-V Characteristics. Zener and Avalanche Junction Breakdown Mechanism. Tunnel diode, varactor diode, solar cell: circuit symbol, characteristics, applications

Unit 3 (14 Lectures)

Bipolar Junction Transistors (BJT): PNP and NPN Transistors, Basic Transistor Action, Emitter Efficiency, Base Transport Factor, Current Gain, Energy Band Diagram of Transistor in Thermal Equilibrium, Quantitative Analysis of Static Characteristics (Minority Carrier Distribution and Terminal Currents), Base- Width Modulation, Modes of operation, Input and Output Characteristics of CB, CE and CC Configurations. Metal Semiconductor Junctions: Ohmic and Rectifying Contacts.

Unit 4 (18 Lectures)

Field Effect Transistors: JFET, Construction, Idea of Channel Formation, Pinch-Off and Saturation Voltage, Current-Voltage Output Characteristics. MOSFET, types of MOSFETs, Circuit symbols, Working and Characteristic curves of Depletion type MOSFET (both N channel and P Channel) and Enhancement type MOSFET (both N channel and P channel). Complimentary MOS (CMOS). **Power Devices:** UJT, Basic construction and working, Equivalent circuit, intrinsic Standoff Ratio, Characteristics and relaxation oscillator-expression. SCR, Construction, Working and Characteristics, Triac, Diac, IGBT, MESFET, Circuit symbols, Basic constructional features, Operation and Applications.

Suggested Books:

- 1) S. M. Sze, Semiconductor Devices: Physics and Technology, 2nd Edition, Wiley India edition (2002).
- 2) Ben G Streetman and S. Banerjee, Solid State Electronic Devices, Pearson Education (2006)
- 3) Dennis Le Croisette, Transistors, Pearson Education (1989)
- 4) Jasprit Singh, Semiconductor Devices: Basic Principles, John Wiley and Sons (2001)
- 5) Kanaan Kano, Semiconductor Devices, Pearson Education (2004)
- 6) Robert F. Pierret, Semiconductor Device Fundamentals, Pearson Education (2006)

Semiconductor Devices Lab (Hardware and Circuit Simulation Software) 60 Lectures

1. Study of the I-V Characteristics of Diode – Ordinary and Zener Diode.
2. Study of the I-V Characteristics of the CE configuration of BJT and obtain r_i, r_o, β .
3. Study of the I-V Characteristics of the

Common Base Configuration of BJT and obtain r_i, r_o, α . 4. Study of the I-V Characteristics of the Common Collector Configuration of BJT and obtain voltage gain, r_i, r_o . 5. Study of the I-V Characteristics of the UJT. 6. Study of the I-V Characteristics of the SCR. 7. Study of the I-V Characteristics of JFET. 8. Study of the I-V Characteristics of MOSFET. 9. Study of Characteristics of Solar Cell 10. Study of Hall Effect.

CC 4: Applied Physics (Credits: Theory- 04, Practicals-02)

Theory Lectures
60

Unit-1 (19 Lectures)

Quantum Physics: Inadequacies of Classical physics. Compton's effect, Photo-electric Effect, Wave-particle duality, de Broglie waves. Basic postulates and formalism of quantum mechanics: probabilistic interpretation of waves, conditions for physical acceptability of wave functions. Schrodinger wave equation for a free particle and in a force field (1 dimension), Boundary and continuity conditions. Operators in Quantum Mechanics, Conservation of probability, Time-dependent form, Linearity and superposition, Operators, Time-independent one dimensional Schrodinger wave equation, Stationary states, Eigen-values and Eigen functions. Particle in a one-dimensional box, Extension to a three dimensional box, Potential barrier problems, phenomenon of tunneling. Kronig Penney Model and development of band structure. Spherically symmetric potentials, the Hydrogen-like atom problem.

Unit-2 (11 Lectures)

Mechanical Properties of Materials: Elastic and Plastic Deformations, Hooke's Law, Elastic Moduli, Brittle and Ductile Materials, Tensile Strength, Theoretical and Critical Shear Stress of Crystals. Strengthening Mechanisms, Hardness, Creep, Fatigue, Fracture.

Unit-3 (15 Lectures)

Thermal Properties: Brief Introduction to Laws of Thermodynamics, Concept of Entropy, Concept of Phonons, Heat Capacity, Debye's Law, Lattice Specific Heat, Electronic Specific Heat, Specific Heat Capacity for Si and GaAs, Thermal Conductivity, Thermoelectricity, Seebeck Effect, Thomson Effect, Peltier Effect.

Unit-4 (15 Lectures)

Electric and Magnetic Properties: Conductivity of metals, Ohm's Law, relaxation time, collision time and mean free path, electron scattering and resistivity of metals, heat developed in current carrying conductor, Superconductivity. Classification of Magnetic Materials, Origin of Magnetic moment, Origin of dia, para, ferro and antiferro magnetism and their comparison, Ferrimagnetic materials, Saturation Magnetisation and Curie temperature, Magnetic domains, Concepts of Giant Magnetic Resistance (GMR), Magnetic recording.

Suggested Books:

1. S. Vijaya and G. Rangarajan, Material Science, Tata Mcgraw Hill (2003)
2. W. E. Callister, Material Science and Engineering: An Introduction, Wiley India (2006)
3. A. Beiser, Concepts of Modern Physics , McGraw-Hill Book Company (1987)
4. A. Ghatak & S. Lokanathan, Quantum Mechanics: Theory and Applications, Macmillan India (2004)

Applied Physics

Lab 60 Lectures

1. To determine Young's modulus of a wire by optical lever method.
2. To determine the modulus of rigidity of a wire by Maxwell's needle.
3. To determine the elastic constants of a wire by Searle's method.
4. To measure the resistivity of a Ge crystal with temperature by four –probe method from room temperature to 200 °C).
5. To determine the value of Boltzmann Constant by studying forward characteristics of diode.
6. To determine the value of Planck's constant by using LEDs of at least 4 different wavelengths.
7. To determine e/m of electron by Bar Magnet or by Magnetic Focusing.

CC 5: Electronics Circuits (Credits: Theory-04, Practicals-02)

Unit- 1 (14 Lectures)

Theory Lectures 60

Diode Circuits: Ideal diode, piecewise linear equivalent circuit, dc load line analysis, Quiescent (Q) point. Clipping and clamping circuits. Rectifiers: HWR, FWR (center tapped and bridge). Circuit diagrams, working and waveforms, ripple factor & efficiency, comparison. Filters: types, circuit diagram and explanation of shunt capacitor filter with waveforms. Zener diode regulator circuit diagram and explanation for load and line regulation, disadvantages of Zener diode regulator.

Unit- 2 (15 Lectures)

Bipolar Junction Transistor: Review of CE, CB Characteristics and regions of operation. Hybrid parameters. Transistor biasing, DC load line, operating point, thermal runaway, stability and stability factor, Fixed bias without and with RE, collector to base bias, voltage divider bias and emitter bias (+VCC and –VEE bias), circuit diagrams and their working. Transistor as a switch, circuit and working, Darlington pair and its applications. BJT amplifier (CE), dc and ac load line analysis, hybrid model of CE configuration, Quantitative study of the frequency response of a CE amplifier, Effect on gain and bandwidth for Cascaded CE amplifiers (RC coupled).

Unit- 3 (13 Lectures)

Feedback Amplifiers: Concept of feedback, negative and positive feedback, advantages and disadvantages of negative feedback, voltage (series and shunt), current (series and shunt) feedback amplifiers, gain, input and output impedances. Barkhausen criteria for oscillations, Study of phase shift oscillator, Colpitts oscillator and Hartley oscillator.

Unit- 4 (18 Lectures)

MOSFET Circuits: Review of Depletion and Enhancement MOSFET, Biasing of MOSFETs, Small Signal Parameters, Common Source amplifier circuit analysis, CMOS circuits. **Power Amplifiers:** Difference between voltage and power amplifier, classification of power amplifiers, Class A, Class B, Class C and their comparisons. Operation of a Class A single ended power amplifier. Operation of Transformer coupled Class A power amplifier, overall efficiency. Circuit operation of complementary symmetry Class B push pull power amplifier, crossover distortion, heat sinks. **Single tuned amplifiers:** Circuit diagram, Working and Frequency Response for each, Limitations of single tuned amplifier, Applications of tuned amplifiers in communication circuits.

Suggested Books:

1. Electronic Devices and circuit theory, Robert Boylestad and Louis Nashelsky, 9th Edition, 2013, PHI
2. Electronic devices, David A Bell, Reston Publishing Company
3. D. L. Schilling and C. Belove, Electronic Circuits: Discrete and Integrated, Tata McGraw Hill (2002)
4. Donald A. Neamen, Electronic Circuit Analysis and Design, Tata McGraw Hill (2002)
5. J. Millman and C. C. Halkias, Integrated Electronics, Tata McGraw Hill (2001)
6. J. R. C. Jaegar and T. N. Blalock, Microelectronic Circuit Design, Tata McGraw Hill (2010)
7. J. J. Cathey, 2000 Solved Problems in Electronics, Schaum's outline Series, Tata McGraw Hill (1991)
8. Allen Mottershed, Electronic Devices and Circuits, Goodyear Publishing Corporation

Simulation Software) 60 Lectures

1. Study of the half wave rectifier and Full wave rectifier.
2. Study of power supply using C filter and Zener diode.
3. Designing and testing of 5V/9 V DC regulated power supply and find its load-regulation
4. Study of clipping and clamping circuits .
5. Study of Fixed Bias, Voltage divider and Collector-to-Base bias Feedback configuration for transistors.
6. Designing of a Single Stage CE amplifier.
7. Study of Class A, B and C Power Amplifier.
8. Study of the Colpitt's Oscillator.
9. Study of the Hartley's Oscillator.
10. Study of the Phase Shift Oscillator
11. Study of the frequency response of Common Source FET amplifier.

CC 6: Digital Electronics and Verilog/VHDL (Credits: Theory-04, Practicals-02)

Theory Lectures
60

Unit-1 (11 Lectures)

Number System and Codes: Decimal, Binary, Hexadecimal and Octal number systems, base conversions, Binary, octal and hexadecimal arithmetic (addition, subtraction by complement method, multiplication), representation of signed and unsigned numbers, Binary Coded Decimal code. **Logic Gates and Boolean algebra:** Introduction to Boolean Algebra and Boolean operators, Truth Tables of OR, AND, NOT, Basic postulates and fundamental theorems of Boolean algebra, Truth tables, construction and symbolic representation of XOR, XNOR, Universal (NOR and NAND) gates. **Digital Logic families:** Fan-in, Fan out, Noise Margin, Power Dissipation, Figure of merit, Speed power product, TTL and CMOS families and their comparison.

Unit-2 (13 Lectures)

Combinational Logic Analysis and Design: Standard representation of logic functions (SOP and POS), Karnaugh map minimization, Encoder and Decoder, Multiplexers and Demultiplexers, Implementing logic functions with multiplexer, binary Adder, binary subtractor, parallel adder/subtractor.

Unit-3 (18 Lectures)

Sequential logic design: Latches and Flip flops , S-R Flip flop, J-K Flip flop, T and D type Flip flop, Clocked and edge triggered Flip flops, master slave flip flop, Registers, Counters (synchronous and asynchronous and modulo-N), State Table, State Diagrams, counter design using excitation table and equations. , Ring counter

and Johnson counter. **Programmable Logic Devices:** Basic concepts- ROM, PLA, PAL, CPLD, FPGA

Unit-4 (18 Lectures)

Introduction to Verilog: A Brief History of HDL, Structure of HDL Module, Comparison of VHDL and Verilog, Introduction to Simulation and Synthesis Tools, Test Benches. Verilog Modules, Delays, data flow style, behavioral style, structural style, mixed design style, simulating design. Introduction to Language Elements, Keywords, Identifiers, White Space Characters, Comments, format, Integers, reals and strings.

Logic Values, Data Types-net types, undeclared nets, scalars and vector nets, Register type, Parameters. Expressions, Operands, Operators, types of Expressions **Data flow Modeling and Behavioral Modeling:** Data flow Modeling: Continuous assignment, net declaration assignments, delays, net delays. Behavioral Modeling: Procedural constructs, timing controls, block statement, procedural assignments, conditional statement, loop statement, procedural continuous assignment. **Gate level modeling** - Introduction, built in Primitive Gates, multiple input gates, Tri-state gates, pull gates, MOS switches, bidirectional switches, gate delay, array instances, implicit nets, Illustrative Examples (both combinational and sequential logic circuits).

OR

Introduction to VHDL: A Brief History of HDL, Structure of HDL Module, Comparison of VHDL and Verilog, Introduction to Simulation and Synthesis Tools, Test Benches. VHDL Modules, Delays, data flow style, behavioral style, structural style, mixed design style, simulating design. Introduction to Language Elements, Keywords, Identifiers, White Space Characters, Comments, format. VHDL terms, describing hardware in VHDL, entity, architectures, concurrent signal assignment, event scheduling, statement concurrency, structural designs, sequential behavior, process statements, process declarative region, process statement region, process execution, sequential statements, architecture selection, configuration statements, power of configurations. **Behavioral Modeling:** Introduction to behavioral modeling, inertial delay, transport delay , inertial delay model, transport delay model, transport vs inertial delay, simulation delta drivers, driver creation, generics, block statements, guarded blocks. **Sequential Processing:** Process statement, sensitivity list, signal assignment vs variable assignment, sequential statements, IF, CASE ,LOOP, NEXT, ,EXIT and ASSERT statements, assertion BNF, WAIT ON signal, WAIT UNTIL expression, WAIT FOR time expression, multiple wait conditions, WAIT Time-Out, Sensitivity List vs WAIT Statement

Concurrent Assignment, Passive Processes. **Data types:** Object types-signal, variable, constant, Data types –scalar types, composite types, incomplete types, File Type caveats, subtypes, Subprograms and functions

Suggested Books:

1. M. Morris Mano Digital System Design, Pearson Education Asia, (Fourth Edition)
2. Thomas L. Floyd, Digital Fundamentals, Pearson Education Asia (1994)
3. W. H. Gothmann, Digital Electronics: An Introduction To Theory And Practice, Prentice Hall of India(2000)
4. R. L. Tokheim, Digital Principles, Schaum's Outline Series, Tata McGraw- Hill (1994)
5. A Verilog HDL Primer – J. Bhasker, BSP, 2003 II Edition.
6. Verilog HDL-A guide to digital design and synthesis-Samir Palnitkar, Pearson, 2nd edition.

Digital Electronics and Verilog/VHDL Lab (Hardware and Circuit Simulation Software) 60 lectures

1. To verify and design AND, OR, NOT and XOR gates using NAND gates.
2. To convert a Boolean expression into logic gate circuit and assemble it using logic gate IC's.
3. Design a Half and Full Adder.
4. Design a Half and Full Subtractor.
5. Design a seven segment display driver.
6. Design a 4 X 1 Multiplexer using gates.
7. To build a Flip- Flop Circuits using elementary gates. (RS, Clocked RS, D-type).
8. Design a counter using D/T/JK Flip-Flop.
9. Design a shift register and study Serial and parallel shifting of data.

Experiments in Verlog/VHDL

1. Write code to realize basic and derived logic gates.
2. Half adder, Full Adder using basic and derived gates.
3. Half subtractor and Full Subtractor using basic and derived gates. 4. Clocked D FF, T FF and JK FF (with Reset inputs).
5. Multiplexer (4x1, 8x1) and Demultiplexer using logic gates.
6. Decoder (2x4, 3x8), Encoders and Priority Encoders.
7. Design and simulation of a 4 bit Adder. 8. Code converters (Binary to Gray and vice versa). 9. 2 bit Magnitude comparator. 10. 3 bit Ripple counter.

CC 7: C Programming and Data Structures (Credits: Theory-04, Practicals-02)

Theory Lectures
60

Unit- 1 (12 Lectures)

C Programming Language: Introduction, Importance of C, Character set, Tokens, keywords, identifier, constants, basic data types, variables: declaration & assigning values. Structure of C program Arithmetic operators, relational operators, logical operators, assignment operators, increment and decrement operators, conditional operators, bit wise operators, expressions and evaluation of expressions, type cast operator, implicit conversions, precedence of operators. Arrays-concepts, declaration, accessing elements, storing elements, two-dimensional and multi-dimensional arrays. Input output statement and library functions (math and string related functions).

Unit-2 (19 Lectures)

Decision making, branching & looping: Decision making, branching and looping: if, if-else, else-if, switch statement, break, for loop, while loop and do loop. Functions: Defining functions, function arguments and passing, returning values from functions. **Structures:** defining and declaring a structure variables, accessing structure members, initializing a structure, copying and comparing structure variables, array of structures, arrays within structures, structures within structures, structures and functions. Pointers. **Introduction to C++:** Object oriented programming, characteristics of an object-oriented language.

Unit-3 (15 Lectures)

Data Structures: Definition of stack, array implementation of stack, conversion of infix expression to prefix, postfix expressions, evaluation of postfix expression. Definition of Queue, Circular queues, Array implementation of queues. Linked List and its implementation, Link list implementation of stack and queue, Circular and doubly linked list.

Unit-4 (14 Lectures)

Searching and sorting: Insertion sort, selection sort, bubble sort, merge sort, linear Search, binary search. **Trees :** Introduction to trees, Binary search tree, Insertion and searching in a BST, preorder, postorder and inorder traversal (recursive)

Suggested Books:

1. Yashavant Kanetkar, Let Us C , BPB Publications
2. Programming in ANSI C, Balagurusamy, 2nd edition, TMH.
3. Byron S Gottfried, Programming with C , Schaum Series
4. Brian W. Kernighan, Dennis M. Ritchie, The C Programming Language, Prentice Hall
5. Yashavant Kanetkar, Pointers in C, BPB Publications
6. S. Sahni and E. Horowitz, "Data Structures", Galgotia Publications
7. Tanenbaum: "Data Structures using C", Pearson/PHI.
8. Ellis Horowitz and Sartaz Sahani "Fundamentals of Computer Algorithms", Computer Science Press.

C Programming and Data Structures Lab

60 Lectures

1. Generate the Fibonacci series up to the given limit N and also print the number of elements in the series.
2. Find minimum and maximum of N numbers.
3. Find the GCD of two integer numbers.
4. Calculate factorial of a given number.
5. Find all the roots of a quadratic equation $Ax^2 + Bx + C = 0$ for non – zero coefficients A, B and C. Else report error.
6. Calculate the value of $\sin(x)$ and $\cos(x)$ using the series. Also print $\sin(x)$ and $\cos(x)$ value using

library function.

7. Generate and print prime numbers up to an integer N.
8. Sort given N numbers in ascending order.
9. Find the sum & difference of two matrices of order MxN and PxQ.
10. Find the product of two matrices of order MxN and PxQ.
11. Find the transpose of given MxN matrix.
12. Find the sum of principle and secondary diagonal elements of the given MxN matrix.
13. Calculate the subject wise and student wise totals and store them as a part of the structure.
14. Maintain an account of a customer using classes.
15. Implement linear and circular linked lists using single and double pointers.
16. Create a stack and perform Pop, Push, Traverse operations on the stack using Linear Linked list
17. Create circular linked list having information about a college and perform Insertion at front, Deletion at end.
18. Create a Linear Queue using Linked List and implement different operations such as Insert, Delete, and Display the queue elements.
19. Implement polynomial addition and subtraction using linked lists.
20. Implement sparse matrices using arrays and linked lists.
21. Create a Binary Tree to perform Tree traversals (Preorder, Postorder, Inorder) using the concept of recursion.
22. Implement binary search tree using linked lists. Compare its time complexity over that of linear search.
23. Implement Insertion sort, Merge sort, Bubble sort, Selection sort.

CC 8: Operational Amplifiers and Applications (Credits: Theory-04, Practicals-02)

Theory Lectures
60

Unit-1 (18 Lectures)

Basic Operational Amplifier: Concept of differential amplifiers (Dual input balanced and unbalanced output), constant current bias, current mirror, cascaded differential amplifier stages with concept of level translator, block diagram of an operational amplifier (IC 741)

Op-Amp parameters: input offset voltage, input offset current, input bias current, differential input resistance, input capacitance, offset voltage adjustment range, input voltage range, common mode rejection ratio, slew rate, supply voltage rejection ratio.

Unit-2 (18 Lectures)

Op-Amp Circuits: Open and closed loop configuration, Frequency response of an op-amp in open loop and closed loop configurations, Inverting, Non-inverting, Summing and difference amplifier, Integrator, Differentiator, Voltage to current converter, Current to voltage converter. **Comparators:** Basic comparator, Level detector, Voltage limiters, Schmitt Trigger. **Signal generators:** Phase shift oscillator, Wein bridge oscillator, Square wave generator, triangle wave generator, saw tooth wave generator, and Voltage controlled oscillator(IC 566).

Unit-3 (12 Lectures)

Multivibrators (IC 555): Block diagram, Astable and monostable multivibrator circuit, Applications of Monostable and Astable multivibrators. Phase locked loops (PLL): Block diagram, phase detectors, IC565. **Fixed and variable IC regulators:** IC 78xx and IC 79xx -concepts only, IC LM317- output voltage equation

Unit-4 (12 Lectures)

Signal Conditioning circuits: Sample and hold systems, Active filters: First order low pass and high pass butterworth filter, Second order filters, Band pass filter, Band reject filter, All pass filter, Log and antilog amplifiers.

Suggested Books:

1. R. A. Gayakwad, Op-Amps and Linear IC's, Pearson Education (2003)
2. R. F. Coughlin and F. F. Driscoll, Operational amplifiers and Linear Integrated circuits, Pearson Education (2001)
3. J. Millman and C.C. Halkias, Integrated Electronics, Tata McGraw-Hill,(2001)
4. A.P.Malvino, Electronic Principals,6th Edition , Tata McGraw-Hill,(2003)
5. K.L.Kishore,OP-AMP and Linear Integrated Circuits, Pearson(2011)

Operational Amplifiers and Application Lab (Hardware and Circuit Simulation Software) 60 Lectures

1. Study of op-amp characteristics: CMRR and Slow rate.
2. Designing of an amplifier of given gain for an inverting and non-inverting configuration using an op-amp.
3. Designing of analog adder and subtractor circuit.
4. Designing of an integrator using op- amp for a given specification and study its frequency response.

5. Designing of a differentiator using op- amp for a given specification and study its frequency response.
6. Designing of a First Order Low-pass filter using op-amp.
7. Designing of a First Order High-pass filter using op-amp.
8. Designing of a RC Phase Shift Oscillator using op-amp.
9. Study of IC 555 as an astable multivibrator.
10. Study of IC 555 as monostable multivibrator.
11. Designing of Fixed voltage power supply using IC regulators using 78 series and 79 series

CC 9: Signals & Systems **(Credits: Theory-04, Practicals-02)**

Theory Lectures
60

Unit-1 (17 Lectures)

Signals and Systems: Continuous and discrete time signals, Transformation of the independent variable, Exponential and sinusoidal signals, Impulse and unit step functions, Continuous-Time and Discrete-Time Systems, Basic System Properties.

Unit-2 (13 Lectures)

Linear Time -Invariant Systems (LTI): Discrete time LTI systems, the Convolution Sum, Continuous time LTI systems, the Convolution integral. Properties of LTI systems, Commutative, Distributive, Associative. LTI systems with and without memory, Invariability, Causality, Stability, Unit Step response. Differential and Difference equation formulation, Block diagram representation of first order systems.

Unit-3 (18 Lectures)

Fourier Series Representation of Periodic Signals: Continuous-Time periodic signals, Convergence of the Fourier series, Properties of continuous-Time Fourier series, Discrete-Time periodic signals, Properties of Discrete-Time Fourier series. Frequency-Selective filters, Simple RC highpass and lowpass filters **Fourier Transform:** Aperiodic signals, Periodic signals, Properties of Continuous-time Fourier transform, Convolution and Multiplication Properties, Properties of Fourier transform and basic Fourier transform Pairs.

Unit-4 (12 Lectures)

Laplace Transform: Laplace Transform, Inverse Laplace Transform, Properties of the Laplace Transform, Laplace Transform Pairs, Laplace Transform for signals, Laplace Transform Methods in Circuit Analysis, Impulse and Step response of RL, RC and RLC circuits.

Suggested Book:

1. V. Oppenheim, A. S. Wilsky and S. H. Nawab, Signals and Systems, Pearson Education (2007)
2. S. Haykin and B. V. Veen, Signal and Systems, John Wiley & Sons (2004)
3. C. Alexander and M. Sadiku, Fundamentals of Electric Circuits , McGraw Hill (2008)
4. H. P. Hsu, Signals and Systems, Tata McGraw Hill (2007)
5. S. T. Karris, Signal and Systems: with MATLAB Computing and Simulink Modelling, Orchard Publications (2008)
6. W. Y. Young, Signals and Systems with MATLAB, Springer (2009)
7. M. Roberts, Fundamentals of Signals and Systems, Tata McGraw Hill (2007)

Signals & Systems Lab (Scilab/MATLAB/ Other Mathematical Simulation software)

60

Lectures

1. Generation of Signals: continuous time
2. Generation of Signals: discrete time
3. Time shifting and time scaling of signals.
4. Convolution of Signals
5. Solution of Difference equations.
6. Fourier series representation of continuous time signals.
7. Fourier transform of continuous time signals.
8. Laplace transform of continuous time signals.
9. Introduction to Xcos/similar function and calculation of output of systems represented by block diagram

CC 10: Electronic Instrumentation (Credits: Theory-04, Practicals- 02)

Theory Lectures
60

Unit-1 (15 Lectures)

Qualities of Measurement: Specifications of instruments, their static and dynamic characteristics, Error (Gross error, systematic error, absolute error and relative error) and uncertainty analysis. Statistical analysis of data and curve fitting. **Basic Measurement Instruments:** PMMC instrument, galvanometer, DC measurement - ammeter, voltmeter, ohm meter, AC measurement, Digital voltmeter systems (integrating and non-integrating types), digital multimeters, digital frequency meter system (different modes and universal counter). **Connectors and Probes:** low capacitance probes, high voltage probes, current probes, identifying electronic connectors – audio and video, RF/Coaxial, USB etc.

Unit-2 (15 Lectures)

Measurement of Resistance and Impedance: Low Resistance: Kelvin's double bridge method, Medium

Resistance by Voltmeter Ammeter method, Wheatstone bridge method, High Resistance by Megger. A.C. bridges, Measurement of Self Inductance, Maxwell's bridge, Hay's bridge, and Anderson's bridge, Measurement of Capacitance, Schering's bridge, DeSauty's bridge, Measurement of frequency, Wien's bridge. **A-D and D-A Conversion:** 4 bit binary weighted resistor type D-A conversion, circuit and working. Circuit of R-2R ladder. A-D conversion characteristics, successive approximation ADC. (Mention of relevant ICs for all).

Unit-3 (16 Lectures)

Oscilloscopes: CRT, wave form display and electrostatic focusing, time base and sweep synchronization, measurement of voltage, frequency and phase by CRO, Oscilloscope probes, Dual trace oscilloscope, Sampling Oscilloscope, DSO and Powerscope: Block diagram, principle and working, Advantages and applications, CRO specifications (bandwidth, sensitivity, rise time). **Signal Generators:** Audio oscillator, Pulse Generator, Function generators.

Unit-4 (14 Lectures)

Transducers and sensors: Classification of transducers, Basic requirement/characteristics of transducers, active & passive transducers, Resistive (Potentiometer, Strain gauge – Theory, types, temperature compensation and applications), Capacitive (Variable Area Type – Variable Air Gap type – Variable Permittivity type), Inductive (LVDT) and piezoelectric transducers. Measurement of displacement, velocity and acceleration (translational and rotational). Measurement of pressure (manometers, diaphragm, bellows), Measurement of temperature (RTD, thermistor, thermocouple, semiconductor IC sensors), Light transducers (photoresistors, photovoltaic cells, photodiodes).

Suggested Books:

1. H. S. Kalsi, Electronic Instrumentation, TMH(2006)
2. W.D. Cooper and A. D. Helfrick, Electronic Instrumentation and Measurement Techniques, Prentice-Hall (2005).
3. Instrumentation Measurement and analysis: Nakra B C, Chaudry K, TMH
4. E.O.Doebelin, Measurement Systems: Application and Design, McGraw Hill Book - fifth Edition(2003).
5. Joseph J Carr, Elements of Electronic Instrumentation and Measurement, Pearson Education (2005)
6. David A. Bell, Electronic Instrumentation and Measurements, Prentice Hall (2013).
7. Oliver and Cage, "Electronic Measurements and Instrumentation", TMH (2009).
8. Alan S. Morris, "Measurement and Instrumentation Principles", Elsevier (Buterworth Heinmann- 2008).
9. A. K Sawhney, Electrical and Electronics Measurements and Instrumentation, DhanpatRai and Sons (2007).
10. C. S. Rangan, G. R. Sarma and V. S. Mani, Instrumentation Devices and Systems, Tata Mcgraw Hill (1998).

Electronic Instrumentation Lab 60 Lectures

1. Design of multi range ammeter and voltmeter using galvanometer.
2. Measurement of resistance by Wheatstone bridge and measurement of bridge sensitivity.
3. Measurement of Capacitance by de'Sautys.

4. Measure of low resistance by Kelvin's double bridge.
5. To determine the Characteristics of resistance transducer - Strain Gauge (Measurement of Strain using half and full bridge.)
6. To determine the Characteristics of LVDT.
7. To determine the Characteristics of Thermistors and RTD.
8. Measurement of temperature by Thermocouples and study of transducers like AD590 (two terminal temperature sensor), PT-100, J- type, K-type.
9. To study the Characteristics of LDR, Photodiode, and Phototransistor:Variable Illumination. (ii) Linear Displacement.
10. Characteristics of one Solid State sensor/ Fiber optic sensor

CC 11: Microprocessor and Microcontrollers (Credits: Theory- 04, Practicals-02)

Theory Lectures
60

Unit-1 (18 Lectures)

Introduction to Microprocessor: Introduction, Applications, Basic block diagram, Speed, Word size, Memory capacity, Classification of microprocessors (mention of different microprocessors being used) **Microprocessor 8085:** Features, Architecture -block diagram, General purpose registers, register pairs, flags, stack pointer, program counter, types of buses. Multiplexed address and data bus, generation of control signals, pin description of microprocessor 8085. Basic interfacing concepts, Memory mapped I/O and I/O mapped I/O. **8085 Instructions:** Operation code, Operand & Mnemonics. Instruction set of 8085, instruction classification, addressing modes, instruction format. Data transfer instructions, arithmetic instructions, increment & decrement instructions, logical instructions, branch instructions and machine control instructions. Assembly language programming examples.

Unit-2 (10 Lectures)

Stack operations, subroutine, call and return instructions. Delay loops, use of counters, timing diagrams-instruction cycle, machine cycle, T- states, time delay. Interrupt structure of 8085A microprocessor, processing of vectored and non-vectored interrupts, latency time and response time; Handling multiple interrupts

Microcontrollers: Introduction, different types of microcontrollers, embedded microcontrollers, processor architectures. Harvard vs. Princeton, CISC vs. RISC architectures, microcontroller memory types, microcontroller features, clocking, I/O pins, interrupts, timers, peripherals.

Unit-3 (18 Lectures)

PIC16F887 Microcontroller: Core features, Architecture, pin diagram, memory organization- Program and data memory organization, I/O Ports, oscillator module, Timer modules (Timer 0, Timer 1 and Timer 2), comparator module, analog-to-digital converter (ADC) module, data EEPROM, Enhanced capture/compare/PWM module, EUSART, master synchronous serial port (MSSP) module, special features of the CPU, interrupts, addressing modes, instruction set.

Unit-4 (14 Lectures)

Interfacing to PIC16F887: LED, Switches, Solid State Relay, Seven Segment Display, 16x2 LCD display, 4x4 Matrix Keyboard, Digital to Analog Converter, Stepper Motor and DC Motor. Interfacing program examples using C language.

Suggested Books:

1. Microprocessor Architecture, Programming and Applications with 8085, Ramesh S.Gaonkar - Wiley Eastern Limited- IV Edition.
2. Fundamentals of Microprocessor & Microcomputer: B. Ram—Danpat Rai Publications.
3. Microchip PIC16F87X datasheet
4. PIC Microcontrollers, Milan Verle, , mikro Elektronika, 1st edition (2008)
5. Muhammad Ali Mazidi, "Microprocessors and Microcontrollers", Pearson, 2006

Microprocessor and Microcontrollers Lab 60 Lectures 8085 Assembly language programs:

1. Program to transfer a block of data.
2. Program for multibyte addition
3. Program for multibyte subtraction
4. Program to multiply two 8-bit numbers.
5. Program to divide a 16 bit number by 8 bit number.
6. Program to search a given number in a given list.
7. Program to generate terms of Fibonacci series.
8. Program to find minimum and maximum among N numbers
9. Program to find the square root of an integer.
10. Program to find GCD of two numbers.
11. Program to sort numbers in ascending/descending order.
12. Program to verify the truth table of logic gates.

PIC Microcontroller Programming Note: Programs to be written using C programming language

1. LED blinking with a delay of 1 second.
2. Solid State Relay Interface
2. Interfacing of LCD (2X16).
3. Interfacing of stepper motor and Rotating stepper motor by N steps clockwise/anticlockwise with

speed control.

4. To test all the gates of a given IC74XX is good or bad.
5. Generate sine, square, saw tooth, triangular and staircase waveform using DAC interface.
6. Display of 4-digit decimal number using the multiplexed 7-segment display interface.
7. Analog to digital conversion using internal ADC and display the result on LCD.
8. Implementation of DC-Volt meter (0-5V) using internal ADC and LCD
9. Digital to analog conversion using PWM (pulse delay to be implemented using timers).
10. Speed control of DC motor using PWM (pulse delay to be implemented using timers).
11. Interfacing of matrix keyboard (4X4).
12. Serial communication between microcontroller and PC.

CC 12: Electromagnetics (Credits: Theory-04, Practicals-02)

Theory Lectures 60

Unit-1 (16 Lectures)

Vector Analysis: Scalars and Vectors, Vector Algebra, Rectangular (Cartesian) Coordinate System, Vector

Components and Unit Vector, Vector Field, Products, Cylindrical Coordinates, Spherical Coordinates, Differential Length, Area and Volume, Line Surface and Volume integrals, Del Operator, Gradient of a Scalar, Divergence and Curl of a Vector, the Laplacian. **Electrostatic Fields:** Coulomb's Law and Electric Field, Field due to Discrete and Continuous Charge Distributions, Electric Flux Density, Gauss's Law and Applications, Divergence Theorem and Maxwell's First Equation. Electric Potential, Potential due to a Charge and Charge distribution, Electric dipole. Electric Fields in Conductors, Current and Current Density, Continuity of Current, Metallic Conductor Properties and Boundary Conditions, Method of Images. Dielectric materials, Polarization, Dielectric Constant, Isotropic and Anisotropic dielectrics, Boundary conditions, Capacitance and Capacitors. Electrostatic Energy and Forces.

Unit- 2 (14 Lectures)

Poisson's Equation and Laplace's Equation: Derivation of Poisson's and Laplace's equation, Uniqueness Theorem, Examples of Solution of Laplace's Equation: Cartesian, Cylindrical and Spherical Coordinates.

Magnetostatics: Biot Savart's law and Applications, Magnetic dipole, Ampere's Circuital Law, Curl and Stoke's Theorem, Maxwell's Equation, Magnetic Flux and Magnetic Flux Density, Scalar and Vector Magnetic Potentials. Magnetization in Materials and Permeability, Anisotropic materials, Magnetic Boundary Conditions, Inductors and Inductances, Magnetic Energy, Magnetic Circuits. Inductances and Inductors, Magnetic Energy, Forces and Torques.

Unit-3 (13 Lectures)

Time-Varying Fields and Maxwell's Equations: Faraday's Law of Electromagnetic Induction, Stationary Circuit in Time-Varying Magnetic Field, Transformer and Motional EMF, Displacement Current, Maxwell's Equations in differential and integral form and Constitutive Relations. Potential Functions, Lorentz gauge and the Wave Equation for Potentials, Concept of Retarded Potentials. Electromagnetic Boundary Conditions. Time-Harmonic Electromagnetic Fields and use of Phasors

Unit-4 (17 Lectures)

Electromagnetic Wave Propagation: Time-Harmonic Electromagnetic Fields and use of Phasors, the Electromagnetic Spectrum, Wave Equation in a source free isotropic homogeneous media, Uniform Plane Waves in Lossless and Lossy unbounded homogeneous media, Wave Polarization, Phase and Group velocity, Flow of Electromagnetic Power and Poynting Vector. Uniform Plane wave incident on a Plane conductor boundary, concept of reflection and standing wave. **Guided Electromagnetic Wave Propagation:** Waves along Uniform Guiding Structures, TEM, TE and TM waves, Electromagnetic Wave Propagation in Parallel Plate and Rectangular Metallic Waveguides.

Suggested Books:

1. Murray. R. Spiegel, Vector Analysis, Schaum series, Tata McGraw Hill (2006)
2. M. N. O. Sadiku, Elements of Electromagnetics, Oxford University Press (2001)
3. W. H. Hayt and J. A. Buck, Engineering Electromagnetics, Tata McGraw Hill (2006)
4. D. C. Cheng, Field and Wave Electromagnetics, Pearson Education (2001)
5. J. A. Edminster, Electromagnetics, Schaum Series, Tata McGraw Hill (2006)
6. N. Narayan Rao, Elements of Engineering Electromagnetics, Pearson Education (2006)

7. Introduction to Electrodynamics, D.J. Griffiths, Pearson Education (2012)
8. Electromagnetic Wave and Radiating System, Jordan and Balmain, Prentice Hall (1979)

Electromagnetics Lab (using Scilab/ any other similar freeware) **60 Lectures**

1. Understanding and Plotting Vectors.
2. Transformation of vectors into various coordinate systems.
3. 2D and 3D Graphical plotting with change of view and rotation.
4. Representation of the Gradient of a scalar field, Divergence and Curl of Vector Fields.
5. Plots of Electric field and Electric Potential due to charge distributions.
6. Plots of Magnetic Flux Density due to current carrying wire.
7. Programs and Contour Plots to illustrate Method of Images
8. Solutions of Poisson and Laplace Equations – contour plots of charge and potential distributions
9. Introduction to Computational Electromagnetics: Simple Boundary Value Problems by FiniteDifference/Finite Element Methods.

**CC 13: Communication
Electronics (Credits: Theory-04,
Practicals- 02)**

**Theory Lectures
60**

Unit-1 (10 Lectures)

Electronic communication: Block diagram of an electronic communication system, electromagnetic spectrum-band designations and applications, need for modulation, concept of channels and base-band signals. Concept of Noise, Types of Noise, Signal to noise ratio, Noise Figure, Noise Temperature, Friss formula.

Unit-2 (20 Lectures)

Amplitude Modulation: Amplitude Modulation, modulation index and frequency spectrum. Generation of AM, Amplitude Demodulation (diode detector), Concept of Double side band suppressed carrier, Single side band suppressed carrier, other forms of AM (Pilot Carrier Modulation, Vestigial Side Band modulation, Independent Side Band Modulation). Block diagram of AM Transmitter and Receiver

Angle modulation: Frequency and Phase modulation, modulation index and frequency spectrum, equivalence between FM and PM, Generation of FM (direct and indirect methods), FM detector (PLL). Block diagram of FM Transmitter and Receiver Comparison between AM, FM and PM.

Unit -3 (14 Lectures)

Pulse Analog Modulation: Channel capacity, Sampling theorem, PAM, PDM, PPM modulation and detection techniques, Multiplexing, TDM and FDM. **Pulse Code**

Modulation: Need for digital transmission, Quantizing, Uniform and Non- uniform Quantization,

Quantization Noise, Companding, Coding, Decoding, Regeneration.

Unit -4 (16 Lectures)

Digital Carrier Modulation Techniques: Block diagram of digital transmission and reception, Information capacity, Bit Rate, Baud Rate and M-ary coding. Amplitude Shift Keying (ASK), Frequency Shift Keying (FSK), Phase Shift Keying (PSK), Binary Phase Shift Keying (BPSK) and Quadrature Phase Shift Keying (QPSK)

Suggested Books:

1. Electronic communication systems- Kennedy, 3rd edition, McGraw international publications
2. Principles of Electronic communication systems – Frenzel, 3rd edition, McGraw Hill
3. Communication Systems, S. Haykin, Wiley India (2006)
4. Advanced electronic communications systems – Tomasi, 6th edition, PHI.
5. Communication Systems, S. Haykin, Wiley India (2006)

Communication Electronics Lab (Hardware and Circuit Simulation Software) 60 Lectures

1. Study of Amplitude Modulation
2. Study of Amplitude Demodulation
3. Study of Frequency Modulation
4. Study of Frequency Demodulation
5. Study of Pulse Amplitude Modulation
6. AM Transmitter/Receiver
7. FM Transmitter/Receiver
8. Study of TDM, FDM
9. Study of Pulse Width Modulation
10. Study of Pulse Position Modulation
11. Study of Pulse Code Modulation
12. Study of Amplitude Shift Keying
13. Study of Phase Shift Keying,
14. Study of Frequency Shift Keying.

CC 14: Photonics (Credits: Theory-04, Practicals-02)

Theory Lectures
60

Unit-1 (22 Lectures)

Light as an Electromagnetic Wave: Plane waves in homogeneous media, concept of spherical waves. Reflection and transmission at an interface, total internal reflection, Brewster's Law. Interaction of electromagnetic waves with dielectrics: origin of refractive index, dispersion. **Interference :** Superposition of waves of same frequency, Concept of coherence, Interference by division of wavefront, Young's double slit, Division of Amplitude, thin film interference, anti-reflecting films, Newton's rings; Michelson interferometer. Holography. **Diffraction:** Huygen Fresnel Principle, Diffraction Integral, Fresnel and Fraunhofer approximations. Fraunhofer Diffraction by a single slit, rectangular aperture, double slit, Resolving power of microscopes and telescopes; Diffraction grating: Resolving power and Dispersive power

Unit-2 (13 Lectures)

Polarization: Linear, circular and elliptical polarization, polarizer-analyzer and Malus' law; Double refraction by crystals, Interference of polarized light, Wave propagation in uniaxial media. Half wave and quarter wave plates. Faraday rotation and electro-optic effect.

Unit-3 (13 Lectures)

Light Emitting Diodes: Construction, materials and operation. **Lasers:** Interaction of radiation and matter, Einstein coefficients, Condition for amplification, laser cavity, threshold for laser oscillation, line shape function. Examples of common lasers. The semiconductor injection laser diode. **Photodetectors:** Bolometer, Photomultiplier tube, Charge Coupled Device. Photo transistors and Photodiodes (p-i-n, avalanche), quantum efficiency and responsivity. **LCD Displays:** Types of liquid crystals, Principle of Liquid Crystal Displays, applications, advantages over LED displays.

Unit-4 (12 Lectures)

Guided Waves and the Optical Fiber: TE and TM modes in symmetric slab waveguides, effective index, field distributions, Dispersion relation and Group Velocity. Step index optical fiber, total internal reflection, concept of linearly polarized waves in the step index circular dielectric waveguides, single mode and multimode fibers, attenuation and dispersion in optical fiber.

Suggested Books:

1. Ajoy Ghatak, Optics, Tata McGraw Hill, New Delhi (2005)
2. E. Hecht, Optics, Pearson Education Ltd. (2002)
3. J. Wilson and J. F. B. Hawkes, Optoelectronics: An Introduction, Prentice Hall India (1996)
4. S. O. Kasap, Optoelectronics and Photonics: Principles and Practices, Pearson Education (2009)
5. Ghatak A.K. and Thyagarajan K., "Introduction to fiber optics," Cambridge Univ. Press. (1998)

Photonics Lab 60 Lectures

1. To verify the law of Malus for plane polarized light.
2. To determine wavelength of sodium light using Michelson's Interferometer.
3. To determine wavelength of sodium light using Newton's Rings.
4. To determine the resolving power and Dispersive power of Diffraction Grating.
5. Diffraction experiments using a laser.
6. Study of Faraday rotation.
7. Study of Electro-optic Effect.
8. To determine the specific rotation of scan sugar using polarimeter.
9. To determine characteristics of LEDs and Photo- detector.
10. To measure the numerical aperture of an optical fiber.

DSE 1: Power Electronics (Credits: Theory-04, Practicals-02)

Theory Lectures 60

Unit- 1 (12 Lectures)

Power Devices: Need for semiconductor power devices, Power diodes, Enhancement of reverse blocking capacity, Introduction to family of thyristors. **Silicon Controlled Rectifier (SCR):** structure, I-V characteristics, Turn-On and Turn-Off characteristics, ratings, Factors affecting the characteristics/ratings of SCR, Gate-triggering circuits, Control circuits design and Protection circuits, Snubber circuit.

Unit- 2 (14 Lectures)

Diac and Triac: Basic structure, working and V-I characteristic of, application of a Diac as a triggering device for a Triac. **Insulated Gate Bipolar Transistors (IGBT):** Basic structure, I-V Characteristics, switching characteristics, device limitations and safe operating area (SOA) etc. **Application of SCR:** SCR as a static switch, phase controlled rectification, single phase half wave, full wave and bridge rectifiers with inductive & non- inductive loads; AC voltage control using SCR and Triac as a switch. **Power MOSFETs:** operation modes, switching characteristics, power BJT, second breakdown, saturation and quasi-saturation state.

Unit- 3 (17 Lectures)

Power Inverters: Need for commutating circuits and their various types, d.c. link invertors, Parallel capacitor commutated invertors with and without reactive feedback and its analysis, Series Invertor, limitations and its improved versions, bridge invertors. **Choppers:** basic chopper circuit, types of choppers (Type A-D), step-down chopper, step-up chopper, operation of d.c. chopper circuits using self commutation (A & B-type commutating circuit), cathode pulse turn-off chopper (using class D commutation), load sensitive cathode pulse turn-off chopper (Jones Chopper), Morgan's chopper

Unit- 4 (17 Lectures)

Electromechanical Machines: DC Motors, Basic understanding of field and armature, Principle of operation, EMF equation, Back EMF, Factors controlling motor speed, Thyristor based speed control of dc motors, AC motor (Induction Motor only), Rotor and stator, torque & speed of induction motor, Thyristor control of ac motors(block diagrams only)

Suggested Books:

1. Power Electronics, P.C. Sen, TMH
2. Power Electronics & Controls, S.K. Dutta
3. Power Electronics, M.D. Singh & K.B. Khanchandani, TMH
4. Power Electronics Circuits, Devices and Applications, 3rd Edition, M.H. Rashid, Pearson Education
5. Power Electronics, Applications and Design, Ned Mohan, Tore.
6. Power Electronics, K. HariBabu, Scitech Publication.
7. Power Electronics, M.S. Jamil Asghar, PHI.
8. A Textbook of Electrical Technology-Vol-II, B.L. Thareja, A.K. Thareja, S.Chand

Power Electronics Lab 60 Lectures

1. Study of I-V characteristics of DIAC
2. Study of I-V characteristics of a TRIAC
3. Study of I-V characteristics of a SCR
4. SCR as a half wave and full wave rectifiers with R and RL loads
5. DC motor control using SCR.
6. DC motor control using TRIAC.
7. AC voltage controller using TRIAC with UJT triggering.
8. Study of parallel and bridge inverter.
9. Design of snubber circuit
10. VI Characteristic of MOSFET and IGBT (Both)
11. Study of chopper circuits

**DSE 2: Digital Signal Processing
(Credits: Theory-04, Practicals-02)**

Theory Lectures 60

Unit- 1 (15 Lectures)

Discrete Time systems: Discrete sequences, linear coefficient difference equation, Representation of DTS, LSI Systems. Stability and causality, frequency domain representations and Fourier transform of DT sequences.

Unit- 2 (15 Lectures)

Z-Transform: Definition and properties, Inverse Z Transform and stability. Parsevals Theorem and applications. **System Function:** signal flow graph, its use in representation and analysis of Discrete Time Systems. Techniques of representations. Matrix generation and solution for DTS evaluations.

Unit- 3 (15 Lectures)

Discrete Fourier Transform: DFT assumptions and Inverse DFT. Matrix relations, relationship with

FT and its inverse, circular convolution, DFT theorems, DCT. Computation of DFT. FFT Algorithms and processing gain, Discrimination, interpolation and extrapolation. Gibbs phenomena. FFT of real functions interleaving and resolution improvement. Word length effects.

Unit- 4 (15 Lectures)

Digital Filters: Analog filter review. System function for IIR and FIR filters, network representation. Canonical and decomposition networks. IIR filter realization methods and their limitations. FIR filter realization techniques. Discrete correlation and convolution; Properties and limitations.

Suggested Books:

1. A.V. Oppenheim and Schafer, Discrete Time Signal Processing, Prentice Hall, 1989.
2. John G. Proakis and D.G. Manolakis, Digital Signal Processing: Principles, Algorithms and Applications, Prentice Hall, 1997.

Digital Signal Processing Lab (Scilab/MATLAB/Other Mathematical Simulation software) 60 Lectures

1. Generation of unit sample sequence, unit step, ramp function, discrete time sequence, real sinusoidal sequence.
2. Generate and plot sequences over an interval.
3. Given $x[n]$, write program to find $X[z]$.
4. Fourier Transform, Discrete Fourier Transform and Fast Fourier Transform
5. Design of a Butterworth analog filter for low pass and high pass.
6. Design of digital filters.

DSE 3: Computer Networks (Credits: Theory-04, Practicals-02)

Theory Lectures 60

Unit- I (15 Lectures)

Data Communications: Components, protocols and standards, Network and Protocol Architecture, Reference Model ISO-OSI, TCP/IP-Overview, topology, transmission mode, digital signals, digital to digital encoding, digital data transmission, DTE-DCE interface, interface standards, modems, cable modem, transmission media- guided and unguided, transmission impairment, Performance, wavelength and Shannon capacity. Review of Error Detection and Correction codes. **Switching:** Circuit switching (space-division, time division and space-time division), packet switching (virtual circuit and Datagram approach), message switching.

Unit-2 (15 Lectures)

Data Link Layer: Design issues, Data Link Control and Protocols: Flow and Error Control, Stop-and-wait ARQ. Sliding window protocol, Go-Back-N ARQ, Selective Repeat

ARQ, HDLC, Point-to-Point Access: PPP Point-to-Point Protocol, PPP Stack, **Medium Access Sub layer**: Channel allocation problem, Controlled Access, Channelization, multiple access protocols, IEEE standard 802.3 & 802.11 for LANS and WLAN, high-speed LANs, Token ring, Token Bus, FDDI based LAN, Network Devices-repeaters, hubs, switches bridges.

Unit-3 (15 Lectures)

Network Layer: Design issues, Routing algorithms, Congestion control algorithms, Host to Host Delivery: Internetworking, addressing and routing, IP addressing (class full & Classless), Subnet, Network Layer Protocols: ARP, IPV4, ICMP, IPV6, ICMPV6.

Unit-4 (15 Lectures)

Transport Layer: Process to Process Delivery: UDP; TCP, congestion control and Quality of service.

Application Layer: Client Server Model, Socket Interface, Domain Name System (DNS): Electronic Mail (SMTP), file transfer (FTP), HTTP and WWW.

Suggested Books:

1. S. Tannenbum, D. Wetherall, "Computer Networks", Prentice Hall, Pearson, 5thEd
2. Behrouz A. Forouzan, "Data Communications and Networking", Tata McGraw-Hill, 4thEd

Computer Networks Lab 60 Lectures

1. Introduction to Computer Network laboratory Introduction to Discrete Event Simulation Discrete Event Simulation Tools - ns2/ns3, Omnet++
2. Using Free Open Source Software tools for network simulation of telnet and ftp between N sources - N sinks (N = 1, 2, 3). Evaluate the effect of increasing data rate on congestion.
3. Using Free Open Source Software tools for network simulation to study the effect of queuing disciplines on network performance - Random Early Detection/Weighted RED / Adaptive RED.
4. Using Free Open Source Software tools for network simulation for http, ftp and DBMS access in networks
5. Using Free Open Source Software tools for network simulation to study effect of VLAN on network performance - multiple VLANs and single router.
6. Using Free Open Source Software tools for network simulation to study effect of VLAN on network performance - multiple VLANs with separate multiple routers.
7. Using Free Open Source Software tools for network simulation to study the performance of wireless networks

BACHELOR OF SCIENCE(ITM)

SEMESTER-I

C:1-PROGRAMMING USING C (Credit:6, Theory:4, Practical: 2)

UNIT- I

Introduction to Programming Language, Introduction to C Programming, Character Set, C Tokens, Keywords & Identifiers, Constants, Variables, Data Types, Variables, Storage Classes, Operators (Arithmetic, Relational, Logical, Assignment, Increment & Decrement, Conditional, Bitwise), Expressions, Input and Output Operations.

UNIT- II

Decision Making and Branching: Simple IF Statement, IF. ELSE Statement, Nesting IF. ELSE Statement, ELSE IF Ladder, Switch Statement, Operator, GOTO Statement. Decision Making and Looping: The WHILE Statement, The DO Statement, The FOR Statement, Jumps in LOOPS. Arrays, Character Arrays and Strings.

UNIT- III

User-defined Functions: Need, Elements & Definition, Function Calls, Function Definition, Category of Functions, Recursion. Structures and Unions: Defining, Declaring, Accessing, Initialization Structure, Arrays of Structures, Arrays within Structures, Structures and Functions, Unions.

UNIT- IV

Pointers: Accessing the Address of a Variable, Declaring Pointer Variables, Initializations of Pointer Variable, Accessing a Variable through its Pointer, Chain of Pointers, Pointer Expressions, Pointer Increments and Scale Factor, Pointers and Arrays, Pointers and Character Strings, Array of Pointers, Pointers as Function Arguments, Functions Returning Pointers, Pointers to Functions, Pointers to Structures, Troubles with Pointers.

UNIT- V

File Management in C: Defining and Opening a File, Closing a File, Input/ Output Operations on Files, Error Handling During I/O Operations, Random Access to Files, Command Line Arguments, Dynamic Memory Allocation.

Recommended Books:

1. E. Balaguruswamy, Programming in ANSI C,4/e, (TMH).
2. Paul Deitel, Harvey Deitel, C: How to Program, 8/e, Prentice Hall.
3. J. R. Hanly, Problem Solving & Program Design in C, 7/e, Pearson.
4. B. Kernighan & D.M. Ritchie, The C Programming Language, 2/e PHI.

C: 2-COMPUTER ORGANIZATION (Credit:6, Theory:4, Practical: 2)

UNIT-I

Character Codes, Decimal System, Binary System, Decimal to Binary Conversion, Hexadecimal Notation, Boolean Algebra, Basic Logic Functions: Electronic Logic Gates, Synthesis of Logic Functions, Minimization of Logic Expressions, Minimization using Karnaugh Maps, Synthesis with NAND and NOR Gates.

UNIT-II

Flip-Flops, Gated Latches, Master-Slave Flip-Flops, Edge-Triggering, T Flip-Flops, JK Flip-Flops.

Registers and Shift Registers, Counters, Decoders, Multiplexers, Programmable Logic Devices (PLDs), Programmable Array Logic (PAL), Complex Programmable Logic Devices (CPLDs), Field-Programmable Gate Array (FPGA), Sequential Circuits, Timing Diagrams, The Finite State Machine Model, Synthesis of Finite State Machines.

UNIT-III

Basic Structure of Computers: Computer Types, Functional Units, Input Unit, Memory Unit, Arithmetic and Logic Unit, Output Unit, Control Unit, Basic Operational Concepts, Bus Structures, Software. Machine Instructions and Programs: Numbers, Arithmetic Operations, and Characters: Number Representation, Addition of Positive Numbers, Addition and Subtraction of Signed Numbers, Overflow of Integer Arithmetic, Characters, Memory Locations and Addresses, Byte Addressability, Word Alignment, Accessing Numbers, Characters, and Character Strings, Memory Operations, Instructions and Instruction Sequencing, Register Transfer Notation, Basic Instruction Types, Instruction Execution and Straight-Line Sequencing, Branching, Condition Codes, Generating Memory Addresses, Addressing Modes, Implementation of Variables and Constants, Indirection and Pointers, Indexing and Arrays, Relative Addressing.

UNIT-IV

THE ARM EXAMPLE: **Registers**, Memory Access, and Data Transfer, Register Structure, Memory Access Instructions and Addressing Modes, Register Move Instructions, Arithmetic and Logic Instructions: Arithmetic Instructions, Logic Instructions, Branch Instructions, Setting Condition Codes, Assembly Language, Pseudo-Instructions, I/O Operations, Subroutines, Vector Dot Product Program, Byte-Sorting Program, Linked-List Insertion and Deletion Subroutines. Basic Input-Output Operations, Stacks and Queues, Subroutines. PowerPC Example: Basic PowerPC Processor Organization, Load and Store Instructions, Arithmetic and Logic Instructions, Flow Control Instructions, Compare Instructions, Logic Instructions, Subroutines.

UNIT-V

Memory System: Semiconductor RAM Memories, Internal Organization of Memory Chips, Static Memories, Asynchronous DRAMS, Synchronous DRAMS, Structure of Large Memories, Memory System Considerations, RAMBUS Memory. Read-Only Memories: ROM, PROM, EPROM, EEPROM, Flash Memory, Speed, Size, and Cost of Memory. Secondary Storage: Magnetic Hard Disks, Optical Disks, Magnetic Tape Systems.

Recommended Books:

1. Carl Hamacher, Z. Vranesic, S. Zaky: Computer Organization, 5/e (TMH)
2. William Stallings: Computer Organization and Architecture (Design for Performance), 9/e
3. S. Brown, & Z. Vranesic, Fundamentals of Digital Logic Design with VHDL, 2/e, McGraw-Hill
4. J. P. Uyemura, A First Course in Digital System Design, An Integrated Approach, Cengage Learning.

GE:1-DISCRETE STRUCTURES

(Credit:6, Theory:4, Practical: 2)

UNIT-I Logic and Proofs: Propositional Logic, Propositional Equivalences, Predicates and Quantifiers, Nested Quantifiers, Rules of Inference, Introduction to Proofs, Normal Forms, Proof Methods and Strategy, Mathematical Induction, Strong Induction and Well-Ordering, Recursive Definitions and Structural Induction, Recursive Algorithms.

UNIT-II

Basic Structures: Sets, Set Operations, Functions, Recursive Functions, Sequences and Summations. Relations: Relations and their Properties, n-ary Relations and their Applications, Representing Relations, Closures of Relations, Equivalence Relations, Partial Ordering. Boolean.

UNIT-III

Algebra: Boolean Functions, Representing Boolean Functions, Logic Gates, Minimization of Circuits. Algebraic Structures & Coding Theory: The Structure of Algebras, Semi-groups, Monoids and Groups, Homomorphism, Normal Subgroups, and Congruence Relations, Rings, Integral Domains and Fields, Quotient and Product Algebras, Coding Theory. Polynomial Rings and Polynomial Codes.

UNIT-IV

Counting: Basics of Counting, The Pigeonhole Principle, Permutations and Combinations, Binomial Coefficients, Generalized Permutations and Combinations, Generating Permutations and Combinations. Advanced Counting Techniques, Applications of Inclusion-Exclusion, Discrete probability, Conditional probability, Bayes Theorem.

UNIT-V

Graphs: Graphs and Graph Models, Graph Terminology and Special Types of Graphs, Havel-Hakimi Theorem, Representing Graphs and Graph Isomorphism, Connectivity, Cut-Sets, Euler and Hamiltonian Paths, Shortest-Path Problem, Planar Graphs, Graph Coloring, Network Flows.

Recommended Books:

1. Kenneth H Rosen, Discrete Mathematics & Its Applications, McGraw-Hill. 7/e.
2. J. L. Hein, Discrete Structures, Logic, and Computability, 3rd Edition, Jones and Bartlett Publishers, 2009
3. C.L. Liu , D.P. Mahopatra, Elements of Discrete mathematics, 2nd Edition , Tata McGraw Hill, 1985
4. M. O. Albertson and J. P. Hutchinson, Discrete Mathematics with Algorithms , John wiley Publication, 1988.

SEMESTER-II

C: 3-PERSONAL MANAGEMENT & ORGANIZATIONAL BEHAVIOUR

(Credit:6, Theory:4, Practical: 2)

C: 4-PROGRAMMING USING C++

(Credit:6, Theory:4, Practical: 2)

UNIT-I

Principles of Object-Oriented Programming: Object-Oriented Programming (OOP) Paradigm, Basic Concepts of OOP, Benefits of OOP, Object Oriented Languages, Applications of OOP. Beginning with C++: Applications of C++, C++ statements, Example with Class, Structure of C++ Program, Creating the Source File, Compiling and Linking. Tokens, Expressions and Control Structures: Tokens, Keywords, Identifiers & Constants, Basic Data Types, User-Defined Data Types, Derived Data Types, Symbolic Constants, Type Compatibility, Declaration of Variables, Dynamic Initialization of Variables, Reference Variables, Operators in C++, Scope Resolution Operator, Member Deferencing Operators, Memory Management Operators, Manipulators, Type Cast Operators, Expressions and their Types, Special Assignment Expressions, Implicit Conversions, Operator Overloading, Operator Precedence, Control Structures.

UNIT- II

Functions in C++: The Main Function, Function Prototyping, Call By Reference, Return by Reference, Inline Functions, Default Arguments, Const. Arguments, Function Overloading, Friend & Virtual Functions, Math. Library Functions. Classes and Objects: Specifying a Class, Defining Member Functions, Making an outside Function Inline, Nested Member Functions, Private Member Functions, Arrays within a Class, Memory Allocation for Objects, Static Data Members, Static Member Functions, Arrays of Objects, Objects as Function Arguments, Friendly Functions, Returning Objects, Const. Member Functions, Pointer to Members, Local Classes.

UNIT- III

Constructors & Destructors: Constructors, Parameterized Constructors, Multiple Constructors in a Class, Constructors with Default Arguments, Dynamic Initialization of Objects, Copy Constructor, Dynamic Constructors, Constructing Two-Dimensional Arrays, Const. Objects, Destructors. Operator Overloading and Type Conversions: Defining Operator Overloading, Overloading Unary Operators, Overloading Binary Operators, Overloading Binary Operators using Friends, Manipulation of Strings using Operators, Rules for Overloading Operators, Type Conversions.

UNIT- IV

Inheritance : Defining Derived Classes, Single Inheritance, Making a Private Member Inheritance, Multilevel Inheritance, Multiple Inheritance, Hierarchical Inheritance, Hybrid Inheritance, Virtual Base Classes, Abstract Classes, Constructors in Derived Classes, Member Classes, Nesting of Classes. Pointers, Virtual Functions and Polymorphism: Pointers, Pointers to Objects, this Pointer, Pointers to Derived Classes, Virtual Functions, Pure Virtual Functions.

UNIT- V

Managing Console I/O Operations: C++ Streams, C++ Stream Classes, Unformatted I/O Operations, Formatted Console I/O Operations, Managing Output with Manipulators. Files: Classes for File Stream Operations, Opening and Closing a File, Detecting end-of-file, File Modes, File Pointers and their Manipulations, Sequential Input and Output Operations, Updating a File: Random Access, Error Handling During File Operations, Command-line Arguments.

Recommended Books:

1. E. Balgurusamy, Object Oriented Programming with C++ :, 4/e (TMH).
2. Paul Deitel, Harvey Deitel, "C++: How to Program", 9/e. Prentice Hall.
3. J. Farrell, Object-Oriented Programming, Cengage Learning.
4. Bjarne Stroustrup, "Programming – Principles and Practice using C++", 2/e, Addison-Wesley 2014.

C: 5-DATA STRUCTURES

(Credit:6, Theory:4, Practical: 2)

UNIT-I

Introduction and Overview: Definitions, Concept of Data Structures, Overview of Data Structures, Implementation of Data Structures. Arrays: Terminology, One-Dimensional Array, Multi-Dimensional Arrays, Pointer Arrays.

UNIT-II

Linked Lists: Single Linked List, Circular Linked List, Double Linked List, Circular Double Linked List, Application of Linked Lists, Memory Representation, Boundary Tag System, De-allocation Strategy, Buddy System, Compaction.

UNIT-III

Stacks: Definition, Representation of Stack (Array, Linked List), Operations on Stacks, Applications of Stack (Evaluation of Arithmetic Expressions, Code Generation, Implementation of Recursion, Factorial Calculation, Quick Sort, Tower of Hanoi, Activation Record Management).

UNITIV

Queues: Definition, Representation of Queues (Array, Linked List), Circular Queue, Deque, Priority Queue, Application of Queues (Simulation, CPU Scheduling in Multiprogramming Environment, Round Robin Algorithm).

UNITV

Tree: Binary Trees, Properties of Binary Tree, Linear Representation of Binary a Binary Tree, Linked Representation of a Binary Tree, Physical Implementation of Binary Tree in Memory, Operations on Binary Tree (Insertion, Deletion, Traversal, Merging of two Binary Trees), Types of Binary Trees (Expression Tree, Binary Search Tree, Heap Tree, Threaded Binary Trees, Height Balanced Binary Tree, Weighted Binary Tree, Decision Trees).

Recommended Books:

1. D. Samanta, Classic Data Structures:, 2/e (PHI).
2. D.S Malik, Data Structure using C++, 2/e, Cengage Learning, 2010.
3. Adam Drozdek, "Data Structures and algorithm in C++", 3/e, Cengage Learning, 2012.
4. Robert L. Kruse, "Data Structures and Program Design in C++", Pearson.

GE:2-STATISTICS FOR BUSINESS**(Credit:6, Theory:4, Practical: 2)****UNIT-I**

Probability and Probability Distribution: Events and the Sample Space, Calculating Probabilities using Simple events, Useful counting rules, Probability rules: Addition rule, Conditional probability and multiplication rule, Bayes rule.

UNIT-II

Probability Distributions: Random Variable, Discrete random variable, Mean and Standard deviation of discrete random variable, Discrete Probability Distributions: Binomial, Poisson and Hypergeometric probability distribution, Continuous Probability distribution: Normal distribution.

UNIT-III

Sampling Distribution: sampling plans and experimental designs, Sampling distribution of a statistic, Central Limit theorem, Sampling distribution of the Sample mean and Proportion. Large Sample Estimation: Point estimation, Interval estimation, Confidence interval of population mean, Population proportion, difference between two population means, difference between two population proportions.

UNIT-IV

Large Sample Tests of Hypothesis: Test of a Population mean, Test of difference of two population means, Test of hypothesis for a binomial proportion, Test of hypothesis for the difference between two binomial proportions. Inference from Small Samples: Students t Distribution, Small Sample inferences concerning a population mean and difference between two population means, Inferences concerning a population variance and difference between two population variances.

UNIT-V

Analysis of Variance: One-way classification, Two-way classification. Linear regression and Correlation: Method of least squares, Analysis of variance for linear regression, Testing the usefulness of the linear regression model, Estimation and Prediction using the fitted line. Carl Pearsons coefficient of Correlation, Test of hypothesis concerning the Correlation coefficient.

Recommended Books:

1. William Mendenhall, Robert J. Beaver, Barbara M. Beaver, Probability and Statistics 14/e, CENGAGE Learning.
2. W. W. Hines, D.C. Montgomery, D.M. Goldsman, & C.M. Borror, Probability & Statistics in Engineering"

SEMESTER-III

C: 6-OPERATING SYSTEMS**(Credit:6, Theory:4, Practical: 2)****UNIT-I**

Operating System, Computer-System Organization, Computer-System Architecture, Operating-System Structure, Operating-System Operations, Process Management, Memory Management, Storage Management, Protection and Security, Distributed Systems, Special Purpose Systems, Computing

Environments, Open-Source Operating Systems. Operating System Services, User Operating System Interface, System Calls, Types of System Calls, System Programs, Operating-System Design and Implementation, Operating System Structure, Virtual Machines, Operating System Debugging, Operating System Generations. System Boot.

UNIT-II

Process: Process Concept, Process Scheduling, Operations on Processes, Inter-Process Communication, Examples of IPC Systems, Communication in Client-Server Systems. Multithreaded Programming: Multithreading Models, Thread Libraries, Threading Issues, Operating-System Examples.

UNIT-III

Process Scheduling: Basic Concepts, Scheduling Criteria, Scheduling Algorithms, Thread Scheduling. Multiple-Process Scheduling. Synchronization: The Critical Section Problem, Peterson's Solution, Synchronization Hardware, Semaphores, Classical Problems of Synchronization, Monitors, Synchronization Examples, Atomic Transactions.

UNIT-IV

Deadlocks: System Model, Deadlock Characterization, Methods of Handling Deadlocks, Deadlock Prevention, Deadlock avoidance, Deadlock Detection, Recovery from Deadlock. Memory Management Strategies: Swapping, Contiguous Memory Allocation, Paging, Structure of the Page Table, Segmentation, Example: The Intel Pentium.

UNIT-V

Virtual-Memory Management: Demand Paging, Copy-on-Write, Page Replacement, Allocation of Frames, Thrashing, Memory-Mapped Files, Allocating Kernel Memory. File System: File Concept, Access Methods, Directory and Disk Structure, File-System Mounting, File Sharing, Protection.

Recommended Books:

1. A Silberschatz, P.B. Galvin, G. Gagne, Operating Systems Concepts, 8/e, John Wiley Publications 2008.
2. A.S. Tanenbaum, Modern Operating Systems, 3/e, Pearson Education 2007.
3. W. Stallings, Operating Systems, Internals & Design Principles, 5/e, Prentice Hall of India. 2008.
4. G. Nutt, Operating Systems: A Modern Perspective, 2/e, Pearson Education 1997.

C: 7-BUSINESS ACCOUNTING

(Credit:6, Theory:4, Practical: 2)

UNIT-I

Introduction to Financial Accounting. Accounting as an Information System. Importance, Scope, and Limitations. Users of Accounting Information. Generally Accepted Accounting Principles. The Accounting Equation. Nature of Accounts and Rules of Debit and Credit. Recording Transactions in General Journal. Recording Transactions in three column Cash Book. An overview of Subsidiary books Purchase Book, Purchase Returns Book, Sales Book, and Sales Returns Book. Opening and Closing Entries. Preparation of Ledger Accounts.

UNIT-II

Introduction to International Financial Reporting Standards (IFRS). Understanding Accounting Standards issued by the ICAI related to Disclosure of Accounting Policies, Depreciation Accounting, and Revenue Recognition. Methods of charging Depreciation Straight-line Method, and Written-down-value Method. Preparation of Trial Balance. Adjustment Entries. Post-adjusted Trial Balance. Bank Reconciliation Statement.

UNIT-III

Preparation of Financial Statements: Preparing Trading Account, Profit & Loss Account and Balance Sheet for a Sole Proprietor. Understanding contents of Financial Statements of a Joint Stock Company as per Companies Act 2013. Understanding the contents of a Corporate Annual Report. Preparation of Cash Flow Statement as per AS-3 (revised).

UNIT-IV

Analyzing Financial Statements: Objectives of Financial Statement Analysis; Sources of Information; Standards of Comparison; Techniques of Financial Statement Analysis - Horizontal Analysis, Vertical Analysis, and Ratio Analysis. Meaning and Usefulness of Financial Ratios; Analysis of Financial Ratios from the perspective of different Stakeholders like Investors, Lenders, and Short-term Creditors; Profitability Ratios, Solvency Ratios, Liquidity Ratios, and Turnover Ratios; Limitations of Ratio Analysis.

Recommended Books:

1. S.N. Maheshwari, Suneel K. Maheshwari, and Sharad K. Maheshwari: An Introduction to Accountancy, Vikas Publishing House Pvt. Ltd.
2. R. Narayanaswamy, Financial Accounting: A Managerial Perspective, PHI Learning Pvt. Ltd.
3. Charles T. Horngren, Gart L. Sundem, John A. Elliott, and Donna R. Philbrick, Introduction to Financial Accounting, Pearson.
4. J.R. Monga, Financial Accounting: Concepts and Applications, Mayur Paperbacks.
5. T.P. Ghosh, Financial Accounting for Managers: Taxmann Allied Services Pvt. Ltd.

C: 8-MANAGERIAL ECONOMICS

(Credit:6, Theory:4, Practical: 2)

UNIT-I

Demand, Supply and Market equilibrium: individual demand, market demand, individual supply, market supply, market equilibrium; Elasticities of demand and supply : Price elasticity of demand, income elasticity of demand, cross price elasticity of demand, elasticity of supply; Theory of consumer behavior : cardinal utility theory, ordinal utility theory(indifference curves, budget line, consumer choice, price effect, substitution effect, income effect for normal, inferior and giffen goods), revealed preference theory.

UNIT-II

Producer and optimal production choice : optimizing behavior in short run(geometry of product curves, law of diminishing margin productivity, three stages of production), optimizing behavior in long run (isoquants, isocost line, optimal combination of resources) Costs and scale : traditional theory of cost (short run and long run, geometry of cot curves, envelope curves), modern theory of cost (short run and long run), economies of scale, economies of scope.

UNIT-III Theory of firm and market organization : perfect competition (basic features, short run equilibrium of firm/industry, long run equilibrium of firm/industry, effect of changes in demand, cost and imposition of taxes) ; monopoly (basic features, short run equilibrium, long run equilibrium, effect of changes in demand, cost and imposition of taxes, comparison with perfect competition, welfare cost of monopoly), price discrimination, multiplant monopoly ; monopolistic competition (basic features, demand and cost, short run equilibrium, long run equilibrium, excess capacity) ; oligopoly (Cournots model, kinked demand curve model, dominant price leadership model, prisoners dilemma)

UNIT-IV

Factor market : demand for a factor by a firm under marginal productivity theory (perfect competition in the product market, monopoly in the product market), market demand for a factor, supply of labour, market supply of labour, factor market equilibrium.

Recommended Books:

1. Dominick Salvatore (2009). Principles of Microeconomics (5th ed.) Oxford University Press.
2. Lipsey and Chrystal. (2008). Economics.(11th ed.) Oxford University Press.
3. Koutosyannis (1979). Modern Micro Economics. Palgrave Macmillan.

4. Pindyck, Rubinfeld and Mehta. (2009). Micro Economics. (7th ed.), Pearson.

SEC:1-BUSINESS COMMUNICATION

(Credits:2)

GE:1-NUMERICAL TECHNIQUES

(Credit:6, Theory:4, Practical: 2)

UNIT-I

Introduction: Numbers and their accuracy, Chopping and Rounding off, Errors: Absolute and Relative errors, Floating point representations of numbers, Loss of significance. Solution of Algebraic and Transcendental Equations: Bisection Method, Newton-Raphson Method, Secant Method, Method of false position, Rate of convergence and comparison of iterative methods.

UNIT-II

Interpolation and Numerical Differentiation: Polynomial Interpolation, Interpolating polynomial: Lagrange form, Newton form, Nested form, Divided difference Interpolation, Inverse Interpolation, Errors in polynomial Interpolation. First derivative and second derivative via Taylor Series, Richardson Extrapolation.

UNIT-III

Numerical Integration: Trapezoidal Rule, Composite Trapezoidal rule, Simpsons 1/3 rule, Simpsons 3/8 rule, Gaussian Quadrature formulae (1-point, 2-point, 3-point)

UNIT-IV

Solution of System of Linear Equations: Gaussian Elimination method and Pivoting, LU factorization method, ill Conditioning, Iterative Methods: Jacobi iterative method, Gauss Seidel iterative method. Eigen Values and Eigen Vectors: Eigen value properties, Computation Eigen values by Power method.

UNIT-V

Solution of Ordinary Differential Equations: Taylor Series method, Runge-Kutta method of order 2 and order 4, Predictor-Corrector method: Adams-Bashforth-Moulton method. Smoothing of Data and the Method of Least Squares: Linear and non-linear least square method.

Recommended Books:

1. E. Ward Cheney and David R. Kincaid, Numerical Methods and Applications CENGAGE Learning India Private Ltd., New Delhi.
2. S.R.K. Iyengar, R.K. Jain, & M.K. Jain, Numerical Methods for Scientific & Engineering Computation, 6/e, New Age Int. Pub.
3. S.S. Sastry, Introductory Methods of Numerical Analysis, 5/e, EEE
4. Steven C. Chapra, Applied Numerical Methods with MATLAB, 2/e, McGraw-Hill.

SEMESTER-IV

C: 9-JAVA PROGRAMMING

(Credit:6, Theory:4, Practical: 2)

UNIT-I

Introduction to Java: Java Architecture and Features, Understanding the semantic and syntax

differences between C++ and Java, Compiling and Executing a Java Program, Variables, Constants, Keywords Data Types, Operators (Arithmetic, Logical and Bitwise) and Expressions, Comments, Doing Basic Program Output, Decision Making Constructs (conditional statements and loops) and Nesting, Java Methods (Defining, Scope, Passing and Returning Arguments, Type Conversion and Type and Checking, Built-in Java Class Methods).

UNIT-II

Arrays, Strings and I/O: Creating & Using Arrays (One Dimension and Multi-dimensional), Referencing Arrays Dynamically, Java Strings: The Java String class, Creating & Using String Objects, Manipulating Strings, String Immutability & Equality, Passing Strings To & From Methods, String Buffer Classes. Simple I/O using System.out and the Scanner class, Byte and Character streams, Reading/Writing from console and files. Object-Oriented Programming Overview: Principles of Object-Oriented Programming, Defining & Using Classes, Controlling Access to Class Members, Class Constructors, Method Overloading, Class Variables & Methods, Objects as parameters, final classes, Object class, Garbage Collection.

UNIT-III

Inheritance, Interfaces, Packages, Enumerations, Autoboxing and Metadata: Inheritance: (Single Level and Multilevel, Method Overriding, Dynamic Method Dispatch, Abstract Classes), Interfaces and Packages, Extending interfaces and packages, Package and Class Visibility, Using Standard Java Packages (util, lang, io, net), Wrapper Classes, Autoboxing/Unboxing, Enumerations and Metadata.

UNIT-IV

Exception Handling, Threading, Networking and Database Connectivity: Exception types, uncaught exceptions, throw, built-in exceptions, Creating your own exceptions; Multi-threading: The Thread class and Runnable interface, creating single and multiple threads, Thread prioritization, synchronization and communication, suspending/resuming threads. Using java.net package, Overview of TCP/IP and Datagram programming. Accessing and manipulating databases using JDBC.

UNIT-V

Applets and Event Handling: Java Applets: Introduction to Applets, Writing Java Applets, Working with Graphics, Incorporating Images & Sounds. Event Handling Mechanisms, Listener Interfaces, Adapter and Inner Classes. The design and Implementation of GUIs using the AWT controls, Swing components of Java Foundation Classes such as labels, buttons, text fields, layout managers, menus, events and listeners; Graphic objects for drawing figures such as lines, rectangles, ovals, using different fonts. Overview of servlets.

Recommended Books:

1. E. Balagurusamy, Programming with Java, 4/e, TMH
2. Bruce Eckel, "Thinking Java", 8/e, Pearson India, 2010.
3. John R. Hubbard, "Programming with JAVA", Schaum's Series, 2/e, 2004.
4. Cay S. Horstmann, Gary Cornell, "Core Java 2 Volume 1", 9/e, Printice Hall, 2012.

C: 10-DATABASE MANAGEMENT SYSTEM

(Credit:6, Theory:4, Practical: 2)

UNIT-I

Databases and Database Users, Database System Concepts and Architecture, Data Modelling using

the Entity-Relationship (ER) Model, The Enhanced Entity-Relationship (EER) Model.

UNIT-II

Relational Model: The Relational Data Model and Relational Database Constraints, The Relational Algebra and Relational Calculus.

UNIT-III

Relational Database Design by ER- and EER-to-Relational Mapping, SQL-99: Schema Definition, Constraints, Queries, and Views, Introduction to SQL Programming Techniques.

UNIT-IV

Functional Dependencies and Normalization for Relational Databases, Relational Database Algorithms and Further Dependencies, Practical Database Design Methodology and use of UML Diagrams.

UNIT-V

Disk Storage, Basic File Structures, and Hashing, Indexing Structures for Files, Algorithms for Query Processing and Optimization, Physical Database Design and Tuning.

Recommended Books:

1. R. Elmasri, S.B. Navathe, Fundamentals of Database Systems, 6/e, Pearson Education, 2010.
2. A. Silberschatz, H.F. Korth, S. Sudarshan, Database System Concepts 6/e, McGraw Hill, 2010.
3. R. Ramakrishnan, J. Gehrke, Database Management Systems, McGraw-Hill.
4. C. Coronel, S. Morris, & P. Rob, Database Principles (Fundamentals of Design, Implementation, and Management), 9/e, Cengage Learning.

C: 11-MANAGEMENT ACCOUNTING

(Credit:6, Theory:4, Practical: 2)

UNIT-I

Nature, Scope of Management Accounting: Meaning, definition, nature and scope of Management Accounting; Comparison of Management Accounting with Cost Accounting and Financial Accounting. Cost concepts: Meaning, Scope, Objectives, and Importance of Cost Accounting; Cost, Costing, Cost Control, and Cost Reduction; Elements of Cost, Components of total Cost, Cost Sheet. Classification of Costs: Fixed, Variable, Semivariable, and Step Costs; Product, and Period Costs; Direct, and Indirect Costs; Relevant, and Irrelevant Costs; Shut-down, and Sunk Costs; Controllable, and Uncontrollable Costs; Avoidable, and Unavoidable Costs; Imputed / Hypothetical Costs; Out-of-pocket Costs; Opportunity Costs; Expired, and Unexpired Costs; Conversion Cost. Cost Ascertainment: Cost Unit and Cost Center. Introduction to Overhead allocation, Overhead apportionment, and Overhead absorption.

UNIT-II

Cost-Volume-Profit Analysis: Contribution, Profit-Volume Ratio, Margin of safety, Cost Break-even Point, Composite Break-even Point, Cash Break-even Point, Key Factor, Break-even Analysis. Relevant Costs and Decision Making: Pricing, Product Profitability, Make or Buy, Exploring new markets, Export Order, Sell or Process Further, Shut down vs. Continue.

UNIT-III

Budgets and Budgetary Control: Meaning, Types of Budgets, Steps in Budgetary Control, Fixed and Flexible Budgeting, Cash Budget. Responsibility Accounting: Concept, Significance, Different

responsibility centers, Divisional performance Financial measures, Transfer pricing.

UNIT-IV

Standard Costing and Variance Analysis: Meaning of Standard Cost and Standard Costing, Advantages, Limitations and Applications; Material, Labor, Overhead and Sales variances. Introduction to Target Costing, Life Cycle Costing, Quality Costing, and Activity based Costing.

Recommended Books:

1. C.T. Horngren, Gary L. Sundem, Jeff O. Schatzberg, and Dave Burgstahler: Introduction to Management Accounting, Pearson.
2. M.N. Arora: A Textbook of Cost and Management Accounting, Vikas Publishing House Pvt. Ltd.
3. M.Y. Khan, and P.K. Jain, Management Accounting: Text Problems and Cases, McGraw Hill Education (India) Pvt. Ltd.
4. S.N. Maheshwari, and S.N. Mittal, Cost Accounting: Theory and Problems, Shree Mahavir Book Depot (Publishers).

SEC: 2-HTML PROGRAMMING

(Credit:2)

UNIT-I

Introduction

The Basics: The Head, the Body, Colors, Attributes, Lists, ordered and unordered.

UNIT-II

Links: Introduction, Relative Links, Absolute Links, Link Attributes, Using the ID Attribute to Link within a Document.

UNIT-III

Images: Putting an Image on a Page, Using Images as Links, Putting an Image in the Background

UNIT-IV

Tables, Creating a Table , Table Headers, Captions, Spanning Multiple Columns, Styling Table

UNIT-V

Forms: Basic Input and Attributes, Other Kinds of Inputs, Styling forms with CSS, Where To Go From Here

Recommended Books:

Introduction to HTML and CSS -O' Reilly.

GE:4-QUANTITATIVE TECHNIQUES

(Credit:6, Theory:4, Practical: 2)

UNIT-I

Linear Programming: Formulation of L.P. Problems, Graphical Solutions (Specialcases: Multiple optimal solution, infeasibility, unbounded solution); Simplex Methods(Special cases: Multiple optimal solution, infeasibility, degeneracy, unbounded solution)Big-M method and Two-phase method; Duality and Sensitivity (emphasis on formulation & economic interpretation); Formulation of Integer programming, Zero-oneprogramming, Goal Programming.

UNIT-II

Elementary Transportation: Formulation of Transport Problem, Solution by N.W. Corner Rule, Least Cost method, Vogels Approximation Method (VAM), Modified Distribution Method. (Special cases: Multiple Solutions, Maximization case, Unbalanced case, prohibited routes) Elementary Assignment: Hungarian Method, (Special cases: Multiple Solutions, Maximization case, Unbalanced case, Restrictions on assignment).

UNIT-III

Network Analysis: Construction of the Network diagram, Critical Path- float and slack analysis (Total float, free float, independent float), PERT, Project Time Crashing.

UNIT-IV

Decision Theory: Pay off Table, Opportunity Loss Table, Expected Monetary Value, Expected Opportunity Loss, Expected Value of Perfect Information and Sample Information.

UNIT-V

Markov Chains: Predicting Future Market Shares, Equilibrium Conditions (Questions based on Markov analysis) Limiting probabilities, Chapman Kolmogorov equation. Introduction to Game Theory: Pay off Matrix- Two person Zero-Sum game, Pure strategy, Saddle point; Dominance Rule, Mixed strategy, Reduction of $m \times n$ game and solution of 2×2 , $2 \times s$, and $r \times 2$ cases by Graphical and Algebraic methods; Introduction to Simulation: Monte Carlo Simulation.

Recommended Books:

1. N. D. Vohra: Quantitative Management, Tata McGraw Hill.
2. P. K. Gupta, Man Mohan, Kanti Swarup: Operations Research, Sultan Chand.
3. V. K. Kapoor: Operations Research, Sultan Chand & Sons.
4. J. K. Sharma: Operations Research Theory & Applications, Macmillan India, Limited.

SEMESTER-V

C: 12-DATA COMMUNICATIONS

(Credit:6, Theory:4, Practical: 2)

UNIT-I

Introduction: Data Communications, Networks, The Internet, Protocols and Standards. Network Models: Layered Tasks, The OSI Model, Layers in the OSI Model, TCP/ IP Protocol Suite, Addressing.

UNIT-II

Data and Signals: Analog and Digital, Periodic Analog Signals, Digital Signals, Transmission Impairment, Data Rate Limits, Performance. Digital Transmission: Digital-To-Digital Conversion, Analog-To-Digital Conversion, Transmission Modes. Analog Transmission: Digital-To-Analog Conversion, Analog-To-Analog Conversion.

UNIT-III

Multiplexing and Spreading: Multiplexing, Spread Spectrum. Transmission Media: Guided Media, Unguided Media (Wireless). Switching: Circuit Switched, Datagrams, Virtual Circuit Networks, Structure of a Switch. Telephone Network, Dial-Up MODEMS, Digital Subscriber Line (DSL), Cable TV Networks, Cable TV for Data Transfer.

UNIT-IV

Error Detection and Correction: Introduction, Block Coding, Linear Block Codes, Cyclic Codes, Checksum. Data Link Control: Framing, Flow and Error Control, Protocols, Noiseless Channels, Noisy Channels, HDLC, Point-To-Point Protocol. Multiple Access: Random Access, Controlled Access, Channelization. Wired LANs: IEEE Standards, Standard Ethernet, Changes in the Standard, Fast Ethernet, Gigabit Ethernet: Wireless LANs: IEEE 802.11, Bluetooth.

UNIT-V— Connecting LANs: Connecting Devices, Backbone Networks, Virtual LANs. Wireless LANs: Cellular Telephony, Satellite Networks. SONET: Architecture, SONET Layers, SONET Frames, STS Multiplexing, SONET Networks, Virtual Tributaries. Virtual-Circuit Networks. Frame Relay, ATM, ATM LANs.

Recommended Books:

1. B. A. Forouzan, Data Communications and Networking, 4/e, THM ,2007.
2. A. S. Tanenbaum, & David J. Wetherall, Computer Networks, 5/e, Pearson

C: 13-SOFTWARE ENGINEERING

(Credit:6, Theory:4, Practical: 2)

UNIT-I

Professional Software Development, Software Engineering Ethics, Software Processes, Software Process Models, Process Activities, Coping with Change, The Rational Unified Process, Agile Software Development, Agile Methods, Plan-Driven and Agile Development, Extreme Programming, Agile Project Management, Scaling Agile Methods.

UNIT-II

Requirements Engineering, Functional and Non-Functional Requirements, The Software Requirements Document, Requirements Specification, Requirements Engineering Processes, Requirements Elicitation and Analysis, Requirements Validation, Requirements Management, System Modelling, Context Models, Interaction Models, Structural Models, Behavioural Models, Model-Driven, Engineering, Architectural Design, Architectural Design Decisions, Architectural Views, Architectural Patterns, Application Architectures.

UNIT-III

Design and Implementation: Object-Oriented Design using the UML, Design Patterns, Implementation Issues, Open Source Development, Software Testing: Development Testing, Test-Driven Development, Release Testing, User Testing, Software Evolution: Evolution Processes, Program Evolution Dynamics, Software Maintenance, Legacy System Management, Dependability and Security.

UNIT-IV

Socio-technical Systems: Complex Systems, Systems Engineering, System Procurement, System Development, System Operation. Dependability and Security: Dependability Properties, Availability and Reliability, Safety, Security. Dependability and Security Specification: Risk-Driven Requirements, Specification, Safety Specification, Reliability Specification, Security, Specification, Formal Specification.

UNIT-V

Dependability Engineering: Redundancy and Diversity, Dependable Processes, Dependable Systems Architectures, Dependable Programming. Security Engineering: Security Risk Management, Design for Security, System Survivability. Dependability and Security Assurance: Static Analysis, Reliability Testing, Security Testing, Process Assurance, Safety and Dependability Cases.

Recommended Books:

1. I. Sommerville, Software Engineering, 9/e, Addison Wesley.
2. R. Mall, Fundamentals of Software Engineering, 3/e, PHI.
3. R.S. Pressman, Software Engineering, A Practitioners Approach, 7/e, McGraw-Hill, 2009.
4. K.K. Aggarwal and Y. Singh, Software Engineering, 2/e, New Age International Publishers, 2008.

DSE: 1-PROGRAMMING IN VISUAL BASIC

(Credit:6, Theory:4, Practical: 2)

UNIT-I

GUI Environment: Introduction to graphical user interface (GUI), programming language (procedural, object oriented, event driven), the GUI environment, compiling, debugging, and running the programs. Controls : Introduction to controls textboxes, frames, check boxes, option buttons, images, setting borders and styles, the shape control, the line control, working with multiple controls and their properties, designing the user interface, keyboard access, tab controls, default & cancel property, coding for controls.

UNIT-II

Operations: Data types, constants, named & intrinsic, declaring variables, scope of variables, val function, arithmetic operations, formatting data. Decision Making: If statement, comparing strings, compound conditions (and, or, not), nested if statements, case structure, using if statements with

option buttons & check boxes, displaying message in message box, testing whether input is valid or not.

UNIT-III

Modular programming: Menus, sub-procedures and sub-functions defining / creating and modifying a menu, using common dialog box, creating a new sub-procedure, passing variables to procedures, passing argument by value or by reference, writing a function/ procedure. Forms Handling : Multiple forms creating, adding, removing forms in project, hide, show method, load, unload statement, me keyword, referring to objects on a different forms.

UNIT-IV

Iteration Handling: Do/loops, for/next loops, using msgbox function, using string function Arrays and Grouped Data Control: Arrays - 1-dimension arrays, initializing an array using for each, user- defined data types, accessing information with user-defined data types, using list boxes with array, two dimensional arrays. lists, loops and printing list boxes & combo boxes, filling the list using property window/additem method, clear method, list box properties, removing an item from a list, list box/ combo box operations.

UNIT-V

Database Connectivity: Database connectivity of forms with back end tool like mysql, populating the data in text boxes, list boxes etc. searching of data in database. using forms. Updating/ editing of data based on a criterion.

Recommended Books:

Programming in Visual Basic 6.0 by Julia Case Bradley, Anita C. Millispangh (Tata Mcgraw Hill Edition 2000 (Fourteenth Reprint 2004).

DSE: 2-FINANCIAL MANAGEMENT

(Credit:6, Theory:4, Practical: 2)

UNIT-I

Nature of Financial Management: Finance and related disciplines; Scope of Financial Management; Profit Maximization, Wealth Maximization - Traditional and Modern Approach; Functions of finance Finance Decision, Investment Decision, Dividend Decision; Objectives of Financial Management; Organisation of finance function; Concept of Time Value of Money, present value, future value, and annuity; Risk & Return: Historical return, expected return, absolute return, holding period return, annualized return, arithmetic & geometric return; Risk - Systematic & unsystematic risk their sources and measures.

UNIT-II

Long -term investment decisions: Capital Budgeting - Principles and Techniques; Nature and meaning of capital budgeting; Estimation of relevant cash flows and terminal value; Evaluation techniques - Accounting Rate of Return, Net Present Value, Internal Rate of Return & MIRR, Net Terminal Value, Profitably Index Method. Concept and Measurement of Cost of Capital: Explicit and Implicit costs; Measurement of cost of capital; Cost of debt; Cost of perpetual debt; Cost of Equity Share; Cost of Preference Share; Cost of Retained Earning; Computation of over-all cost of capital based on Historical and Market weights.

UNIT-III

Capital Structures: Approaches to Capital Structure Theories - Net Income approach, Net Operating Income approach, Modigliani-Miller (MM) approach, Traditional approach, Capital Structure and Financial Distress, Trade-Off Theory.

Dividend Policy Decision - Dividend and Capital; The irrelevance of dividends: General, MM hypothesis; Relevance of dividends: Walter's model, Gordon's model; Leverage Analysis: Operating and Financial Leverage; EBIT -EPS analysis; Combined leverage.

UNIT-IV

Working Capital Management: Management of Cash - Preparation of Cash Budgets (Receipts and Payment Method only); Cash management technique, Receivables Management Objectives; Credit Policy, Cash Discount, Debtors.

Outstanding and Ageing Analysis; Costs - Collection Cost, Capital Cost, Default Cost, Delinquency Cost, Inventory Management (Very Briefly) - ABC Analysis; Minimum Level; Maximum Level; Reorder Level; Safety Stock; EOQ, Determination of Working Capital.

Recommended Books:

1. M.Y. Khan & P.K. Jain: Financial Management Text Problem and Cases, Tata McGraw Hill Publishing Co. Ltd.
2. R. P. Rustogi: Financial Management: Theory Concepts and Practices, Taxmann Publication.
3. I.M. Pandey: Financial Management: Theory and Practices, Vikas Publishing House.
4. R.A. Brealey, S.C. Myers, F. Allen & P. Mohanty: Principles of Corporate Finance, McGraw Hill Higher Education.
5. J.V. Horne & J.M. Wachowicz: Fundamentals of Financial Management Prentice Hall.

SEMESTER-VI

C: 14-INTERNET TECHNOLOGY

(Credit:6, Theory:4, Practical: 2)

UNIT-I

Java: Use of Objects, Array and Array List class.

UNIT-II

JavaScript: Data types, operators, functions, control structures, events and event handling.

UNIT-III

JDBC:JDBC Fundamentals, Establishing Connectivity and working with connection interface, Working with statements, Creating and Executing SQL Statements, Working with Result Set Objects. **UNIT-IV** JSP: Introduction to Java Server Pages, HTTP and Servlet Basics, The Problem with Servlets, The Anatomy of a JSP Page, JSP Processing, JSP Application Design with MVC, Setting Up the JSP Environment, Implicit JSP Objects, Conditional Processing, Displaying Values, Using an expression to Set an Attribute, Declaring Variables and Methods, Error Handling and Debugging, Sharing Data Between JSP Pages, Requests, and Users, Database Access.

UNIT-V

Java Beans: Java Beans Fundamentals, JAR files, Introspection, Developing a simple Bean, Connecting to DB.

Recommended Books:

1. Ivan Bayross, Web Enabled Commercial Application Development Using HTML, DHTML, Javascript, Perl CGI , BPB Publications, 2009.
2. Cay Horstmann, BIG Java, Wiley Publication , 3/e, 2009.
3. Herbert Schildt , Java 7, The Complete Reference, , 8/e, 2009.
4. Jim Keogh ,The Complete Reference J2EE, TMH, , 2002.

**C: 15-PROGRAMMING IN NET
(Credit:6, Theory:4, Practical: 2)****DSE: 3-E-COMMERCE
(Credit:6, Theory:4, Practical: 2)****UNIT-I**

An introduction to Electronic commerce: What is E-Commerce (Introduction And Definition), Main activities E-Commerce, Goals of E-Commerce, Technical Components of E-Commerce, Functions of E-Commerce, Advantages and disadvantages of E-Commerce, Scope of E-Commerce, Electronic Commerce Applications, Electronic Commerce and Electronic Business(C2C)(C2G,G2G, B2G, B2P, B2A, P2P, B2A, C2A, B2B, B2C).

UNIT-II

The Internet and WWW: Evolution of Internet, Domain Names and Internet Organization (.edu, .com, .mil, .gov, .net etc.) , Types of Network, Internet Service Provider, World Wide Web, Internet & Extranet, Role of Internet in B2B Application, building own Website, Cost, Time, Reach, Registering a Domain Name, Web promotion, Target email, Baner, Exchange, Shopping Bots.

UNIT-III

Internet Security: Secure Transaction, Computer Monitoring, Privacy on Internet, CorporateEmail privacy, Computer Crime(Laws , Types of Crimes), Threats, Attack on Computer System, Software Packages for privacy, Hacking, Computer Virus(How it spreads, Virus problem, virus protection, Encryption and Decryption, Secret key Cryptography, DES, Public Key Encryption, RSA, Authorisation and Authentication, Firewall, Digital Signature(How it Works).

UNIT-IV

Electronic Data Exchange: Introduction, Concepts of EDI and Limitation, Applications of EDI, Disadvantages of EDI, EDI model,Electronic Payment System: Introduction, Types of Electronic Payment System, Payment Types, Value Exchange System, Credit Card System, Electronic Fund Transfer, Paperless bill, Modern Payment Cash, Electronic Cash.

UNIT-V

Planning for Electronic Commerce: Planning Electronic Commerce initiates, Linking objectives to business strategies, Measuring cost objectives, Comparing benefits to Costs, Strategies for developing electronic commerce web sites.

Recommended Books:

1. E-Commerce Concepts, Models, Strategies-G.S.V.Murthy, Himalaya Publishing House.
2. E- Commerce:-Kamlesh K Bajaj and Debjani Nag.
3. Electronic commerce-Gray P. Schneider.
4. E-Commerce, Fundamentals & Applications: Chand (Wiley) Web and E-Commerce.

DSE: 4-PROJECT WORK
(Credit:6)

MATHEMATICS (HONOURS)

SEMESTER-I

C:1-CALCULUS-I

(Total Marks: 100)

Part-I (Marks: 70)

4 Lectures, 1 Tutorial (per week)

Unit-I

Hyperbolic functions, higher order derivatives, Leibnitz rule and its applications to problems of the type $e^{ax+b} \sin x$, $e^{ax+b} \cos x$, $(ax + b)^n \sin x$, $(ax + b)^n \cos x$, concavity and inflection points, asymptotes, curve tracing in Cartesian coordinates, tracing in polar coordinates of standard curves, L'Hospital's rule, applications in business, economics and life sciences.

Unit-II

Reduction formulae, derivations and illustrations of reduction formulae of the type $\int \sin^n x dx$, $\int \cos^n x dx$, $\int \tan^n x dx$, $\int \sec^n x dx$, $\int (\log x)^n dx$, $\int \sin^n x \cos^n x dx$, volumes by slicing, disks and washers methods, volumes by cylindrical shells, parametric equations, parameterizing a curve, arc length, arc length of parametric curves, area of surface of revolution.

Unit-III

Techniques of sketching conics, reflection properties of conics, rotation of axes and second degree equations, classification into conics using the discriminant, polar equations of conics. Sphere, Cone, Cylinder, Conicoids.

Unit-IV

Vector triple product, Introduction to vector functions, operations with vector-valued functions, limits and continuity of vector functions, differentiation and integration of vector functions, tangent and normal components of acceleration.

Part-II(PRACTICAL)

(Marks: 30)

List of Practical (Using any software/MATLAB) Practical/Lab work to be performed on a Computer.

1. Plotting the graphs of the functions e^{ax+b} , $\log(ax + b)$, $1/(ax + b)$, $\sin(ax + b)$, $\cos(ax + b)$, $|ax + b|$ and to illustrate the effect of a and b on the graph.
2. Plotting the graphs of the polynomial of degree 4 and 5, the derivative graph, the second derivative graph and comparing them.

3. Sketching parametric curves (eg. Trochoid, Cycloid, Epicycloids, Hypocycloid).
4. Obtaining the surface of revolution of curves.
5. Tracing of conics in cartesian/polar coordinates.
6. Sketching Ellipsoid, Hyperboloid of one and two sheets, Elliptic cone, Elliptic, Paraboloid, Hyperbolic paraboloid using cartesian coordinates.
7. Matrix operation (addition, multiplication, inverse, transpose).

Books Recommended:

1. H. Anton, I. Bivens and S. Davis: Calculus, 10-th Ed., John Wiley and Sons (Asia) P. Ltd., Singapore, 2002. Chapters: 3 (3.1, 3.2), 5 (5.2-5.5), 6(6.5, 6.8), 10 (10.1-10.5), 11(11.1, 11.4), 12(12.1, 12.2, 12.3, 12.6).
2. B.P. Acharya and D.C. Sahu: Analytical Geometry of Quadratic Surfaces, B.P. Acharya and D.C. Sahu, Kalyani Publishers, New Delhi, Ludhiana, Chapters: 2 and 3.
3. Shantinakaran: Text Book of Calculus(Part-II), S. Chand & Co. Pvt. Ltd., New Delhi, Chapters: 6,7, 10 (Art. 33-36).
4. Shantinakaran: Text Book of Calculus(Part-III), S. Chand & Co., Pvt. Ltd., New Delhi, Chapters: 1(Art.1,2), 3 (Art.7,8), 6 (15 restricted).

Books for Reference:

1. G.B. Thomas and R.L. Finney: Calculus, 9-th Ed., Pearson Education, Delhi, 2005.
2. R. Courant and F. John: Introduction to Calculus and Analysis (Volumes I & II), Springer- Verlag, New York, Inc., 1989.
3. Shanti Narayan and P.K. Mittal: Analytical Solid Geometry, S. Chand & Co. Pvt. Ltd., New Delhi.
4. M.J. Strauss, G.L. Bradley and K. J. Smith: Calculus, 3-rd Ed., Dorling Kindersley (India) P. Ltd. (Pearson Education), Delhi, 2007.

C:2-ALGEBRA-I

Total Marks: 100-(Theory: 80 Marks+Mid-Sem: 20 Marks)

5 Lectures, 1 Tutorial (per week)

Unit-I

Polar representation of complex numbers, n -th roots of unity, De Moivres theorem for rational indices and its applications.

Unit-II

Equivalence relations, Basic Terminology, Functions, Inverse and composition of functions, One-to-One correspondence and cardinality of a set, Division algorithm, Divisibility and Euclidean algorithm, Prime numbers, Congruence relation between integers, Principles of Mathematical Induction, Statement of Fundamental Theorem of Arithmetic.

Unit-III

Systems of linear equations, row reduction and echelon forms, vector equations, the matrix equation $Ax = b$, solution sets of linear systems, applications of linear systems, linear independence.

Unit-IV

Introduction to linear transformations, Matrix of a linear transformation, Inverse of a matrix, Characterizations of invertible matrices. Subspaces of \mathbb{R}^n , Dimension of subspaces of \mathbb{R}^n and Rank of a matrix, Eigen values, Eigen Vectors and Characteristic equation of a matrix.

Books Recommended:

1. Titu Andreescu and Dorin Andrica: Complex Numbers from A to Z , Birkhauser, 2006. Chapter: 2.
2. Edgar G. Goodaire and Michael M. Parmenter: Discrete Mathematics with Graph Theory, 3-rd Ed., Pearson Education (Singapore) P. Ltd., Indian Reprint, 2005. Chapters: 2(2.4), 3, 4(4.1 – 4.1.6, 4.2 – 4.2.12, 4.3 – 4.3.9, 4.4 – 4.4.8), 5(5.1 – 5.1.4).
3. David C. Lay: Linear Algebra and its Applications, 3rd Ed., Pearson Education Asia, Indian Reprint, 2007. Chapters: 1(1.1 – 1.9), 2(2.1 – 2.3, 2.8, 2.9), 5(5.1, 5.2).

SEMESTER-II

C:3-REAL ANALYSIS (ANALYSIS-I)

Total Marks: 100-(Theory: 80 Marks+Mid-Sem: 20 Marks)

5 Lectures, 1 Tutorial (per week)

Unit-I

Review of Algebraic and Order Properties of \mathbb{R} , Upper bound & Lower bound, Least upper bound (LUB), Greatest lower bound (GLB), LUB & GLB property of an ordered field, Completeness of an ordered field, Incompleteness of \mathbb{Q} , Supremum and Infimum, Roots, Archimedean property, Rational & Irrational density theorems, Decimal representations of real numbers.

Unit-II

Idea of countable, uncountable sets and theorems relating to these sets, Sequences, Convergence & divergence of sequences, Limit of a sequence & Limit Theorems, Monotonic sequences, Weierstrass completeness principle, Nested Intervals, Cantor's completeness principle, Idea about higher order cardinals (restricted).

Unit-III

Subsequences, Bolzano Weierstrass theorem for sequences, Cluster points, Cauchy(Fundamental)

sequence, Cauchy's Convergence Criterion, Limit superior and Limit inferior, Convergence and divergence of infinite series, Series of positive terms, Tests of convergence.

Unit-IV

Absolute convergence, Rearrangement of terms of a series, Conditional convergence of a series, Open sets, Closed sets, Limit points, Closure, Interior and Boundary of sets. Bolzano Weierstrass theorem for sets.

Book Recommended:

1. G. Das and S. Pattanayak: Fundamentals of Mathematics Analysis, TMH Publishing Co. , Chapters: 2(2.1-2.7), 3(3.1-3.4), 4(4.1-4.8, 4.11-4.13), 5(5.1-5.5).

Books for Reference:

1. R.G. Bartle and D. R. Sherbert: Introduction to Real Analysis, 3-rd Ed., John Wiley and Sons (Asia) Pvt. Ltd., Singapore, 2002.
2. Gerald G. Bilodeau , Paul R. Thie, G.E. Keough: An Introduction to Analysis, 2-nd Ed., Jones & Bartlett, 2010.
3. Brian S. Thomson, Andrew. M. Bruckner and Judith B. Bruckner: Elementary Real Analysis, Prentice Hall, 2001.
4. S.K. Berberian: A First Course in Real Analysis, Springer Verlag, New York, 1994.
5. S.C. Mallik and S. Arora: Mathematical Analysis, New Age International Publications.
6. D. Somasundaram and B. Choudhury: A First Course in Mathematical Analysis, Narosa Publishing House.
7. S.L. Gupta and Nisha Rani: Real Analysis, Vikas Publishing House Pvt. Ltd., New Delhi.

C-:4-DIFFERENTIAL EQUATIONS

(Total Marks:100)

Part-I (Marks: 70)

4 Lectures, 1 Tutorial (per week)

Unit-I

Basic concepts of Differential equations and mathematical models. First order and first degree Ordinary differential equations(variables separable, homogeneous, exact, and linear). Applications of first order differential equations(Growth, Decay and Chemical Reactions, Heat flow, Oxygen debt, Economics). Equations of first order but of higher degree.

Unit-II

Second order linear equations(both homogeneous and non-homogeneous) with constant coefficients, second order equations with variable coefficients, variation of parameters, method of undetermined coefficients, Euler's equation, Second order differential equations with variable coefficients, Equations reducible to linear equations with constant coefficients.

Unit-III

Power series solutions of second order differential equations.

Unit-IV

Laplace transforms and its applications to solutions of differential equations.

Part-II(PRACTICAL)

(Marks: 30)

List of Practical (Using any Software/MATLAB) Practical/Lab work to be performed on a Computer.

1. Plotting of second order solution of family of differential equations.
2. Plotting of third order solution of family of differential equations.
3. Growth model (exponential case only).
4. Decay model (exponential case only).
5. Oxygen debt model.
6. Economic model.
7. Vibration problems.

Book Recommended:

1. J. Sinha Roy and S. Padhy: A Course of Ordinary and Partial Differential Equations, Kalyani Publishers, New Delhi. Chapters: 1, 2, 3, 4(4.1-4.8), 5, 7, 9(9.1-9.5, 9.10, 9.11, 9.13).

Books for Reference:

1. Martin Braun: Differential Equations and their Applications, Springer International.
2. M.D. Raisinghania: Advanced Differential Equations, S. Chand & Company Ltd., New Delhi.
3. G. Dennis Zill: A First Course in Differential Equations with Modelling Applications, Cengage Learning India Pvt. Ltd.
4. S.L. Ross: Differential Equations, John Wiley & Sons, India, 2004.

SEMESTER-III

C-5: THEORY OF REAL FUNCTIONS (ANALYSIS-II)

Total Marks: 100-(Theory: 80 Marks+Mid-Sem: 20 Marks)

5 Lectures, 1 Tutorial (per week)

Unit-I

Limits of functions ($\epsilon - \delta$ approach), Sequential criterion for limits, Divergence criteria. Limit theorems, one-sided limits. Infinite limits and limit at infinity. Continuous functions, Sequential criterion for continuity, Algebra of continuous functions and theorems related to continuity of functions.

Unit-II

Discontinuity and kinds of discontinuity, Further properties of continuity, Uniform continuity, Differentiable functions, Left hand & Right hand derivatives, Algebra of differentiable functions, Caratheodory's theorem.

Unit-III

Mean value conditions, Global and local maximum & minimum, Rolle's theorem, Generalized mean value theorem, Cauchy mean value theorem, Lagrange's mean value theorem and their applications, Darboux's theorem, Indeterminant forms, Higher order derivatives (Leibnitz theorem), Taylor's theorem and its applications to approximating functions by means of polynomials.

Unit-IV

Maxima and Minima, Taylor's theorem with different forms of remainder, Maclaurin's theorem, Deduction of Taylor's theorem from mean value theorem, Taylor's and Maclaurin's infinite series, Taylor's series and Maclaurin's series expansions of exponential and trigonometric functions, $\ln(1+x)$, $1/(ax+b)$ and $(1+x)^n$.

Books Recommended:

1. G. Das and S. Pattanayak: Fundamentals of Mathematics Analysis, TMH Publishing Co., Chapters: 6(6.1-6.7), 7(7.1-7.7), 9(9.7 only).
2. S.C. Mallik and S. Arora: Mathematical Analysis, New Age International Publications, Chapter: 6(8.1-8.6).

Books for Reference:

1. R. Bartle and D.R. Sherbert, Introduction to Real Analysis, John Wiley and Sons, 2003.
2. K.A. Ross, Elementary Analysis: The Theory of Calculus, Springer, 2004.
3. A. Mattuck, Introduction to Analysis, Prentice Hall, 1999.
4. S.R. Ghorpade and B.V. Limaye, A Course in Calculus and Real Analysis, Springer, 2006.

C-6: GROUP THEORY (ALGEBRA-II)

Total Marks: 100-(Theory: 80 Marks+Mid-Sem: 20 Marks)

5 Lectures, 1 Tutorial (per week)

Unit-I

Symmetries of a square, Dihedral groups, Definition and examples of groups including permutation groups and quaternion groups (illustration through matrices), Elementary properties of groups.

Subgroups and examples of subgroups, Centralizer, Normalizer, Center of a group, Product of two subgroups.

Unit-II

Properties of cyclic groups, Classification of subgroups of cyclic groups. Cycle notation for permutations, Properties of permutations, Even and Odd permutations, Alternating group, Properties of cosets, Lagranges theorem and consequences including Fermats Little theorem.

Unit-III

External direct product of a finite number of groups, Normal subgroups, Factor groups, Cauchy's theorem for finite abelian groups.

Unit-IV

Group homomorphisms, properties of homomorphisms, Cayley's theorem, Properties of isomorphisms, First isomorphism theorem, Second and Third isomorphism theorems (Statements only).

Book Recommended:

1. Joseph A. Gallian: Contemporary Abstract Algebra(4-th Edn.), Narosa Publishing House, New Delhi, Chapters: I, II, III, IV, V, VI(up to Theorem 6.2 only), VII, VIII, IX, X, XI.

Books for Reference:

1. D.S. Malik, J.M. Mordeson, and M.K. Sen: Fundamentals of Abstract Algebra, McGraw-Hill, 1997.
2. John B. Fraleigh: A First Course in Abstract Algebra, 7-th Ed., Pearson, 2002.
3. M. Artin: Abstract Algebra, 2-nd Ed., Pearson, 2011.
4. Joseph J. Rotman: An Introduction to the Theory of Groups, 4-th Ed., Springer Verlag, 1995.
5. I.N. Herstein: Topics in Algebra, Wiley Eastern Limited, India, 1975.

C-7: PARTIAL DIFFERENTIAL EQUATIONS & SYSTEMS OF ORDINARY DIFFERENTIAL EQUATIONS

(Total Marks: 100)

Part-I (Marks: 70)

04 Lectures (per week)

Unit-I

Systems of Linear Differential Equations: Basic theory of linear systems, Trial solution method for linear system with constant coefficients, Simultaneous linear first order equations in three variables, Methods of solution, Pfaffian differential equations, methods of solutions of Pfaffian differential equations in three variables.

Unit-II

Formation of first order partial differential equations, Linear and non-linear partial differential equations of first order, Special types of first-order equations, Solutions of partial differential equations of first order satisfying given conditions.

Unit-III

Linear partial differential equations with constant coefficients, Equations reducible to linear partial differential equations with constant coefficients, Partial differential equations with variable coefficients, Some standard forms of variable coefficients.

Unit-IV

Laplace equation, Solution of Laplace equations by separation of variables, One-dimensional Wave equation, Solution of the Wave equation (method of separation of variables), Diffusion equation, Solution of one-dimensional diffusion equation, Method of separation of variables.

Part-II(PRACTICAL)

(Marks: 30)

List of Practical (Using any Software/MATLAB) Practical/Lab work to be performed on a Computer.

1. To find the general solution of the non-homogeneous system of the form:

$$\frac{dx}{dt} = a_1x + b_1y + f_1(t), \quad \frac{dy}{dt} = a_2x + b_2y + f_2(t)$$

with given conditions.

2. Plotting the integral surfaces of a given first order PDE with initial data.

3. Solution of wave equation $\frac{\partial^2 u}{\partial t^2} - c^2 \frac{\partial^2 u}{\partial x^2} = 0$ for the following associated conditions:

(a) $u(x, 0) = \varphi(x)$, $u_t(x, 0) = \psi(x)$, $x \in \mathbb{R}$, $t > 0$. (b) $u(x, 0) = \varphi(x)$, $u_t(x, 0) = \psi(x)$, $u_x(0, t) = 0$, $x \in (0, \infty)$, $t > 0$. (c) $u(x, 0) = \varphi(x)$, $u_t(x, 0) = \psi(x)$, $u(0, t) = 0$, $x \in (0, \infty)$, $t > 0$. (d) $u(x, 0) = \varphi(x)$, $u_t(x, 0) = \psi(x)$, $u(0, t) = 0$, $u(1, t) = 0$, $0 < x < 1$, $t > 0$.

4. Solution of Diffusion equation $\frac{\partial u}{\partial t} - k^2 \frac{\partial^2 u}{\partial x^2} = 0$ for the following associated conditions:

(a) $u(x, 0) = \varphi(x)$, $u(0, t) = a$, $u(l, t) = b$, $0 < x < l$, $t > 0$.

(b) $u(x, 0) = \varphi(x)$, $x \in \mathbb{R}$, $0 < t < T$.

(c) $u(x, 0) = \varphi(x)$, $u(0, t) = a$, $x \in (0, \infty)$, $t \geq 0$.

Book Recommended:

1. J.Sinha Roy and S. Padhy: A Course on Ordinary and Partial Differential Equations, Kalyani Publishers, New Delhi, Ludhiana, 2012.
Chapters: 8 (8.1-8.3), 11, 12, 13(13.1-13.5), 15(15.1 & 15.5 only), 16(16.1 & 16.1.1 only), 17(17.1-17.3).

Books for References:

1. Tyn Myint-U and Lokenath Debnath: Linear Partial Differential Equations for Scientists and Engineers, 4-th edition, Springer, Indian reprint, 2006.

2. S.L. Ross: Differential equations, 3-rd Ed., John Wiley and Sons, India, 2004.

SEMESTER-IV

C-8: NUMERICALMETHODS

(Total Marks: 100)

Part-I (Marks: 70)

04 Lectures (per week)

Unit-I

Rate of convergence, Algorithms, Errors: Relative, Absolute, Round off, Truncation. Numerical solution of non-linear equations : Bisection method, Regular-Falsi method, Secant method, Newton-Raphson method, Fixed-point Iteration method, Newton-Raphson method for multiple roots, Aitken's O^2 process, Muller's method. Rate of convergence of these methods.

Unit-II

System of linear equations: Gaussian Elimination method, Gauss-Jordan method, Gauss Jacobi method, Gauss-Seidel method and their convergence analysis, .

Unit-III

Polynomial interpolation: Existence uniqueness of interpolating polynomials, Lagrange and Newtons divided difference interpolation, Error in interpolation, Central difference & averaging operators, Gauss-forward and backward difference interpolation, Simple numerical methods for derivatives, Interpolatory formulas.

Unit-IV

Numerical Integration: Some simple quadrature rules, Newton-Cotes rules, Trapezoidal rule, Simpsons rule, Simpsons $\frac{3}{8}$ -th rule, Compound quadrature rules, Compound mid-point rule, Compound

Trapezoidal rule, Compound Simpsons rule, Gauss-Legendre 2-point & 3-point rules. Numerical solutions of Differential Equations: Eulers method. Runge-Kutta methods of orders two, three and four.

Part-II(PRACTICAL)

(Marks: 30)

List of Practical (Using any Software/MATLAB) Practical/Lab work to be performed on a Computer.

1. Calculate the sum $1/1 + 1/2 + 1/3 + 1/4 + \dots + 1/N$.
2. To find the absolute value of an integer.
3. Enter 100 integers into an array and sort them in an ascending order.

4. Bisection Method.
5. Newton-Raphson Method.
6. Secant Method.
7. Regular-Falsi Method.
8. LU decomposition Method.
9. Gauss-Jacobi Method.
10. SOR Method or Gauss-Siedel Method.
11. Lagrange Interpolation or Newton Interpolation.
12. Simpsons rule.

Note: For any of the CAS (Computer aided software) Data types-simple data types, floating data types, character data types, arithmetic operators and operator precedence, variables and constant declarations, expressions, input/output, relational operators, logical operators and logical expressions, control statements and loop statements, arrays should be introduced to the students.

Book Recommended:

1. B.P. Acharya and R.N. Das: A Course on Numerical Analysis, Kalyani Publishers, New Delhi, Ludhiana. Chapters: 0(0.2, 0.8), 1(1.8, 1.9), 2(2.1-2.4, 2.6-2.9), 3(3.1-3.4, 3.6-3.11), 5(5.1- 5.3), 6(6.1-6.3, 6.5, 6.10, 6.11), 7(7.1-7.5 & 7.7).
2. Brian Bradie, A Friendly Introduction to Numerical Analysis, Pearson Education, India, 2007.

Books for Reference:

1. M.K. Jain, S.R.K. Iyengar and R.K. Jain: Numerical Methods for Scientific and Engineering Computation, 6th Ed., New age International Publisher, India, 2007.
2. C.F. Gerald and P.O. Wheatley: Applied Numerical Analysis, Pearson Education, India, 2008.
3. Uri M. Ascher and Chen Greif: A First Course in Numerical Methods, 7th Ed., PHI Learning Private Limited, 2013.
4. John H. Mathews and Kurtis D. Fink: Numerical Methods using Matlab, 4th Ed., PHI Learning Private Limited, 2012.
5. P. Khandasamy, K. Thilagavathy and K. Gunavathi: Numerical Methods, S. Chand & Company Ltd., 2012.
6. E. Balagurusamy: Numerical Methods, Tata McGraw-Hill Pub. Co. Ltd., 1999.

C-9: RIEMANN INTEGRATION & SERIES OF FUNCTIONS (ANALYSIS-III)

Total Marks: 100-(Theory: 80 Marks+Mid-Sem: 20 Marks)

5 Lectures, 1 Tutorial (per week)

Unit-I

Riemann integration, Inequalities of upper and lower sums, Riemann conditions of integrability. Riemann sum and definition of Riemann integral through Riemann sums, Equivalence of two definitions, Riemann integrability of monotone and continuous functions, Properties of the Riemann integral, Definition and integrability of piecewise continuous and monotone functions, Fundamental theorems of Calculus.

Unit-II

Improper integrals; Series and Integrals, Absolute convergence of integrals, Convergence of Beta and Gamma functions.

Unit-III

Point-wise and Uniform convergence of sequence of functions, Cauchy's criterion & Weierstrass M-test for uniform convergence, Dedekind test, Uniform convergence and Continuity, Term by term integration of series, Term by term differentiation of series.

Unit-IV

Power series (Cauchy Hadamard Theorem), Radius of convergence, Differentiation and integration of power series, Abels Limit Theorem, Stirling's formula, More about Taylor's series, Weierstrass Approximation Theorem.

Books Recommended:

1. G. Das and S. Pattanayak: Fundamentals of Mathematics Analysis, TMH Publishing Co., Chapters: 4(4.14 only), 8 (8.1-8.6), 9 (9.1-9.6, 9.8).
2. S.C. Mallik and S. Arora: Mathematical Analysis, New Age International Ltd., New Delhi, Chapters: 11(3.3, 4.3 only), 12(Restricted).

Books for Reference:

1. K.A. Ross, Elementary Analysis: The Theory of Calculus, Undergraduate Texts in Mathematics, Springer (SIE), Indian reprint, 2004.
2. R.G. Bartle D.R. Sherbert: Introduction to Real Analysis, 3rd Ed., John Wiley and Sons (Asia) Pvt. Ltd., Singapore, 2002.
3. Charles G. Denlinger: Elements of Real Analysis, Jones & Bartlett (Student Edition), 2011.
4. Shanti Narayan and M.D. Raisinghania: Elements of Real Analysis, S. Chand & Co. Pvt. Ltd.

C-10: RING THEORY & LINEAR ALGEBRA (ALGEBRA-III)

Total Marks: 100-(Theory: 80 Marks+Mid-Sem: 20 Marks)

5 Lectures, 1 Tutorial (per week)

Unit-I

Definition and examples of rings, Properties of rings, Subrings, Integral domains and Fields, Characteristic of a ring, Ideal, Ideal generated by a subset of a ring, Factor rings, Operations on Ideals, Prime and Maximal ideals.

Unit-II

Ring homomorphisms, Properties of ring homomorphisms, Isomorphism Theorems I, II and III, Field of quotients.

Unit-III

Vector spaces, Subspaces, Algebra of subspaces, Quotient spaces, Linear combination of vectors, Linear span, Linear independence, Basis and Dimension, Dimension of subspaces.

Unit-IV

Linear transformations, Null space, Range, Rank and Nullity of a linear transformation, Matrix representation of a linear transformation, Algebra of linear transformations. Isomorphisms, Isomorphism theorems, Invertibility and Isomorphisms, Change of co-ordinate matrix.

Book Recommended:

1. Joseph A. Gallian: Contemporary Abstract Algebra(8th Edn.), Narosa Publishing House, New Delhi. Chapters: 12, 13, 14, 15.
2. Stephen H. Friedberg, Arnold J. Insel, and Lawrence E. Spence: Linear Algebra, 4th Ed., Prentice- Hall of India Pvt. Ltd., New Delhi, 2004. Chapters: 1 (1.2-1.6), 2(2.1-2.5).

Books for Reference:

1. John B. Fraleigh: A First Course in Abstract Algebra, 7th Ed., Pearson, 2002.
2. M. Artin: Abstract Algebra, 2nd Ed., Pearson, 2011.
3. S. Lang: Introduction to Linear Algebra, 2nd Ed., Springer, 2005.
4. Gilbert Strang: Linear Algebra and its Applications, Cengage Learning India Pvt. Ltd.
5. S. Kumaresan: Linear Algebra- A Geometric Approach, Prentice Hall of India,1999.
6. Kenneth Hoffman, and Ray Alden Kunze: Linear Algebra, 2nd Ed., Prentice-Hall of India Pvt. Ltd., 1971.
7. I.N. Herstein: Topics in Algebra, Wiley Eastern Pvt. Ltd.

SEMESTER-V

C-11: MULTIVARIATE CALCULUS (CALCULUS-II)

Total Marks: 100-(Theory:80 Marks+Mid-Sem: 20 Marks)

5 Lectures, 1 Tutorial (per week)

Unit-I

Functions of several variables, limit and continuity of functions of two variables, Partial differentiation, Tangent planes, Approximation and Differentiability, Chain rule for one and two independent parameters.

Unit-II

Directional derivatives and gradient, Maximal property of the gradient, Normal property of the gradient, Tangent planes and the normal lines, Extrema of functions of two variables, Method of Lagrange multipliers, Lagrange Multipliers, Constrained optimization problems, A geometrical interpretation.

Unit-III

Double integration over rectangular region and over non-rectangular region, Double integrals in polar co-ordinates, Triple integrals, Triple integral over a parallelepiped and solid regions, Volume by triple integrals. cylindrical and spherical co-ordinates. Change of variables in double integrals and triple integrals.

Unit-IV

Definition of vector field, Divergence and Curl, Line integrals, Applications of line integrals: Mass and Work, Fundamental theorem and path independence for line integrals.

Unit-V

Green's theorem, Area as a line integral, Alternative forms of Green's theorem, Normal derivatives, Surface integrals, Integrals over parametrically defined surfaces. Stokes theorem, The Divergence theorem.

Book Recommended:

1. M.J. Strauss, G.L. Bradley and K. J. Smith: Calculus, 3rd Ed., Dorling Kindersley (India) Pvt. Ltd. (Pearson Education), Delhi, 2007. Chapters: 11(11.1(Pages: 541-543), 11.2- 11.6, 11.7(Pages:598-605), 11.8(Pages:610-614)), 12 (12.1, -12.3, 12.4(Pages:652-660), 12.5, 12.6), 13 (13.1-13.3, 13.4(Pages:712-716, 718-720), 13.5(Pages:723-726; 729-730), 13.6 (Pages:733-737), 13.7(Pages:742-745)).

Books for Reference:

1. G.B. Thomas and R.L. Finney: Calculus, 9th Ed., Pearson Education, Delhi, 2005.
2. E. Marsden, A.J. Tromba and A. Weinstein: Basic Multivariable Calculus, Springer (SIE), Indian reprint, 2005.
3. Santosh K. Sengar and S.P. Singh: Advanced Calculus, Cengage Learning India Pvt. Ltd.

C-12: PROBABILITY & STATISTICS

Total Marks:100-(Theory: 80 Marks+Mid-Sem: 20 Marks)

4 Lectures, 1 Tutorial (per week)

Unit-I

Sample space, Probability axioms, Independent events, Conditional probability & Bayes' theorem, Real random variables (discrete and continuous), Cumulative distribution function, Expectation of random variables, Some special expectations.

Unit-II

Multivariate distributions, Joint cumulative distribution functions, Joint probability distributions, Marginal & conditional distributions, Some probability distributions(Discrete case), Uniform distribution, Binomial distribution, Negative Binomial & Geometric distributions, Poisson distribution.

Unit-III

Some probability distributions(Continuous case), Uniform, Gamma, Exponential, Beta distributions, Normal distributions, Normal approximation to the Binomial distribution, Bivariate normal distribution.

Unit-IV

Distribution of two random variables, Expectation of function of two random variables, Moment generating functions, Conditional distributions & expectations, Correlation coefficient, Co-variance, Independent random variables, Linear regression for two variables.

Unit-V

Limit theorems, Markov's inequality, Chebyshev's inequality, Statement and interpretation of Weak and Strong law of large numbers, Central Limit theorem for independent and identically distributed random variables with finite variance, Markov Chains: Introduction, Chapman-Kolmogorov equations.

Books Recommended:

1. Irwin Miller and Marylees Miller, John E. Freund: Mathematical Statistics with Applications, 7th Ed., Pearson Education, Asia, 2006. Chapters: 2 (excluding Art.9), 3 (excluding Art.8), 4, 5(5.1, 5.2, 5.4, 5.5,5.7), 6(6.1-6.7), 14(14.1, 14.2)
2. Sheldon Ross: Introduction to Probability Models, 9th Ed., Academic Press, Indian Reprint, 2007. Chapters:8(8.1-8.4(up to pages 428)), 9(9.1, 9.2).

Books for Reference:

1. Alexander M. Mood, Franklin A. Graybill and Duane C. Boes: Introduction to the Theory of Statistics, 3rd Ed., Tata McGraw- Hill, Reprint 2007.
2. S.C. Gupta and V.K. Kapoor: Fundamentals of Mathematical Statistics, S. Chand and Company Pvt. Ltd., New Delhi.
3. Sheldon Ross: A First Course in Probability, Pearson Education.
4. Robert V. Hogg, Joseph W. McKean and Allen T. Craig: Introduction to Mathematical Statistics, Pearson Education, Asia, 2102.

5. Kai Lai Chung: Elementary Probability Theory with Stochastic Processes, 3-rd Edn., Springer International Student Edition.

SEMESTER-VI

C-13: METRIC SPACES & COMPLEX ANALYSIS (ANALYSIS-IV)

Total Marks: 100-(Theory: 80 Marks+Mid-Sem: 20 Marks)

5 Lectures, 1 Tutorial (per week)

Unit-I

Metric spaces: Definition and examples, Open & Closed spheres, Neighborhoods, Interior points, Open set, Closed set, Boundary points, Limit points & isolated points, Closure of a set, Dense sets, Separable metric spaces, Sequences in metric spaces, Convergent sequences, Cauchy sequences, Complete metric spaces, Distance between sets & diameter of a set, Subspaces, Cantor's theorem.

Unit-II

Continuous functions: Definition & characterizations, Sequential criterion and other characterizations of continuity, Uniform continuity, Homeomorphism, Connectedness, Connected subsets of \mathbb{R} , Separated sets, Disconnected sets, Contraction mappings, Banach Fixed point theorem.

Unit-III

Properties of complex numbers, Regions in the complex plane, Functions of complex variable, Mappings, Limits & Continuity of complex functions, Derivatives, Differentiation formulas, Cauchy-Riemann equations, Sufficient conditions for differentiability, Polar Co-ordinates, Analytic functions, Examples of analytic functions.

Unit-IV

Exponential function, Logarithmic function, Trigonometric function, Derivatives of these functions, Definite integrals of functions, Contours, Contour integrals and its examples, Upper bounds for moduli of contour integrals, Theorems on antiderivatives, Cauchy- Goursat theorem (statement only), Cauchy integral formula, Its extension and consequences.

Unit-V

Liouville's theorem and the Fundamental theorem of Algebra, Convergence of sequences and series, Taylor series with examples, Laurent series (without proof) with examples, Absolute and uniform convergence of power series.

Books Recommended:

1. P.K. Jain and K. Ahmad: Metric Spaces, Narosa Publishing House, New Delhi. Chapters: 2(1-9, 12), 3(1-4), 4(1-4), 6(1-2, 4), 7(1 only).
2. James Ward Brown and Ruel V. Churchill: Complex Variables and Applications, 8th Ed., McGraw Hill International Edition, 2009. Chapters: 1(11 only), 2(12, 13, 15-25), 3(29, 30, 34), 4(37-41, 43-46, 50-53), 5(55-60, 62,63,66).

Books for Reference:

1. Satish Shirali and Harikishan L. Vasudeva: Metric Spaces, Springer Verlag, London, 2006.
2. S. Kumaresan: Topology of Metric Spaces, 2nd Ed., Narosa Publishing House, 2011.
3. S. Arumgum, A.T. Issac and A. Somasundaram: Complex Analysis, Scitech Publ. Pvt. Ltd.
4. S. Ponnusamy: Foundations of Complex Analysis, Alpha Science International Ltd.
5. J.B. Conway: Functions of one complex variable, Springer International Student Edn..
6. N. Das: Complex Function Theory, Allied Publishers Pvt. Ltd., Mumbai.

C-14: LINEAR PROGRAMMING

Total Marks: 100-(Theory: 80 Marks+Mid-Sem: 20 Marks)

5 Lectures, 1 Tutorial (per week)

Unit-I

Introduction to linear programming problems(LPP), Mathematical formulation of the LPP with illustrations, Graphical method, General Linear programming problems, Canonical & standard form of LPP.

Unit-II

Theory of Simplex method, Optimality and unboundedness, the Simplex algorithm, Simplex method in tableau format, Introduction to artificial variables, Two-phase method, Big-M method and their comparisons.

Unit-III

Duality in LPP: Introduction, General Primal-Dual pair, Formulation of the Dual problem, Primal- Dual relationships, Duality theorems, Complementary slackness theorem, Duality & Simplex method, Economic interpretation of the Duality.

Unit-IV

Transportation Problem(TP): LP formulation of TP, Existence of solution and Duality in TP, Solution of Transportation problems, North-West corner method, Least-Cost method and Vogel approximation method for determination of starting basic solution, Algorithm for solving transportation problem, Assignment problem and its mathematical formulation, Solution methods of Assignment problem, Special cases in Assignment problems.

Unit-V

Games and Strategies: Introduction, Formulation of two person zero sum games, solving two person zero sum games, Maximin-Minimax principle, Games without saddle points, Games with mixed strategies, Graphical solution procedure to $(2 \times n)$ and $(m \times 2)$ games.

Book Recommended:

1. Kanti Swarup, P.K. Gupta and Man Mohan: Operations Research, S. Chand and Co. Pvt. Ltd., Chapters: 2, 3, 4, 5(5.1-5.8), 10(10.1-10.10), 11(11.1-11.4), 17(17.1-17.6).

Books for Reference:

1. G. Hadley: Linear Programming, Narosa Publishing House, New Delhi, 2002.
2. N.V.R. Naidu, G. Rajendra and T. Krishna Rao: Operations Research, I.K. International Publishing House Pvt. Ltd., New Delhi, Bangalore.
3. R. Veerachamy and V. Ravi Kumar: Operations Research- I.K. International Publishing House Pvt. Ltd., New Delhi, Bangalore.
4. P.K. Gupta and D.S. Hira: Operations Research, S. Chand and Company Pvt. Ltd., New Delhi.
5. Mokhtar S. Bazaraa, John J. Jarvis and Hanif D. Sherali: Linear Programming and Network Flows, 2-nd Ed., John Wiley and Sons, India, 2004.
6. F.S. Hillier and G.J. Lieberman: Introduction to Operations Research, 9-th Ed., Tata McGraw Hill, Singapore, 2009.
7. Hamdy A. Taha: Operations Research, An Introduction, 8-th Ed., PrenticeHall India, 2006.

DISCIPLINE SPECIFIC ELECTIVES(DES)

DSE-1 Programming in C++ (Compulsory)

(Total Marks; 100)

Part-I(Marks: 70)

Introduction to structured programming: data types- simple data types, floating data types, character data types, string data types, arithmetic operators and operators precedence, variables and constant declarations, expressions, input using the extraction operator `&&` and `cin`, output using the insertion operator `ij` and `cout`, preprocessor directives, increment(++) and decrement(–) operations, creating a C++ program, input/ output, relational operators, logical operators and logical expressions, if and if-else statement, switch and break statements. for, while and do-while loops and continue statement, nested control statement, value returning functions, value versus reference parameters, local and global variables, one dimensional array, two dimensional array, pointer data and pointer variables.

Book Recommended:

1. D. S. Malik: C++ Programming Language, Edition-2009, Course Technology, Cengage Learning, India Edition. Chapters: 2(Pages:37-95), 3(Pages:96-129), 4(Pages:134-178), 5(Pages:181- 236), 6, 7(Pages:287-304), 9 (pages: 357-390), 14(Pages:594-600).

Books for Reference:

1. E. Balaguruswami: Object oriented programming with C++, fifth edition, Tata McGraw Hill Education Pvt. Ltd.
2. R. Johnsonbaugh and M. Kalin-Applications Programming in ANSI C, Pearson Education.
3. S. B. Lippman and J. Lajoie, C++ Primer, 3rd Ed., Addison Wesley, 2000.
4. Bjarne Stroustrup , The C++ Programming Language, 3rd Ed., Addison Welsley.

Part-II(PRACTICAL, Marks:30)

List of Practicals (Using any software) Practical/Lab work to be performed on a Computer.

1. Calculate the Sum of the series $\frac{1}{1} \pm \frac{1}{2} \pm \frac{1}{3} + \frac{1}{N}$ for any positive integer N .
2. Write a user defined function to find the absolute value of an integer and use it to evaluate the function $(-1)^n/|n|$, for $n = -2, -1, 0, 1, 2$.
3. Calculate the factorial of any natural number.
4. Read floating numbers and compute two averages: the average of negative numbers and the average of positive numbers.
5. Write a program that prompts the user to input a positive integer. It should then output a message indicating whether the number is a prime number.
6. Write a program that prompts the user to input the value of a, b and c involved in the equation $ax^2+bx+c=0$ and outputs the type of the roots of the equation. Also the program should outputs all the roots of the equation.
7. write a program that generates random integer between 0 and 99. Given that first two Fibonacci numbers are 0 and 1, generate all Fibonacci numbers less than or equal to generated number.
8. Write a program that does the following:
 - a. Prompts the user to input five decimal numbers.
 - b. Prints the five decimal numbers.
 - c. Converts each decimal number to the nearest integer.
 - d. Adds these five integers.
 - e. Prints the sum and average of them.
9. Write a program that uses whileloops to perform the following steps:
 - a. Prompt the user to input two integers :first Num and second Num (first Num shoul be less than second Num).
 - b. Output all odd and even numbers between first Num and second Num.
 - c. Output the sum of all even numbers between first Num and second Num.
 - d. Output the sum of the square of the odd numbers firs tNum and second Num.
 - e. Output all uppercase letters corresponding to the numbers between first Num and second Num, if any.

10. Write a program that prompts the user to input five decimal numbers. The program should then add the five decimal numbers, convert the sum to the nearest integer, and print the result.
11. Write a program that prompts the user to enter the lengths of three sides of a triangle and then outputs a message indicating whether the triangle is a right triangle or a scalene triangle.
12. Write a value returning function smaller to determine the smallest number from a set of numbers. Use this function to determine the smallest number from a set of 10 numbers.
13. Write a function that takes as a parameter an integer (as a long value) and returns the number of odd, even, and zero digits. Also write a program to test your function.
14. Enter 100 integers into an array and sort them in an ascending/ descending order and print the largest/ smallest integers.
15. Enter 10 integers into an array and then search for a particular integer in the array.
16. Multiplication/ Addition of two matrices using two dimensional arrays.
17. Using arrays, read the vectors of the following type: $A = (12345678)$, $B = (02340156)$ and compute the product and addition of these vectors.
18. Read from a text file and write to a text file.
19. Write a function, reverse Digit, that takes an integer as a parameter and returns the number with its digits reversed. For example, the value of function reverse Digit 12345 is 54321 and the value of reverse Digit -532 is -235.

DSE-2

Total Marks:100-(Theory: 80 Marks+Mid-Sem: 20 Marks)

5 Lectures, 1 Tutorial (per week)

(Any one of the following)

1-DISCRETE MATHEMATICS

Unit-I

Propositional Logic, Propositional equivalences, Predicates and Quantifiers, Nested quantifiers, Rules of Inference, Methods of proof, Relations and their properties, n-ary relations and their applications, The basic counting, the Pigeon-hole principle, Generalized Permutations and Combinations.

Unit-II

Recurrence relations, Modelling with recurrence relations, Solving linear homogeneous recurrence relations with constant coefficients, Generating functions, Solving recurrence relations using generating functions, Principle of Inclusion-Exclusion & applications.

Unit-III

Partially ordered sets, Hasse diagram of partially ordered sets, maps between ordered sets, Boolean

expressions and Boolean functions, Duality principle, Lattices as ordered sets, Lattices as algebraic structures, sublattices, Boolean algebra and its properties.

Unit-IV

Graphs: Basic concepts and graph terminology, representing graphs and graph isomorphism, Cut-vertices and Cut-edges, Distance in a graph (restricted), Connectivity, Euler and Hamiltonian path, Shortest-Path problems, Planar graphs, Graph coloring.

Book Recommended:

1. Kenneth H. Rosen: Discrete Mathematics and Applications, Tata McGraw Hill Publications, Chapters: 1(1.1-1.6), 4(4.1, 4.2, 4.5), 5(5.1, 5.2, 5.5), 6(6.1, 6.2, 6.4-6.6), 7(7.1, 7.2), 8, 10(10.1, 10.2).

Books for References:

1. B A. Davey and H. A. Priestley: Introduction to Lattices and Order, Cambridge University Press, Cambridge, 1990.
2. Edgar G. Goodaire and Michael M. Parmenter: Discrete Mathematics with Graph Theory (2nd Edition), Pearson Education (Singapore) Pte. Ltd., Indian Reprint 2003.
3. Rudolf Lidl and Gnter Pilz: Applied Abstract Algebra (2nd Edition), Undergraduate Texts in Mathematics, Springer (SIE), Indian reprint, 2004.
4. D.S. Malik: Discrete Mathematics: Theory & Applications, Cengage Learning India Pvt. Ltd.
5. Kevin Ferland: Discrete Mathematical Structures, Cengage Learning India Pvt. Ltd.

2-MATHEMATICAL MODELLING

Unit-I

Simple situations requiring Mathematical modelling. The technique of Mathematical modelling, Mathematical modelling through differential equations, linear growth and decay models, non-linear growth and decay models, compartment models, Mathematical modelling of geometrical problems through ordinary differential equations of first order.

Unit-II

Mathematical modelling in population dynamics, Mathematical modelling of epidemics through systems of ordinary differential equations of first order, compartment models through systems of ordinary differential equations, Mathematical modelling in economics through systems of ordinary differential equations of first order.

Unit-III

Mathematical models in medicine, arms race, battles and international trade in terms of systems of ordinary differential equations, Mathematical modelling of planetary motions, Mathematical modelling of circular motion and motion of satellites, mathematical modelling through linear differential equations of second order.

Unit-IV

Situation giving rise to partial differential equations models, mass balance equations: First method of getting PDE models, momentum balance equations. The second method of obtaining partial differential models, variational principles, third function, fourth method of obtaining partial differential equation models, models for traffic flow of a highway. Situation that can be modelled through graphs, mathematical models in terms of directed graphs, optimization principles and techniques, Mathematical modelling through calculus of variations.

Book Recommended:

1. J.N. Kapur: Mathematical Modelling, Chapters: 1(1.1 and 1.2), 2(2.1 to 2.4, 2.6), 3(3.1 to 3.5), 4(4.1 to 4.3), 6(6.1 to 6.6), 7(7.1 to 7.2), 9(9.1 and 9.2).

3-NUMBER THEORY

Unit-I

Divisibility theorem in integers, Primes and their distributions, Fundamental theorem of arithmetic, Greatest common divisor, Euclidean algorithms, Modular arithmetic, Linear Diophantine equation, prime counting function, statement of prime number theorem, Goldbach conjecture.

Unit-II

Introduction to congruences, Linear Congruences, Chinese Remainder theorem, Polynomial congruences, System of linear congruences, complete set of residues, Chinese remainder theorem, Fermats little theorem, Wilsons theorem.

Unit-III

Number theoretic functions, sum and number of divisors, totally multiplicative functions, definition and properties of the Dirichlet product, the Mbius inversion formula, the greatest integer function, Eulers phi function, Eulers theorem, reduced set of residues, some properties of Eulers phi-function.

Unit-IV

Order of an integer modulo n , primitive roots for primes, composite numbers having primitive roots, Eulers criterion, the Legendre symbol and its properties, quadratic reciprocity, quadratic congruences with composite moduli.

Book Recommended:

1. D.M. Burton: Elementary Number Theory, McGraw Hill, Chapters: 2(2.1 to 2.4), 3(3.1 to 3.3), 4(4.1 to 4.4), 5(5.1 to 5.4), 6(6.1 to 6.3), 7(7.1 to 7.3), 8(8.1 to 8.2), 9(9.1 to 9.3).

Books for Reference:

1. K.H. Rosen: Elementary Number Theory & its Applications, Pearson Addition Wesley.
2. I. Niven and H.S. Zuckerman: An Introduction to Theory of Numbers, Wiley Eastern Pvt. Ltd.

3. Tom M. Apostol: Introduction to Analytic Number Theory, Springer International Student Edn.
4. Neville Robinns: Beginning Number Theory (2nd Edition), Narosa Publishing House Pvt. Limited, Delhi, 2007.

4-BOOLEAN ALGEBRA & AUTOMATA THEORY

Unit-I

Definition, examples and basic properties of ordered sets, maps between ordered sets, duality principle, lattices as ordered sets, lattices as algebraic structures, sublattices, products and homomorphisms. Definition, examples and properties of modular and distributive lattices, Boolean algebras, Boolean polynomials, minimal forms of Boolean polynomials, QuinnMcCluskey method, Karnaugh diagrams, switching circuits and applications of switching circuits.

Unit-II

Introduction: Alphabets, strings, and languages. Finite Automata and Regular Languages: deterministic and non-deterministic finite automata, regular expressions, regular languages and their relationship with finite automata, pumping lemma and closure properties of regular languages.

Unit-III

Context Free Grammars and Pushdown Automata: Context free grammars (CFG), parse trees, ambiguities in grammars and languages, pushdown automaton (PDA) and the language accepted by PDA, deterministic PDA, Non- deterministic PDA, properties of context free languages; normal forms, pumping lemma, closure properties, decision properties.

Unit-IV

Turing Machines: Turing machine as a model of computation, programming with a Turing machine, variants of Turing machine and their equivalence. Undecidability: Recursively enumerable and recursive languages, undecidable problems about Turing machines: halting problem, Post Correspondence Problem, and undecidability problems About CFGs.

Books Recommended:

1. B A. Davey and H. A. Priestley, Introduction to Lattices and Order, Cambridge University Press, Cambridge, 1990.
2. Edgar G. Goodaire and Michael M. Parmenter, Discrete Mathematics with Graph Theory, (2nd Ed.), Pearson Education (Singapore) P.Ltd., Indian Reprint 2003.
3. Rudolf Lidl and Gnter Pilz, Applied Abstract Algebra, 2nd Ed., Undergraduate Texts in Mathematics, Springer (SIE), Indian reprint, 2004.
4. J. E. Hopcroft, R. Motwani and J. D. Ullman, Introduction to AutomataTheory, Languages, and Computation, 2nd Ed., Addison-Wesley, 2001.
5. H.R. Lewis, C.H. Papadimitriou, C. Papadimitriou, Elements of the Theory of Computation, 2nd Ed., Prentice-Hall, NJ, 1997.

6. J.A. Anderson, Automata Theory with Modern Applications, Cambridge University Press, 2006.

DSE-3

**Total Marks:100-(Theory:80 Marks+Mid-Sem:20 Marks) 5 Lectures,
1 Tutorial (per week)
(Any one of the following)**

1-DIFFERENTIAL GEOMETRY

Unit-I

Theory of Space Curves: Space curves, Planer curves, Curvature, torsion and Serret-Frenet formulae. Osculating circles, Osculating circles and spheres. Existence of space curves. Evolutes and involutes of curves.

Unit-II

Osculating circles, Osculating circles and spheres. Existence of space curves. Evolutes and involutes of curves.

Unit-III

Developables: Developable associated with space curves and curveson surfaces, Minimal surfaces.

Unit-IV

Theory of Surfaces: Parametric curves on surfaces. Direction coefficients. First and second Fundamental forms. Principal and Gaussian curvatures. Lines of curvature, Eulers theorem. Rodrigues formula, Conjugate and Asymptotic lines.

Book Recommended:

1. C.E. Weatherburn, Differential Geometry of Three Dimensions, Cambridge University Press 2003. Chapters:1(1-4, 7,8,10), 2(13, 14, 16, 17), 3, 4(29-31, 35, 37, 38).

Books for References

1. T.J. Willmore, An Introduction to Differential Geometry, Dover Publications, 2012.
2. S. Lang, Fundamentals of Differential Geometry, Springer, 1999.
3. B. O'Neill, Elementary Differential Geometry, 2nd Ed., Academic Press, 2006.
4. A.N. Pressley-Elementary Differential Geometry, Springer.
5. B.P. Acharya and R.N. Das-Fundamentals of Differential Geometry, Kalyani Publishers, Ludhiana, New Delhi.

2-MECHANICS

Unit-I

Moment of a force about a point and an axis, couple and couple moment, Moment of a couple about a line, resultant of a force system, distributed force system, free body diagram, free body involving interior sections, general equations of equilibrium, two point equivalent loading, problems arising from structures, static indeterminacy.

Unit-II

Laws of Coulomb friction, application to simple and complex surface contact friction problems, transmission of power through belts, screw jack, wedge, first moment of an area and the centroid, other centers, Theorem of Pappus-Guldinus, second moments and the product of area of a plane area, transfer theorems, relation between second moments and products of area, polar moment of area, principal axes.

Unit-III

Conservative force field, conservation for mechanical energy, work energy equation, kinetic energy and work kinetic energy expression based on center of mass, moment of momentum equation for a single particle and a system of particles.

Unit-IV

Translation and rotation of rigid bodies, Chasles theorem, general relationship between time derivatives of a vector for different references, relationship between velocities of a particle for different references, acceleration of particle for different references.

Book Recommended:

1. I.H. Shames and G. Krishna Mohan Rao, Engineering Mechanics: Statics and Dynamics, (4th Ed.), Dorling Kindersley (India) Pvt. Ltd. (Pearson Education), Delhi, 2009. Chapters:3, 4, 5, 6(6.1-6.7), 7, 11, 12(12.5, 12.6), 13.

Books for Reference:

1. R.C. Hibbeler and Ashok Gupta, Engineering Mechanics: Statics and Dynamics, 11th Ed., Dorling Kindersley (India) Pvt. Ltd. (Pearson Education), Delhi.
2. Grant R Fowles, Analytical Mechanics, Cengage Learning India Pvt. Ltd.

3-MATHEMATICAL FINANCE

Unit-I

Basic principles: Comparison, arbitrage and risk aversion, Interest (simple and compound, discrete and continuous), time value of money, inflation, net present value, internal rate of return (calculation by bisection and Newton-Raphson methods), comparison of NPV and IRR. Bonds, bond prices and yields, Macaulay and modified duration, term structure of interest rates: spot and forward rates, explanations of term structure, running present value, floating-rate bonds, immunization, convexity, puttable and callable bonds.

Unit-II

Asset return, short selling, portfolio return, (brief introduction to expectation, variance, covariance

and correlation), random returns, portfolio mean return and variance, diversification, portfolio diagram, feasible set, Markowitz model (review of Lagrange multipliers for 1 and 2 constraints), Two fund theorem, risk free assets, One fund theorem, capital market line, Sharpe index. Capital Asset Pricing Model (CAPM), betas of stocks and portfolios, security market line, use of CAPM in investment analysis and as a pricing formula, Jensen's index.

Unit-III

Forwards and futures, marking to market, value of a forward/futures contract, replicating portfolios, futures on assets with known income or dividend yield, currency futures, hedging (short, long, cross, rolling), optimal hedge ratio, hedging with stock index futures, interest rate futures, swaps.

Unit-IV

Lognormal distribution, Lognormal model / Geometric Brownian Motion for stock prices, Binomial Tree model for stock prices, parameter estimation, comparison of the models. Options, Types of options: put / call, European / American, pay off of an option, factors affecting option prices, put call parity.

Books Recommended:

1. David G. Luenberger, Investment Science, Oxford University Press, Delhi, 1998. Chapters:1, 2, 3, 4, 6, 7, 8(8.5-8.8), 10(except 10.11, 10.12), 11(except 11.2 11.8).
2. John C. Hull, Options, Futures and Other Derivatives (6th Edition), Prentice-Hall India, Indian reprint, 2006. Chapters: 3, 5, 6, 7(except 7.10, 7.11), 8, 9.
3. Sheldon Ross, An Elementary Introduction to Mathematical Finance (2nd Edition), Cambridge University Press, USA, 2003. Chapter:3

Books for References:

1. R.C. Hibbeler and Ashok Gupta, Engineering Mechanics: Statics and Dynamics, 11th Ed., Dorling Kindersley (India) Pvt. Ltd. (Pearson Education), Delhi.
2. Grant R Fowles, Analytical Mechanics, Cengage Learning India Pvt. Ltd.

4-RING THEORY & LINEAR ALGEBRA-II

Unit-I

Polynomial rings over commutative rings, division algorithm and consequences, principal ideal domains, factorization of polynomials, reducibility tests, irreducibility tests, Eisenstein criterion, unique factorization in $\mathbb{Z}[x]$.

Unit-II

Divisibility in integral domains, irreducibles, primes, unique factorization domains, Euclidean domains.

Unit-III

Dual spaces, dual basis, double dual, transpose of a linear transformation and its matrix in the

dual basis, annihilators, Eigenspaces of a linear operator, diagonalizability, invariant subspaces and Cayley-Hamilton theorem, the minimal polynomial for a linear operator.

Unit-IV

Inner product spaces and norms, Gram-Schmidt orthogonalisation process, orthogonal complements, Bessels inequality, the adjoint of a linear operator, Least Squares Approximation, minimal solutions to systems of linear equations, Normal and self-adjoint operators, Orthogonal projections and Spectral theorem.

Books Recommended:

1. Joseph A. Gallian: Contemporary Abstract Algebra (4th Ed.), Narosa Publishing House, 1999. Chapters: 16, 17, 18.
2. Stephen H. Friedberg, Arnold J. Insel, Lawrence E. Spence: Linear Algebra (4th Edition), Prentice-Hall of India Pvt. Ltd., New Delhi, 2004. Chapters: 2(2.6 only), 5(5.1, 5.2, 5.4), 6(6.1, 6.4, 6.6), 7(7.3 only).

Books for Reference:

(For LINEAR ALGEBRA)

1. S Lang: Introduction to Linear Algebra (2nd edition), Springer, 2005
2. Gilbert Strang: Linear Algebra and its Applications, Thomson, 2007
3. S. Kumaresan: Linear Algebra- A Geometric Approach, Prentice Hall of India, 1999.
4. 4. Kenneth Hoffman, Ray Alden Kunze: Linear Algebra 2nd Ed., Prentice-Hall Of India Pvt. Limited, 1971.

(For RING THEORY)

1. John B. Fraleigh: A first course in Abstract Algebra, 7th Edition, Pearson Education India, 2003.
2. Herstein: Topics in Algebra (2nd edition), John Wiley & Sons, 2006
3. Michael Artin: Algebra (2nd edition), Pearson Prentice Hall, 2011
4. Robinson, Derek John Scott.: An introduction to abstract algebra, Hindustan book agency, 2010.

DSE-4

PROJECT WORK/DISSERTATION (Compulsory)

Total Marks:100-(Project:75 Marks+Viva-Voce:25 Marks)

SKILL ENHANCEMENT COURSES (SEC)
(Credit: 2 each, Total Marks:50) SEC-1
to SEC-4

SEC-1

COMMUNICATIVE ENGLISH & WRITING SKILL (Compulsory)

SEC-2

(Any one of the following)

1-COMPUTER GRAPHICS

Development of computer Graphics: Raster Scan and Random Scan graphics storages, displays processors and character generators, colour display techniques, interactive input/output devices. Points, lines and curves: Scan conversion, line-drawing algorithms, circle and ellipse generation, conic-section generation, polygon filling anti aliasing. Two-dimensional viewing: Coordinate systems, linear transformations, line and polygon clipping algorithms.

Books Recommended:

1. D. Hearn and M.P. Baker-Computer Graphics, 2nd Ed., PrenticeHall of India, 2004.
2. J.D. Foley, A van Dam, S.K. Feiner and J.F. Hughes-Computer Graphics: Principals and Practices, 2nd Ed., Addison-Wesley, MA, 1990.
3. D.F. Rogers-Procedural Elements in Computer Graphics, 2nd Ed., McGraw Hill Book Company, 2001.
4. D.F. Rogers and A.J. Admas-Mathematical Elements in Computer Graphics, 2nd Ed., McGraw Hill Book Company, 1990.

2-LOGIC & SETS

Introduction, propositions, truth table, negation, conjunction and disjunction. Implications, biconditional propositions, converse, contra positive and inverse propositions and precedence of logical operators. Propositional equivalence: Logical equivalences. Predicates and quantifiers: Introduction, Quantifiers, Binding variables and Negations. Sets, subsets, Set operations and the laws of set theory and Venn diagrams. Examples of finite and infinite sets. Finite sets and counting principle. Empty set, properties of empty set. Standard set operations. Classes of sets. Power set of a set. Difference and Symmetric difference of two sets. Set identities, Generalized union and intersections. Relation: Product set, Composition of relations, Types of relations, Partitions, Equivalence Relations with example of congruence modulo relation, Partial ordering relations, nary relations.

Books Recommended:

1. R.P. Grimaldi-Discrete Mathematics and Combinatorial Mathematics, Pearson Education, 1998.
2. P.R. Halmos-Naive Set Theory, Springer, 1974.
3. E. Kamke-Theory of Sets, Dover Publishers, 1950.

3-COMBINATORIAL MATHEMATICS

Basic counting principles, Permutations and Combinations (with and without repetitions), Binomial theorem, Multinomial theorem, Counting subsets, Set-partitions, Stirling numbers Principle of Inclusion and Exclusion, Derangements, Inversion formulae Generating functions: Algebra of formal power series, Generating function models, Calculating generating functions, Exponential generating functions. Recurrence relations: Recurrence relation models, Divide and conquer relations, Solution of recurrence relations, Solutions by generating functions. Integer partitions, Systems of distinct representatives.

Books Recommended:

1. J.H. van Lint and R.M. Wilson-A Course in Combinatorics, 2nd Ed., Cambridge University Press, 2001.
2. V. Krishnamurthy-Combinatorics, Theory and Application, Affiliated East-West Press 1985.
3. P.J. Cameron-Combinatorics, Topics, Techniques, Algorithms, Cambridge University Press, 1995.
4. M. Jr. Hall-Combinatorial Theory, 2nd Ed., John Wiley & Sons, 1986.
5. S.S. Sane-Combinatorial Techniques, Hindustan Book Agency, 2013.
6. R.A. Brualdi-Introductory Combinatorics, 5th Ed., Pearson Education Inc., 2009.

4-INFORMATION SECURITY

Overview of Security: Protection versus security; aspects of security data integrity, data availability, privacy; security problems, user authentication, Orange Book. Security Threats: Program threats, worms, viruses, Trojan horse, trap door, stack and buffer over flow; system threats- intruders; communication threats- tapping and piracy. Security Mechanisms: Intrusion detection, auditing and logging, tripwire, system-call monitoring.

Books Recommended:

1. C. Pfleeger and S.L. Pfleeger-Security in Computing , 3rd Ed., Prentice-Hall of India, 2007.
2. D. Gollmann-Computer Security, John Wiley and Sons, NY, 2002.
3. J. Piwprzyk, T. Hardjono and J. Seberry-Fundamentals of Computer Security, Springer- Verlag Berlin, 2003.

4. J.M. Kizza-Computer Network Security, Springer, 2007.
5. M. Merkow and J. Breithaupt-Information Security: Principles and Practices, Pearson Education, 2006.

GENERIC ELECTIVES(Interdisciplinary)
(04 Papers, 02 papers each from two Allied disciplines) (Credit: 06 each,
Marks:100)
GE-1 to GE-4

GE-1 : CALCULUS & ORDINARY DIFFERENTIAL EQUATIONS

Total Marks:100-(Theory: 80 Marks+Mid-Sem: 20 Marks)

Unit-I

Curvature, Asymptotes, Tracing of Curves (Cartenary, Cycloid, Folium of Descartes), Rectification, Quadrature, Elementary ideas about Sphere, Cones, Cylinders and Conicoids.

Unit-II

Review of limits, continuity and differentiability of functions of one variables and their properties, Limit and Continuity of functions of several variables, Partial derivatives, Partial derivatives of higher orders, Homogeneous functions, Change of variables, Mean value theorem, Taylors theorem and Maclaurins theorem for functions of two variables(statements & applications).

Unit-III

Maxima and Minima of functions of two and three variables, Implicit functions, Lagranges multipliers (Formulae & its applications), Concepts of Multiple integrals & its applications.

Unit-IV

Ordinary Differential Equations of order one and degree one (variables separable, homogeneous, exact and linear). Equations of order one but higher degree. Second order linear equations with constant coefficients, homogeneous forms, Second order equations with variable coefficients, Variation of parameters.

Books Recommended:

1. S.K. Sengar and S.P. Singh: Advanced Calculus, Cengage Learning India Pvt. Ltd.(6th Indian Reprint), Chapters: 1(1.11-1.14 restricted), 2(2.1-2.13 restricted), 4(4.1-4.11), 5, 7(7.1-7.3 restricted), 11(restricted).
2. Shantinayakan: Text Book of Calculus, Part-II, S. Chand and Co., Chapter-8 (Art. 24, 25, 26)
3. Shantinayakan: Text Book of Calculus, Part-III, S. Chand and Co., Chapter-1 (Art 1,2), 3, 4(Art. 10 to 12 ommitting Simpsons Rule), 5(Art-13) and 6(Art-15).
4. B.P. Acharya and D.C. Sahu: Analytical Geometry of Quadratic Surfaces, Kalyani Publishers, New Delhi, Ludhiana.

5. J. Sinharoy and S. Padhy: A Course of Ordinary and Partial Differential Equations, Kalyani Publishers. Chapters: 2(2.1 to 2.7), 3, 4(4.1 to 4.7), 5.

Books for Reference:

1. Shanti Narayan and P.K. Mittal: Analytical Solid Geometry, S. Chand & Company Pvt.Ltd., New Delhi.
2. David V. Weider: Advanced Calculus, Dover Publications.
3. Martin Braun: Differential Equations and their Applications-Martin Braun, Springer International.
4. M.D. Raisinghania: Advanced Differential Equations, S. Chand & Company Ltd., New Delhi.
5. G. Dennis Zill: A First Course in Differential Equations with Modelling Applications, Cengage Learning India Pvt. Ltd.

GE-2: LINEAR ALGEBRA, ABSTRACT ALGEBRA & NUMERICAL ANALYSIS

Total Marks:100-(Theory: 80 Marks+Mid-Sem: 20 Marks)

Unit-I

Vector space, Subspace, Span of a set, Linear dependence and Independence, Dimensions and Basis. Linear transformations, Range, Kernel, Rank, Nullity, Inverse of a linear map, Rank-Nullity theorem.

Unit-II

Matrices and linear maps, Rank and Nullity of a matrix, Transpose of a matrix, Types of matrices. Elementary row operations, System of linear equations, Matrix inversion using row operations, Determinant and Rank of matrices, Eigen values, Eigen vectors.

Unit-III

Group Theory: Definition and examples, Subgroups, Normal subgroups, Cyclic groups, Cosets, Quotient groups, Permutation groups, Homomorphism. Elementary ideas about Rings, Field (definitions, statements, and examples only).

Unit-IV

Convergence, Errors: Relative, Absolute, Round off, Truncation. Transcendental and Polynomial equations: Bisection method, Newtons method, Secant method. Rate of convergence of these methods. System of linear algebraic equations: Gaussian Elimination and Gauss Jordan methods. Interpolation: Lagrange and Newtons methods. Error bounds. Finite difference operators. Gregory forward and backward difference interpolation (statements, definitions and uses/examples only).

Books Recommended:

1. V. Krishnamurty, V. P. Mainra, J. L. Arora: An introduction to Linear Algebra, Affiliated East-West Press Pvt. Ltd., New Delhi, Chapters: 3, 4(4.1 to 4.7), 5(except 5.3), 6(6.1, 6.2, 6.5, 6.6, 6.8), 7(7.4 only).

2. I.N. Herstein: Topics in Algebra, Wiley Eastern Pvt. Ltd. Chapters: 2(2.1-2.7), 3(3.1, 3.2).
3. B.P. Acharya and R.N. Das: A Course on Numerical Analysis, Kalyani Publishers, New Delhi, Ludhiana. Chapters: 1, 2(2.1 to 2.4, 2.6, 2.8, 2.9), 3(3.1 to 3.4), 4(4.1, 4.2), 5(5.1- 5.3), 6(6.1- 6.3, 6.10, 6.11).

Books for References:

1. I.H. Seth: Abstract Algebra, Prentice Hall of India Pvt. Ltd., New Delhi.
2. S. Kumaresan: Linear Algebra, A Geometric Approach, Prentice Hall of India.
3. Rao and Bhimasankaran: Linear Algebra, Hindustan Publishing House.
4. S. Singh: Linear Algebra, Vikas Publishing House Pvt. Ltd., New Delhi.
5. Gilbert Strang: Linear Algebra & its Applications, Cengage Learning India Pvt. Ltd.
6. Gallian: Contemporary Abstract Algebra, Narosa publishing House.
7. Artin: Algebra, Prentice Hall of India.
8. V.K. Khanna and S.K. Bhambri: A Course in Abstract Algebra, Vikas Publishing House Pvt. Ltd., New Delhi.

PHYSICS(HONOURS)

SEMESTER-I

C-I: MATHEMATICAL PHYSICS-I

(Credits: Theory-04, Practicals-02)
Marks:100 (Theory:70, Practical: 30)
Theory: 40 Classes (1 hr. duration)

The emphasis of course is on applications in solving problems of interest to physicists. The students are to be examined entirely on the basis of problems, seen and unseen.

UNIT-I

Calculus: Calculus of functions of more than one variable: Partial derivatives, exact and inexact differentials, Integrating factor, with simple illustration. Constrained Maximization using Lagrange Multipliers. (4 Lectures)

Vector Calculus: Recapitulation of vectors: Properties of vectors under rotations. Scalar product and its invariance under rotations. Vector product, Scalar triple product and their interpretation in terms of area and volume respectively. Scalar and Vector fields. (5 Lectures)

UNIT-II

Orthogonal Curvilinear Coordinates: Orthogonal Curvilinear Coordinates, Derivation of Gradient, Divergence, Curl and Laplacian in Cartesian, Spherical and Cylindrical Coordinate Systems. Comparison of velocity and acceleration in cylindrical and spherical coordinate system. (7 Lectures)

Dirac Delta function and its properties: Definition of Dirac delta function. Representation as limit of a Gaussian function and rectangular function. Properties of Dirac delta function. (3 Lectures)

UNIT-III

Vector Differentiation: Directional derivatives and normal derivative. Gradient of a scalar field and its geometrical interpretation. Divergence and curl of a vector field. Del and Laplacian operators. Vector identities, Gradient, divergence, curl and Laplacian in spherical and cylindrical coordinates. (8 Lectures)

UNIT-IV

Vector Integration: Ordinary Integrals of Vectors. Multiple integrals, Jacobian. Notion of infinitesimal line, surface and volume elements. Line, surface and volume integrals of Vector fields. Flux of a vector field. Gauss' divergence theorem, Green's and Stokes Theorems and their applications (no rigorous proofs). (13 Lectures)

Reference Books:

1. Mathematical Methods for Physicists, G.B. Arfken, H.J. Weber, F.E. Harris, 2013, 7th Edn., Elsevier.
2. An introduction to ordinary differential equations, E.A. Coddington, 2009, PHI learning.

3. Differential Equations, George F. Simmons, 2007, McGraw Hill.
4. Mathematical Tools for Physics, James Nearing, 2010, Dover Publications.
5. Mathematical methods for Scientists and Engineers, D.A. McQuarrie, 2003, Viva Book
6. Advanced Engineering Mathematics, D.G. Zill and W.S. Wright, 5 Ed., 2012, Jones and Bartlett Learning
7. Advanced Engineering Mathematics, Erwin Kreyszig, 2008, Wiley India.
8. Essential Mathematical Methods, K.F.Riley & M.P.Hobson, 2011, Cambridge Univ. Press
9. Mathematical Physics and Special Relativity-M. Das, P.K. Jena and B.K. Dash (Srikrishna Prakashan) 2nd Edition 2009
10. Mathematical Physics–H. K. Dass, Dr. Rama Verma (S. Chand Higher Academics), th Edition 2011.
11. Mathematical PhysicsC. Harper, (Prentice Hall India) 2006.
12. Mathematical Physics-Goswami (Cengage Learning) 2014
13. Mathematical Method for Physical Sciences- M. L. Boas (Wiley India) 2006

PHYSICS LAB-C:I

20 Classes (2 hrs. duration)

The aim of this Lab is not just to teach computer programming and numerical analysis but to emphasize its role in solving problems in Physics.

- Highlights the use of computational methods to solve physical problems.
- The course will consist of lectures (both theory and practical) in the Lab.
- Evaluation done not on the programming but on the basis of formulating the problem.
- Aim at teaching students to construct the computational problem to be solved.
- Students can use any one operating system Linux or Microsoft Windows.

Topics	Description with Applications
Introduction and Overview	Computer architecture and organization, memory and Input/output devices.
Basics of scientific computing	Binary and decimal arithmetic, Floating point numbers, algorithms, Sequence, Selection and Repetition, single and double precision arithmetic, underflow & overflow emphasize the importance of making equations in terms of dimensionless variables, Iterative methods.
Errors and error Analysis	Truncation and round off errors, Absolute and relative errors, Floating point computations.
Review of C & C++ programming fundamentals	Introduction to Programming, constants, variables and data types, operators and Expressions, I/O statements, scanf and printf, c in and c out, Manipulators for data formatting, Control statements (decision making and looping statements) (If-statement. If-else Statement. Nested if Structure. Else-if Statement. Ternary Operator.

	Goto Statement. Switch Statement. Unconditional and Conditional Looping. While Loop. Do-While Loop. FOR Loop. Break and Continue Statements. Nested Loops), Arrays (1D & 2D) and strings, user defined functions, Structures and Unions, Idea of classes and objects.
Programs	Sum & average of a list of numbers, largest of a given list of numbers and its location in the list, sorting of numbers in ascending descending order, Binarysearch.
Random number generation	Area of circle, area of square, volume of sphere, value of π .

Referred Books:

1. Introduction to Numerical Analysis, S.S. Sastry, 5th Edn. , 2012, PHI Learning Pvt. Ltd.
2. Schaum's Outline of Programming with C++. J. Hubbard, 2000, McGraw-Hill Pub.
3. Numerical Recipes in C: The Art of Scientific Computing, W.H. Pressetal, 3rd Edn. 2007, Cambridge University Press.
4. A first course in Numerical Methods, U.M. Ascher & C. Greif, 2012, PHI Learning.
5. Elementary Numerical Analysis, K.E. Atkinson, 3 rd Edn. , 2007 , Wiley India Edition.
6. Numerical Methods for Scientists & Engineers, R.W. Hamming, 1973, Courier Dover Pub.
7. An Introduction to computational Physics, T. Pang, 2nd Edn., 2006,Cambridge Univ. Press.

C-2: MECHANICS

(Credits: Theory-04, Practicals-02)

Marks:100 (Theory:70, Practical: 30)

Theory: 40 Classes (1 hr. duration)

UNIT-I

Rotational Dynamics: Centre of Mass and Laboratory frames. Angular momentum of a particle and system of particles. Torque. Principle of conservation of angular momentum. Rotation about a fixed axis. **Moment of Inertia.** Calculation of moment of inertia for rectangular, cylindrical and spherical bodies. Kinetic energy of rotation. Motion involving both translation and rotation. (9 Lectures)

Non-Inertial Systems: Non-inertial frames and fictitious forces. Uniformly rotating frame. Laws of Physics in rotating coordinate systems. Centrifugal force. Coriolis force and its applications. (3 Lectures)

UNIT-II

Elasticity: Relation between Elastic constants. Twisting torque on a Cylinder or Wire. (3 Lectures)

Fluid Motion: Kinematics of Moving Fluids: Poiseuilles Equation for Flow of a Liquid through a Capillary Tube . (3 Lectures)

Oscillations: SHM: **Simple Harmonic Oscillations.** Differential equation of SHM and its solution. Kinetic energy, potential energy, total energy and their time-average values. Damped oscillation. Forced oscillations: Transient and steady states; Resonance, sharpness of resonance; power dissipation and Quality Factor. (5 Lectures)

UNIT-III

Gravitation and Central Force Motion: Law of gravitation. Gravitational potential energy. Inertial and gravitational mass. Potential and field due to spherical shell and solid sphere. (3 Lectures)

Motion of a particle under a central force field. Two-body problem and its reduction to one-body problem and its solution. The energy equation and energy diagram. **Keplers Laws.** Satellite in circular orbit and applications. Geosynchronous orbits. Weightlessness. Basic idea of global positioning system (GPS). Physiological effects on astronauts.(5 Lectures)

UNIT-IV

Special Theory of Relativity: Michelson-Morley Experiment and its outcome. Postulates of Special Theory of Relativity. Lorentz Transformations. Simultaneity and order of events. Lorentz contraction. Time dilation. Relativistic transformation of velocity, frequency and wave number. Relativistic addition of velocities. Variation of mass with velocity. Massless Particles. Mass-energy Equivalence. Relativistic Doppler effect. Relativistic Kinematics. Transformation of Energy and Momentum. Energy-Momentum Four Vector. (9 Lectures)

Reference Books:

1. An introduction to mechanics, D. Kleppner, R.J. Kolenkow, 1973, McGraw-Hill.
2. Mechanics, Berkeley Physics, vol.1, C.Kittel, W.Knight, et.al. 2007, Tata McGraw-Hill.
3. Physics, Resnick, Halliday and Walker 8/e. 2008, Wiley.
4. Analytical Mechanics, G.R. Fowles and G.L. Cassiday. 2005, Cengage Learning.

5. Feynman Lectures, Vol. I, R.P.Feynman, R.B.Leighton, M.Sands, 2008, Pearson Education
6. Introduction to Special Relativity, R. Resnick, 2005, John Wiley and Sons.
7. University Physics, Ronald Lane Reese, 2003, Thomson Brooks/Cole.
(Additional Books for Reference)
8. Mechanics, D.S. Mathur, S. Chand and Company Limited, 2000
9. University Physics. F.W Sears, M.W Zemansky, H.D Young 13/e, 1986, Addison Wesley
10. Physics for scientists and Engineers with Modern Phys., J.W. Jewett, R.A.Serway, 2010, Cengage Learning
11. Theoretical Mechanics, M.R. Spiegel, 2006, Tata McGraw Hill.
12. Mechanics - J. C. Slater and N. H. Frank (McGraw-Hill)

PHYSICS LAB-C:II

20 Classes (2 hrs. duration)

1. To study the random error in observations.
2. To determine the height of a building using a Sextant.
3. To study the Motion of Spring and calculate (a) Spring constant, (b) g and (c) Modulus of rigidity.
4. To determine the Moment of Inertia of a Flywheel.
5. To determine g and velocity for a freely falling body using Digital Timing Technique
6. To determine Coefficient of Viscosity of water by Capillary Flow Method (Poiseuilles method).
7. To determine the Young's Modulus of a Wire by Optical Lever Method.
8. To determine the Modulus of Rigidity of a Wire by Maxwells needle. 9. To determine the elastic Constants of a wire by Searles method.
9. To determine the value of g using Bar Pendulum.
10. To determine the value of g using Katers Pendulum

Reference Books:

1. Advanced Practical Physics for students, B. L. Flint and H.T. Worsnop, 1971, AsiaPublishing House
2. Advanced level Physics Practicals, Michael Nelson and Jon M. Ogborn, 4th Edition, reprinted 1985, Heinemann Educational Publishers
3. A Text Book of Practical Physics, I.Prakash & Ramakrishna, 11th Edn, 2011, Kitab Mahal

SEMESTER-II

C-3: ELECTRICITY AND MAGNETISM

(Credits: Theory-04, Practicals-02)

Marks:100 (Theory:70, Practical: 30)

Theory: 40 Classes (1 hr. duration)

UNIT-I

Electric Field and Electric Potential: Electric field: Electric field lines. Electric flux. Gauss Law with applications to charge distributions with spherical, cylindrical and planar symmetry. (3 Lectures)

Conservative nature of Electrostatic Field. Electrostatic Potential. Laplaces and Poissonequations. The Uniqueness Theorem. Potential and Electric Field of a dipole. Force and Torque on a dipole. (3 Lectures)

Electrostatic energy of system of charges. Electrostatic energy of a charged sphere. Conductors in an electrostatic Field. Surface charge and force on a conductor. Capacitance of a system of charged conductors. Parallel-plate capacitor. Capacitance of an isolated conductor. Method of Images and its application to: (1) Plane Infinite Sheet and (2) Sphere. (4 Lectures)

UNIT-II

Magnetic Field: Magnetic force between current elements and definition of Magnetic Field B. Biot-Savarts Law and its simple applications: straight wire and circular loop. Current Loop as a Magnetic Dipole and its Dipole Moment (Analogy with Electric Dipole). Amperes Circuital Law and its application to (1) Solenoid and (2) Toroid. Properties of B: curl and divergence. Vector Potential. Magnetic Force on (1) point charge (2) current carrying wire (3) between current elements. Torque on a current loop in a uniform Magnetic Field. Ballistic Galvanometer: Torque on a current Loop. Ballistic Galvanometer: Current and Charge Sensitivity. Electromagnetic damping. Logarithmic damping. CDR. (10 Lectures)

UNIT-III

Dielectric Properties of Matter: Electric Field in matter. Polarization, Polarization Charges. Electrical Susceptibility and Dielectric Constant. Capacitor (parallel plate, spherical, cylindrical) filled with dielectric. Displacement vector D. Relations between E, P and D. Gauss Law in dielectrics. (4 Lecturers)

Magnetic Properties of Matter: Magnetization vector (M). Magnetic Intensity (H). Magnetic Susceptibility and permeability. Relation between B, H, M. Ferromagnetism. B-H curve and hysteresis. (4 Lecturers)

Electromagnetic Induction: Faradays Law. Lenzs Law. Self Inductance and Mutual Inductance. Reciprocity Theorem. Energy stored in a Magnetic Field. (2 Lectures)

UNIT-IV

Electrical Circuits: AC Circuits: Kirchhoffs laws for AC circuits. Complex Reactance and Impedance. Series LCR Circuit: (1) Resonance, (2) Power Dissipation and (3) Quality Factor, and (4) Band Width,. Parallel LCR Circuit. (5 Lectures)

Network theorems: Ideal Constant-voltage and Constant-current Sources. Network Theorems:

Thevenin theorem, Norton theorem, Superposition theorem, Reciprocity theorem, Maximum Power Transfer theorem. Growth & decay of currents in RC, RL, and LCR Series circuits for DC. (5 Lectures)

Reference Books:

1. Electricity, Magnetism & Electromagnetic Theory, S. Mahajan and Choudhury, 2012, Tata McGraw
2. Electricity and Magnetism, Edward M. Purcell, 1986 McGraw-Hill Education
3. Introduction to Electrodynamics, D.J. Griffiths, 3rd Edn., 1998, Benjamin Cummings.
4. Feynman Lectures Vol.2, R.P.Feynman, R.B.Leighton, M. Sands, 2008, Pearson Education
5. Elements of Electromagnetics, M.N.O. Sadiku, 2010, Oxford University Press.
6. Electricity and Magnetism, J.H.Fewkes & J.Yarwood. Vol. I, 1991, Oxford Univ. Press.

PHYSICS LAB-C:III

20 Classes (2 hrs. duration)

1. Use a Multimeter for measuring (a) Resistances, (b) AC and DC Voltages, (c) DC Current, (d) Capacitances, and (e) Checking electrical fuses.
2. To study the characteristics of a series RC Circuit.
3. To determine an unknown Low Resistance using Potentiometer.
4. To determine an unknown Low Resistance using Carey Fosters Bridge.
5. To compare capacitances using DeSautys bridge.
6. Measurement of field strength B and its variation in a solenoid (determine dB/dx)
7. To verify the Thevenin and Norton theorems.
8. To verify the Superposition, and Maximum power transfer theorems.
9. To determine self inductance of a coil by Andersons bridge.
10. To study response curve of a Series LCR circuit and determine its (a) Resonant frequency, (b) Impedance at resonance, (c) Quality factor Q, and (d) Band width.
11. To study the response curve of a parallel LCR circuit and determine its (a) Antiresonant frequency and (b) Quality factor Q.
12. Measurement of charge and current sensitivity and CDR of Ballistic Galvanometer
13. Determine a high resistance by leakage method using Ballistic Galvanometer.
14. To determine self-inductance of a coil by Rayleighs method.

15. To determine the mutual inductance of two coils by Absolute method.

Reference Books:

1. Advanced Practical Physics for students, B.L. Flint and H.T. Worsnop, 1971, Asia Publishing House
2. A Text Book of Practical Physics, I.Prakash & Ramakrishna, 11th Ed., 2011, Kitab Mahal
3. Advanced level Physics Practicals, Michael Nelson and Jon M. Ogborn, 4th Edition, reprinted 1985, Heinemann Educational Publishers
4. A Laboratory Manual of Physics for undergraduate classes, D.P.Khandelwal, 1985, Vani Pub.

C-4: WAVES AND OPTICS

(Credits: Theory-04, Practicals-02)

Marks:100 (Theory:70, Practical: 30)

Theory: 40 Classes (1 hr. duration)

UNIT-I

Geometrical optics: Fermats principle, reflection and refraction at plane interface, Matrix formulation of geometrical Optics. Idea of dispersion. **Application to thick lense, Ramsden and Huygens eyepiece.**(5 Lecturers)

Wave Optics: Electromagnetic nature of light. Definition and properties of wave front. Huygens Principle. Temporal and Spatial Coherence. Division of amplitude and wavefront. Youngs double slit experiment. Lloyds Mirror and Fresnels Biprism. Phase change on reflection: Stokestreatment. (5 Lecturers)

UNIT-II

Wave Motion: Plane and Spherical Waves. Longitudinal and Transverse Waves. Plane Progressive (Travelling) Waves. Wave Equation. Particle and Wave Velocities. Differential Equation. Pressure of a Longitudinal Wave. Energy Transport. Intensity of Wave. Water Waves: Ripple and Gravity Waves. (5 Lectures)

Superposition of two perpendicular Harmonic Oscillations: Graphical and Analytical Methods. Lissajous Figures (1:1 and 1:2) and their uses. Superposition of N harmonic waves. (3 Lectures)

UNIT-III

Interference: **Interference in Thin Films:** parallel and wedge-shaped films. Fringes of equal inclination (Haidinger Fringes); Fringes of equal thickness (Fizeau Fringes). Newtons Rings: Measurement of wavelength and refractive index. (5 Lecturers)

Interferometer: Michelson Interferometer-(1) Idea of form of fringes (No theory required), (2) Determination of Wavelength, (3) Wavelength Difference, (4) Refractive Index, and (5) Visibility of Fringes. Fabry-Perot interferometer. . (5 Lectures)

UNIT-IV

Fraunhofer diffraction: Single slit. Circular aperture, Resolving Power of a telescope. Double slit. Multiple slits. Diffraction grating. Resolving power of grating. (6 Lectures)

Fresnel Diffraction: Fresnel's Assumptions. Fresnel's Half-Period Zones for Plane Wave. Explanation of Rectilinear Propagation of Light. Theory of a Zone Plate: Multiple Foci of a Zone Plate. Fresnel's Integral, Fresnel diffraction pattern of a straight edge, a slit and a wire. (6 Lectures)

Reference Books:

1. Waves: Berkeley Physics Course, vol. 3, Francis Crawford, 2007, Tata McGraw-Hill.
2. Fundamentals of Optics, F.A. Jenkins and H.E. White, 1981, McGraw-Hill
3. Principles of Optics, Max Born and Emil Wolf, 7th Edn., 1999, Pergamon Press.
4. Optics, Ajoy Ghatak, 2008, Tata McGraw Hill
5. The Physics of Vibrations and Waves, H. J. Pain, 2013, John Wiley and Sons.
6. The Physics of Waves and Oscillations, N.K. Bajaj, 1998, Tata McGraw Hill.
7. Optics - Brijlal & Subramaniam- (S. Chand Publication) 2014.
8. Geometrical and Physical Optics R.S. Longhurst, Orient Blackswan, 01-Jan-1986
9. Vibrations and Waves - A. P. French, (CBS) Indian print 2003
10. Optics, E. Hecht (Pearson India)

PHYSICS LAB-C:IV

20 Classes (2 hrs. duration)

1. To determine the frequency of an electric tuning fork by Melde's experiment and verify $2T$ law.
2. To investigate the motion of coupled oscillators.
3. To study Lissajous Figures.
4. Familiarization with: Schuster's focusing; determination of angle of prism.
5. To determine refractive index of the material of a prism using sodium source.
6. To determine the dispersive power and Cauchy constants of the material of a prism using mercury source.
7. To determine the wavelength of sodium source using Michelson's interferometer.
8. To determine wavelength of sodium light using Fresnel Biprism.
9. To determine wavelength of sodium light using Newton's Rings.
10. To determine the thickness of a thin paper by measuring the width of the interference fringes produced by a wedge-shaped film.

11. To determine wavelength of (1) Na source and (2) spectral lines of Hg source using plane diffraction grating.
12. To determine dispersive power and resolving power of a plane diffraction grating.

Reference Books:

1. Advanced Practical Physics for students, B.L. Flint and H.T. Worsnop, 1971, Asia Publishing House
2. A Text Book of Practical Physics, I. Prakash & Ramakrishna, 11th Ed., 2011, Kitab Mahal
3. Advanced level Physics Practicals, Michael Nelson and Jon M. Ogborn, 4th Edition, reprinted 1985, Heinemann Educational Publishers
4. A Laboratory Manual of Physics for undergraduate classes, D.P. Khandelwal, 1985, Vani

SEMESTER-III

C-5: MATHEMATICAL PHYSICS-II

(Credits: Theory-04, Practicals-02)

Marks:100 (Theory:70, Practical: 30)

Theory: 40 Classes (1 hr. duration)

The emphasis of the course is on applications in solving problems of interest to physicists. Students are to be examined on the basis of problems, seen and unseen.

UNIT-I

Fourier series: Periodic functions. Orthogonality of sine and cosine functions, Dirichlet Conditions (Statement only). Expansion of periodic functions in a series of sine and cosine functions and determination of Fourier coefficients. Complex representation of Fourier series. Expansion of functions with arbitrary period. Expansion of non-periodic functions over an interval. Even and odd functions and their Fourier expansions. Application. Summing of Infinite Series. Term-by-Term differentiation and integration of Fourier series. Parseval Identity. (11 Lectures)

UNIT-II

Frobenius Method and Special Functions: Singular Points of Second Order Linear Differential Equations and their importance, Frobenius method and its applications to differential equations: Legendre & Hermite Differential Equations. Properties of Legendre & Hermite Polynomials: Rodrigues Formula, Generating Function, Orthogonality. Simple recurrence relations. Expansion of function in a series of Legendre Polynomials. Associated Legendre polynomials and spherical harmonics. (10 Lectures)

UNIT-III

Some Special Integrals: Beta and Gamma Functions and Relation between them. Expression of Integrals in terms of Gamma Functions. Error Function (Probability Integral). (5 Lectures) Theory of Errors: Systematic and Random Errors. Propagation of Errors. Normal Law of Errors. Standard and Probable Error. (4 Lectures)

UNIT-IV

Partial Differential Equations: Solutions to partial differential equations, using separation of variables: Laplace's Equation in problems of rectangular, cylindrical and spherical symmetry. Conducting and dielectric sphere in an external uniform electric field. Wave equation and its solution for vibrational modes of a stretched string. (10 Lectures)

Reference Books:

1. Mathematical Methods for Physicists: Arfken, Weber, 2005, Harris, Elsevier.
2. Fourier Analysis by M.R. Spiegel, 2004, Tata McGraw-Hill.
3. Mathematics for Physicists, Susan M. Lea, 2004, Thomson Brooks/Cole.
4. Differential Equations, George F. Simmons, 2006, Tata McGraw-Hill.
5. Partial Differential Equations for Scientists & Engineers, S.J. Farlow, 1993, Dover Pub.
6. Mathematical methods for Scientists & Engineers, D.A. McQuarrie, 2003, Viva Books
7. Mathematical Physics and Special Relativity –M. Das, P.K. Jena and B.K. Dash (Srikrishna Prakashan) 2nd Edition 2009
8. Mathematical Physics–H. K. Dass, Dr. Rama Verma (S. Chand Higher Academics) 6th Edition 2011.
9. Mathematical Physics C. Harper, (Prentice Hall India) 2006.
10. Mathematical Physics–Goswami (CENGAGE Learning) 2014
11. Mathematical Method for Physical Sciences – M. L. Boas (Wiley India) 2006
12. Mathematics for Physicists, P. Dennery and A. Krzywicki Dover)
13. Advanced Engineering Mathematics, E. Kreyszig (New Age Publication) 2011.

PHYSICS LAB-C:V

20 Classes (2 hrs. duration)

The aim of this Lab is to use the computational methods to solve physical problems. Course will consist of lectures (both theory and practical) in the Lab. Evaluation done not on the programming but on the basis of formulating the problem.

Topics	Description with Applications
Introduction to Numerical computation software Scilab	Introduction to Scilab, Advantages and disadvantages, Scilab environment, Command window, Figure window, Edit window, Variables and arrays, Initialising variables in Scilab, Multidimensional arrays, Subarray, Special values, Displaying output data, data file, Scalar and array operations, Hierarchy of operations, Built in Scilab functions, Introduction to plotting, 2D and 3D plotting (2), Branching Statements and program design, Relational & logical operators, the while loop, for loop, details of loop operations, break & continue statements, nested loops, logical arrays and vectorization (2) User defined functions, Introduction to Scilab functions, Variable passing in Scilab, optional arguments, preserving data between calls to a function, Complex and Character data, string function, Multidimensional arrays (2) an introduction to Scilab file processing, file opening and closing, Binary I/o functions, comparing binary and formatted functions, Numerical methods and developing the skills of writing a program (2).
Curve fitting, Least square fit, Goodness of fit, standard deviation	Ohms law to calculate R, Hookes law to calculate spring constant
Solution of Linear system of equations by Gauss elimination method and Gauss Seidal method. Diagonalization of matrices, Inverse of a matrix, Eigen vectors, eigen values problems.	Solution of mesh equations of electric circuits (3 meshes) Solution of coupled spring mass systems (3 masses)

<p>Solution of ODE First order Differential equation Euler, modified Euler and Runge-Kutta second order methods Second order differential equation. Fixed difference method.</p>	<p>First order differential equation</p> <ul style="list-style-type: none"> • Radioactive decay • Current in RC, LC circuits with DC source • Newtons law of cooling • Classical equations of motion <p>Second order Differential Equation</p> <ul style="list-style-type: none"> • Harmonic oscillator (no friction) • Damped Harmonic oscillator • Over damped • Critical damped • Oscillatory • Forced Harmonic oscillator • Transient and • Steady state solution • Apply above to LCR circuits also.
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Reference Books:

1. Mathematical Methods for Physics and Engineers, K.F Riley, M.P. Hobson and S. J.20 Bence, 3rd ed., 2006, Cambridge University Press
2. Complex Variables, A.S. Fokas & M.J. Ablowitz, 8th Ed., 2011, Cambridge Univ. Press
3. First course in complex analysis with applications, D.G. Zill and P.D. Shanahan, 1940, Jones & Bartlett
4. Simulation of ODE/PDE Models with MATLAB, OCTAVE and SCILAB: Scientific and Engineering Applications: A.V. Wouwer, P. Saucez, C.V. Fernandez. 2014 Springer
5. Scilab by example: M. Affouf 2012, ISBN: 978-1479203444
6. Scilab (A free software to Matlab): H.Ramchandran, A.S.Nair. 2011 S.Chand & Company
7. Scilab Image Processing: Lambert M. Surhone. 2010 Betascript Publishing

C-6: THERMAL PHYSICS

(Credits: Theory-04, Practicals-02)
Marks:100 (Theory:70, Practical: 30)
Theory: 40 Classes (1 hr. duration)

UNIT-I

Introduction to Thermodynamics: Recapitulation of Zeroth and First law of thermodynamics: Second Law of Thermodynamics: Reversible and Irreversible process with examples. Conversion of Work into Heat and Heat into Work. Heat Engines. Carnots Cycle, Carnot engine & efficiency. Refrigerator & coefficient of performance, 2nd Law of Thermodynamics: Kelvin-Planck and Clausius Statements and their Equivalence. **Carnots Theorem. Applications of Second Law of Thermodynamics:** Thermodynamic Scale of Temperature and its Equivalence to Perfect Gas Scale. (5 Lectures)

Entropy: Concept of Entropy, Clausius Theorem. Clausius Inequality, Second Law of Thermodynamics in terms of Entropy. Entropy of a perfect gas. Principle of Increase of Entropy. Entropy Changes in Reversible and Irreversible processes with examples. Entropy of the Principle of Increase of Entropy. Temperature Entropy diagrams for Carnots Cycle. Third Law of Thermodynamics. Unattainability of Absolute Zero. (6 Lectures)

UNIT-II

Thermodynamic Potentials: Extensive and Intensive Thermodynamic Variables. Thermodynamic Potentials: Internal Energy, Enthalpy, Helmholtz Free Energy, Gibbs Free Energy. Their Definitions, Properties and Applications. Surface Films and Variation of Surface Tension with Temperature. Magnetic Work, Cooling due to adiabatic demagnetization, first and second order Phase Transitions with examples, Clausius Clapeyron Equation and Ehrenfest equations (5 Lectures)

Maxwells Thermodynamic Relations: Derivations and applications of Maxwells Relations, Maxwells Relations:(1) Clausius Clapeyron equation, (2) Values of C_p-C_v , (3) Tds Equations, (4) Joule-Kelvin coefficient for Ideal and Van der Waal Gases, (5) Energy equations, (6) Change of Temperature during Adiabatic Process. (5 Lectures)

UNIT-III

Kinetic Theory of Gases

Distribution of Velocities: Maxwell-Boltzmann Law of Distribution of Velocities in an Ideal Gas and its Experimental Verification. Sterns Experiment. Mean, RMS and Most Probable Speeds. Degrees of Freedom. Law of Equipartition of Energy (No proof required). Specific heats of Gases. (5 Lectures)

Molecular Collisions: Mean Free Path. Collision Probability. Estimates of Mean Free Path. Transport Phenomenon in Ideal Gases: (1) Viscosity, (2) Thermal Conductivity and (3) Diffusion. Brownian motion and its Significance. (4 Lectures)

UNIT-IV

Real Gases: Behavior of Real Gases: Deviations from the Ideal Gas Equation. The Virial Equation. Andrews Experiments on CO_2 Gas. Critical Constants. Continuity of Liquid and Gaseous State. Vapour and Gas. Boyle Temperature. Van der Waals Equation of State for Real Gases. Values of Critical Constants. Law of Corresponding States. Comparison with Experimental Curves. P-V Diagrams. Joules Experiment. Free Adiabatic Expansion of a Perfect Gas. Joule-Thomson Porous Plug Experiment. Joule-Thomson Effect for Real and Van der Waal Gases. Temperature of Inversion. Joule-Thomson Cooling. (10 Lectures)

Reference Books:

1. Heat and Thermodynamics, M.W. Zemansky, Richard Dittman, 1981, McGraw-Hill.
2. A Treatise on Heat, Meghnad Saha, and B.N.Srivastava, 1958, Indian Press
3. Thermal Physics, S. Garg, R. Bansal and Ghosh, 2nd Edition, 1993, Tata McGraw-Hill
4. Modern Thermodynamics with Statistical Mechanics, Carl S. Helrich, 2009, Springer.
5. Thermodynamics, Kinetic Theory & Statistical Thermodynamics, Sears & Salinger. 1988, Narosa.

6. Concepts in Thermal Physics, S.J. Blundell and K.M. Blundell, 2nd Ed., 2012, Oxford University Press
7. Heat and Thermal Physics-Brijlal & Subramaiam (S.Chand Publication)2014
8. Thermal Physics– C. Kittel and H. Kroemer (McMillan Education India)2010

PHYSICS LAB-C:VI

20 Classes (2hr duration)

1. To determine Mechanical Equivalent of Heat, J, by Callender and Barnes constant flow method.
2. To determine the Coefficient of Thermal Conductivity of Cu by Searles Apparatus.
3. To determine the Coefficient of Thermal Conductivity of Cu by Angstroms Method.
4. To determine the Coefficient of Thermal Conductivity of a bad conductor by Lee and Charltons disc method.
5. To determine the Temperature Coefficient of Resistance by Platinum Resistance Thermometer (PRT).
6. To study the variation of Thermo-Emf of a Thermocouple with Difference of Temperature of its Two Junctions.
7. To calibrate a thermocouple to measure temperature in a specified Range using (1) Null Method, (2) Direct measurement using Op-Amp difference amplifier and to determine Neutral Temperature.
8. To determine J by Calorimeter.

Reference Books:

1. Advanced Practical Physics for students, B. L. Flint and H.T. Worsnop, 1971, Asia Publishing House
2. A Text Book of Practical Physics, I.Prakash & Ramakrishna, 11th Ed., 2011, Kitab Mahal
3. Advanced level Physics Practicals, Michael Nelson and Jon M. Ogborn, 4th Edition, reprinted 1985, Heinemann Educational Publishers
4. A Laboratory Manual of Physics for undergraduate classes,D.P.Khandelwal,1985, Vani Pub.

C-7: DIGITAL SYSTEMS AND APPLICATIONS

(Credits: Theory-04, Practicals-02)

Marks:100 (Theory:70, Practical: 30)

Theory: 40 Classes (1 hr. duration)

UNIT-I

Digital Circuits: Difference between Analog and Digital Circuits. Binary Numbers. Decimal to Binary and Binary to Decimal Conversion. BCD, Octal and Hexadecimal numbers. AND, OR and NOT Gates (realization using Diodes and Transistor). NAND and NOR Gates as Universal Gates. XOR and XNOR Gates and application as Parity Checkers. (5 Lectures)

Boolean algebra: De Morgan's Theorems. Boolean Laws. Simplification of Logic Circuit using Boolean algebra. Fundamental Products. Idea of Minterms and Maxterms. Conversion of a Truth table into Equivalent Logic Circuit by (1) Sum of Products Method and (2) Karnaugh Map. (5 Lectures)

UNIT-II

Data processing circuits: Basic idea of Multiplexers, De-multiplexers, Decoders, Encoders. (3 Lectures)

Arithmetic Circuits: Binary Addition. Binary Subtraction using 2's Complement. Half and Full Adders. Half & Full Subtractors, 4-bit binary Adder/Subtractor. (4 Lectures)

Timers: IC 555: block diagram and applications: Astable multivibrator and Monostable multivibrator. (3 Lectures)

UNIT-III

Integrated Circuits (Qualitative treatment only): Active & Passive components. Discrete components. Wafer. Chip. Advantages and drawbacks of ICs. Scale of integration: SSI, MSI, LSI and VLSI (basic idea and definitions only). Classification of ICs. Examples of Linear and Digital ICs. (5 Lectures)

Introduction to CRO: Block Diagram of CRO. Electron Gun, Deflection System and Time Base. Deflection Sensitivity. Applications of CRO: (1) Study of Waveform, (2) Measurement of Voltage, Current, Frequency, and Phase Difference. (5 Lectures)

UNIT-IV

Introduction to Computer Organization: Input/output Devices. Data storage (idea of RAM and ROM). Computer memory. Memory organization & addressing. Memory Interfacing. Memory Map. (4 Lectures)

Shift registers: Serial-in-Serial-out, Serial-in-Parallel-out, Parallel-in-Serial-out and Parallel-in-Parallel-out Shift Registers (only up to 4 bits). (2 Lectures)

Counters (4 bits): Ring Counter. Asynchronous counters, Decade Counter. Synchronous Counter. (4 Lectures)

Reference Books:

1. Digital Principles and Applications, A.P. Malvino, D.P. Leach and Saha, 7th Ed., 2011, Tata McGraw
2. Fundamentals of Digital Circuits, Anand Kumar, 2nd Edn, 2009, PHI Learning Pvt. Ltd.
3. Digital Circuits and systems, Venugopal, 2011, Tata McGraw Hill.
4. Digital Systems: Principles & Applications, R.J. Tocci, N.S. Widmer, 2001, PHI Learning

5. Logic circuit design, Shimon P. Vingron, 2012, Springer.
6. Digital Electronics, Subrata Ghoshal, 2012, Cengage Learning.
7. Microprocessor Architecture Programming & applications with 8085, 2002, R.S. Goankar, Prentice Hall.
8. Concept of Electronics: D.C.Tayal (Himalay Publication) 2011.
9. Electronics-V. K. Meheta (S. Chand Publication),2013
10. The Art of Electronics, P. Horowitz and W. Hill, CUP.

PHYSICS PRACTICAL-C:VII

20 Classes (2 hrs. duration)

1. To measure (a) Voltage, and (b) Time period of a periodic waveform using CRO.
2. To test a Diode and Transistor using a Multimeter.
3. To design a switch (NOT gate) using a transistor.
4. To verify and design AND, OR, NOT and XOR gates using NAND gates.
5. To design a combinational logic system for a specified Truth Table.
6. To convert a Boolean expression into logic circuit and design it using logic gate ICs.
7. To minimize a given logic circuit.
8. Half Adder, Full Adder and 4-bit binary Adder.
9. Half Subtractor, Full Subtractor, Adder-Subtractor using Full Adder I.C.
10. To build Flip-Flop (RS, Clocked RS, D-type and JK) circuits using NAND gates.
11. To build JK Master-slave flip-flop using Flip-Flop ICs
12. To build a 4-bit Counter using D-type/JK Flip-Flop ICs and study timing diagram.
13. To make a 4-bit Shift Register (serial and parallel) using D-type/JK Flip-Flop ICs.
14. To design an astable multivibrator of given specifications using 555 Timer.
15. To design a monostable multivibrator of given specifications using 555 Timer.

Reference Books:

1. Modern Digital Electronics, R.P. Jain, 4th Edition, 2010, Tata McGraw Hill.
2. Basic Electronics: A text lab manual, P.B. Zbar, A.P. Malvino, M.A. Miller, 1994, Mc-Graw Hill.

3. Microprocessor Architecture Programming and applications with 8085, R.S. Goankar, 2002, Prentice Hall.
4. Microprocessor 8085:Architecture, Programming and interfacing, A. Wadhwa, 2010, PHI Learning.

SEMESTER-IV

C-VIII: MATHEMATICAL PHYSICS-III

(Credits: Theory-04, Practicals-02)
 Marks:100 (Theory:70, Practical: 30)
 Theory: 40 Classes (1 hr. duration)

The emphasis of the course is on applications in solving problems of interest to physicists. Students are to be examined on the basis of problems, seen and unseen.

UNIT-I

Complex Analysis: Brief Revision of Complex Numbers and their Graphical Representation. Euler's formula, De Moivre's theorem, Roots of Complex Numbers. Functions of Complex Variables. Analyticity and Cauchy-Riemann Conditions. Examples of analytic functions. Singular functions: poles and branch points, order of singularity, branch cuts. Integration of a function of a complex variable. Cauchy's Inequality. Cauchy's theorem, Cauchy's Integral formula. Simply and multiply connected. (10 Lectures)

UNIT-II

Integrals Transforms: Laurent and Taylor's expansion. Residues and Residue Theorem. Application in solving Definite Integrals. Fourier Transforms: Fourier Integral theorem. Fourier Transform. Examples. Fourier transform of trigonometric, Gaussian, finite wave train & other functions. Representation of Dirac delta function as a Fourier Integral. (10 Lectures)

UNIT-III

Integrals Transforms: Fourier transform of derivatives, Inverse Fourier transform, Convolution theorem. Properties of Fourier transform (translation, change of scale, complex conjugation, etc.). Three dimensional Fourier transforms with examples. Application of Fourier Transforms to differential equations: One dimensional Wave and Diffusion/Heat Flow Equations. (10 Lectures)

UNIT-IV

Laplace Transforms: Laplace Transform (LT) of Elementary functions. Properties of LTs: Change of Scale Theorem, Shifting Theorem. LTs of Derivatives and Integrals of Functions, Derivatives and Integrals of LTs. LT of Unit Step function, Dirac Delta function, Periodic Functions. Convolution Theorem. Inverse LT. Application of Laplace Transforms to Differential Equations: Damped Harmonic Oscillator, Simple Electrical Circuits. (10 Lectures)

Reference Books:

1. Mathematical Methods for Physics and Engineers, K.F Riley, M.P. Hobson and S. J. Bence, 3rd ed., 2006, Cambridge University Press
2. Mathematical Methods for Physicists: Arfken, Weber, 2005, Harris, Elsevier.
3. Advanced Engineering Mathematics, E. Kreyszig (New Age Publication) 2011.
4. Mathematics for Physicists, P. Dennery and A. Krzywicki, 1967, Dover Publications
5. Complex Variables, A. S. Fokas & M. J. Ablowitz, 8th Ed., 2011, Cambridge Univ. Press

6. Complex Variables and Applications, J.W. Brown & R.V. Churchill, 7th Ed. 2003, Tata McGraw-Hill
7. First course in complex analysis with applications, D.G. Zill and P.D. Shanahan, 1940, Jones & Bartlett.
8. Mathematical Physics—H. K. Dass, Dr. Rama Verma (S. Chand Higher Academics) 6th Edition 2011.
9. Mathematical Physics C. Harper, (Prentice Hall India) 2006.
10. Mathematical Physics-Goswami (Cengage Learning) 2014
11. Mathematical Method for Physical Sciences - M. L. Boas (Wiley India) 2006
12. Introduction to the theory of functions of a complex variable- E.T.Copson (Oxford) Univ. Press, 1970

PHYSICS PRACTICAL-C:VIII

20 Classes (2 hrs. duration)

Scilab based simulations experiments based on Mathematical Physics problems like

1. Solve differential equations:

(i) $\frac{dy}{dx} = e^{-x}$ with $y = 0$ for $x = 0$. (ii) $\frac{dy}{dx} + e^{-xy} = x^2$. (iii) $\frac{d^2y}{dt^2} + 2\frac{dy}{dt} = -y$.

(iv) $\frac{d^2y}{dt^2} + e^{-t}\frac{dy}{dt} = -y$.

1 2. Dirac Delta Function: Evaluate $\int_{-\infty}^{\infty} \frac{e^{-x^2}}{\sqrt{2\pi\sigma^2}} (x+3) dx$ for $\sigma = 1, 0.1, 0.01$ and show it tends to 5.

3. Fourier Series: Program to $\sum_{n=1}^{\infty} (0.2)^n$.
Evaluate the Fourier coefficients of a given periodic function (square wave)

4. Frobenius method and Special functions: $\int_{-1}^1 P_n(\mu)P_m(\mu) d\mu = \delta_{n,m}$. Plot $P_n(x)$, $J(x)$. Show recursion relation.

5. Calculation of error for each data point of observations recorded in experiments done in previous semesters (choose any two).

6. Calculation of least square fitting manually without giving weightage to error. Confirmation of least square fitting of data through computer program.

7. Evaluation of trigonometric functions e.g. $\sin \theta$, Given Bessels function at N — points, find its value at an intermediate point. Complex analysis: Integrate $1/(x^2 + 2)$ numerically and check with computer integration.

8. Integral transform: FFT of e^{-x^2} .

Reference Books:

1. Mathematical Methods for Physics and Engineers, K.F Riley, M.P. Hobson and S. J. Bence, 3rd ed., 2006, Cambridge University Press
2. Mathematics for Physicists, P. Dennery and A. Krzywicki, 1967, Dover Publications
3. Simulation of ODE/PDE Models with MATLAB, OCTAVE and SCILAB: Scientific and Engineering Applications: A. Vande Wouwer, P. Saucez, C. V. Fernandez. 2014 Springer ISBN: 978-3319067896
4. Scilab by example: M. Affouf, 2012. ISBN: 978-1479203444
5. Scilab (A free software to Matlab): H.Ramchandran, A.S.Nair. 2011 S.Chand & Company
6. Scilab Image Processing: Lambert M. Surhone. 2010 Betascript Publishing.

C-IX: ELEMENTS OF MODERN PHYSICS

(Credits: Theory-04, Practicals-02)

Marks:100 (Theory:70, Practical: 30)

Theory: 40 Classes (1 hr. duration)

UNIT-I

Atomic Spectra and Models: Inadequacy of classical physics, Brief Review of Black body Radiation , **Photoelectric effect**, Compton effect, dual nature of radiation, wave nature of particles. Atomic spectra, Line spectra of hydrogen atom, Ritz Rydberg combination principle. Alpha Particle Scattering, Rutherford Scattering Formula, Rutherford Model of atom and its limitations, Bohrs model of H atom, explanation of atomic spectra, correction for finite mass of the nucleus, Bohr correspondence principle, limitations of Bohr model, discrete energy exchange by atom, Frank Hertz Expt. Sommerfeld's Modification of Bohrs Theory. (11 Lectures)

UNIT-II

Wave Particle Duality: de Broglie hypothesis, Experimental confirmation of matter wave, Davis- son Germer Experiment, velocity of de Broglie wave, wave particle duality, Complementarity. Superposition of two waves, phase velocity and group velocity , wave packets ,Gaussian WavePacket , spatial distribution of wave packet, Localization of wave packet in time.

Time development of a wave Packet ; Wave Particle Duality, Complementarity . **Heisenberg Uncertainty Principle** ,Illustration of the Principle through thought Experiments of Gamma ray microscope and electron diffraction through a slit. Estimation of ground state energy of harmonic oscillator and hydrogen atom, non existence of electron in the nucleus. **Uncertainty and Complementarities**. (11 Lectures)

UNIT-III

Nuclear Physics: Size and structure of atomic nucleus and its relation with atomic weight; Impossibility of an electron being in the nucleus as a consequence of the uncertainty principle. Nature of nuclear force, NZ graph, **Liquid Drop model: semi-empirical mass formula and binding energy**,

Nuclear Shell Model and magic numbers. Radioactivity: stability of the nucleus; Law of radioactive decay; Mean life and half-life (8 Lectures)

UNIT-IV

Alpha decay; Beta decay- energy released, spectrum and Pauli's prediction of neutrino; Gamma ray emission, energy-momentum conservation: electron-positron pair creation by gamma photons in the vicinity of a nucleus.

Fission and fusion- mass deficit, relativity and generation of energy; Fission - nature of fragments and emission of neutrons. Nuclear reactor: slow neutrons interacting with Uranium 235; Fusion and thermonuclear reactions driving stellar energy (brief qualitative discussions). (10 Lectures)

Reference Books:

1. Concepts of Modern Physics, Arthur Beiser, 2002, McGraw-Hill.
2. Introduction to Modern Physics, Rich Meyer, Kennard, Coop, 2002, Tata McGraw Hill
3. Introduction to Quantum Mechanics, David J. Griffith, 2005, Pearson Education.
4. Physics for scientists and Engineers with Modern Physics, Jewett and Serway, 2010, Cengage Learning.
5. Quantum Mechanics: Theory & Applications, A.K.Ghatak & S.Lokanathan, 2004, Macmillan
6. Modern Physics Bernstein, Fishbane and Gasiorowicz (Pearson India) 2010
7. Quantum Physics of Atoms, Molecules, Solids, Nuclei and Particles – R. Eisberg (Wiley India), 2012.

(Additional Books for Reference)

8. Modern Physics, J.R. Taylor, C.D. Zafiratos, M.A. Dubson, 2004, PHI Learning.
9. Theory and Problems of Modern Physics, Schaum's outline, R. Gautreau and W. Savin, 2nd Edn, Tata McGraw-Hill Publishing Co. Ltd.
10. Quantum Physics, Berkeley Physics, Vol.4. E.H.Wichman, 1971, Tata McGraw-Hill Co.
11. Basic ideas and concepts in Nuclear Physics, K.Heyde, 3rd Edn., Institute of Physics Pub.
12. Six Ideas that Shaped Physics: Particle Behave like Waves, T.A.Moore, 2003, McGraw Hill
13. Modern Physics-Serway (CENGAGE Learnings) 2014
14. Modern Physics —Murugesan and Sivaprasad (S. Chand Higher Academics)
15. Physics of Atoms and Molecules Bransden (Pearson India) 2003

PHYSICS PRACTICAL-C:IX

20 Classes (2 hrs. duration)

1. Measurement of Planck's constant using black body radiation and photo-detector

2. Photo-electric effect: photo current versus intensity and wavelength of light; maximum energy of photo-electrons versus frequency of light
3. To determine work function of material of filament of directly heated vacuum diode.
4. To determine the Planck's constant using LEDs of at least 4 different colours.
5. To determine the wavelength of H-alpha emission line of Hydrogen atom.
6. To determine the ionization potential of mercury.
7. To determine the absorption lines in the rotational spectrum of Iodine vapour.
8. To determine the value of e/m by (a) Magnetic focusing or (b) Bar magnet.
9. To setup the Millikan oil drop apparatus and determine the charge of an electron.
10. To show the tunneling effect in tunnel diode using I-V characteristics.
11. To determine the wavelength of laser source using diffraction of single slit.
12. To determine the wavelength of laser source using diffraction of double slits.
13. To determine (1) wavelength and (2) angular spread of He-Ne laser using plane diffraction grating

Reference Books:

1. Advanced Practical Physics for students, B.L. Flint and H.T. Worsnop, 1971, Asia Publishing House
2. Advanced level Physics Practicals, Michael Nelson and Jon M. Ogborn, 4th Edition, reprinted 1985, Heinemann Educational Publishers
3. A Text Book of Practical Physics, I. Prakash & Ramakrishna, 11th Edn, 2011, Kitab Mahal

C-X: ANALOG SYSTEMS AND APPLICATIONS

(Credits: Theory-04, Practicals-02)
 Marks:100 (Theory:70, Practical: 30)
 Theory: 40 Classes (1 hr. duration)

UNIT-I

Semiconductor Diodes: P and N type semiconductors. Energy Level Diagram. Conductivity and Mobility, Concept of Drift velocity. PN Junction Fabrication (Simple Idea). Barrier Formation in PN Junction Diode. Static and Dynamic Resistance. Current Flow Mechanism in Forward and Reverse Biased Diode. Drift Velocity. Derivation for Barrier Potential, Barrier Width and Current for Step Junction. (5 Lectures)

Two-terminal Devices and their Applications: (1) Rectifier Diode: Half-wave Rectifiers.

Centre-tapped and Bridge Full-wave Rectifiers, Calculation of Ripple Factor and Rectification Efficiency, (2) Zener Diode and Voltage Regulation. Principle and structure of (1) LEDs, (2) Photodiode, (3) Solar Cell. (5 Lectures)

UNIT-II

Bipolar Junction transistors: n-p-n and p-n-p Transistors. Characteristics of CB, CE and CC Configurations. Current gains α and β Relations between α and β . Load Line analysis of Transistors. DC Load line and Q-point. Physical Mechanism of Current Flow. Active, Cutoff and Saturation Regions. (5 Lectures)

Amplifiers: Transistor Biasing and Stabilization Circuits. Fixed Bias and Voltage Divider Bias. Transistor as 2-port Network. h-parameter Equivalent Circuit. Analysis of a single-stage CE amplifier using Hybrid Model. Input and Output Impedance. Current, Voltage and Power Gains. Classification of Class A, B & C Amplifiers. (5 Lectures)

UNIT:III

Coupled Amplifier: RC-coupled amplifier and its frequency response. (4 Lectures)

Feedback in Amplifiers: Effects of Positive and Negative Feedback on Input Impedance, Output Impedance, Gain, Stability, Distortion and Noise. (2 Lectures)

Sinusoidal Oscillators: Barkhausen's Criterion for self-sustained oscillations. RC Phase shift oscillator, determination of Frequency. Hartley & Colpitts oscillators. (4 Lectures)

UNIT-IV

Operational Amplifiers (Black Box approach): Characteristics of an Ideal and Practical Op-Amp. (IC 741) Open-loop and Closed-loop Gain. Frequency Response. CMRR. Slew Rate and concept of Virtual ground. (5 Lectures)

Applications of Op-Amps: (1) Inverting and non-inverting amplifiers, (2) Adder, (3) Subtractor, (4) Differentiator, (5) Integrator, (6) Log amplifier, (7) Zero crossing detector (8) Wein bridge oscillator. (5 Lectures)

Reference Books:

1. Integrated Electronics, J. Millman and C.C. Halkias, 1991, Tata Mc-Graw Hill.
2. Electronics: Fundamentals and Applications, J.D. Ryder, 2004, Prentice Hall.
3. Solid State Electronic Devices, B.G. Streetman & S.K. Banerjee, 6th Edn., 2009, PHI Learning
4. Electronic Devices & circuits, S. Salivahanan & N.S. Kumar, 3rd Ed., 2012, Tata Mc-Graw Hill
5. OP-Amps and Linear Integrated Circuit, R. A. Gayakwad, 4th edition, 2000, Prentice Hall
6. Electronic circuits: Handbook of design & applications, U. Tietze, C. Schenk, 2008, Springer
7. Semiconductor Devices: Physics and Technology, S.M. Sze, 2nd Ed., 2002, Wiley India
8. Electronic Devices, 7/e Thomas L. Floyd, 2008, Pearson India
9. Concept of Electronics: D.C. Tayal (Himalay Publication) 2011
10. Electronic devices :Circuits and Applications :W.D. Stanley Prentice Hall

11. Electronics- V. K. Meheta (S. Chand Publication)2013
12. Electronic Circuits :L.Schilling and Velove: 3rd Ed Mc Graw Hill
13. ElectronicsRaskhit & Chattopadhyay (New age International Publication)2011
14. Electricity and Electronic-D.C.Tayal (Himalaya Pub.)2011
15. Electronic devices and circuits R.L. Boylstad (Pearson India) 2009.

PHYSICS PRACTICAL-C:X

20 Classes (2 hrs. duration)

1. To study V-I characteristics of PN junction diode, and Light emitting diode.
2. To study the V-I characteristics of a Zener diode and its use as voltage regulator.
3. Study of V-I & power curves of solar cells, and find maximum power point & efficiency.
4. To study the characteristics of a Bipolar Junction Transistor in CE configuration.
5. To study the various biasing configurations of BJT for normal class A operation.
6. To design a CE transistor amplifier of a given gain (mid-gain) using voltage divider bias.
7. To study the frequency response of voltage gain of a RC-coupled transistor amplifier.
8. To design a Wien bridge oscillator for given frequency using an op-amp.
9. To design a phase shift oscillator of given specifications using BJT.
10. To study the Colpitt's oscillator.
11. To design a digital to analog converter (DAC) of given specifications.
12. To study the analog to digital convertor (ADC) IC.
13. To design an inverting amplifier using Op-amp (741,351) for dc voltage of given gain
14. To design inverting amplifier using Op-amp (741,351) and study its frequency response
15. To design non-inverting amplifier using Op-amp (741,351) & study its frequency response
16. To study the zero-crossing detector and comparator
17. To add two dc voltages using Op-amp in inverting and non-inverting mode
18. To design a precision Differential amplifier of given I/O specification using Op-amp.
19. To investigate the use of an op-amp as an Integrator.
20. To investigate the use of an op-amp as a Differentiator.

21. To design a circuit to simulate the solution of a 1st/2nd order differential equation.

Reference Books:

1. Basic Electronics: A text lab manual, P.B. Zbar, A.P. Malvino, M.A. Miller, 1994, Mc-Graw Hill.
2. OP-Amps and Linear Integrated Circuit, R. A. Gayakwad, 4th edition, 2000, Prentice Hall.
3. Electronic Principle, Albert Malvino, 2008, Tata Mc-Graw Hill.
4. Electronic Devices & circuit Theory, R.L. Boylestad & L.D. Nashelsky, 2009, Pearson

SEMESTER-V

C-XI: QUANTUM MECHANICS AND APPLICATIONS

(Credits: Theory-04, Practicals-02)

Marks:100 (Theory:70, Practical: 30)

Theory: 40 Classes (1hr duration)

UNIT:I

Schrodinger equation & the operators: Time dependent Schrodinger equation and dynamical evolution of a quantum state; Properties of Wave Function. Interpretation of Wave Function Probability and probability current densities in three dimensions; Conditions for Physical Acceptability of Wave Functions. Normalization. Linearity and Superposition Principles. Hermitian operator, Eigen values and Eigen functions. Position, momentum and Energy operators; commutator of position and momentum operators; Expectation values of position and momentum. Wave Function of a Free Particle. (8 Lectures)

UNIT:II

Time independent Schrodinger equation: Hamiltonian, stationary states and energy eigen values; expansion of an arbitrary wave function as a linear combination of energy eigen functions; General solution of the time dependent Schrodinger equation in terms of linear combinations of stationary states; Application to spread of Gaussian wave-packet for a free particle in one dimension; wave packets, Fourier transforms and momentum space wave function; Position-momentum uncertainty principle. (6 Lectures)

UNIT:III

General discussion of bound states in an arbitrary potential: continuity of wave function, boundary condition and emergence of discrete energy levels; application to one-dimensional problem-square well potential; Quantum mechanics of simple harmonic oscillator-energy levels and energy eigen functions ground state, zero point energy & uncertainty principle. One dimensional infinitely rigid box- energy eigen values and eigen functions, normalization; Quantum dot as example; Quantum mechanical scattering and tunnelling in one dimension-across a step potential & rectangular potential barrier. (14 Lectures)

UNIT-IV

Atoms in Electric & Magnetic Fields: Electron angular momentum. Space quantization. Electron Spin and Spin Angular Momentum. Larmors Theorem. Spin Magnetic Moment. Stern- Gerlach Experiment. Zeeman Effect: Electron Magnetic Moment and Magnetic Energy, Gyromagnetic Ratio and Bohr Magneton.

Atoms in External Magnetic Fields: Normal and Anomalous Zeeman Effect. Paschen Back and Stark Effect (Qualitative Discussion only). (12 Lectures)

Reference Books:

1. A Text book of Quantum Mechanics, P. M.Mathews and K.Venkatesan, 2nd Ed., 2010, Mc-Graw Hill
2. Quantum Mechanics, Robert Eisberg and Robert Resnick, 2nd Edn., 2002, Wiley.
3. Quantum Mechanics, Leonard I. Schiff, 3rd Edn. 2010, Tata McGraw Hill.
4. Quantum Mechanics, G. Aruldas, 2nd Edn. 2002, PHI Learning of India.
5. Quantum Mechanics, Bruce Cameron Reed, 2008, Jones and Bartlett Learning. Quantum Mechanics: Foundations & Applications, Arno Bohm, 3rd Edn., 1993, Springer
6. Quantum Mechanics for Scientists & Engineers, D.A.B. Miller, 2008, Cambridge University Press
7. Quantum Physics-S. Gasiorowicz (Wiley India) 2013
8. Quantum Mechanics -J.L. Powell and B. Craseman (Narosa) 1988
9. Introduction to Quantum Mechanics- M.Das, P.K.Jena,(SriKrishna Prakashan)
10. Basic Quantum Mechanics A.Ghatak (Mc Millan India) 2012
11. Introduction to Quantum Mechanics R. Dicke and J. Wittke
12. Quantum Mechanics- Eugen Merzbacher, 2004, John Wiley and Sons, Inc.
13. Introduction to Quantum Mechanics, D.J. Griffith, 2nd Ed. 2005, Pearson Education
14. Quantum Mechanics, Walter Greiner, 4th Edn., 2001, Springer
15. Quantum Mechanics - F. Mandl (CBS) 2013
16. Cohen-Tannoudji, B Diu and F Lalo, Quantum Mechanics (2 vols) Wiley-VCH 1977

PHYSICS PRACTICAL-C:XI

20 Classes (2hr duration)

Use C/C++/Scilab for solving the following problems based on Quantum Mechanics like

1. Solve the s-wave Schrodinger equation for the ground state and the first excited state of the hydrogen atom:
Here, m is the reduced mass of the electron. Obtain the energy eigenvalues and plot the corresponding wavefunctions. Remember that the ground state energy of the hydrogen atom is -13.6 eV. Take $e = 3.795$ (eV)^{1/2}, $c = 1973$ (eV) and $m = 0.511 \times 10^6$ eV/c².
2. Solve the s-wave radial Schrodinger equation for an atom:
where m is the reduced mass of the system (which can be chosen to be the mass of an electron), for the screened coulomb potential Find the energy (in eV) of the ground state of the atom to an accuracy of three significant digits. Also, plot the corresponding wavefunction. Take $e = 3.795$ (eV)^{1/2}, $m = 0.511 \times 10^6$ eV/c², and $a = 3, 5, 7$. In these units $c = 1973$ (eV). The ground state energy is expected to be above -12 eV in all three cases.

3. Solve the s-wave radial Schrodinger equation for a particle of mass m :
For the anharmonic oscillator potential for the ground state energy (in MeV) of particle to an accuracy of three significant digits. Also, plot the corresponding wave function. Choose $m = 940 \text{ MeV}/c^2$, $k = 100 \text{ MeV fm}^{-2}$, $b = 0, 10, 30 \text{ MeV fm}^{-3}$ In these units, $c = 197.3 \text{ MeV fm}$. The ground state energy is expected to lie between 90 and 110 MeV for all three cases.
4. Solve the s-wave radial Schrodinger equation for the vibrations of hydrogen molecule:
Where is the reduced mass of the two-atom system for the Morse potential Find the lowest vibrational energy (in MeV) of the molecule to an accuracy of three significant digits. Also plot the corresponding wave function.
Take: $m = 940 \times 10^6 \text{ eV}/c^2$, $D = 0.755501 \text{ eV}$, $\alpha = 1.44$, $\rho = 0.131349$ Laboratory based experiments:
5. Study of Electron spin resonance- determine magnetic field as a function of the resonance frequency.
6. Study of Zeeman effect: with external magnetic field; Hyperfine splitting
7. To show the tunneling effect in tunnel diode using I-V characteristics.
8. Quantum efficiency of CCDs

Reference Books:

1. Schaum's outline of Programming with C++. J.Hubbard, 2000, McGraw-Hill Publication
2. Numerical Recipes in C: The Art of Scientific Computing, W.H. Press et al., 3rd Edn., 2007, Cambridge University Press.
3. An introduction to computational Physics, T.Pang, 2nd Edn., 2006, Cambridge Univ. Press
4. Simulation of ODE/PDE Models with MATLAB, OCTAVE and SCILAB: Scientific & Engineering Applications: A. Vande Wouwer, P. Saucez, C. V. Fernandez. 2014 Springer.
5. Scilab (A Free Software to Matlab): H. Ramchandran, A.S. Nair. 2011 S. Chand & Co.
6. Scilab Image Processing: L.M. Surhone. 2010 Betascript Publishing ISBN:978-6133459274

C-XII: SOLID STATE PHYSICS

(Credits: Theory-04, Practicals-02)
Marks:100 (Theory:70, Practical: 30)
Theory: 40 Classes (1 hr. duration)

UNIT:I

Crystal Structure: Solids- Amorphous and Crystalline Materials. Lattice Translation Vectors. Lattice with a Basis Central and Non-Central Elements. Unit Cell. Miller Indices. Types of Lattices, Reciprocal Lattice. Brillouin Zones. **Diffraction of X-rays by Crystals. Bragg's Law.** Atomic and

Geometrical Factor. (8 Lectures)

UNIT:II

Elementary Lattice Dynamics: Lattice Vibrations and Phonons: Linear **Monoatomic and Di-atomic Chains**. Acoustical and Optical Phonons. Qualitative Description of the Phonon Spectrum in Solids. Dulong and Petits Law, **Einstein and Debye theories of specific heat of solids. T3 law** (6 Lectures)

Magnetic Properties of Matter: Dia-, Para-, Ferri- and Ferromagnetic Materials. Classical Langevin Theory of diaand Paramagnetic Domains. Curies law, Weiss Theory of Ferromagnetism and Ferromagnetic Domains. (6 Lectures)

UNIT:III

Dielectric Properties of Materials: Polarization. Local Electric Field at an Atom. Depolar- ization Field. Electric Susceptibility. Polarizability. Clausius Mosotti Equation. Classical Theory of Electric Polarizability. (4 Lectures)

Lasers: Einsteins A and B coefficients. Metastable states. Spontaneous and Stimulated emissions. Optical Pumping and Population Inversion. Three-Level and Four-Level Lasers. **Ruby Laser and He-Ne Laser**. (4 Lectures)

UNIT-IV

Elementary band theory: Kronig Penny model. Band Gap. Conductor, Semiconductor (P and N type) and insulator. Conductivity of Semiconductor, mobility, Hall Effect. Measurement of conductivity (O4 probe method) & Hall coefficient. (8 Lectures)

Superconductivity: Experimental Results. Critical Temperature. Critical magnetic field. **Meissner effect. Type I and type II Superconductors**, Londons Equation and Penetration Depth. Isotope effect. Idea of BCS theory (No derivation).(4 Lectures)

Reference Books:

1. Introduction to Solid State Physics, Charles Kittel, 8th Edition, 2004, Wiley India Pvt. Ltd.
2. Elements of Solid State Physics, J.P. Srivastava, 2nd Edition, 2006, Prentice-Hall of India
3. Introduction to Solids, Leonid V. Azaroff, 2004, Tata Mc-Graw Hill
4. Solid State Physics, N.W. Ashcroft and N.D. Mermin, 1976, Cengage Learning
5. Solid-state Physics, H. Ibach and H. Luth, 2009, Springer
6. Elementary Solid State Physics, 1/e M. Ali Omar, 1999, Pearson India
7. Solid State Physics, M.A. Wahab, 2011, Narosa Publications
8. Solid State Physics S. O. Pillai (New Age Publication)
9. Solid State Physics- R.K.Puri & V.K. Babbar (S.Chand Publication)2013
10. Lasers and Non linear Optics B.B.Laud-Wiley Eastern.
11. LASERS: Fundamentals and Applications Thyagarajan and Ghatak (McMillanIndia), 2012

PHYSICS PRACTICAL-C:XII

20 Classes (2 hrs. duration)

1. Measurement of susceptibility of paramagnetic solution (Quinck's Tube Method)
2. To measure the Magnetic susceptibility of Solids.
3. To determine the Coupling Coefficient of a Piezoelectric crystal.
4. To measure the Dielectric Constant of a dielectric Materials with frequency
5. To determine the complex dielectric constant and plasma frequency of metal using Surface Plasmon resonance (SPR)
6. To determine the refractive index of a dielectric layer using SPR
7. To study the PE Hysteresis loop of a Ferroelectric Crystal.
8. To draw the BH curve of Fe using Solenoid & determine energy loss from Hysteresis.
9. To measure the resistivity of a semiconductor (Ge) with temperature by four-probe method (room temperature to 150 oC) and to determine its band gap.
10. To determine the Hall coefficient of a semiconductor sample.

Reference Books:

1. Advanced Practical Physics for students, B.L. Flint and H.T. Worsnop, 1971, Asia Publishing House.
2. Advanced level Physics Practicals, Michael Nelson and Jon M. Ogborn, 4th Edition, reprinted 1985, Heinemann Educational Publishers.
3. A Text Book of Practical Physics, I.Prakash & Ramakrishna, 11th Ed., 2011, Kitab Mahal
4. Elements of Solid State Physics, J.P. Srivastava, 2nd Ed., 2006, Prentice-Hall of India.

C-XIII: ELECTROMAGNETIC THEORY

(Credits: Theory-04, Practicals-02)

Marks:100 (Theory:70, Practical: 30)

Theory: 40 Classes (1 hr. duration)

UNIT:I

Maxwell Equations: Maxwells equations. Displacement Current. Vector and Scalar Potentials. Gauge

Transformations: Lorentz and Coulomb Gauge. Boundary Conditions at Interface between Different Media. Wave Equations. Plane Waves in Dielectric Media. Poynting Theorem and Poynt- ing Vector. Electromagnetic (EM) Energy Density. Physical Concept of Electromagnetic Field Energy Density. (8 Lectures)

UNIT:II

EM Wave Propagation in Unbounded Media: Plane EM waves through vacuum and isotropic dielectric medium, transverse nature of plane EM waves, refractive index and dielectric constant, wave impedance.

Propagation through conducting media, relaxation time, skin depth. Electrical conductivity of ionized gases, plasma frequency, refractive index, skin depth, application to propagation through ionosphere. (8 Lectures)

UNIT:III

EM Wave in Bounded Media: Boundary conditions at a plane interface between two media. Reflection & Refraction of plane waves at plane interface between two dielectric media-Laws of Reflection & Refraction. Fresnel's Formulae for perpendicular & parallel polarization cases, Brewster's law. Reflection & Transmission coefficients. Total internal reflection, evanescent waves. Metallic reflection (normal Incidence).

Optical Fibres: Numerical Aperture. Step and Graded Indices (Definitions Only). Single and Multiple Mode Fibres (Concept and Definition Only). (12 Lectures)

UNIT-IV

Polarization of Electromagnetic Waves: Description of Linear, Circular and Elliptical Polarization. Propagation of E.M. Waves in Anisotropic Media. Symmetric Nature of Dielectric Tensor. Fresnel's Formula. Uniaxial and Biaxial Crystals. Light Propagation in Uniaxial Crystal. Double Refraction. Polarization by Double Refraction. Nicol Prism. Ordinary & extraordinary refractive indices. Production & detection of Plane, Circularly and Elliptically Polarized Light. Phase Retardation Plates: Quarter-Wave and Half-Wave Plates. Babinet Compensator and its Uses. Analysis of Polarized Light.

Rotatory Polarization: Optical Rotation. Biot's Laws for Rotatory Polarization. Fresnel's Theory of optical rotation. Calculation of angle of rotation. Experimental verification of Fresnel's theory. Specific rotation. Laurent's half-shade polarimeter. (12 Lectures)

Reference Books:

1. Introduction to Electrodynamics, D.J. Griffiths, 3rd Ed., 1998, Benjamin Cummings.
2. Elements of Electromagnetics, M.N.O. Sadiku, 2001, Oxford University Press.
3. Introduction to Electromagnetic Theory, T.L. Chow, 2006, Jones & Bartlett Learning
4. Fundamentals of Electromagnetics, M.A.W. Miah, 1982, Tata McGraw Hill
5. Electromagnetic field Theory, R.S. Kshetrimayun, 2012, Cengage Learning
6. Electromagnetic Field Theory for Engineers & Physicists, G. Lehner, 2010, Springer
7. Electricity and Magnetism —D C Tayal (Himalaya Publication)2014
8. Introduction to Electrodynamics-A.Z.Capri & P.V.Panat (Alpha Science) 2002
9. Optics E.Hecht, (Pearson India) **(Additional Books for Reference)**
10. Electromagnetic Fields & Waves, P.Lorrain & D.Corson, 1970, W.H.Freeman & Co.

11. Electromagnetics, J.A. Edminster, Schaum Series, 2006, Tata McGraw Hill.
12. Electromagnetic field theory fundamentals, B. Guru and H. Hiziroglu, 2004, Cambridge University Press
13. Electromagnetic Theory-A. Murthy (S. Chand Publication)2014
14. Classical Electrodynamics, J. D. Jackson (Wiley India)

PHYSICS PRACTICAL-C:XIII

20 Classes (2 hrs. duration)

1. To verify the law of Malus for plane polarized light.
2. To determine the specific rotation of sugar solution using Polarimeter.
3. To analyze elliptically polarized Light by using a Babinets compensator.
4. To study dependence of radiation on angle for a simple Dipole antenna.
5. To determine the wavelength and velocity of ultrasonic waves in a liquid (Kerosene Oil, Xylene, etc.) by studying the diffraction through ultrasonic grating.
6. To study the reflection, refraction of microwaves
7. To study Polarization and double slit interference in microwaves.
8. To determine the refractive index of liquid by total internal reflection using Wollastons air-film.
9. To determine the refractive Index of (1) glass and (2) a liquid by total internal reflection using a Gaussian eyepiece.
10. To study the polarization of light by reflection and determine the polarizing angle for air- glass interface.
11. To verify the Stefan's law of radiation and to determine Stefans constant.
12. To determine the Boltzmann constant using V-I characteristics of PN junction diode.

Reference Books:

1. Advanced Practical Physics for students, B.L. Flint and H.T. Worsnop, 1971, Asia Publishing House.
2. Advanced level Physics Practicals, Michael Nelson and Jon M. Ogborn, 4th Edition, reprinted 1985, Heinemann Educational Publishers
3. A Text Book of Practical Physics, I.Prakash & Ramakrishna, 11th Ed., 2011, Kitab Mahal
4. Electromagnetic Field Theory for Engineers & Physicists, G. Lehner, 2010, Springer

C-XIV: STATISTICAL MECHANICS

(Credits: Theory-04, Practicals-02)

Marks:100 (Theory:70, Practical: 30)

Theory: 40 Classes (1 hr. duration)

UNIT:I

Classical Statistics: Macrostate & Microstate, Elementary Concept of Ensemble, Microcanonical, Canonical and grand canonical ensemble. Phase Space, Entropy and Thermodynamic Probability, Maxwell-Boltzmann Distribution Law, Partition Function, Thermodynamic Functions of an Ideal Gas, Classical Entropy Expression. (12 Lectures)

UNIT:II

Gibbs Paradox, Sackur Tetrode equation, Law of Equipartition of Energy (with proof) Applications to Specific Heat and its Limitations, Thermodynamic Functions of a Two-Energy Levels System, Negative Temperature.(8 Lectures)

UNIT:III

Radiation: Properties of Thermal Radiation. Blackbody Radiation. Pure temperature dependence. Kirchhoffs law. Stefan-Boltzmann law: Thermodynamic proof. Radiation Pressure. Wiens Displacement law. Wiens Distribution Law. **Sahas Ionization Formula. Rayleigh-Jeans Law. Ultraviolet Catastrophe.** Plancks Law of Blackbody Radiation: Experimental Verification. Deduction of (1) Wiens Distribution Law, (2) Rayleigh-Jeans Law, (3) Stefan-Boltzmann Law, (4) Wiens Displacement law from Plancks law.(12 Lectures)

UNIT=IV

Quantum Statistics: Identical particles, macrostates and micro states. Fermions and Bosons, **Bose Einstein distribution function and Fermi-Dirac Distribution function.** Bose-Einstein Condensation, Bose deviation from Planck's law, Effect of temperature on F-D distribution function, degenerate Fermigas, Density of States, Fermi energy.(8 Lectures)

Reference Books:

1. Statistical Mechanics-R.K.Pathria & Paul D. Beale (Academic Press) 3rd Edition (2011)
2. Statistical Physics, Berkeley Physics Course, F. Reif, 2008, Tata McGraw-Hill
3. Statistical and Thermal Physics, S. Lokanathan and R.S. Gambhir. 1991, Prentice Hall
4. Thermodynamics, Kinetic Theory and Statistical Thermodynamics, Francis W. Sears and Gerhard L. Salinger, 1986, Narosa.
5. Modern Thermodynamics with Statistical Mechanics, Carl S. Helrich, 2009, Springer
6. An Introduction to Statistical Mechanics & Thermodynamics, R.H. Swendsen, 2012, Oxford Univ. Press.
7. An introduction to Equilibrium Statistical Mechanics: Palash Das (I.K.International Publication) 2012
8. Statistical Physics - F. Mandl (CBS) 2012

9. Statistical Physics of Particles-M. Kardar (CUP 2007)

PHYSICS PRACTICAL-C:XIV

20 Classes (2 hrs. duration)

Use C/C++/Scilab for solving the problems based on Statistical Mechanics like

1. Plot Plancks law for Black Body radiation and compare it with Weins Law and Raleigh- Jeans Law at high temperature (room temperature) and low temperature.
2. Plot Specific Heat of Solids by comparing (a) Dulong-Petit law, (b) Einstein distribution function, (c) Debye distribution function for high temperature (room temperature) and low temperature and compare them for these two cases
3. Plot Maxwell-Boltzmann distribution function versus temperature.
4. Plot Fermi-Dirac distribution function versus temperature.
5. Plot Bose-Einstein distribution function versus temperature.

Reference Books:

1. Elementary Numerical Analysis, K.E. Atkinson, 3 r d Edn. 2007, Wiley India Edition
2. Statistical Mechanics, R.K. Pathria, Butterworth Heinemann: 2nd Ed., 1996, Oxford Univer- sity Press.
3. Thermodynamics, Kinetic Theory and Statistical Thermodynamics, Francis W. Sears and Gerhard L. Salinger, 1986, Narosa.
4. Modern Thermodynamics with Statistical Mechanics, Carl S. Helrich, 2009, Springer
5. Simulation of ODE/PDE Models with MATLAB, OCTAVE and SCILAB: Scientific and En- gineering Applications: A. Vande Wouwer, P. Saucez, C. V. Fernndez. 2014 Springer ISBN: 978-3319067896
6. Scilab by example: M. Affouf, 2012. ISBN: 978-1479203444
7. Scilab Image Processing: L.M.Surhone. 2010, Betascript Pub., ISBN: 978- 6133459274

Discipline Specific Elective (DSE)
(4 papers including the Project) DSE-1 to
DSE-4 (6 Credits each)

CLASSICAL DYNAMICS
(Credits: Theory-05, Tutorial-01) Theory: 50
Classes (1 hr. duration)

The emphasis of the course is on applications in solving problems of interest to physicists. Students are to be examined on the basis of problems, seen and unseen.

UNIT-I

Classical Mechanics of Point Particles: Generalised coordinates and velocities. Hamilton's Principle, Lagrangian and Euler-Lagrange equations. Applications to simple systems such as coupled oscillators. Canonical momenta & Hamiltonian. **Hamilton's equations of motion.** Applications: Hamiltonian for a harmonic oscillator, particle in a central force field. **Motion of charged particles in external electric and magnetic fields.** (25 Lectures)

UNIT-II

Special Theory of Relativity: Postulates of Special Theory of Relativity. **Lorentz Transformations.** Minkowski space. The invariant interval, light cone and world lines. Space-time diagrams. **Time-dilation, length contraction & twin paradox.** Four-vectors: space-like, time-like & light-like. Four-velocity and acceleration. Metric and alternating tensors. Four-momentum and energy-momentum relation. Doppler effect from a four vector perspective. Concept of four-force. **Conservation of four-momentum.** Relativistic kinematics. **Application to two-body decay of an unstable particle.** (25 Lectures) **Reference Books:**

1. Classical Mechanics, H.Goldstein, C.P. Poole, J.L. Safko, 3rd Edn. 2002, Pearson Education.
2. Mechanics, L. D. Landau and E. M. Lifshitz, 1976, Pergamon.
3. Classical Mechanics: An introduction, Dieter Strauch, 2009, Springer.
4. Solved Problems in classical Mechanics, O.L. Delange and J. Pierrus, 2010, Oxford Press
5. Classical Mechanics-J. C.Upadhyay (Himalaya Publication) 2014
6. Classical Dynamics of Particles and Systems S. T. Thornton (Cengage Learning) 2012
7. Introduction to Classical Mechanics-R. K. Takwale, S.Puranik-(Tata Mc Graw Hill)
8. Classical Mechanics-M. Das, P.K.Jena, M. Bhuyan, R.N.Mishra (Srikrishna Prakashan)

NUCLEAR & PARTICLE PHYSICS
(Credits: Theory-05, Tutorials-01) Theory: 50
Classes (1 hr. duration)

UNIT-I

General Properties of Nuclei: Constituents of nucleus and their Intrinsic properties, quantitative facts about mass, radii, charge density (matter density), binding energy, average binding energy and its variation with mass number, main features of binding energy versus mass number curve, N/A plot, angular momentum, parity, magnetic moment, electric moments, nuclear excited states. **Nuclear Models:** Liquid drop model approach, semi empirical mass formula and significance of its various terms, condition of nuclear stability, two nucleon separation energies, evidence for nuclear shell structure, nuclear magic numbers, basic assumption of shell model,

Radioactivity decay: (a) α -decay: basics of α -decay processes, theory of α -emission, Gamow factor, Geiger Nuttall law. (b) β -decay: energy kinematics for β -decay, positron emission, electron capture, neutrino hypothesis. (c) Elementary idea of Gamma decay.

Nuclear Reactions: Types of Reactions, Conservation Laws, kinematics of reactions, Q-value, (25 Lectures)

UNIT-II

Detector for Nuclear Radiations: Gas detectors: estimation of electric field, mobility of particle, for ionization chamber and GM Counter. Basic principle of Scintillation Detectors and construction of photo-multiplier tube (PMT). Semiconductor Detectors (Si and Ge) for charge particle and photon detection (concept of charge carrier and mobility), neutron detector.

Particle Accelerators: Van-de Graaff generator (Tandem accelerator), Linear accelerator, Cyclotron, Synchrotrons.

Particle physics: Particle interactions; basic features, types of particles and its families. Symmetries and Conservation Laws: energy and momentum, angular momentum, parity, baryon number, Lepton number, Isospin, Strangeness and charm. Elementary ideas of quarks and gluons. (25 Lectures)

Reference Books:

1. Introductory nuclear Physics by Kenneth S. Krane (Wiley India Pvt. Ltd., 2008).
2. Concepts of nuclear physics by Bernard L. Cohen. (Tata Mcgraw Hill, 1998).
3. Introduction to High Energy Physics, D.H. Perkins, Cambridge Univ. Press
4. Introduction to Elementary Particles, D. Griffith, John Wiley & Sons
5. Basic ideas and concepts in Nuclear Physics - An Introductory Approach by K. Heyde (IOP-Institute of Physics Publishing, 2004).
6. Theoretical Nuclear Physics, J.M. Blatt & V.F. Weisskopf (Dover Pub.Inc., 1991)
7. Atomic and Nuclear Physics -A. B. Gupta, Dipak Ghosh. (Books and Allied Publishers)
8. Physics of Atoms and Molecules Bransden (Pearson India) 2003
9. Subatomic Physics - Henley and Gracia (World Scientific) 2012

10. Introduction to Nuclear and Particle Physics-A.Das and T.Ferbel (World Scientific)

11. Radiation detection and measurement, G.F. Knoll (John Wiley & Sons, 2000).

COMPUTATIONAL PHYSICS

(Credits: Theory-05, Tutorials-01) Theory: 50
Classes (1 hr. duration)

The aim of this course is not just to teach computer programming and numerical analysis but to emphasize its role in solving problems in Physics.

- Highlights the use of computational methods to solve physical problems
- Use of computer language as a tool in solving physics problems (applications)
- Course will consist of hands on training on the Problem solving on Computers.

UNIT-I

Introduction: Importance of computers in Physics, paradigm for solving physics problems for solution. Usage of linux as an Editor. **Algorithms and Flowcharts:** Algorithm- Definition, properties and development. Flowchart- Concept of flowchart, symbols, guidelines, types. Examples: Cartesian to Spherical Polar Coordinates, Roots of Quadratic Equation, Sum of twomatrices, Sum and Product of a finite series, calculation of $\sin(x)$ as a series, algorithm for plotting (1) lissajous figures and (2) trajectory of a projectile thrown at an angle with the horizontal.

Scientific Programming: Some fundamental Linux Commands (Internal and External com- mands). Development of FORTRAN, Basic elements of FORTRAN: Character Set, Constants and their types, Variables and their types, Keywords, Variable Declaration and concept of instruction and program. Operators: Arithmetic, Relational, Logical and Assignment Operators. Expressions: Arithmetic, Relational, Logical, Character and Assignment Expressions. Fortran Statements: I/O Statements (unformatted/formatted), Executable and Non-Executable Statements, Layout of For- tran Program, Format of writing Program and concept of coding, Initialization and Replacement Logic. Examples from physics problems. (25 Lectures)

UNIT-II

Control Statements: Types of Logic (Sequential, Selection, Repetition), Branching Statements (Logical IF, Arithmetic IF, Block IF, Nested Block IF, SELECT CASE and ELSE IF Ladder state- ments), Looping Statements (DO-CONTINUE, DO-ENDDO, DOWHILE, Implied and Nested DO Loops), Jumping Statements (Unconditional GOTO, Computed GOTO, Assigned GOTO) Sub- scripted Variables (Arrays: Types of Arrays, DIMENSION Statement, Reading and Writing Arrays), Functions and Subroutines (Arithmetic Statement Function, Function Subprogram and Subroutine), RETURN, CALL, COMMON and EQUIVALENCE Statements), Structure, Disk I/O Statements, open a file, writing in a file, reading from a file. Examples from physics problems.

Programming:

1. Exercises on syntax on usage of FORTRAN
2. To print out all natural even/ odd numbers between given limits.
3. To find maximum, minimum and range of a given set of numbers.
4. To find a set of prime numbers and Fibonacci series.

(25 Lectures)

Reference Books:

1. Introduction to Numerical Analysis, S.S. Sastry, 5th Edn., 2012, PHI Learning Pvt. Ltd.
2. Computer Programming in Fortran 77. V. Rajaraman (Publisher: PHI).
3. Schaums Outline of Theory and Problems of Programming with Fortran, S Lipsdutz and A Poe, 1986Mc-Graw Hill Book Co.
4. Computational Physics: An Introduction, R. C. Verma, et al. New Age International Publish- ers, New Delhi(1999)
5. A first course in Numerical Methods, U.M. Ascher and C. Greif, 2012, PHI Learning
6. Elementary Numerical Analysis, K.E. Atkinson, 3 rd Edn., 2007, Wiley India Edition.

NANO MATERIALS & APPLICATIONS

(Credits: Theory-05, Tutorial-01) Theory: 50
Classes (1 hr. duration)

UNIT-I

Nanoscale Systems: Length scales in physics, Nanostructures: 1D, 2D and 3D nanostructures (nanodots, thin films, nanowires, nanorods), Band structure and density of states of materials at nanoscale, Size Effects in nano systems, Quantum confinement: Applications of Schrodinger equation- Infinite potential well, potential step, potential box, quantum confinement of carriers in 3D, 2D, 1D nanostructures and its consequences.

Synthesis Of Nanostructure Materials: Top down and Bottom up approach, Photolithogra- phy. Ball milling. Gas phase condensation. Vacuum deposition. Physical vapor deposition (PVD): Thermal evaporation, E-beam evaporation, Pulsed Laser deposition. Chemical vapor deposition (CVD). Sol-Gel. Electro deposition. Spray pyrolysis. Hydrothermal synthesis. Preparation through colloidal methods. MBE growth of quantum dots. (25 Lectures)

UNIT-II

Characterization: X-Ray Diffraction. Optical Microscopy. Scanning Electron Microscopy. Trans- mission Electron Microscopy. Atomic Force Microscopy. Scanning Tunneling Microscopy.

Applications: Applications of nanoparticles, quantum dots, nanowires and thin films for photonic devices (LED, solar cells). Single electron devices (no derivation). CNT based transistors. Nano- material Devices: Quantum dots heterostructure lasers, optical switching and optical data storage. Magnetic quantum well; magnetic dots - magnetic data storage. Micro Electromechanical Systems (MEMS), Nano Electromechanical Systems (NEMS). (25 Lectures)

Reference books:

1. C.P. Poole, Jr. Frank J. Owens, Introduction to Nanotechnology (Wiley India Pvt. Ltd.).
2. S.K. Kulkarni, Nanotechnology: Principles & Practices (Capital Publishing Company)

3. K.K. Chattopadhyay and A. N. Banerjee, Introduction to Nanoscience and Technology (PHI Learning Private Limited).
4. Richard Booker, Earl Boysen, Nanotechnology (John Wiley and Sons).
5. M. Hosokawa, K. Nogi, M. Naita, T. Yokoyama, Nanoparticle Technology Handbook (Elsevier, 2007).
6. Bharat Bhushan, Springer Handbook of Nanotechnology (Springer-Verlag, Berlin, 2004).
7. Nanotechnology- Rakesh Rathi (S Chand & Company, New Delhi)

BIO-PHYSICS

**(Credits: Theory-05, Tutorials-01) Theory: 50
Classes (1 hr. duration)**

UNIT-I

Building Blocks & Structure of Living State: Atoms and ions, molecules essential for life, what is life. Living state interactions: Forces and molecular bonds, electric & thermal interactions, electric dipoles, Casimir interactions, domains of physics in biology.

Heat Transfer in bio-materials: Heat Transfer Mechanism, The Heat equation, Joule heating of tissue.

Living State Thermodynamics: Thermodynamic equilibrium, first law of thermodynamics and conservation of energy. Entropy and second law of thermodynamics, Physics of many particle systems, Two state systems, continuous energy distribution, Composite systems, Casimir contribution of free energy, Protein folding and unfolding. (25 Lectures)

UNIT-II

Open systems and chemical thermodynamics: Enthalpy, Gibbs Free Energy and chemical potential, activation energy and rate constants, enzymatic reactions, ATP hydrolysis & synthesis, Entropy of mixing, The grand canonical ensemble, Hemoglobin.

Diffusion and transport: Maxwell-Boltzmann statistics, Fick's law of diffusion, sedimentation of Cell Cultures, diffusion in a centrifuge, diffusion in an electric field, Lateral diffusion in membranes, Navier-Stokes equation, low Reynolds Number Transport, Active and passive membrane transport. **Fluids:** Laminar and turbulent fluid flow, Bernoulli's equation, equation of continuity, Venturi effect, Fluid dynamics of circulatory systems, capillary action.

Bio-energetics and Molecular motors: Kinesins, Dyneins, and microtubule dynamics, Brownian motion, ATP synthesis in Mitochondria, Photosynthesis in Chloroplasts, Light absorption in biomolecules, vibrational spectra of bio-biomolecules. (25 Lectures)

Reference Books:

1. Introductory Biophysics, J. Claycomb, JQP Tran, Jones & Bartlett Publishers
2. Aspects of Biophysics, Hugh S W, John Wiley and Sons.
3. Essentials of Biophysics by P Narayanan, New Age International.

4. Molecular Biophysics- P.K.Banarjee (S. Chand Publication), 2014.
5. Essentials of Biophysics : P. Narayanan, (New Age International, New Delhi), 2005 .
6. Biophysics: An introduction : Rodney Cotterill, John Wiley and Sons Ltd, 2002.
7. Biophysics- Dr.G.R.Chatwal (Himalaya Pub.),2011.

**Project Work (Credits:
06) (Compulsory)**

SKILL ENHANCEMENT COURSE
(Credit: 04 each)- SEC-1 and SEC-2

1- Communicative English and English Writing Skill(Compulsory) (Credits: 02)
Theory: 20 Classes (1 hr.duration)

2-BASIC INSTRUMENTATION SKILLS
(Credits: 02)
Theory: 20 Classes (1 hr. duration)

This course is to get exposure with various aspects of instruments and their usage through hands-on mode. Experiments listed below are to be done in continuation of the topics.

UNIT-I

Basic of Measurement: Instruments accuracy, precision, sensitivity, resolution range etc. Errors in measurements and loading effects.

Multimeter: Principles of measurement of dc voltage and dc current, ac voltage, ac current and resistance. Specifications of a multimeter and their significance.

Electronic Voltmeter: Advantage over conventional multimeter for voltage measurement with respect to input impedance and sensitivity. Principles of voltage, measurement (block diagram only). Specifications of an electronic Voltmeter/ Multimeter and their significance.

AC millivoltmeter: Type of AC millivoltmeters: Amplifier- rectifier, and rectifier- amplifier. Block diagram ac millivoltmeter, specifications and their significance.

Cathode Ray Oscilloscope: Block diagram of basic CRO. Construction of CRT, Electron gun, electrostatic focusing and acceleration (Explanation only no mathematical treatment), brief discussion on screen phosphor, visual persistence & chemical composition. Time base operation, synchronization. Front panel controls. Specifications of a CRO and their significance. Use of CRO for the measurement of voltage (dc and ac frequency, time period. Special features of dual trace, introduction to digital oscilloscope, probes. Digital storage Oscilloscope: Block diagram and principle of working. (10 Lectures)

UNIT-II

Signal Generators and Analysis Instruments: Block diagram, explanation and specifications of low frequency signal generators. pulse generator, and function generator. Brief idea for testing, specifications. Distortion factor meter, wave analysis.

Digital Instruments: Principle and working of digital meters. Comparison of analog & digital instruments. Characteristics of a digital meter. Working principles of digital voltmeter.

Digital Multimeter: Block diagram and working of a digital multimeter. Working principle of time interval, frequency and period measurement using universal counter/ frequency counter, time- base stability, accuracy and resolution. (10 Lectures)

The test of lab skills will be of the following test items:

1. Use of an oscilloscope.
2. CRO as a versatile measuring device.
3. Circuit tracing of Laboratory electronic equipment,
4. Use of Digital multimeter/VTVM for measuring voltages
5. Circuit tracing of Laboratory electronic equipment,
6. Winding a coil / transformer.
7. Study the layout of receiver circuit.
8. Trouble shooting a circuit
9. Balancing of bridges

Laboratory Exercises:

1. To observe the loading effect of a multimeter while measuring voltage across a low resistance and high resistance.
2. To observe the limitations of a multimeter for measuring high frequency voltage and currents.
3. To measure Q of a coil and its dependence on frequency, using a Q- meter.
4. Measurement of voltage, frequency, time period and phase angle using CRO.
5. Measurement of time period, frequency, average period using universal counter/ frequency counter.
6. Measurement of rise, fall and delay times using a CRO.
7. Measurement of distortion of a RF signal generator using distortion factor meter.
8. Measurement of R, L and C using a LCR bridge/ universal bridge.

Open Ended Experiments:

1. Using a Dual Trace Oscilloscope.
2. Converting the range of a given measuring instrument (voltmeter, ammeter).

Reference Books:

1. A text book in Electrical Technology - B L Theraja - S Chand and Co.
2. Performance and design of AC machines - M G Say ELBS Edn.
3. Digital Circuits and systems, Venugopal, 2011, Tata McGraw Hill.
4. Logic circuit design, Shimon P. Vingron, 2012, Springer.

5. Digital Electronics, Subrata Ghoshal, 2012, Cengage Learning.
6. Electronic Devices and circuits, S. Salivahanan & N. S.Kumar, 3rd Ed., 2012, Tata Mc-Graw Hill.
7. Electronic circuits: Handbook of design and applications, U.Tietze, Ch.Schenk, 2008, Springer
8. Electronic Devices, 7/e Thomas L. Floyd, 2008, Pearson India.

3-RENEWABLE ENERGY & ENERGY HARVESTING

(Credits: 02)

Theory: 20 Classes (1hr duration)

The aim of this course is not just to impart theoretical knowledge to the students but to provide them with exposure and hands-on learning wherever possible.

UNIT-I

Fossil fuels and Alternate Sources of energy: Fossil fuels and nuclear energy, their limitation, need of renewable energy, non-conventional energy sources. An overview of developments in Offshore Wind Energy, Tidal Energy, Wave energy systems, Ocean Thermal Energy Conversion, solar energy, biomass, biochemical conversion, biogas generation, geothermal energy tidal energy, Hydroelectricity.

Solar energy: Solar energy, its importance, storage of solar energy, solar pond, non plate collector, solar distillation, solar cooker, solar green houses, solar cell, absorption air conditioning. Need and characteristics of photovoltaic (PV) systems, PV models and equivalent circuits, and sun tracking systems.(10 Lectures)

UNIT-II

Wind Energy harvesting: Fundamentals of Wind energy, Wind Turbines and different electrical machines in wind turbines, Power electronic interfaces, and grid interconnection topologies.

Ocean Energy: Ocean Energy Potential against Wind and Solar, Wave Characteristics and Statistics, Wave Energy Devices. Tide characteristics and Statistics, Tide Energy Technologies, Ocean Thermal Energy, Osmotic Power, Ocean Bio-mass. Geothermal Energy: Geothermal Resources, Geothermal Technologies.

Hydro Energy: Hydropower resources, hydropower technologies, environmental impact of hydro power sources. (10 Lectures)

Reference Books:

1. Non-conventional energy sources - G.D Rai - Khanna Publishers, New Delhi
2. Solar energy - M P Agarwal - S Chand and Co. Ltd.
3. Solar energy - Suhas P Sukhative Tata McGraw - Hill Publishing Company Ltd.
4. Godfrey Boyle, Renewable Energy, Power for a sustainable future, 2004, Oxford University Press, in association with The Open University.
5. Dr. P Jayakumar, Solar Energy: Resource Assesment Handbook, 2009

6. J.Balfour, M.Shaw and S. Jarosek, Photovoltaics, Lawrence J Goodrich (USA).

7. [http://en.wikipedia.org/wiki/Renewable energy](http://en.wikipedia.org/wiki/Renewable_energy).

4-APPLIED OPTICS

(Credits: 02)

THEORY: 20 Classes (1 hr. duration)

Theory includes only qualitative explanation. Minimum five experiments should be performed covering minimum three sections.

UNIT-I

Sources and Detectors: Lasers, Spontaneous and stimulated emissions, Theory of laser action, Einsteins coefficients, Light amplification, Characterization of laser beam, He-Ne laser, Semiconductor lasers.

Elementary ideas of Fourier Optics.

Concept of Spatial frequency filtering, Fourier transforming property of a thin lens. (10 Lectures)

UNIT-II

Holography

Basic principle and theory: coherence, resolution, Types of holograms, white light reflection hologram, application of holography in microscopy, interferometry, and character recognition.

Photonics: Fibre Optics

Optical fibres and their properties, Principal of light propagation through a fibre, The numerical aperture, Attenuation in optical fibre and attenuation limit, Single mode and multimode fibres, Fibre optic sensors: Fibre Bragg Grating. (10 Lectures)

Reference Books:

1. Fundamental of optics, F. A. Jenkins & H. E. White, 1981, Tata McGraw Hill.
2. LASERS: Fundamentals & applications, K.Thyagrajan & A.K.Ghatak, 2010, Tata McGraw Hill
3. Fibre optics through experiments, M.R.Shenoy, S.K.Khijwania, et.al. 2009, Viva Books.
4. Nonlinear Optics, Robert W. Boyd, (Chapter-I), 2008, Elsevier.
5. Optics, Karl Dieter Moller, Learning by computing with model examples, 2007, Springer.
6. Optical Systems and Processes, Joseph Shamir, 2009, PHI Learning Pvt. Ltd.
7. Optoelectronic Devices and Systems, S.C. Gupta, 2005, PHI Learning Pvt. Ltd.
8. Optical Physics, A.Lipson, S.G.Lipson, H.Lipson, 4th Edn., 1996, Cambridge Univ. Press.
9. Optics E.Hecht, (Pearson India).

GENERIC ELECTIVE (GE) (Minor-Physics)
For other Departments/Disciplines-(Credit: 06 each)

**GE:I-MECHANICS & PROPERTIES OF MATTER, OSCILLATION & WAVES,
THERMAL PHYSICS, ELECTRICITY, MAGNETISM & ELECTRONICS**

(Credits: Theory - 04, Practicals 02)

Theory: 40 classes (1 hr. duration each)-Full Marks: 70

UNIT-I: Mechanics & Properties of Matter

Moment of Inertia Parallel axis and perpendicular axis theorem, M.I. of a Solid sphere and Solid cylinder, Gravitational potential and field due to a thin spherical shell and a solid sphere at external points and internal points. Relation among elastic constants, depression at free end of a light cantilever. Surface tension, pressure difference across a curved membrane, viscous flow, Poiseulle's formula. (8 classes) 14 Marks

UNIT-II: Oscillation and Waves

Simple harmonic motion, damped harmonic motion, under damped, over damped and critically damped motion, Forced vibration, Resonance. Wave equation in a medium, Velocity of Longitudinal waves in an elastic medium and velocity of transverse wave in a stretched string. Composition of SHM, Lissajous figures for superposition of two orthogonal simple harmonic vibrations (a) with same frequency, (b) frequency with 2:1. (8 classes) 14 Marks

UNIT-III: Thermal Physics

Entropy, change in entropy in reversible and irreversible process, Carnot engine and its efficiency. Carnot Theorem, Second law of thermodynamics, Kelvin-Planck, Clausius formula. Thermal conductivity, differential equation for heat flow in one dimension. Maxwell thermodynamic relation (statement only), Clausius-Clapeyron equation. Black body radiation, Planck radiation formula (No derivation). (8 classes) 14 Marks

UNIT-IV: Electricity and Magnetism

Gauss law of electrostatics, use of Gauss law to compute electrostatic field due to a linear charge distribution. Magnetic induction B, Lorentz force law. Biot-Savart's law, Magnetic induction due to long straight current carrying conductor, and in the axis of a current carrying circular coil. Ampere's Circuital law, its differential form. The law of electromagnetic equations, its differential and integral form. Maxwell's electro-magnetic equations and their physical significance.

Growth and decay of currents in LR and RC circuits, time constant, alternating currents in RC, RL and LCR circuits, impedance, power factor, resonance. (8 classes) 14 Marks

UNIT-V: Electronics

Extrinsic and intrinsic semiconductors, P-type and N-type semiconductors. PN-Junction as rectifier, Half wave and Full wave rectifiers (Bridge type), efficiency, ripple factor, use of RC, LC, and filters, working of PNP and NPN transistors, transistor configurations in CE and CB circuits and relation between α and β . JFET, its operation and characteristics of V-I curve. (8 classes) 14 Marks

Reference Books:

1. Properties of Matter D.S. Mathur (S. Chand Publication).
2. Heat and Thermodynamics A.B. Gupta & H.B. Ray (New Central Book Agency).
3. Sound M. Ghosh (S. Chand Publication).
4. Introduction to Electrodynamics D.I. Griffith (Prentice Hall of India).
5. Foundations of Electronics Chattopadhyaya and Rakshit.
6. Physics of Degree students Vol.I M. Das, P.K. Jena, M. Bhuyan, D.K. Rout (Srikrishna Prakashan).
7. Physics of Degree students Vol.I M. Das, P.K. Jena, M. Bhuyan, and others (Srikrishna Prakashan).
8. University Physics Sears, Zemansky, H.D. Young (Addison Wesley).

GE:I LAB.

20 classes (2 hours duration each)-Full Marks: 30

1. Measurement of length (or diameter) using Vernier calipers, Screw gauge and travelling microscope.
2. To determine the moment of inertia of a fly wheel.
3. To determine the Young's modulus Y of a wire by Searls method.
4. To determine the modulus of rigidity of a wire by Maxwells needle/Torsion Pendulum (Dynamic method).
5. To determine g by bar pendulum.
6. To determine the elastic constants of a wire by Searls method.
7. To determine the value of Y of a rubber by using travelling microscope.
8. To determine the Rigidity of modulus by static method.
9. To determine the frequency of a telescope by using Sonometer.
10. Verification of Laws of Vibration of a string by using Sonometer.
11. To compare capacitances using DeSauty bridge.
12. To determine the Law of resistance by using Foster bridge.
13. To determine the Mechanical equivalent of heat J by Callender and Barnes constants flow method.
14. To determine the J by Joules Calorimeter.
15. To determine the coefficient of viscosity of water by Capillary flow method (Poiseilles method).
16. Compare the specific heat of two liquids by method of Cooling.

Reference Books:

1. Advanced Practical Physics for students, B.L.Flint & H.T.Worsnop, 1971, Asia Publishing House B.B. Swain.
2. A Laboratory Manual of Physics for Undergraduate Classes, D.P.Khandelwal (1985), VaniPublication.
3. A Text book of Practical Physics, Indu Prakash and Ramakrishna, 11th Edition (2011), Kitab Mahal, New Delhi.

GE:II-OPTICS, SPECIAL THEORY OF RELATIVITY, ATOMIC PHYSICS, QUANTUM MECHANICS & NUCLEAR PHYSICS

(Credits: Theory - 04, Practicals 02) Theory:
40 classes (1hr duration each)-Full Marks: 70

UNIT-I: Optics-I

Elementary ideas of monochromatic aberrations and their minimization, chromatic aberration, achromatic combination. Theory of formation of Primary and Secondary rainbow. Condition of interference. Coherent sources. Youngs Double Slit experiment. Biprism and measurement of wave length of light of by it. Colour of thin films and Newtons rings. Fresnel and Fraunhofer diffraction, diffraction by Single slit Plane transmission grating.(8 classes) 14 Marks

UNIT-II: Optics-II and Relativity

Electromagnetic nature of light, polarized and unpolarized light, polarization by reflection and refraction. Brewsters Law, Malus Law, Double refraction. Ordinary and extraordinary rays. Galilean transformation, Newtonian relativity and its limitation, Michelson Morley experiment and its consequence, postulates of special theory of relativity. Lorentz transformation, length contraction, time dilation, relativistic mass and momentum, mass energy relation.(8 classes) 14 Marks

UNIT-III: Atomic Physics

Inadequacy of classical physics, brief outline of Rayleigh Jeans theory and Plancks quantum theory of radiation, particle nature of electromagnetic radiation photo electric effect, Compton effect, dual nature of radiation, wave nature of particles, de-Broglie hypothesis, matter wave, wave-particle duality, Davisson-Germer experiment.

Bohrs theory of Hydrogen atom, explanation of Hydrogen Spectra correction for finite mass of the nucleus. Bohrs correspondence principle, limitations of Bohrs theory. Discrete energy, exchange by atom Frank Hertz experiment.(8 classes) 14 Marks

UNIT-IV: Quantum Mechanics

Heisenbergs Uncertainty relation. Time dependent Schrodingers wave equation in one dimension and three dimensions. The physical interpretation of the wave function. Probability density and probability current density. Equation of continuity. Normalization of the Wave function, Expectation value of an observable, Ehrenfests theorem.

Time independent Schrodingers wave equation in one dimension particle in a box, energy eigen values and eigen functions.(8 classes) 14 Marks

UNIT-V: Nuclear Physics

Properties of the nucleus Charge, Size, Spin, Magnetic Moment, Mass, Mass defect, Binding energy, Packing fraction, Nuclear force, and its characteristics features. Radioactive decay laws, average life, half life, nuclear fission, nuclear fusion, Linear accelerators, and cyclotron.(8 classes) 14 Marks

Reference Books:

1. Principles of Optics A.B. Gupta.
2. Fundamentals of Optics Jenkins and White.
3. Relativity R. Resnick.
4. Modern Physics H.S. Mani and G.K. Meheta.

5. Quantum Mechanics J.L. Powel and B. Craseman.
6. Atomic and Nuclear Physics Gupta and Ghosh (Books and allied).
7. Physics of Degree students Vol. III M. Das, P.K. Jena and others (SrikrishnaPrakashan).
8. Physics of Degree students Vol. IV M. Das, P.K. Jena and others (SrikrishnaPrakashan).
9. Concept of Modern Physics Arthur Beiser (Mc-graw Hill) (2009).
10. University Physics Sears, Zemansky, H.D. Young (Addison Wesley).

GE:II LAB.

20 classes (2 hours duration each)-Full Marks: 30

1. Determination of Horizontal component of Earths magnetic field and magnetic moment of a bar magnet using deflection and oscillation magnetometer.
2. Determination of E.C.E. of a Copper by taking 3 readings.
3. Familiarization with Schuster focusing and determination of angle of prism.
4. Determination of Refractive index of the material of a prism using Sodium light.
5. To determine the wavelength of light using plane diffraction grating.
6. To determine the wavelength of light using Newtons ring.
7. Determination of refractive index of (a) glass and (b) liquid by using travelling microscope.
8. Determination of radius of curvature of a convex/concave mirror by using Kohlrauschs method.
9. To determine the magnifying power of a given telescope.
10. Verification of inverse square law of magnetism by using a deflection magnetometer.
11. To draw the static characteristics of a P-N junction diode.
12. Obtain the static characteristics of a P-N-P / N-P-N transistor / Triode Valve.
13. To determine the reduction factor of a tangent Galvanometer.
14. Variation of magnetic field along the axis of a circular coil carrying current.
15. To study the characteristics of a series RC circuit.

Reference Books:

1. Advanced Practical Physics for students, B.L.Flint & H.T.Worsnop, 1971, Asia Publishing House.
2. A Laboratory Manual of Physics for Undergraduate Classes, D.P.Khandelwal (1985), VaniPublication.
3. A Text book of Practical Physics, Indu Prakash And Ramakrishna, 11th Edition (2011), Kitab Mahal, New Delhi.

PHYSICS(PASS)

SEMESTER-I

DSC 1A: MECHANICS

(Credits: Theory-04, Practicals-02) Theory:
40 Classes (1 hr. duration)-Marks: 70

UNIT-I

Vectors: Vector algebra. Scalar and vector products. Derivatives of a vector with respect to a parameter. (2 Lectures)

Ordinary Differential Equations: 1st order homogeneous differential equations. 2nd order homogeneous differential equations with constant coefficients. (2 Lectures)

Laws of Motion: Frames of reference. Newtons Laws of motion. Dynamics of a system of particles. Centre of Mass. (4 Lectures)

Momentum and Energy: Conservation of momentum. Work and energy. Conservation of energy. Motion of rockets. (2 Lectures)

Rotational Motion: Angular velocity and angular momentum. Torque. Conservation of angular momentum. (3 Lectures)

Gravitation: Newtons Law of Gravitation. Motion of a particle in a central force field (motion is in a plane, angular momentum is conserved, areal velocity is constant). Keplers Laws (statement only). Satellite in circular orbit and applications. Geosynchronous orbits. Basic idea of global positioning system (GPS). Weightlessness. Physiological effects on astronauts. (7 Lectures)

UNIT-II

Oscillations: Simple harmonic motion. Differential equation of SHM and its solutions. Kinetic and Potential Energy, Total Energy and their time averages. Damped oscillations. (6 Lectures) **Elasticity:**

Hooke's law - Stress-strain diagram - Elastic moduli-Relation between elastic constants

- Poissons Ratio-Expression for Poissons ratio in terms of elastic constants - Work done in stretching and work done in twisting a wire - Twisting couple on a cylinder - Determination of Rigidity modulus by static torsion - Torsional pendulum-Determination of Rigidity modulus and moment of inertia - q , η and σ by Searles method. (8 Lectures)

Special Theory of Relativity: Constancy of speed of light. Postulates of Special Theory of Relativity. Length contraction. Time dilation. Relativistic addition of velocities. (6 Lectures)

Note: *Students are not familiar with vector calculus. Hence all examples involve differentiation either in one dimension or with respect to the radial coordinate.*

Reference Books:

1. University Physics. F.W. Sears, M.W. Zemansky and H.D. Young, 13/e, 1986. Addison- Wesley
2. Mechanics Berkeley Physics, v.1: Charles Kittel, et. al. 2007, Tata McGraw-Hill.

3. Physics Resnick, Halliday & Walker 9/e, 2010, Wiley
4. University Physics, Ronald Lane Reese, 2003, Thomson Brooks/Cole.
5. Properties of Matter - D.S. Mathur (S.Chand publication) 2013
6. Mechanics- D.C.Tayal (Himalaya Publication) 2013
7. Classical Dynamics of Particles and Systems S. T. Thornton (Cengage Learning) 2012
8. Analytical Mechanics-Fowles (Cengage Learnings) 2014

DSC 1A-LAB: MECHANICS

20 Classes (2 hrs. duration)-Marks:30

1. Measurements of length (or diameter) using vernier caliper, screw gauge and travelling microscope.
2. To determine the Height of a Building using a Sextant.
3. To determine the Moment of Inertia of a Flywheel.
4. To determine the Young's Modulus of a Wire by Optical Lever Method.
5. To determine the Modulus of Rigidity of a Wire by Maxwells needle.
6. To determine the Elastic Constants of a Wire by Searles method.
7. To determine g by Bar Pendulum.
8. To determine g by Katers Pendulum.
9. To study the Motion of a Spring and calculate (a) Spring Constant, (b) g.

Reference Books:

1. Advanced Practical Physics for students, B.L. Flint and H.T. Worsnop, 1971, Asia Publishing House.
2. Advanced level Physics Practicals, Michael Nelson and Jon M. Ogborn, 4th Edition, reprinted 1985, Heinemann Educational Publishers.
3. A Text Book of Practical Physics, Indu Prakash and Ramakrishna, 11th Edition, 2011, Kitab Mahal, New Delhi.

SEMESTER-II

DSC 1B: ELECTRICITY, MAGNETISM AND EMT

(Credits: Theory-04, Practicals-02) Theory:
40 Classes (1 hr. duration)-Marks:70

UNIT-I

Vector Analysis: Scalar and Vector product, gradient, divergence, Curl and their significance, Vector Integration, Line, surface and volume integrals of Vector fields, Gauss-divergence theorem and Stoke's theorem of vectors (statement only). (8 Lectures)

Electrostatics: Electrostatic Field, electric flux, Gauss's theorem of electrostatics. Applications of Gauss theorem- Electric field due to point charge, infinite line of charge, uniformly charged spherical shell and solid sphere, plane charged sheet, charged conductor. Electric potential as line integral of electric field, potential due to a point charge, electric dipole, uniformly charged spherical shell and solid sphere. Calculation of electric field from potential. Capacitance of an isolated spherical conductor. Parallel plate, spherical and cylindrical condenser. Energy per unit volume in electrostatic field. Dielectric medium, Polarisation, Displacement vector. Gauss's theorem in dielectrics. Parallel plate capacitor completely filled with dielectric. (12 Lectures)

UNIT-II

Magnetism:

Magnetostatics: Biot-Savart's law and its applications- straight conductor, circular coil, solenoid carrying current. Divergence and curl of magnetic field. Magnetic vector potential. Ampere's circuital law. Magnetic properties of materials: Magnetic intensity, magnetic induction, permeability, magnetic susceptibility. Brief introduction of dia-, para-and ferromagnetic materials. (6 Lectures)

Electromagnetic Induction: Faraday's laws of electromagnetic induction, Lenz's law, self and mutual inductance, L of single coil, M of two coils. Energy stored in magnetic field. (4 Lectures)

Maxwell's equations and Electromagnetic wave propagation: Equation of continuity of current, Displacement current, Maxwell's equations, Poynting vector, energy density in electro- magnetic field, electromagnetic wave propagation through vacuum and isotropic dielectric medium, transverse nature of EM waves, polarization. (10 Lectures)

Reference Books:

1. Electricity and Magnetism, Edward M. Purcell, 1986, McGraw-Hill Education
2. Electricity & Magnetism, J.H. Fewkes & J.Yarwood. Vol. I, 1991, Oxford Univ. Press
3. Electricity and Magnetism, D C Tayal, 1988, Himalaya Publishing House.
4. University Physics, Ronald Lane Reese, 2003, Thomson Brooks/Cole.
5. D.J.Griffiths, Introduction to Electrodynamics, 3rd Edn, 1998, Benjamin Cummings.
6. Electricity and Magnetism- K.K Tewari (S. Chand Higher Academics)2013
7. Electricity and Magnetism -D. C. Tayal (Himalay Pub.)2014

DSC 1B-LAB: ELECTRICITY, MAGNETISM AND EMT

20 Classes (2 hrs. duration)-Marks:30

1. To use a Multimeter for measuring (a) Resistances, (b) AC and DC Voltages, (c) DC Current, and (d) checking electrical fuses.
2. Ballistic Galvanometer:
 - (i) Measurement of charge and current sensitivity
 - (ii) Measurement of CDR
 - (iii) Determine a high resistance by Leakage Method

- (iv) To determine Self Inductance of a Coil by Rayleighs Method. 3. To compare capacitances using DeSautys bridge.
4. Measurement of field strength B and its variation in a Solenoid (Determine dB/dx) 5. To study the Characteristics of a Series RC Circuit.
6. To study a series LCR circuit LCR circuit and determine its (a) Resonant frequency, (b) Quality factor
7. To study a parallel LCR circuit and determine its (a) Anti-resonant frequency and (b) Quality factor Q
8. To determine a Low Resistance by Carey Fosters Bridge.
9. To verify the Thevenin and Norton theorems.
10. To verify the Superposition, and Maximum Power Transfer Theorems.

Reference Books:

1. Advanced Practical Physics for students, B.L.Flint & H.T.Worsnop, 1971, Asia Publishing House.
2. Advanced level Physics Practicals, Michael Nelson and Jon M. Ogborn, 4th Edition, reprinted 1985, Heinemann Educational Publishers
3. A Text Book of Practical Physics, I.Prakash & Ramakrishna, 11th Ed.2011, Kitab Mahal

SEMESTER-III

DSC 1C: THERMAL PHYSICS AND STATISTICAL MECHANICS

(Credits: Theory-04, Practicals-02) Theory:

40 Classes (1 hr. duration)-Marks: 70

UNIT-I

Laws of Thermodynamics: Thermodynamic Description of system: Zeroth Law of thermo- dynamics and temperature. First law and internal energy, conversion of heat into work, Various Thermodynamical Processes, Applications of First Law: General Relation between CP and CV, Work Done during Isothermal and Adiabatic Processes, Compressibility and Expansion Coefficient, Reversible and irreversible processes, Second law and Entropy, Carnots cycle & theorem, Entropy changes in reversible & irreversible processes, Entropy-temperature diagrams, Third law ofthermo- dynamics, Unattainability of absolute zero. (10 Lectures)

Thermodynamical Potentials: Enthalpy, Gibbs, Helmholtz and Internal Energy functions, Maxwells relations and applications - Joule-Thompson Effect, Clausius- Clapeyron Equation, Ex- pression for (CP CV), CP/CV, TdS equations. (10 Lectures)

UNIT-II

Kinetic Theory of Gases: Derivation of Maxwells law of distribution of velocities and its exper- imental verification, Mean free path (Zeroth Order), Transport Phenomena: Viscosity, Conduction and Diffusion (for vertical case), Law of equipartition of energy (no derivation) and its applications to specific heat of gases; mono-atomic and diatomic gases. (10 Lectures)

Theory of Radiation: Blackbody radiation, Spectral distribution, Concept of Energy Density,

Derivation of Planck's law, Deduction of Wiens distribution law, Rayleigh- Jeans Law, Stefan Boltzmann Law and Wiens displacement law from Plancks law. (6 Lectures)

Statistical Mechanics: Maxwell-Boltzmann law - distribution of velocity - Quantum statistics- Phase space - Fermi-Dirac distribution law - electron gas - Bose-Einstein distribution law - photon gas - comparison of three statistics. (4 Lectures)

Reference Books:

1. Thermal Physics, S. Garg, R. Bansal and C. Ghosh, 1993, Tata McGraw-Hill.
2. A Treatise on Heat, Meghnad Saha, and B.N. Srivastava, 1969, Indian Press.
3. Thermodynamics, Enrico Fermi, 1956, Courier Dover Publications.
4. Thermodynamics, Kinetic theory & Statistical thermodynamics, F.W.Sears and G.L. Salinger. 1988, Narosa
5. University Physics, Ronald Lane Reese, 2003, Thomson Brooks/Cole.
6. Thermal and Statistical Physics —M. Das , P. K. Jena and others (Sri Krishna Prakashan)
7. Heat and Thermal Physics-Brijlal & Subramaiaam (S.Chand Publication)2014
8. Thermal Physics– C. Kittel and H. Kroemer (McMillan Education India)2010
9. Thermodynamics & Statistical Physics-J.K.Sharma, K.K.Sarkar (Himalaya Pub.)2014

DSC 1C-LAB: THERMAL PHYSICS AND STATISTICAL MECHANICS

20 Classes (2 hrs. duration)-Marks:30

1. To determine Mechanical Equivalent of Heat, J, by Callender and Barnes constant flow method.
2. Measurement of Plancks constant using black body radiation.
3. To determine Stefans Constant.
4. To determine the coefficient of thermal conductivity of Cu by Searles Apparatus.
5. To determine the Coefficient of Thermal Conductivity of Cu by Angstroms Method.
6. To determine the coefficient of thermal conductivity of a bad conductor by Lee and Charltons disc method.
7. To determine the temperature co-efficient of resistance by Platinum resistance thermometer.
8. To study the variation of thermo emf across two junctions of a thermocouple with temperature.
9. To record and analyze the cooling temperature of an hot object as a function of time using a thermocouple and suitable data acquisition system.
10. To calibrate Resistance Temperature Device (RTD) using Null Method/Off- Balance Bridge.

Reference Books:

1. Advanced Practical Physics for students, B.L.Flint & H.T.Worsnop, 1971, Asia Publishing House.

2. A Text Book of Practical Physics, Indu Prakash and Ramakrishna, 11th Edition, 2011, Kitab Mahal, New Delhi.
3. A Laboratory Manual of Physics for Undergraduate Classes, D.P.Khandelwal, 1985, Vani Publication.

SEMESTER-IV

DSC 1D: WAVES AND OPTICS

(Credits: Theory-04, Practicals-02) Theory:
40 Classes (1hr duration)-Marks: 70

UNIT-I

Fluids: Surface Tension- Synclastic and anticlastic surface - Excess of pressure - Application to spherical and cylindrical drops and bubbles - variation of surface tension with temperature - Jaegers method. Viscosity - Rate flow of liquid in a capillary tube - Poiseuilles formula - Determination of coefficient of viscosity of a liquid - Variations of viscosity of liquid with temperature- lubrication. (6 Lectures)

Sound: Simple harmonic motion - forced vibrations and resonance - Fouriers Theorem - Application to saw tooth wave and square wave - Intensity and loudness of sound - Decibels - Intensity levels - musical notes - musical scale. Acoustics of buildings: Reverberation and time of reverberation - Absorption coefficient - Sabines formula - measurement of reverberation time - Acoustic aspects of halls and auditoria. (6 Lectures)

Superposition of Two Perpendicular Harmonic Oscillations: Graphical and Analytical Methods. Lissajous Figures (1:1 and 1:2) and their uses. (2 Lectures)

Waves Motion- General: Transverse waves on a string. Travelling and standing waves on a string. Normal Modes of a string. Group velocity, Phase velocity. Plane waves. Spherical waves, Wave intensity. (2 Lectures)

Wave Optics: Electromagnetic nature of light. Definition and Properties of wave front. Huygens Principle. (2 Lectures)

UNIT-II

Interference: Interference: Division of amplitude and division of wavefront. Youngs Double Slit experiment. Lloyds Mirror and Fresnels Biprism. Phase change on reflection: Stokes treatment. Interference in Thin Films: parallel and wedge-shaped films. Fringes of equal inclination (Haidinger Fringes); Fringes of equal thickness (Fizeau Fringes). Newtons Rings: measurement of wavelength and refractive index. (10 Lectures)

Michelsons Interferometer: (1) Idea of form of fringes (no theory needed), (2) Determination of wavelength, (3) Wavelength difference, (4) Refractive index, and (5) Visibility of fringes. (2 Lectures)

Diffraction: Fraunhofer diffraction- Single slit; Double Slit. Multiple slits and Diffraction grating. Fresnel Diffraction: Half-period zones. Zone plate. Fresnel Diffraction pattern of a straight edge, a slit and a wire using half-period zone analysis. (7 Lectures)

Polarization: Transverse nature of light waves. Plane polarized light production and analysis. Circular and elliptical polarization. (3 Lectures)

Reference Books:

1. Fundamentals of Optics, F.A Jenkins and H.E White, 1976, McGraw-Hill
2. Principles of Optics, B.K. Mathur, 1995, Gopal Printing
3. Fundamentals of Optics, H.R. Gulati and D.R. Khanna, 1991, R. Chand Publications
4. University Physics. F.W. Sears, M.W. Zemansky and H.D. Young. 13/e, 1986. Addison- Wesley.

DSC 1D-LAB: WAVES AND OPTICS

20 Classes (2 hrs. duration)-Marks: 30

1. To investigate the motion of coupled oscillators.
2. To determine the Frequency of an Electrically Maintained Tuning Fork by Melde's Experiment and to verify $2T$ Law.
3. To study Lissajous Figures.
4. Familiarization with Schuster's focussing; determination of angle of prism.
5. To determine the Coefficient of Viscosity of water by Capillary Flow Method (Poiseuille's method).
6. To determine the Refractive Index of the Material of a Prism using Sodium Light.
7. To determine Dispersive Power of the Material of a Prism using Mercury Light.
8. To determine the value of Cauchy Constants.
9. To determine the Resolving Power of a Prism.
10. To determine wavelength of sodium light using Fresnel Biprism.
11. To determine wavelength of sodium light using Newton's Rings.
12. To determine the wavelength of Laser light using Diffraction of Single Slit.
13. To determine wavelength of (1) Sodium and (2) Spectral lines of the Mercury light using plane diffraction Grating
14. To determine the Resolving Power of a Plane Diffraction Grating.
15. To measure the intensity using photosensor and laser in diffraction patterns of single and double slits.

Reference Books:

1. Advanced Practical Physics for students, B.L. Flint and H.T. Worsnop, 1971, Asia Publishing House.
2. Advanced level Physics Practicals, Michael Nelson and Jon M. Ogborn, 4th Edition, reprinted 1985, Heinemann Educational Publishers
3. A Text Book of Practical Physics, Indu Prakash and Ramakrishna, 11th Edition, 2011, Kitab Mahal, New Delhi.

DISCIPLINE SPECIFIC ELECTIVE(DSE)

(Select Two Papers).

DSE: DIGITAL AND ANALOG CIRCUITS AND INSTRUMENTATION

(Credits: Theory-04, Practicals-02)

Theory: 40 Lectures-Marks: 70

UNIT-1:

Digital Circuits

Difference between Analog and Digital Circuits. Binary Numbers. Decimal to Binary and Binary to Decimal Conversion, AND, OR and NOT Gates (Realization using Diodes and Transistor). NAND and NOR Gates as Universal Gates. XOR and XNOR Gates. (5 Lectures)

De Morgan's Theorems. Boolean Laws. Simplification of Logic Circuit using Boolean Algebra. Fundamental Products. Minterms and Maxterms. Conversion of a Truth Table into an Equivalent Logic Circuit by (1) Sum of Products Method and (2) Karnaugh Map. (5 Lectures)

UNIT-2:

Semiconductor Devices and Amplifiers:

Semiconductor Diodes: p and n type semiconductors. Barrier Formation in PN Junction Diode. Qualitative Idea of Current Flow Mechanism in Forward and Reverse Biased Diode. PN junction and its characteristics. Static and Dynamic Resistance. Principle and structure of (1) LEDs (2) Photodiode (3) Solar Cell. (5 Lectures)

Bipolar Junction transistors: n-p-n and p-n-p Transistors. Characteristics of CB, CE and CC Configurations. Current gains α and β . Relations between α and β . Load Line analysis of Transistors. DC Load line and Q-point. Active, Cutoff, and Saturation Regions. Voltage Divider Bias Circuit for CE Amplifier. h-parameter Equivalent Circuit. Analysis of a single-stage CE amplifier using Hybrid Model. Input and Output Impedance. Current, Voltage and Power Gains. Class A, B, and C Amplifiers. (10 Lectures)

UNIT-3:

Operational Amplifiers (Black Box approach):

Characteristics of an Ideal and Practical Op-Amp (IC 741), Open-loop & Closed-loop Gain. CMRR, concept of Virtual ground. Applications of Op-Amps: (1) Inverting and Non-inverting Amplifiers, (2) Adder, (3) Subtractor, (4) Differentiator, (5) Integrator, (6) Zero Crossing Detector. (7 Lectures)

Instrumentations:

Introduction to CRO: Block Diagram of CRO. Applications of CRO: (1) Study of Waveform, (2) Measurement of Voltage, Current, Frequency, and Phase Difference. (3 Lectures)

Power Supply: Half-wave Rectifiers. Centre-tapped and Bridge Full-wave Rectifiers Calculation of Ripple Factor and Rectification Efficiency, Basic idea about capacitor filter, Zener Diode and Voltage Regulation (5 Lectures)

Reference Books:

1. Integrated Electronics, J. Millman and C.C. Halkias, 1991, Tata Mc-Graw Hill.
2. Electronic devices and circuits, S. Salivahanan and N.Suresh Kumar, 2012, Tata Mc-Graw Hill.
3. Microelectronic Circuits, M.H. Rashid, 2ndEdn.,2011, Cengage Learning.
4. Modern Electronic Instrumentation & Measurement Tech., Helfrick & Cooper, 1990, PHI Learning
5. Digital Principles & Applications, A.P.Malvino, D.P.Leach & Saha, 7th Ed.,2011, Tata Mc- Graw Hill
6. Fundamentals of Digital Circuits, A. Anand Kumar, 2nd Edition, 2009, PHI Learning Pvt. Ltd.
7. OP-AMP and Linear Digital Circuits, R.A. Gayakwad, 2000, PHI Learning Pvt. Ltd.

DSC-LAB: DIGITAL AND ANALOG CIRCUITS AND INSTRUMENTATION

20 Classes (2 hrS. duration)-Marks:30

1. To measure (a) Voltage, and (b) Frequency of a periodic waveform using a CRO.
2. To verify and design AND, OR, NOT and XOR gates using NAND gates.
3. To minimize a given logic circuit.
4. Half adder, Full adder and 4-bit Binary Adder.
5. Adder-Subtractor using Full Adder I.C.
6. To design an astable multivibrator of given specifications using 555 Timer.
7. To design a monostable multivibrator of given specifications using 555 Timer.
8. To study IV characteristics of PN diode, Zener and Light emitting diode.
9. To study the characteristics of a Transistor in CE configuration.
10. To design a CE amplifier of a given gain (mid-gain) using voltage divider bias.
11. To design an inverting amplifier of given gain using Op-amp 741 and study its frequency response.
12. To design a non-inverting amplifier of given gain using Op-amp 741 and study its Frequency Response.
13. To study a precision Differential Amplifier of given I/O specification using Opamp.
14. To investigate the use of an op-amp as a Differentiator.
15. To design a Wien Bridge Oscillator using an op-amp.

Reference Books:

1. Basic Electronics: A text lab manual, P.B.Zbar, A.P.Malvino, M.A.Miller, 1994,Mc-Graw Hill.
2. Electronics: Fundamentals and Applications, J.D. Ryder, 2004, Prentice Hall.
3. OP-Amps and Linear Integrated Circuit, R. A. Gayakwad, 4th edition, 2000, Prentice Hall.
4. Electronic Principle, Albert Malvino, 2008, Tata Mc-Graw Hill.

DSE: SOLID STATE PHYSICS
(Credits: Theory-04, Practicals-02)
Theory: 40 Lectures-Marks: 70

Prerequisites: Knowledge of Elements of Modern Physics

UNIT-1:

Crystal Structure: Solids-Amorphous and Crystalline Materials. Lattice Translation Vectors. Lattice with a Basis Central and Non-Central Elements. Unit Cell. Miller Indices. Reciprocal Lattice. Types of Lattices. Brillouin Zones. Diffraction of X-rays by Crystals. Braggs Law. Atomic and Geometrical Factor. (8 Lectures)

Elementary Lattice Dynamics: Lattice Vibrations and Phonons-Linear Monoatomic and Di-atomic Chains. Acoustical and Optical Phonons. Qualitative Description of the Phonon Spectrum in Solids. Dulong and Petits Law, Einstein and Debye theories of specific heat of solids. T3 law (6 Lectures)

Magnetic Properties of Matter: Dia-, Para-, Ferri- and Ferromagnetic Materials. Classical Langevin Theory of dia and Paramagnetic Domains. Quantum Mechanical Treatment of Paramagnetism. Curies law, Weiss Theory of Ferromagnetism and Ferromagnetic Domains. Discussion of B-H Curve. Hysteresis and Energy Loss. (8 Lectures)

UNIT-II

Dielectric Properties of Materials: Polarization. Local Electric Field at an Atom. Depolarization Field. Electric Susceptibility. Polarizability. Clausius Mosotti Equation. Classical Theory of Electric Polarizability. Normal and Anomalous Dispersion. Cauchy and Sellmeier relations. Langevin-Debye equation. Complex Dielectric Constant. Optical Phenomena. Application: Plasma Oscillations, Plasma Frequency, Plasmons. (6 Lectures)

Elementary band theory: Kronig Penny model. Band Gaps. Conductors, Semiconductors and insulators. P and N type Semiconductors. Conductivity of Semiconductors, mobility, Hall Effect, Hall coefficient. (6 Lectures)

Superconductivity: Experimental Results. Critical Temperature. Critical magnetic field. Meissner effect. Type I and type II Superconductors, Londons Equation and Penetration Depth. Isotope effect. (6 Lectures)

Reference Books:

1. Introduction to Solid State Physics, Charles Kittel, 8th Ed., 2004, Wiley India Pvt. Ltd.
2. Elements of Solid State Physics, J.P. Srivastava, 2nd Ed., 2006, Prentice-Hall of India
3. Introduction to Solids, Leonid V. Azaroff, 2004, Tata Mc-Graw Hill
4. Solid State Physics, N.W. Ashcroft and N.D. Mermin, 1976, Cengage Learning
5. Solid-state Physics, H. Ibach and H. Luth, 2009, Springer
6. Elementary Solid State Physics, 1/e M. Ali Omar, 1999, Pearson India

7. Solid State Physics, M.A. Wahab, 2011, Narosa Publications

DSC LAB: SOLID STATE PHYSICS

20 Classes (2 hrs. duration)-Marks: 30

1. Measurement of susceptibility of paramagnetic solution (Quinck's Tube Method).
2. To measure the Magnetic susceptibility of Solids.
3. To determine the Coupling Coefficient of a Piezoelectric crystal.
4. To measure the Dielectric Constant of a dielectric Materials with frequency.
5. To determine the complex dielectric constant and plasma frequency of metal using Surface Plasmon resonance (SPR).
6. To determine the refractive index of a dielectric layer using SPR.
7. To study the PE Hysteresis loop of a Ferroelectric Crystal.
8. To study the BH curve of iron using a Solenoid and determine the energy loss.
9. To measure the resistivity of a semiconductor (Ge) crystal with temperature by four-probe method (room temperature to 150 oC) and to determine its band gap.
10. To determine the Hall coefficient of a semiconductor sample.

Reference Books:

1. Advanced Practical Physics for students, B.L. Flint and H.T. Worsnop, 1971, Asia Publishing House.
2. Advanced level Physics Practicals, Michael Nelson and Jon M. Ogborn, 4th Edition, reprinted 1985, Heinemann Educational Publishers
3. A Text Book of Practical Physics, I.Prakash & Ramakrishna, 11th Edn., 2011, Kitab Mahal
4. Elements of Solid State Physics, J.P. Srivastava, 2nd Ed., 2006, Prentice-Hall of India

DSE: ELEMENTS OF MODERN PHYSICS

(Credits: Theory-04, Practicals-02)

Theory: 40 Lectures-Marks: 70

UNIT-I

Plancks quantum, Plancks constant and light as a collection of photons; Photoelectric effect and Compton scattering. De Broglie wavelength and matter waves; Davisson-Germer experiment.(6 Lectures)

Problems with Rutherford model-instability of atoms and observation of discrete atomic spectra; Bohr's quantization rule and atomic stability; calculation of energy levels for hydrogen like atoms and their spectra. (4 Lectures)

Position measurement-gamma ray microscope thought experiment; Wave-particle duality, Heisenberg uncertainty principle- impossibility of a particle following a trajectory; Estimating minimum energy of a confined particle using uncertainty principle; Energy-time uncertainty principle. (4 Lectures)

Two slit interference experiment with photons, atoms & particles; linear superposition principle as a consequence; Matter waves and wave amplitude; Schrodinger equation for non-relativistic particles; Momentum and Energy operators; stationary states; physical interpretation of wavefunction, probabilities and normalization; Probability and probability current densities in one dimension. (8 Lectures)

UNIT-II

One dimensional infinitely rigid box-energy eigenvalues and eigenfunctions, normalization; Quantum dot as an example; Quantum mechanical scattering and tunnelling in one dimension - across a step potential and across a rectangular potential barrier. (8 Lectures)

Size and structure of atomic nucleus and its relation with atomic weight; Impossibility of an electron being in nucleus as a consequence of the uncertainty principle. Nature of nuclear force, NZ graph, semi-empirical mass formula and binding energy. (4Lectures)

Radioactivity: stability of nucleus; Law of radioactive decay; Mean life and half-life; α decay; β decay-energy released, spectrum and Pauli's prediction of neutrino; γ -ray emission.(4 Lectures) Fission and fusion-mass deficit, relativity and generation of energy; Fission - nature of fragments and emission of neutrons. Nuclear reactor: slow neutrons interacting with Uranium 235; Fusion and thermonuclear reactions. (2 Lectures)

Reference Books:

1. Concepts of Modern Physics, Arthur Beiser, 2009, McGraw-Hill.
2. Modern Physics, J.R. Taylor, C.D. Zafiratos, M.A. Dubson,2009, PHI Learning
3. Six Ideas that Shaped Physics:Particle Behave like Waves, Thomas A. Moore, 2003, McGraw Hill
4. Quantum Physics, Berkeley Physics,Vol.4. E.H. Wichman, 2008, Tata McGraw-Hill Co.
5. Modern Physics, R.A. Serway, C.J. Moses, and C.A.Moyer, 2005, Cengage Learning

DSC LAB: ELEMENTS OF MODERN PHYSICS

20 Classes (2 hrs. duration)-Marks: 30

1. To determine value of Boltzmann constant using V-I characteristic of PN diode.
2. To determine work function of material of filament of directly heated vacuum diode.
3. To determine the ionization potential of mercury.
4. To determine value of Plancks constant using LEDs of at least 4 different colours.
5. To determine the wavelength of H-alpha emission line of Hydrogen atom.
6. To determine the absorption lines in the rotational spectrum of Iodine vapour.
7. To study the diffraction patterns of single and double slits using laser and measure its intensity variation using Photosensor & compare with incoherent source Na.
8. Photo-electric effect: photo current versus intensity and wavelength of light; maximum energy of photo-electrons versus frequency of light.
9. To determine the value of e/m by (a) Magnetic focusing or (b) Bar magnet.

10. To setup the Millikan oil drop apparatus and determine the charge of an electron.

Reference Books:

1. Advanced Practical Physics for students, B.L. Flint and H.T. Worsnop, 1971, Asia Publishing House.
2. Advanced level Physics Practicals, Michael Nelson and Jon M. Ogborn, 4th Edition, reprinted 1985, Heinemann Educational Publishers
3. A Text Book of Practical Physics, Indu Prakash and Ramakrishna, 11th Edition, 2011, Kitab Mahal, New Delhi.

SKILL ENHANCEMENT COURSE(Four)

(Credit: 02 each)-SEC:1 to SEC:4

1. COMMUNICATIVE ENGLISH & ENGLISH WRITINGSKILL(Compulsory)

(Credits: Theory-02)

2. COMPUTATIONAL PHYSICS

(Credits: Theory-02) Theory:
20 Classes (1 hr. duration)

UNIT-I

Introduction: Importance of computers in Physics, paradigm for solving physics problems for solution. Usage of linux as an Editor. Algorithms and Flowcharts: Algorithm: Definition, properties and development. Flowchart: Concept of flowchart, symbols, guidelines, types. Examples: Cartesian to Spherical Polar Coordinates, Roots of Quadratic Equation, Sum of a finite series.

Scientific Programming: Development of FORTRAN, Basic elements of FORTRAN: Character Set, Constants and their types, Variables and their types, Keywords, Variable Declaration and concept of instruction and program. Fortran Statements: I/O Statements (unformatted/formatted), Executable and Non-Executable Statements, Layout of Fortran Program, Format of writing. (10 Lectures)

UNIT-II

Control Statements: Types of Logic (Sequential, Selection, Repetition), Branching Statements (Logical IF, Arithmetic IF, Block IF, Nested Block IF, SELECT CASE and ELSE IF Ladder statements), DO Loop Statements, Jumping Statements (Unconditional GOTO, Computed GOTO, Assigned GOTO) Subscripted Variables (Arrays: Types of Arrays, DIMENSION Statement, Reading and Writing Arrays), Functions and Subroutines (Arithmetic Statement Function, Function Subprogram and Subroutine), RETURN, CALL Statements), open a file, writing in a file, reading from a file.

Programming:

1. Exercises on syntax on usage of FORTRAN.
2. To print out all natural even/ odd numbers between given limits.
3. To find maximum, minimum and range of a given set of numbers.
4. To find a set of prime numbers and Fibonacci series. (10 Lectures)

Reference Books:

1. Introduction to Numerical Analysis, S.S. Sastry, 5th Edn., 2012, PHI Learning Pvt. Ltd.
2. Computer Programming in Fortran 77. V. Rajaraman (Publisher: PHI).
3. Schaums Outline of Theory and Problems of Programming with Fortran, S Lipsdutz and A Poe, 1986Mc-Graw Hill Book Co.

4. Computational Physics: An Introduction, R. C. Verma, et al. New Age International Publishers, New Delhi(1999).
5. A first course in Numerical Methods, U.M. Ascher and C. Greif, 2012, PHI Learning.
6. Elementary Numerical Analysis, K.E. Atkinson, 3 r d Edn., 2007, Wiley India Edition.

3. BASIC INSTRUMENTATION SKILLS

(Credits: Theory-02) Theory: 20
Classes (1 hr. duration)

This course is to get exposure with various aspects of instruments and their usage through hands-on mode. Experiments listed below are to be done in continuation of the topics.

UNIT-I

Basic of Measurement: Instruments accuracy, precision, sensitivity, resolution range etc. Errors in measurements and loading effects. Multimeter: Principles of measurement of dc voltage and dc current, ac voltage, ac current and resistance. Specifications of a multimeter and their significance.

Electronic Voltmeter: Advantage over conventional multimeter for voltage measurement with respect to input impedance and sensitivity. Principles of voltage, measurement (block diagram only). Specifications of an electronic Voltmeter/ Multimeter and their significance.

AC millivoltmeter: Type of AC millivoltmeters: Amplifier- rectifier, and rectifier- amplifier. Block diagram ac millivoltmeter, specifications and their significance.

Cathode Ray Oscilloscope: Block diagram of basic CRO. Construction of CRT, Electron gun, electrostatic focusing and acceleration (Explanation only no mathematical treatment), brief discussion on screen phosphor, visual persistence & chemical composition. Time base operation, synchronization. Front panel controls. Specifications of a CRO and their significance.

Use of CRO for the measurement of voltage (dc and ac frequency, time period. Special features of dual trace, introduction to digital oscilloscope, probes. Digital storage Oscilloscope: Block diagram and principle of working. (10 Lectures)

UNIT-II

Signal Generators and Analysis Instruments: Block diagram, explanation and specifications of low frequency signal generators. pulse generator, and function generator. Brief idea for testing, specifications. Distortion factor meter, wave analysis.

Digital Instruments: Principle and working of digital meters. Comparison of analog & digital instruments. Characteristics of a digital meter. Working principles of digital voltmeter.

Digital Multimeter: Block diagram and working of a digital multimeter. Working principle of time interval, frequency and period measurement using universal counter/ frequency counter, time- base stability, accuracy and resolution. (10 Lectures)

The test of lab skills will be of the following test items:

1. Use of an oscilloscope.
2. CRO as a versatile measuring device.

3. Circuit tracing of Laboratory electronic equipment.
4. Use of Digital multimeter/VTVM for measuring voltages,
5. Circuit tracing of Laboratory electronic equipment.
6. Winding a coil / transformer.
7. Study the layout of receiver circuit.
8. Trouble shooting a circuit.
9. Balancing of bridges.

Laboratory Exercises:

1. To observe the loading effect of a multimeter while measuring voltage across a low resistance and high resistance.
2. To observe the limitations of a multimeter for measuring high frequency voltage and currents.
3. To measure Q of a coil and its dependence on frequency, using a Q- meter.
4. Measurement of voltage, frequency, time period and phase angle using CRO.
5. Measurement of time period, frequency, average period using universal counter/ frequency counter.
6. Measurement of rise, fall and delay times using a CRO.
7. Measurement of distortion of a RF signal generator using distortion factor meter.
8. Measurement of R, L and C using a LCR bridge/ universal bridge.

Open Ended Experiments:

1. Using a Dual Trace Oscilloscope.
2. Converting the range of a given measuring instrument (voltmeter, ammeter).

Reference Books:

1. A text book in Electrical Technology - B L Theraja - S Chand and Co.
2. Performance and design of AC machines - M G Say ELBS Edn.
3. Digital Circuits and systems, Venugopal, 2011, Tata McGraw Hill.
4. Logic circuit design, Shimon P. Vingron, 2012, Springer.
5. Digital Electronics, Subrata Ghoshal, 2012, Cengage Learning.
6. Electronic Devices and circuits, S. Salivahanan & N. S.Kumar, 3rd Ed., 2012, Tata Mc-Graw Hill.
7. Electronic circuits: Handbook of design and applications, U.Tietze, Ch.Schenk, 2008, Springer.
8. Electronic Devices, 7/e Thomas L. Floyd, 2008, Pearson India.

4. RENEWABLE ENERGY AND ENERGY HARVESTING

(Credits: Theory-02) Theory:
20 Classes (1 hr. duration)

The aim of this course is not just to impart theoretical knowledge to the students but to provide them with exposure and hands-on learning wherever possible.

UNIT-I

Fossil fuels and Alternate Sources of energy: Fossil fuels and nuclear energy, their limitation, need of renewable energy, non-conventional energy sources. An overview of developments in Offshore Wind Energy, Tidal Energy, Wave energy systems, Ocean Thermal Energy Conversion, solar energy, biomass, biochemical conversion, biogas generation, geothermal energy tidal energy, Hydroelectricity.

Solar energy: Solar energy, its importance, storage of solar energy, solar pond, non plate collector, solar distillation, solar cooker, solar green houses, solar cell, absorption air conditioning. Need and characteristics of photovoltaic (PV) systems, PV models and equivalent circuits, and sun tracking systems. (10 Lectures)

UNIT-II

Wind Energy harvesting: Fundamentals of Wind energy, Wind Turbines and different electrical machines in wind turbines, Power electronic interfaces, and grid interconnection topologies.

Ocean Energy: Ocean Energy Potential against Wind and Solar, Wave Characteristics and Statistics, Wave Energy Devices.

Tide characteristics and Statistics, Tide Energy Technologies, Ocean Thermal Energy, Osmotic Power, Ocean Bio-mass.

Geothermal Energy: Geothermal Resources, Geothermal Technologies.

Hydro Energy: Hydropower resources, hydropower technologies, environmental impact of hydro power sources.(10 Lectures)

Reference Books:

1. Non-conventional energy sources - G.D Rai - Khanna Publishers, New Delhi
2. Solar energy - M P Agarwal - S Chand and Co. Ltd.
3. Solar energy - Suhas P Sukhative Tata McGraw - Hill Publishing Company Ltd.
4. Godfrey Boyle, Renewable Energy, Power for a sustainable future, 2004, Oxford University Press, in association with The Open University.
5. Dr. P Jayakumar, Solar Energy: Resource Assesment Handbook, 2009
6. J.Balfour, M.Shaw and S. Jarosek, Photovoltaics, Lawrence J Goodrich (USA).
7. [http://en.wikipedia.org/wiki/Renewable energy](http://en.wikipedia.org/wiki/Renewable_energy).

5. APPLIED OPTICS

(Credits: Theory-02) Theory:

20 Classes (1 hr. duration)

Theory includes only qualitative explanation. Minimum five experiments should be performed covering minimum three sections.

UNIT-I

Sources and Detectors: Lasers, Spontaneous and stimulated emissions, Theory of laser action, Einsteins coefficients, Light amplification, Characterization of laser beam, He-Ne laser, Semiconductor lasers.

Elementary ideas of Fourier Optics: Concept of Spatial frequency filtering, Fourier trans- forming property of a thin lens. (10 Lectures)

UNIT-II

Holography

Basic principle and theory: coherence, resolution, Types of holograms, white light reflection holo- gram, application of holography in microscopy, interferometry, and character recognition. **Pho- tonics:** Fibre Optics, Optical fibres and their properties, Principal of light propagation through a fibre, The numerical aperture, Attenuation in optical fibre and attenuation limit, Single mode and multimode fibres, Fibre optic sensors: Fibre Bragg Grating. (10 Lectures)

Reference Books:

1. Fundamental of optics, F. A. Jenkins & H. E. White, 1981, Tata McGraw hill.
2. LASERS: Fundamentals & applications, K.Thyagrajan & A.K.Ghatak, 2010, Tata McGraw Hill
3. Fibre optics through experiments, M.R.Shenoy, S.K.Khijwania, et.al. 2009, Viva Books
4. Nonlinear Optics, Robert W. Boyd, (Chapter-I), 2008, Elsevier.
5. Optics, Karl Dieter Moller, Learning by computing with model examples, 2007, Springer.
6. Optical Systems and Processes, Joseph Shamir, 2009, PHI Learning Pvt. Ltd.
7. Optoelectronic Devices and Systems, S.C. Gupta, 2005, PHI Learning Pvt. Ltd.
8. Optical Physics, A.Lipson, S.G.Lipson, H.Lipson, 4th Edn., 1996, Cambridge Univ. Press.

ZOOLOGY(HONOURS)

SEMESTER-I

C:1-DIVERSITY AND EVOLUTION OF NON-CHORDATA (PROTISTA TO PSEUDOCOELOMATES)

(Credits:6, Theory-4, Practical-2) Lectures:
60 (Theory:40, Practical:20) Max.
Marks:100 (Theory:70, Practical:30)

UNIT-I: Kingdom Protista

General characteristics and classification up to classes; Life cycle, pathogenicity and prophylaxis of *Plasmodium vivax*, *Trypanosoma gambiense* and *Entamoeba histolytica*; Locomotion and reproduction in Protista.

UNIT-II: Phylum Porifera and Ctenophora

General characteristics and classification up to classes; Canal system in sponges; General characteristics and evolutionary significance; Evolution of Parazoa and Metazoa.

UNIT-III: Phylum Cnidaria

General characteristics and classification up to classes; Metagenesis in *Obelia*; Polymorphism in Cnidaria; Corals and coral reefs.

UNIT-IV: Phylum Platyhelminthes

General characteristics and classification up to classes; Life cycle, pathogenicity and prophylaxis of *Faciola hepatica* and *Taenia solium*; Parasitic adaptations.

UNIT-V: Phylum Nematelminthes

General characteristics and classification up to classes; Life cycle, pathogenicity and prophylaxis of *Ascaris lumbricoides* and *Wuchereria Bancrofti*; Parasitic adaptations.

Note: Classification to be followed from “ Barnes RD (1982) Invertebrate Zoology; 5th Edition.”

PRACTICAL

Kingdom Protista

1. Morphology of *Paramecium*, Binary fission and Conjugation in *Paramecium*.
2. Life stages of *Plasmodium vivax*, *Trypanosoma gambiense* and *Entamoeba histolytica* (Slides/Microphotographs).
3. Examination of pond water for protists.

Phylum Porifera

4. Study of *Sycon* (including T.S. and L.S.), *Hyalonema*, and *Euplectella*.
5. Temporary mounts of spicules, gemmules and sponging fibres.

Phylum Cnidaria

6. Study of *Obelia*, *Physalia*, *Millepora*, *Aurelia*, *Ephyra* larva, *Tubipora*, *Corallium*, *Alcyonium*, *Gorgonia* and *Metridium* (including T.S. and L.S.).

Phylum Ctenophora

7. Any one specimen/slide.

Phylum Platyhelminthes

8. Study of adult *Fasciola hepatica*, *Taenia solium* and their life stages (Slides/microphotographs).

Phylum Nematelminthes

9. Study of adult *Ascaris lumbricoides*, *Wuchereria bancrofti* and their life stages (Slides/microphotographs).

Note: Classification to be followed from “ Barnes RD (1982) Invertebrate Zoology; 5th Edition.”

Recommended Books:

1. Arora MP (2006) Non-Chordata-I. 1st edition. Himalaya Publishing House, New Delhi.
2. Arora MP (2008) Non-Chordata-II. 1st edition. Himalaya Publishing House, New Delhi.
3. Barnes RD (1982) Invertebrate Zoology. 6th Edition. Holt Saunders International Edition.
4. Barnes RSK, Calow P, Olive PJW, Golding DW & Spicer JI (2002) The Invertebrates: A New Synthesis. 3rd Edition. Blackwell Science, USA.
5. Barrington EJW (1979) Invertebrate Structure and Functions. 2nd Edition. ELBS and Nelson.
6. Boradale LA and Potts EA (1961) Invertebrates: A Manual for the use of Students. Asia Publishing Home.
7. Jordan EL and Verma PS (1963) Invertebrate Zoology. Revised Edition. S. Chand, New Delhi.
8. Mohanty PK (2000) Illustrated Dictionary of Biology. Kalyani Publishers, Ludhiana.

C:2-PERSPECTIVES IN ECOLOGY AND BIOSTATISTICS

(Credits:6, Theory-4, Practical-2) Lectures:

60 (Theory:40, Practical:20) Max.

Marks:100 (Theory:70, Practical:30)

UNIT-I: Introduction to Ecology and Ecosystem

Relevance of studying ecology; History of ecology; Laws of limiting factors; Detailed study of temperature and light as physical factors; Types of ecosystem; Food chain, Detritus and grazing food chains; Food web; Energy flow through the ecosystem; Ecological pyramids.

UNIT-II: Population

Unitary and modular populations; Unique and group attributes of population: Density, natality, mortality, life tables, fecundity tables, survivorship curves, age ratio, sex ratio, dispersal and dispersion; Exponential and logistic growth, equation and patterns, r and K strategies, Population regulation-density-dependent and independent factors; Population interactions, Gause's Principle with laboratory and field examples; Lotka-Volterra equation for competition and Predation, functional and numerical responses.

UNIT-III: Community

Community characteristics: dominance, diversity, species richness, abundance, stratification; Ecotone and edge effect; Ecosystem development (succession) with example and Theories pertaining to climax community; Nutrient and biogeochemical cycle, Nitrogen cycle and Sulphur cycle.

UNIT-IV: Conservation of Biodiversity

Types of biodiversity, its significance, loss of biodiversity; Conservation strategies (in situ and ex situ); Endangered species concept; Role of ZSI, WWF, IUCN; Wildlife (Protection) Act, 1972.

UNIT-V: Biostatistics

Concept, definition and scope of biostatistics, biological data, sampling techniques, measures of central tendency (mean, median and mode), measures of dispersion, hypothesis and testing of hypothesis

(chi square test, t test and Z test), correlation and regression analysis; Data analysis using EXCEL programme.

PRACTICAL

1. Study of life tables and plotting of survivorship curves of different types from the hypothetical/real data provided.
2. Determination of population density in a natural/hypothetical community by quadrat method and calculation of Shannon-Weiner diversity index for the same community.
3. Study of an aquatic ecosystem: fauna and flora Measurement of area, temperature, turbidity/penetration of light, determination of pH, and Dissolved Oxygen content (Winklers method), Chemical Oxygen Demand and free CO₂.
4. Report on a visit to National Park/Biodiversity Park/Wildlife sanctuary.
5. Determination of mean, median, mode and standard deviation of biological data.

Recommended Books

1. Colinvaux PA (1993) Ecology. II Edition. John Wiley and Sons, Inc., USA.
2. Dash MC (1993) Fundamentals of Ecology. McGraw Hill Book Company, New Delhi.
3. Joshi N and Joshi PC (2012) Ecology and Environment. 1st Edition. Himalaya Publishing House, New Delhi.
4. Odum EP (2008) Fundamentals of Ecology. Indian Edition. Brooks/Cole.
5. Ricklefs, R.E., (2000). Ecology. 5th Edition. Chiron Press.
6. Robert Leo Smith Ecology and field biology Harper and Row.
7. Singh JS, Gupta SR and Singh SP (2014) Ecology, Environmental Science and Conservation. S. Chand, New Delhi.
8. Chainy, GBN, Mishra G and Mohanty PK. Basic Biostatistics, Kalyani Publisher.

C:3-DIVERSITY AND EVOLUTION OF NON-CHORDATA (COELOMATE NONCHORDATES)

(Credits:6, Theory-4, Practical-2) Lectures:
60 (Theory:40, Practical:20) Max.
Marks:100 (Theory:70, Practical:30)

UNIT-I: Phylum Annelida

General characteristics and classification up to classes; Evolution of Coelom; Metamerism and Excretion in Annelida.

UNIT-II: Phylum Arthropoda

General characteristics and classification up to classes; Vision in Arthropoda; Respiration in Arthropoda; Moulting in insects, Metamorphosis in insects; Social life in insects (bees and termites) and Larval forms in Crustacea.

UNIT-III: Phylum Onychophora

General characteristics and evolutionary significance and affinities of Peripatus.

UNIT-IV: Phylum Mollusca

General characteristics and classification up to classes; Respiration in Mollusca; Torsion and detorsion in Gastropoda; Pearl formation in bivalves and Evolutionary significance of trochophore larva.

UNIT-V: Phylum Echinodermata

General characteristics and classification up to classes; Water-vascular system in Asterozoa; Larval forms in Echinodermata and Evolutionary significance (Affinities with Chordates).

Note: Classification to be followed from “ Barnes, R.D. (1982). Invertebrate Zoology, 5th Edition, Holt Saunders International Edition.”

PRACTICAL

Phylum Annelida

1. Study of Aphrodite, Nereis, Sabella, Terebella, Serpula, Chaetopterus, Pheretima and Hirudinaria.
2. T.S. through pharynx, gizzard, and typhlosolar intestine of earthworm.
3. T.S. through crop of leech.

Phylum Arthropoda

4. Study of Limulus, Palamnaeus, Palaemon, Daphnia, Balanus, Sacculina, Cancer, Eupagurus, Scolopendra, Julus, termite, louse, honeybee, silk moth, wasp and dragon fly. **Phylum Onychophora**
5. Any one specimen/slide.

Phylum Mollusca

6. Study of Chiton, Dentalium, Pila, Doris, Helix, Unio, Ostrea, Mytilus, Loligo, Sepia, Octopus and Nautilus and Cypraea (cowrie).

Phylum Echinodermata

7. Study of echinoderm larvae.
8. Study of Pentaceros, Asterias, Ophiura, Clypeaster, Echinus, Echinocardium, Cucumaria and Antedon.

Note: Classification to be followed from “ Barnes, R.D. (1982). Invertebrate Zoology, 5th Edition, Holt Saunders International Edition.”

Recommended books

1. Arora MP (2006) Non-Chordata-I. 1st edition. Himalaya Publishing House, New Delhi.
2. Arora MP (2008) Non-Chordata-II. 1st edition. Himalaya Publishing House, New Delhi.
3. Barnes RD (1982) Invertebrate Zoology. 6th Edition. Holt Saunders International Edition.
4. Barnes RSK, Calow P, Olive PJW, Golding DW & Spicer JI (2002) The Invertebrates: A New Synthesis. 3rd Edition. Blackwell Science, USA.
5. Barrington EJW (1979) Invertebrate Structure and Functions. 2nd Edition. ELBS and Nelson.
6. Boradale LA and Potts EA (1961) Invertebrates: A Manual for the use of Students. Asia Publishing Home.
7. Jordan EL and Verma PS (1963) Invertebrate Zoology. Revised Edition. S. Chand, New Delhi.
8. Mohanty PK (2000) Illustrated Dictionary of Biology. Kalyani Publishers, Ludhiana.

C:4-PHYSIOLOGY: LIFE SUSTAINING SYSTEMS

(Credits:6, Theory-4, Practical-2) Lectures:
60 (Theory:40, Practical:20) Max.
Marks:100 (Theory:70, Practical:30)

UNIT-I: Digestive System

Structural organization, histology and functions of gastrointestinal tract and its associated glands; Mechanical and chemical digestion of food; Absorptions of carbohydrates, lipids, proteins, water, minerals and vitamins; Role of gastrointestinal hormones on the secretion and control of enzymes of gastrointestinal tract.

UNIT-II: Respiratory System

Histology of trachea and lung; Mechanism of respiration, Pulmonary ventilation; Respiratory volume and capacity; Transport of oxygen in the blood; Oxygen- hemoglobin and myoglobin, dissociation curve and the factors influencing it; Carbon monoxide poisoning; Carbon dioxide transport in the blood; buffering action of blood and haemoglobin and Control of respiration.

UNIT-III: Excretory System

Structure of kidney and its histological details; Renal blood supply; Mechanism of urine formation and its regulation and Regulation of acid-base balance.

UNIT-IV: Blood

Components of blood and their functions; Structure and functions of haemoglobin; Haemopoiesis; Haemostasis, Coagulation of blood and Disorders of blood.

UNIT-V: Heart

Structure of heart; Coronary circulation; Structure of conducting and working of myocardial fibers; Origin and conduction of cardiac impulses functions of AV node; Cardiac cycle; Cardiac output and its regulation-Frank-Starling Law of the heart; Nervous and chemical regulation of heart rate; Blood pressure and its regulation and Electrocardiogram.

PRACTICAL

1. Enumeration of red blood cells using haemocytometer.
2. Estimation of haemoglobin using Sahli's haemoglobinometer.
3. Preparation of haemin and haemochromogen crystals.
4. Recording of blood pressure using a Sphygmomanometer.
5. Examination of sections of mammalian oesophagus, stomach, duodenum, ileum, rectum liver, trachea, lung and kidney.

Recommended Books

1. Arey LB (1974) Human Histology. 4th Edition. W.B. Saunders, USA.
2. Chatterjee CC (2008) Human Physiology. Vol. I and II. Medical Allied Agency, Kolkata.
3. Guyton AC and Hall JE (2006) Textbook of Medical Physiology. 9th Edition. W.B. Saunders Company, Philadelphia.
4. Tortora GJ and Derrickson B (2012) Principles of Anatomy & Physiology. 13th Edition John Wiley and sons, USA.
5. Victor PE (2008) diFiores Atlas of Histology with Functional Correlations. 12th Edition, Lippincott W. & Wilkins, USA.

C:5-DIVERSITY AND DISTRIBUTION OF CHORDATA

(Credits:6, Theory-4, Practical-2) Lectures:
60 (Theory:40, Practical:20) Max.
Marks:100 (Theory:70, Practical:30)

UNIT-I: Protochordata and Origin of Chordates

General characters of Hemichordata, Urochordata and Cephalochordata; Study of larval forms in protochordates; Retrogressive metamorphosis in Urochordata; Dipleurula concept and the Echinoderm theory of origin of chordates.

UNIT-II: Introduction to Vertebrata and Agnatha

Advanced features of vertebrates over Protochordata; General characters and classification of cyclostomes up to class; Structural peculiarities and affinities of Petromyzon and Myxine.

UNIT-III: Pisces and Amphibia

General characters of Chondrichthyes and Osteichthyes and classification up to order; Migration; Osmoregulation and Parental care in fishes; Scales in fishes; Origin of Tetrapoda (Evolution of terrestrial ectotherms); General characters and classification up to order and Parental care in Amphibians.

UNIT-IV: Reptilia and Aves

General characters and classification up to order; Skull in Reptilia; Affinities of Sphenodon; Poison apparatus and Biting mechanism in snakes; General characters and classification up to order; Principles and aerodynamics of flight, Flight adaptations; Archaeopteryx- a connecting link and Migration in birds.

UNIT-V: Mammals and Zoogeography

General characters and classification up to order; Affinities of Prototheria and Metatheria; Dentition in mammals; Adaptive radiation with reference to locomotory appendages; Zoogeographical realms; Theories pertaining to distribution of animals and Distribution of vertebrates in different realms.

PRACTICAL

Protochordata

1. Balanoglossus, Herdmania, Branchiostoma and Colonial Urochordata.
2. Sections of Balanoglossus through proboscis and branchiogenital regions.
3. Sections of Amphioxus through pharyngeal, intestinal and caudal regions.
4. Permanent slide of spicules of Herdmania.

Agnatha

5. Petromyzon and Myxine.

Fishes

6. Sphyrna, Pristis, Trygon, Torpedo, Chimaera, Notopterus, Mystus, Heteropneustes, Hippocampus, Exocoetus, Echeneis, Anguilla, Tetradon, Diodon, Anabas and Flat fish.

Amphibia

7. Ichthyophis/Ureotyphlus, Necturus, Duttaphrynus, Polypedates, Hyla, Alytes and Salamandra.

Reptiles

8. Chelone, Trionyx, Hemidactylus, Varanus, Uromastix, Chamaeleon, Draco, Ophiosaurus, Bungarus, Vipera, Naja, Hydrophis, Zamenis and Crocodylus.
9. Key for Identification of poisonous and non-poisonous snakes.

Aves

10. Study of six common birds from different orders.
11. Types of beaks and claws.
12. Types of feathers.

Mammalia

13. Sorex, Bat (Insectivorous and Frugivorous), Funambulus, Loris, Herpestes and Hemiechenis.

Recommended Books

1. Agarwal VK (2011) Zoology for degree students. S. Chand, New Delhi.
2. Arora MP (2006) Chordata-1. 1st Edition. Himalaya Publishing House, New Delhi.
3. Hall BK and Hallgrímsson B (2008) Strickberger's Evolution. 4th Edition. Jones and Bartlett Publishers Inc., USA.
4. Jordan EL and Verma PS (1963) Chordate Zoology. Revised Edition. S. Chand, New Delhi.
5. Young JZ (2004) The Life of Vertebrates. 3rd Edition. Oxford University Press, USA.

C:6-PHYSIOLOGY CONTROLLING AND COORDINATING SYSTEM

(Credits:6, Theory-4, Practical-2) Lectures:

60 (Theory:40, Practical:20) Max.

Marks:100 (Theory:70, Practical:30)

UNIT-I: Tissues and Glands, Bone and cartilage

Structure, location, function and classification of Epithelial tissue, Connective tissue, Muscular tissue, Nervous tissue; Types of glands and their functions; Structure and types of bones and cartilages; Ossification, bone growth and resorption.

UNIT-II: Nervous System

Structure of neuron, resting membrane potential; Origin of action potential and its propagation across the myelinated and unmyelinated nerve fibers; types of synapses, Synaptic transmission; Neuromuscular junction; Reflex action and its types, Reflex arc and Physiology of hearing and vision.

UNIT-III: Muscle

Histology of different types of muscle; Ultra structure of skeletal muscle; Molecular and chemical basis of muscle contraction; Characteristics of muscle twitch; Motor Unit, summation and tetanus.

UNIT-IV: Reproductive System

Histology of male and female reproductive systems; Puberty; Physiology of reproduction of male and female; Methods of contraception (depicted through flow chart).

UNIT-V: Endocrine System

Functional Histology of endocrine glands – pineal, pituitary, thyroid, parathyroid, thymus, pancreas, adrenals; Hormones secreted by them and their mechanism of action; Gonadal hormones; Classification of hormones; Regulation of their secretion; Mode of hormone action; Signal transduction pathways utilized by steroidal and non-steroidal hormones; Hypothalamus (neuroendocrine gland), principal nuclei involved in neuroendocrine control of anterior pituitary and endocrine system and Placental hormones.

PRACTICAL

1. Demonstration of the unconditioned reflex action (Deep tendon reflex such as knee jerk reflex).
2. Preparation of temporary mounts: Squamous epithelium, Striated muscle fibres and nerve cells.
3. Examination of sections of mammalian skin, Cartilage, Bone, Spinal cord, Nerve cell, Pituitary, Pancreas, Testis, Ovary, Adrenal, Thyroid and Parathyroid.

Recommended Books

1. Arey LB (1974) Human Histology. 4th Edition. W.B. Saunders, USA.

- Chatterjee CC (2008) Human Physiology. Vol. I and II. Medical Allied Agency, Kolkata.
- Guyton AC and Hall JE (2006) Textbook of Medical Physiology. 9th Edition. W.B. Saunders Company, Philadelphia.
- Tortora GJ and Derrickson B (2012) Principles of Anatomy & Physiology. 13th Edition John Wiley and sons, USA.
- Victor PE (2008) diFiore Atlas of Histology with Functional Correlations. 12th Edition, Lippincott W. and Wilkins, USA.

C:7-COMPARATIVE ANATOMY OF VERTEBRATES

(Credits:6, Theory-4, Practical-2) Lectures:

60 (Theory:40, Practical:20) Max.

Marks:100 (Theory:70, Practical:30)

UNIT-I: Integumentary System and Skeletal System

Structure, functions and derivatives of integument; Axial and appendicular skeletons; Jaw suspension in vertebrates.

UNIT-II: Digestive and Respiratory System

Alimentary canal and associated glands; Skin, gills, lungs and air sacs and Accessory respiratory organs in fishes.

UNIT-III: Circulatory System

General plan of circulation; Evolution of heart and aortic arches.

UNIT-IV: Urinogenital System

Succession of kidney; Evolution of urinogenital ducts and Types of mammalian uteri.

UNIT-V: Nervous System and Sense Organs

Comparative account of brain; Autonomic nervous system; Spinal Nerves; Spinal cord; Cranial nerves in Mammals; Classification of receptors; visual receptors, chemoreceptors and mechanoreceptors.

PRACTICAL

- Study of placoid, cycloid and ctenoid scales through permanent slides/photographs.
- Disarticulated skeleton of Frog, Varanus, Fowl and Rabbit.
- Carapace and plastron of turtle or tortoise.
- Mammalian skulls (One herbivorous and one carnivorous animal).

Recommended Books

- Hilderbrand M and Gaslow GE. Analysis of Vertebrate Structure. John Wiley and Sons., USA.
- Kardong KV (2005) Vertebrates Comparative Anatomy, Function and Evolution. 4th Edition. McGraw-Hill Higher Education, New York.
- Kent GC and Carr RK (2000) Comparative Anatomy of the Vertebrates. 9th Edition. The McGraw-Hill Companies, New York.
- Weichert CK and William Presch (1970) Elements of Chordate Anatomy. Tata McGraw Hill, New York.

C:8-BIOCHEMISTRY OF METABOLIC PROCESSES

(Credits:6, Theory-4, Practical-2) Lectures:
60 (Theory:40, Practical:20) Max.
Marks:100 (Theory:70, Practical:30)

UNIT-I: Biomolecules

Structures and properties of important mono-, di- and polysaccharides; Fatty acids, triglycerides and steroids; and amino acids and proteins.

UNIT-II: Carbohydrate Metabolism

Glycolysis; Citric acid cycle; pentose phosphate pathway; Gluconeogenesis; Shuttle systems (Malate-aspartate shuttle, Glycerol 3-phosphate shuttle); Glycogenolysis; Glycogenesis.

UNIT-III: Lipid Metabolism

β -oxidation of saturated fatty acids with even and odd number of carbon atoms; Biosynthesis of palmitic acid and Ketogenesis and its regulation.

UNIT-IV: Protein Metabolism

Catabolism of amino acids: Transamination, Deamination; Urea cycle; Fate of C-skeleton of Glucogenic and Ketogenic amino acids.

UNIT-V: Enzymes and Oxidative Phosphorylation

Kinetics and Mechanism of action of enzymes; Inhibition of enzyme action; Allosteric enzymes; Oxidative phosphorylation in mitochondria; Respiratory chain, ATP synthase, Inhibitors and Uncouplers.

PRACTICAL

1. Identification of unknown carbohydrates in given solutions (Starch, Sucrose, Lactose, Galactose, Glucose, Fructose).
2. Colour tests of functional groups in protein solutions.
3. Action of salivary amylase under optimum conditions.
4. Effect of pH on the action of salivary amylase.
5. Effect of temperature on the action of salivary amylase.
6. Estimation of total protein in given solutions by Lowrys method.

Recommended Books

1. Berg JM, Tymoczko JL and Stryer L (2007) Biochemistry. 6th Edition, W.H. Freeman and Co., New York.
2. Cox MM and Nelson DL (2008) Lehninger Principles of Biochemistry. 5th Edition. W.H. Freeman and Co., New York.
3. Devesena T (2014) Enzymology. 2nd Edition. Oxford University Press, UK.
4. Hames BD and Hooper NM (2000) Instant Notes in Biochemistry. 2nd Edition. BIOS Scientific Publishers Ltd., U.K.
5. Murray RK, Bender DA, Botham KM, Kennelly PJ, Rodwell VW and Well PA (2009) Harpers Illustrated Biochemistry. 28th Edition. International Edition. The McGraw-Hill Companies Inc., New York.

C:9-CELL BIOLOGY

(Credits:6, Theory-4, Practical-2) Lectures:
60 (Theory:40, Practical:20) Max.
Marks:100 (Theory:70, Practical:30)

UNIT-I: Cells and Plasma Membrane

Prokaryotic and Eukaryotic cells; Mycoplasma; Virus, Viroids, Virions and Prions; Various models

of plasma membrane; Transport across membranes; Cell junctions: Occluding junctions (Tight junctions), Anchoring junctions (desmosomes), Communicating junctions (gap junctions) and Plasmodesmata.

UNIT-II: Endomembrane System, Mitochondria and Peroxisomes

The Endoplasmic Reticulum; Golgi apparatus; Mechanism of vesicular transport; Lysosomes; Structure and function of mitochondria: Chemi-osmotic hypothesis; Semiautonomous nature of mitochondria; Endosymbiotic hypothesis and Peroxisomes.

UNIT-III: Cytoskeleton and Nucleus

Structure and functions of intermediate filament, microtubules and microfilaments; Ultra structure of nucleus; Nuclear envelope: Structure of nuclear pore complex; Chromosomal DNA and its packaging; Structure and function of Nucleolus.

UNIT-IV: Cell Cycle and Cell Signaling

Cell cycle, Regulation of cell cycle; Signaling molecules and their receptors.

UNIT-V: Apoptosis and Cancer

Extrinsic (Death Receptor) Pathway and Intrinsic (Mitochondrial) Pathway; Growth and development of tumors and Metastasis.

PRACTICAL

1. Gram's staining technique for visualization of prokaryotic cells.
2. Study various stages of mitosis from permanent slides.
3. Study various stages of meiosis from permanent slides.
4. Study the presence of Barr body in human female blood cells/cheek cells. (Preparation of permanent slides).
5. Cytochemical demonstration (Preparation of permanent slides).
 - (i) DNA by Feulgen reaction.
 - (ii) Mucopolysaccharides by PAS reaction.
 - (iii) Proteins by Mercurobromophenol blue.
 - (iv) DNA and RNA by Methyl Green Pyronin.

(In practical examination, 05 marks should be of permanent slide submission; one mark each for DNA, PAS, Proteins, MGP and Barr body slide.)

Recommended Books

1. Becker WM, Kleinsmith LJ, Hardin J and Bertoni G P (2009) The World of the Cell. 7th Edition. Pearson Benjamin Cummings Publishing, San Francisco.
2. Bruce Albert, Bray Dennis, Levis Julian, Raff Martin, Roberts Keith and Watson James (2008) Molecular Biology of the Cell. 5th Edition. Garland publishing Inc., New York.
3. Cooper GM and Hausman RE (2009) The Cell: A Molecular Approach. 5th Edition. ASM Press, Washington D.C.
4. De Robertis EDP and De Robertis EMF (2006) Cell and Molecular Biology. 8th Edition. Lippincott Williams and Wilkins, Philadelphia.
5. Karp G (2010) Cell and Molecular Biology: Concepts and Experiments. 6th Edition. John Wiley and Sons. Inc., USA.

C:10-PRINCIPLES OF GENETICS

(Credits:6, Theory-4, Practical-2) Lectures:
60 (Theory:40, Practical:20) Max.
Marks:100 (Theory:70, Practical:30)

UNIT-I: Mendelian Genetics and its Extension

Principles of inheritance; Incomplete dominance and co-dominance; Multiple alleles, Lethal alleles; Epistasis; Pleiotropy; Sex-linked inheritance.

UNIT-II: Linkage, Crossing Over and Chromosomal Mapping

Linkage and crossing over; Cytological basis of crossing over; Molecular mechanisms of crossing over; Recombination frequency as a measure of linkage intensity; Two factor and three factor crosses; Interference and coincidence and Somatic cell hybridization.

UNIT-III: Mutations

Gene mutations; Chromosomal mutations: Deletion, duplication, inversion, translocation; Aneuploidy and polyploidy; Induced versus spontaneous mutations; Backward and forward mutations; Suppressor mutations; Molecular basis of mutations in relation to UV light and chemical mutagens; Detection of mutations: CLB method, attached X method and DNA repair mechanisms.

UNIT-IV: Sex Determination and Quantitative Genetics

Chromosomal mechanisms of sex determination; Sex-linked, sex-influenced and sex limited characters; Polygenic inheritance and Transgressive variation.

UNIT-V: Extra-chromosomal Inheritance

Criteria for extra-chromosomal inheritance; Antibiotic resistance in Chlamydomonas; Mitochondrial mutations and Maternal effects.

PRACICAL

1. To study the Mendelian laws and gene interactions and their verification by Chi square analyses using seeds/beads/Drosophila.
2. Identification of various mutants of Drosophila.
3. To calculate allelic frequencies by Hardy-Weinberg Law.
4. Linkage maps based on data from crosses of Drosophila.
5. Study of human karyotype (normal and abnormal).
6. Pedigree analysis of some human inherited traits.
7. Preparation of polytene chromosomes from larva of Chironomous/Drosophila.
8. To study mutagenicity in Salmonella/E. coli by Ames test.

Recommended Books

1. Gardner EJ, Simmons MJ, Snustad DP (2008) Principles of Genetics. 8th Edition. Wiley India.
2. Griffiths AJF, Wessler SR, Lewontin RC and Carroll SB. Introduction to Genetic Analysis. 9th Edition. W. H. Freeman and Co., NewYork.
3. Klug WS, Cummings MR, Spencer CA and Palladino MA (2012) Concepts of Genetics. 10th Edition. Pearson Education, Inc., USA.
4. Russell PJ (2009) Genetics- A Molecular Approach. 3rd Edition. Benjamin Cummings, USA.
5. Snustad DP and Simmons MJ (2012) Principles of Genetics. 6th Edition. John Wiley and Sons Inc., USA.
6. Verma PS and AgarwalVK (2010) Genetics. 9th Edition. S. Chand, New Delhi.

C:11-DEVELOPMENTAL BIOLOGY

(Credits:6, Theory-4, Practical-2) Lectures:
60 (Theory:40, Practical:20) Max.
Marks:100 (Theory:70, Practical:30)

UNIT-I: Introduction

History and basic concepts: Epigenesis, preformation, Mosaic and regulative development; Discovery of induction; Cell-Cell interaction; Pattern formation; Differentiation and growth; Differential gene expression; Cytoplasmic determinants and asymmetric cell division.

UNIT-II: Early Embryonic Development

Gametogenesis (Spermatogenesis, Oogenesis); Types of eggs; Egg membranes; Fertilization: Changes in gametes, monospermy and polyspermy; Planes and patterns of cleavage; Early development of frog and chick up to gastrulation; Fate maps; Embryonic induction and organizers.

UNIT-III: Late Embryonic Development

Fate of germ layers; Extra-embryonic membranes in birds; Implantation of embryo in humans and Placenta (Structure, types and functions of placenta).

UNIT-IV: Post Embryonic Development

Metamorphosis: Changes, hormonal regulations in amphibians; Regeneration: Modes of regeneration (epimorphosis, morphallaxis and compensatory regeneration); Ageing: Concepts and models.

UNIT-V: Implications of Developmental Biology

Teratogenesis: Teratogenic agents and their effects on embryonic development; *in vitro* Fertilization; Stem cell culture and Amniocentesis.

PRACTICAL

1. Study of whole mounts and sections of developmental stages of frog through permanent slides: Cleavage stages, blastula, gastrula, neurula, tail-bud stage, tadpole (external and internal gill stages).
2. Study of whole mounts of developmental stages of chick through permanent slides: Primitive streak (13 and 18 hours), 21, 24, 28, 33, 36, 48, 72, and 96 hours of incubation (Hamilton and Hamburger stages).
3. Study of developmental stages (above mentioned) by raising chick embryo in the laboratory.
4. Study of the developmental stages and life cycle of *Drosophila* from stock culture.
5. Study of different types of placenta.
6. Project report on *Drosophila* culture/chick embryo development.

Recommended Books

1. Balinsky BI and Fabian BC (1981) An Introduction to Embryology. 5th Edition. International Thompson Computer Press.
2. Gilbert SF (2010) Developmental Biology. 9th Edition. Sinauer Associates, Inc., USA.
3. Kalthoff (2008) Analysis of Biological Development. 2nd Edition. McGraw-Hill, New York.
4. Wolpert L, Beddington R, Jessell T, Lawrence P, Meyerowitz E and Smith J (2002) Principles of Development. 1st Edition, Oxford University Press, New York.

C:12-MOLECULAR BIOLOGY

(Credits:6, Theory-4, Practical-2)

Lectures: 60 (Theory:40, Practical:20)

Max. Marks:100 (Theory:70, Practical:30)

UNIT-I: Nucleic Acids and DNA Replication

Salient features of DNA double helix; Watson and Crick model of DNA; DNA denaturation and renaturation; DNA topology - linking number and DNA topoisomerases; Cot curves; Structure of RNA, tRNA and DNA and RNA associated proteins; DNA Replication in prokaryotes and eukaryotes; Mechanism of DNA replication; Role of proteins and enzymes in replication; Licensing factors; Semiconservative, bidirectional and semi-discontinuous replication; RNA priming; Replication of circular and linear ds-DNA and replication of telomeres.

UNIT-II: Transcription

RNA polymerase and transcription Unit; Mechanism of transcription in prokaryotes and Eukaryotes; Synthesis of rRNA and mRNA; Transcription factors and regulation of transcription.

UNIT-III: Translation

Genetic code, Degeneracy of the genetic code and Wobble Hypothesis; Process of protein synthesis in prokaryotes: Ribosome structure and assembly in prokaryotes, fidelity of protein synthesis, aminoacyl tRNA synthetases and charging of tRNA; Proteins involved in initiation, elongation and termination of polypeptide chain; Inhibitors of protein synthesis; Difference between prokaryotic and eukaryotic translation.

UNIT-IV: Post Transcriptional Modifications and Processing of Eukaryotic RNA Structure of globin mRNA; Split genes: concept of introns and exons, splicing mechanism, alternative splicing, exon shuffling, and RNA editing.

UNIT-V: Gene Regulation and Regulatory RNAs

Transcription regulation in prokaryotes: Principles of transcriptional regulation with examples from lac operon and trp operon; Transcription regulation in eukaryotes: Activators, repressors, enhancers, silencers elements; Gene silencing, Genetic imprinting; Ribo-switches, RNA interference, miRNA and siRNA.

PRACTICAL

1. Study of DNA replication using Photographs or slides and special cases, e.g., Polytenyusing permanent slides of polytene chromosomes.
2. Preparation of liquid culture medium (LB) and raise culture of *E. coli*.
3. Estimation of the growth kinetics of *E. coli* by turbidity method.
4. Preparation of solid culture medium (LB) and growth of *E. coli* by spreading and streaking.
5. Demonstration of antibiotic sensitivity/resistance of *E. coli* to antibiotic pressure and interpretation of results.
6. Quantitative estimation of salmon sperm/calf thymus DNA using colorimeter (Diphenylamine reagent) or spectrophotometer (A260 measurement).
7. Quantitative estimation of RNA using Orcinol reaction.

Recommended Books

1. Becker WM, Kleinsmith LJ, Hardin J and Bertoni GP (2009) The World of the Cell. 7th Edition. Pearson Benjamin Cummings Publishing, San Francisco.
2. Bruce Alberts, Alexander Johnson, Julian Lewis, Martin Raff, Keith Roberts, Peter Walter (2008) Molecular Biology of the Cell, 4th Edition. Garland publishing Inc., New York.
3. Cooper GM and Hausman RE (2007) The Cell: A Molecular Approach. 4th Edition, ASM Press, USA.
4. De Robertis EDP and De Robertis EMF (2006) Cell and Molecular Biology. 8th Edition; Lippincott Williams and Wilkins, Philadelphia.

5. Karp G (2010) Cell and Molecular Biology: Concepts and Experiments. 6th Edition; John Wiley and Sons. Inc., USA.

C:13-IMMUNOLOGY

(Credits:6, Theory-4, Practical-2) Lectures:
60 (Theory:40, Practical:20) Max.
Marks:100 (Theory:70, Practical:30)

UNIT-I: Immune System and Immunity

Historical perspective of Immunology, Early theories of Immunology, Haematopoiesis, Cells and organs of the Immune system; Anatomical barriers, Inflammation, Cell and molecules involved in innate immunity, Adaptive immunity (Cell mediated and humoral), Passive: Artificial and natural Immunity, Active: Artificial and natural Immunity and Immune dysfunctions.

UNIT-II: Antigens

Antigenicity and immunogenicity, Immunogens, Adjuvants and haptens, Factors influencing immunogenicity, B and T -Cell epitopes.

UNIT-III: Immunoglobulins

Structure and functions of different classes of immunoglobulins, Antigen-antibody interactions, Immunoassays, Polyclonal sera, Monoclonal antibodies and Hybridoma technology.

UNIT-IV: Major Histocompatibility Complex and Complement System

Structure and functions of endogenous and exogenous pathway of antigen presentation; Components and pathways of complement activation.

UNIT-V: Cytokines, Hypersensitivity and Vaccines

Properties and functions of cytokines; Cytokine-based therapies; Gell and Coombs classification and Brief description of various types of hypersensitivities; Types of vaccines: Recombinant vaccines and DNA vaccines.

PARCTICAL

1. Demonstration of lymphoid organs.
2. Ouchterlony's double immuno-diffusion method.
3. Determination of ABO blood group.
4. Preparation of single cell suspension of splenocytes from chick spleen, cell counting and viability test.
5. ELISA/ dot Elisa (using kit).
6. Principles, experimental set up and applications of immuno-electrophoresis, RIA, F.

Recommended Books

1. Abbas KA and Lichtman HA (2003) Cellular and Molecular Immunology. 5th Edition. Saunders Publication, Philadelphia.
2. David M, Jonathan B, David RB and Ivan R (2006) Immunology. 7th Edition. Elsevier Publication, USA .
3. Kindt TJ, Goldsby RA, Osborne BA and Kuby J (2006) Immunology. 6th Edition. W.H. Freeman and Company, New York.

C:14-EVOLUTIONARY BIOLOGY

(Credits:6, Theory-4, Practical-2) Lectures:
60 (Theory:40, Practical:20) Max.
Marks:100 (Theory:70, Practical:30)

UNIT-I: History of Life, theories of Evolution and Extinction

Chemogeny, Biogeny, RNA World, Major Events in History of Life; Lamarckism; Darwinism; Neo-Darwinism; Background of extinction, Mass extinction (Causes, Names of five major extinctions, K-T extinction in detail) and Role of extinction in evolution.

UNIT-II: Evidences of Evolution

Fossils and its types; Dating of fossils, Phylogeny of horse and human; Molecular evidences (Globin gene families as an example) and Molecular clock concept.

UNIT-III: Processes of Evolutionary Change

Organic variations; Isolating mechanisms; Natural selection (Industrial melanism, Pesticide/Antibiotic resistance); Types of natural selection (Directional, Stabilizing, Disruptive), Sexual Selection and Artificial selection.

UNIT-IV: Principles of population genetics

Concept of gene pool, Gene frequencies equilibrium frequency (Hardy-Weinberg equilibrium), Shift in gene frequency without selection Genetic drift, Mutation pressure and Gene flow and Shifts in gene frequencies with selection.

UNIT-V: Species Concept and Evolution above species level

Biological concept of species (Advantages and Limitations); Sibling species, Polymorphic species, Polytypic species, Ring species; Modes of speciation (Allopatric, Sympatric); Macro-evolutionary Principles (Darwins Finches); Convergence, Divergence and Parallelism.

PRACTICAL

1. Study of fossil evidences from plaster cast models and pictures.
2. Study of homology and analogy from suitable specimens/ pictures.
3. Demonstration of changing allele frequencies with and without selection.
4. Construction of cladogram based on morphological characteristics.
5. Construction of phylogenetic tree with bioinformatics tools (Clustal X and Phylip).
6. Interpretation of phylogenetic trees.

Recommended Books

1. Barton NH, Briggs DEG, Eisen JA, Goldstein DB and Patel NH (2007) Evolution. Cold Spring Harbour Laboratory Press.
2. Campbell NA and Reece JB (2011) Biology. 9th Edition. Pearson Education Inc., NewYork.
3. Douglas JF (1997) Evolutionary Biology. Sinauer Associates,USA.
4. Hall BK and Hallgrimsson B (2008) Evolution. 4th Edition. Jones and Bartlett Publishers,USA.
5. Pevsner J (2009) Bioinformatics and Functional Genomics. 2nd Edition. Wiley-Blackwell, USA.
6. Ridley M (2004) Evolution. 3rd Edition. Blackwell Publishing, USA.

DISCIPLINE SPECIFIC ELECTIVE

DSE:1-ANIMAL BEHAVIOUR

(Credits:6, Theory-4, Practical-2) Lectures:
60 (Theory:40, Practical:20) Max.
Marks:100 (Theory:70, Practical:30)

UNIT-I: Introduction and Mechanisms of Behaviour

Origin and history of Ethology; Brief profiles of Karl von Frisch, Ivan Pavlov, Konrad Lorenz, Niko Tinbergen; Proximate and ultimate behavior; Objective of behaviour, Behaviour as a basis of evolution; Behaviour as a discipline of science; Innate behaviour, Instinct, Stimulus filtering, Sign stimuli and Code breakers.

UNIT-II: Patterns of Behaviour

Reflexes: Types of reflexes, reflex path, characteristics of reflexes (latency, after discharge, summation, fatigue, inhibition) and its comparison with complex behavior.

Orientation: Primary and secondary orientation; kinesis-orthokinesis, klinokinesis; taxistropotaxis and klinotaxis and menotaxis (light compass orientation) and mnemotaxis.

Learning: Associative learning, classical and operant conditioning, Habituation and Imprinting.

UNIT-III: Social Behaviour

Insects society; Honey bee: Society organization, polyethism, foraging, round dance, waggledance, Experiments to prove distance and direction component of dance, learning ability in honey bee, formation of new hive/queen; Reciprocal altruism, Hamiltons rule and inclusive fitness with suitable examples.

UNIT-IV: Sexual Behaviour

Asymmetry of sex, Sexual dimorphism, Mate choice, Intra-sexual selection (male rivalry), Inter-sexual selection (female choice), Infanticide, Consequences of mate choice for female fitness, Sexual conflict for male versus female parental care and Courtship behaviour in three spine stickleback.

UNIT-V: Biological Clocks

Circadian rhythm, Tidal rhythm, Lunar rhythm, Advantages of biological clocks, Jet lag and Entrainment.

PRACTICAL

1. To study different types of animal behaviour such as habituation, social life, courtship behaviour in insects, and parental care from short videos/movies and prepare a short report.
2. To study nests and nesting habits of the birds and social insects.
3. To study the behavioural responses of wood lice to dry condition.
4. To study behavioural responses of wood lice in response to humid condition.
5. To study geotaxis behaviour in earthworm.
6. To study the phototaxis behaviour in insect larvae.
7. Visit to Forest/ Wild life Sanctuary/Biodiversity Park/Zoological Park to study behavioural activities of animals and prepare a short report.

Recommended Books

1. David McF. Animal Behaviour. Pitman Publishing Limited, London, UK.
2. John A (2001) Animal Behaviour. 7th Edition. Sinauer Associate Inc., USA.
3. Manning A and Dawkins MS. An Introduction to Animal Behaviour. Cambridge University Press, USA.
4. Paul WS and John A (2013) Exploring Animal Behaviour. 6th Edition. Sinauer Associate Inc., Massachusetts, USA.

DSE:2-ECONOMIC ZOOLOGY

(Credits:6, Theory-4, Practical-2) Lectures:
60 (Theory:40, Practical:20) Max.
Marks:100 (Theory:70, Practical:30)

UNIT-I: Bee-keeping and Bee Economy (Apiculture)

Varieties of honey bees and Bee pasturage; Setting up an apiary: Langstroths/Newton's hive, bee veil, brood and storage chambers, iron frames and comb sheets, drone excluder, rearing equipments, handling of bees, artificial diet; Diseases of honey bee, American and European Foulbrood, and their management; Honey extraction techniques; Physicochemical analysis of honey; Other beneficial products from bee; Visit to an apiculture institute and honey processing Units.

UNIT-II: Silk and Silk Production (Sericulture)

Different types of silk and silkworms in India; Rearing of Bombyx mori, Rearing racks and trays, disinfectants, rearing appliances, black boxing, Chawki rearing, bed cleaning, mountages, harvesting of cocoons; Silkworm diseases: Pebrine, Flacherie, Grasserie, Muscardine and Aspergillosis, and their management; Silkworm pests and parasites: Uzi fly, Dermestid beetles and their management; Silk reeling techniques and Quality assessment of silk fibre.

UNIT-III: Aquaculture I

Brood stock management; Induced breeding of fish; Management of hatchery of fish; Management of nursery, rearing and stocking ponds; Preparation and maintenance of fish aquarium; Preparation of compound diets for fish; Role of water quality in aquaculture; Fish diseases: Bacterial, viral and parasitic; Preservation and processing of harvested fish; Fishery by-products.

UNIT-IV: Aquaculture II

Prawn farming; Culture of crab; Pearl culture and Culture of air breathing fishes.

UNIT-V: Dairy and Poultry Farming

Introduction; Indigenous and exotic breeds; Rearing, housing, feed and rationing; Commercial importance of dairy and poultry farming; Varietal improvement techniques; Diseases and their management; Dairy or poultry farm management and business plan; Visit to any dairy farm or Poultry farm.

* Submission of report on anyone field visits mentioned above.

PRACTICAL

1. Study of different types of bees (Queens, Drones and Worker bees).
2. Study of different types of silk moths.
3. Study of different types of pearls.
4. Study of different types of fish diseases.
5. Identification of different types of scales in fishes.
6. Study of different types of fins.
7. Study of different modified structures of fishes (Saw of sawfish, Hammer of hammer head fish, tail of sharks etc.)
8. Identification of various types of natural silks.

Recommended Books

1. Dhyani Singh Bisht, Apiculture, ICAR Publication.
2. Dunham RA (2004) Aquaculture and Fisheries Biotechnology Genetic Approaches. CABI publications, U.K.
3. Hafez ESE (1962) Reproduction in Farm Animals. Lea and Fabiger Publishers.
4. Knobil E and Neill JD (2006) The Physiology of Reproduction. Vol. 2. Elsevier Publishers, USA.
5. Prost PJ (1962) Apiculture. Oxford and IBH, New Delhi.

6. Singh S. Beekeeping in India, Indian council of Agricultural Research, New Delhi.
7. Srivastava CBL (1999) Fishery Science and Indian Fisheries. Kitab Mahal publications, India.

DSE:3-MICROBIOLOGY

(Credits:6, Theory-4, Practical-2) Lectures:
60 (Theory:40, Practical:20) Max.
Marks:100 (Theory:70, Practical:30)

UNIT-I:

History of Microbiology; Microbial World Characterization, Classification and identification of microbes.

UNIT-II:

Prokaryotes: General morphology and classification of bacteria, their characters and economic importance; Gram-positive and Gram-negative bacteria.

UNIT-III:

Eukaryotes: General morphology of Protista and Fungi classification and economic importance.

UNIT-IV:

Viruses: structure, genome, replication cycle; Epidemiology of infectious diseases with reference of human hosts Bacterial (Tuberculosis), Viral (Hepatitis), Protozoan (Amoebiasis) and Fungal (any one) disease.

UNIT-V:

Microbe interactions-Immune Responses-Antibiotics and other chemotherapeutic agents; Applied microbiology in the fields of food, agriculture, industry and environment.

PRATICAL

1. Cleaning of glasswares, sterilisation principle and methods - moist heat - dry heat and filtration methods.
2. Media preparation: Liquid media, Solid media, Agar slants, Agar plates. Basal, enriched, selective media preparation - quality control of media, growth supporting properties, sterility check of media.
3. Pure culture techniques: Streak plate, pour plate and decimal dilution.
4. Cultural characteristics of microorganisms: Growth on different media, growth characteristics and description and demonstration of pigment production.
5. Staining techniques: Smear preparation, simple staining, Grams staining, Acidfast staining and staining for meta chromatic granules.
6. Morphology of microorganisms.
7. Antibiotic sensitivity testing: Disc diffusion test - Quality control with standard strains.
8. Physiology characteristics: IMViC test, H₂S, Oxidase, catalase, urease test, Carbohydrate fermentation, Maintenance of pure culture, Paraffin method, Stab culture and maintenance of mold culture.

Recommended Books

1. Ahsan J and Sinha SP (2010) A Hand book on Economic Zoology. S Chand, NewDelhi.
2. Arora DR and Arora B (2001) Medical Parasitology.2nd Edition.CBS Publications and Distributers.
3. Atwal AS (1993) Agricultural Pests of India and South East Asia. Kalyani Publishers, Ludhiana.
4. Dubey RC and Maheshwari DK (2013) A Textbook of Microbiology. S. Chand, New Delhi.
5. Dunham RA (2004) Aquaculture and Fisheries Biotechnology Genetic Approaches. CABI publications.
6. Pelczar MJ, Chan ECS and Krieg NR (1993) Microbiology.5th Edition, Tata McGraw Hill Publishing Co.Ltd.

7. Pradhan, S (1983) Insect Pests of Crops. National Book Trust of India, New Delhi.
8. Shukla, G.S. and Upadhya, V.B. (2013) Economic Zoology. 5th Edition, Rastogi Publications, Meerut.

DSE:4-PROJECT WORK
(Credits:6, Max. Marks:100)

SKILL ENHANCEMENT COURSES(SEC)

SEC:1-COMMUNICATIVE ENGLISH & ENGLISH WRITING SKILL

(Compulsory)

(Credits: 02) Theory: 20 Classes (1hr duration)

SEC:2-PUBLIC HEALTH AND HYGIENE

(Credits:2)

Lectures:30, Max. Marks:50

UNIT-I:

Scope of Public health and Hygiene; nutrition and health; classification of foods; Nutritional deficiencies; Vitamin deficiencies.

UNIT-II:

Pollution: water pollution, air pollution, soil pollution, noise pollution, thermal pollution and radioactive pollution.

UNIT-III:

Environment and Health hazards; Environmental degradation and health hazards due to pollutants.

UNIT-IV:

Communicable diseases and their control measures such as Measles, Polio, Chikungunya, Rabies, Plague, Leprosy and AIDS.

UNIT-V:

Non-Communicable diseases and their preventive measures such as Hypertension, Coronary Heart diseases, Stroke, Diabetes, Obesity and Mental ill-health.

Recommended Books

1. Arora DR and Arora B (2001) Medical Parasitology.2nd Edition.CBS Publications and Distributers.
2. Dubey RC and Maheshwari DK (2013) A text book of Microbiology. S. Chand, New Delhi.
3. Pelczar MJ, Chan ECS and Krieg NR (1993) Microbiology.5th Edition. Tata McGraw Hill Publishing Co. Ltd.

GENERIC ELECTIVE PAPERS(GE)

Credits: 06 each)

GE-1: ANIMAL DIVERSITY (NON-CHORDATE), PHYSIOLOGY AND ENDOCRINOLOGY

(Credits:6, Theory-4, Practical-2) Lectures:
60 (Theory:40, Practical:20) Max.
Marks:100 (Theory:70, Practical:30)

General characteristics and classification up to classes and study of types mentioned

UNIT-I:

Protozoa: Paramecium with reference to structure and reproduction.

Porifera: Structure of Sycon and Canal system in sponges.

Cnidaria: Structure, reproduction and life cycle of Aurelia.

UNIT-II:

Platyhelminthes: Structure, reproduction and life cycle of Fasciola.

Nemathelminthes: Structure, reproduction and life cycle of Ascaris.

Annelida: Structure, digestion and excretion of Hirudinaria.

UNIT-III:

Arthropoda: External morphology, digestive and excretory system of Paleamon.

Mollusca: Morphology and respiration of Pila.

Echimodermata: Morphology and water vascular system of Asterias.

UNIT-IV: Mammalian Physiology

Digestion, Respiration, Transport of respiratory gases, Structure of heart and cardiac cycle, Composition and clotting of blood, Blood group, Structure of neuron and transmission of nerve impulse, Structure of skeletal muscle and muscle contraction.

UNIT-V: Endocrinology

Structure and function of Pituitary, Thyroid and Gonads.

Note: Classification to be followed from " Barnes RD (1982) Invertebrate Zoology. 5th Edition."

PRACTICAL

Experiment (Physiology) Estimation of haemoglobin concentration in man, Estimation of casein in milk, Estimation of lipid in any given sample.

Endocrinology slides as mentioned in syllabus Museum Specimens and slides Slides: Morphology of Paramecium, Binary fission and Conjugation in Paramecium. Section through Sycon, Spicules and Gemmules of sponge, Ephyra larva.

Museum specimens: Spongilla, Sycon, Gorgonia, Physallia, Porpita, Penatulla, Nereis, Aphrodite, Sacculina, Eupagurus, Chiton, Aplysia, Octopus, Starfish, sea-Urchin, sea Cucumber.

Recommended Books

1. Arora MP (2006) Non-Chordata-I. 1st edition. Himalaya Publishing House, New Delhi.
2. Arora MP (2008) Non-Chordata-II. 1st edition. Himalaya Publishing House, New Delhi.

3. Barnes RD (1982) Invertebrate Zoology. 6th Edition. Holt Saunders International Edition.
4. Barnes RSK, Calow P, Olive PJW, Golding DW & Spicer JI (2002) The Invertebrates: A New Synthesis. 3rd Edition. Blackwell Science, USA.
5. Barrington EJW (1979) Invertebrate Structure and Functions. 2nd Edition. ELBS and Nelson.
6. Boradale LA and Potts EA (1961) Invertebrates: A Manual for the use of Students. Asia Publishing Home.
7. Jordan EL and Verma PS (1963) Invertebrate Zoology. Revised Edition. S. Chand, New Delhi.
8. A text book of medical Physiology. Guyton and Hall.
9. Human physiology. Chatterjee.
10. Principle of Anatomy and Physiology. Tortora and Derrickson.
11. A book of Physiology and Functional Histology, A K berry.
12. Mohanty PK (2000) Illustrated Dictionary of Biology. Kalyani Publishers, Ludhiana.

GE-2: ANIMAL DIVERSITY (PROTOCHORDATA, CHORDATA), DEVELOPMENTAL BIOLOGY AND IMMUNOLOGY

(Credits:6, Theory-4, Practical-2) Lectures:
60 (Theory:40, Practical:20) Max.
Marks:100 (Theory:70, Practical:30)

UNIT-I: Protochordata and Origin of Chordates

General characters of Hemichordata, Urochordata and Cephalochordata; Structure, Digestive system, Respiratory and reproduction in Balanoglossus, Herdmania and Amphioxus.

UNIT-II: Pisces and Amphibia

General characters of Chondrichthyes and Osteichthyes and classification up to order; Digestive and reproductive system in Scoliodon General characters and classification of amphibian up to order, Circulatory and Nervous system (Brain and Cranial nerves).

UNIT-III: Reptilia, Aves and Mammals

Urogenital system of Calotes; Respiratory system of Pigeon and Flight adaptation in Birds; Digestive and Nervous System (Brain and Cranial nerves) of rabbit.

UNIT-IV: Developmental Biology

Gametogenesis, structure of gametes, Mechanism of fertilization, Types of Cleavage, Development of Amphioxus and frog up to formation of three germ layers.

UNIT-V: Immunology

Innate and acquired immunity, Antigens, structure and function of immunoglobulins, Antigen- Antibody interaction, Vaccines.

PRACTICAL

Immunology: Blood Grouping

Museum specimens: Balanoglossus, Herdmania, Amphioxus, Exocoetus, Hippocampus, Anabas, Ambystoma, Axolotl larva, Polypedates, Ichthyophis, Draco, Chelone, Trionyx, Hemidactylus, Varanus, Chamaeleon, Sea snake, Cobra, Viper, Krait, Pigeon, Crow, Bat, Rat.

Slides: Sections through Balanoglossus and Amphioxus; Tissue sections through Liver, Pancreas; Embryological slides of frog.

Bones: Amphibia and mammals.

Recommended Books

1. Agarwal VK (2011) Zoology for degree students. S. Chand, NewDelhi.
2. Arora MP (2006) Chordata-1. 1st Edition. Himalaya Publishing House, New Delhi.
3. Hall BK and Hallgrimsson B (2008) Strickbergers Evolution. 4th Edition. Jones and Bartlett Publishers Inc., USA.
4. Jordan EL and Verma PS (1963) Chordate Zoology. Revised Edition.S. Chand, New Delhi.
5. Young JZ (2004) The Life of Vertebrates. 3rd Edition. Oxford University Press, USA.
6. Kindt TJ, Goldsby RA, Osborne BA, Immunology.
7. Gilbert SF, Developmental Biology.

GE-3: FOOD, NUTRITION AND HEALTH

(Credits:6, Theory-4, Practical-2) Lectures:
60 (Theory:40, Practical:20) Max.
Marks:100 (Theory:70, Practical:30)

UNIT-I:

Food; Diet; Nutrient; Vitamins; Disorders due to deficiency of vitamins; Synthetic foods and drinks.

UNIT-II:

Functions of food; Components of food; Nutrients (Macro and micronutrients): their biochemical role and dietary sources; Food groups and the concept of a balanced diet; Causes of food spoilage; Food adulteration; Nutrition through the life cycle- Physiological considerations, nutrient needs and dietary pattern for various groupsadults, pregnant and nursing mothers, infants, preschool and school children, adolescents and elderly.

UNIT-III:

Nutritional Biochemistry Carbohydrates, Lipids, Proteins - Definition, Classification, Structure and properties Significance of acid value, iodine value and saponification value of lipids; Essential and Non-essential amino acids; Enzymes- Definition, Classification, Properties; Coenzymes Vitamins- Fat-soluble and Water-soluble vitamins; their Structure and properties Minerals- Iron, calcium, phosphorus, iodine, selenium and zinc and their properties.

UNIT-IV:

Introduction to health- Definition and concept of health; Major nutritional deficiency Diseases: Protein Energy Malnutrition; Life style related diseases- hypertension, diabetes mellitus, and obesity- their causes and prevention through dietary or lifestyle modifications. Social health problems- smoking, alcoholism, drug dependence and Acquired Immuno Deficiency Syndrome (AIDS); Common ailments- cold, cough, fevers, diarrhoea, constipation: their causes and dietary treatment.

UNIT-V:

Food hygiene, Potable water- sources and methods of purification, Food and Water Borne Infections.

PRACTICAL

1. To detect adulteration in a) Ghee b) Sugars c) Tea leaves and d) Turmeric.
2. To determine absorbed oil content in fried foods.
3. Estimation of lactose in milk.
4. Ascorbic acid estimation in food by titrimetry.
5. Estimation of calcium in foods by titrimetry.

6. Preparation of temporary mounts of various stored grain pests.
7. Project- Undertake computer aided diet analysis and nutrition counselling for different age groups. OR Identify nutrient rich sources of foods, their seasonal availability and price; study of Nutrition labelling on selected foods.

Recommended Books

1. Bamji MS, Rao NP and Reddy V (2009) Text Book of Human Nutrition. Oxford & IBH Publishing Co. Pvt Ltd.
2. Jain P et al. (2007) Poshan vaswasthya ke mool siddhant (Hindi). 1st Ed. Academic Pratibha.
3. Lakra P and Singh MD (2008) Text book of Nutrition and Health. 1st Edition. Academic Excellence.
4. Manay MS, Shadaksharaswamy (1998) Food-Facts and Principles. New Age International (P) Ltd.
5. Mohanty PK (2000) Illustrated Dictionary of Biology. Kalyani Publishers, Ludhiana.
6. Mudambi SR and Rajagopal MV (2007) Fundamentals of Foods, Nutrition and Diet Therapy. 5th Edition. New Age International Publishers.
7. Srilakshmi B (2002) Nutrition Science. New Age International (P) Ltd.
8. Srilakshmi B (2007) Food Science. 4th Edition. New Age International (P) Ltd.
9. Swaminathan M (1986) Handbook of Foods and Nutrition. 5th Edition. BAPPCO.
10. Wardlaw GM, Hampl JS (2007) Perspectives in Nutrition. 7th Edition. McGraw Hill.

GE-4: BIOTECHNOLOGY: MICROBES TO ANIMALS

(Credits:6, Theory-4,
Practical-2) Lectures:
60 (Theory:40,
Practical:20) Max.
Marks:100 (Theory:70,
Practical:30)

UNIT-I: Introduction

Concept and scope of Biotechnology; Importance of biotechnology and Application of biotechnology.

UNIT-II: Techniques in Gene Manipulation

Restriction and modifying enzymes, Cloning vectors and Expression vectors, Transformation techniques, Identification of recombinants, Construction and screening of DNA libraries; Molecular analysis of DNA, RNA and proteins (i.e., Southern, Northern and Western blotting), DNA sequencing (Sanger's method and automation), Polymerase Chain Reaction, Microarrays, DNA fingerprinting and RAPD.

UNIT-III: Microbes in Biotechnology

Growth kinetics of microbes, Applications of microbes in industry (Concept of primary and secondary metabolites, Fermentation/Bioreactors, Downstream processing), Bioremediation and Biosensing.

UNIT-IV: Transgenic Animal

Production of transgenic animals: Retroviral method, DNA microinjection method, embryonic stem cell method, nuclear transplantation; Applications of transgenic animals; Knockout mice; Transgenic livestock and Transgenic fish.

UNIT-V: Biotechnology and Human Welfare

Animal cell technology: Concept of expressing cloned genes in mammalian cells, Recombinant DNA in health (Recombinant insulin and human growth hormone), Production of recombinant vaccines, Gene therapy: in vitro, in-vivo and ex-vivo. Ethical issues concerning: Transgenesis, Bio safety and Intellectual Property Rights.

PRACTICAL

1. Isolation of genomic DNA from E. coli and analyze it using agarose gel electrophoresis.
2. Isolation of plasmid DNA (pUC 18/19) and analyse it using agarose gel electrophoresis.
3. Transformation of E. coli (pUC 18/19) and calculation of transformation efficiency.
4. Restriction digestion of lambda (λ) DNA using EcoR1 and Hind III.
5. DNA ligation (lambda DNA EcoR1/Hind III digested).
6. Construction of restriction digestion maps from data provided.
7. Study of Southern blot hybridization and PCR; Analysis of DNA fingerprinting (Dry Lab).
8. Project on Animal Cell Culture.

Recommended Books

1. Beauchamp TI and Childress JF (2008) Principles of Biomedical Ethics. 6th Edition. Oxford University Press, USA.
2. Brown TA (1998) Molecular Biology Labfax II: Gene Cloning and DNA Analysis. 2nd Edition. Academic Press, USA.
3. Glick BR and Pasternak JJ and Patten CL (2009) Molecular Biotechnology-Principles and Applications of Recombinant DNA. 4th Edition. ASM press, Washington, USA.
4. Griffiths AJF, Miller JH, Suzuki DT, Lewontin RC and Gelbart WM (2009) An Introduction to Genetic Analysis. 9th Edition. W.H. Freeman and Co., USA.
5. Snustad DP and Simmons MJ (2009) Principles of Genetics. 5th Edition, John Wiley and Sons Inc., USA.
6. Watson JD, Myers RM, Caudy A and Witkowski JK (2007) Recombinant DNA-Genes and Genomes- A Short Course. 3rd Edition, Freeman and Co., USA.

	Skill Development
	Employability
	Entrepreneurship
	All the three
	Skill Development and Employability
	Skill Development and Entrepreneurship
	Employability and Entrepreneurship

SYLLABUS FOR B.COM HONS.						
B.Com. Hons. (CBCS) for the Academic Year 2018-19						
	Course Structure	Category	Marks			Credits
	Semester I		Theory	Practical /Internal	Total	
BCH-1.1	Environmental Science	AECC-1	80	20 (I)	100	4
BCH-1.2	Financial Accounting	Core -1	80	20 (I)	100	6
BCH-1.3	Business Law	Core -2	80	20 (I)	100	6
BCH-1.4	Micro Economics	GE-1	80	20 (I)	100	6
Total			320	80	400	22
	Semester-II					
BCH-2.1	English Communication	AECC-2	80	20 (I)	100	4
BCH-2.2	Corporate Accounting	Core -3	80	20 (I)	100	6
BCH-2.3	Corporate Laws	Core -4	80	20 (I)	100	6
BCH-2.4	Macro Economics	GE-2	80	20 (I)	100	6
Total			400	100	400	26
	Semester III					
BCH-3.1	Human Resource Management	Core-5	80	20 (I)	100	6
BCH-3.2	Income-tax Law and Practice	Core -6	80	20 (I)	100	6
BCH-3.3	Management Principles and Application	Core -7	80	20 (I)	100	6
BCH-3.4	Business Statistics	GE-3	80	20 (I)	100	6
BCH-3.5	E-Commerce(Compulsory)	SEC-2	80	20 (I)	100	4
Total			400	100	500	28
	Semester IV					
BCH-4.1	Cost and Management Accounting	Core -8	80	20 (I)	100	6
BCH-4.2	Business Mathematics	Core -9	80	20 (I)	100	6

BCH-4.3	Computer Applications in Business	Core -10	80	20 (I)	100	6
BCH-4.4	Indian Economy - Performance and Policies	GE-4	80	20 (I)	100	6
BCH-4.5	Entrepreneurship(Compulsory)	SEC-3	80	20 (I)	100	4
	Total		400	100	500	28

	Course Structure		Category	Theory	Practical / Internal	Total	Credits
	Semester V						
BCH-5.1	Principles of Marketing		Core -11	80	20 (I)	100	6
BCH-5.2	Fundamentals of Financial Management		Core -12	80	20 (I)	100	6
BCH-5.3	DSE-1 (Any one of the following)		DSE-1	80	20 (I)	100	6
	A. Accounting and Finance	Financial Markets , Institution and Services					
	B. Banking and Insurance	Indian Banking and Insurance System					
	C. Financial Markets	Indian Financial System					
BCH-5.4	DSE-2 (Any one of the following)		DSE-2	80	20 (I)	100	6
	A. Accounting and Finance	Financial Statement Analysis and Reporting					
	B. Banking and Insurance	Merchant Banking and Financial Services					
	C. Financial Markets	Financial Institutions and Services					
	Total			320	80	400	24
	Semester VI						
BCH-6.1	Auditing and Corporate Governance		Core -13	80	20 (I)	100	6
BCH-6.2	Indirect Tax Law		Core-14	80	20 (I)	100	6
BCH-6.3	DSE-3 (Any one of the following)		DSE-3	80	20 (I)	100	6
	A. Accounting and Finance	Corporate Tax Planning					
	B. Banking and Insurance	Fundamentals of Investment					
	C. Financial Markets	Financial Market Operations					
BCH-6.4	Business Research Methods and Project Work*		DSE-4	50	50(I)	100	6
	Total			290	110	400	24

Grand Total				2600 (Min)	148 (Min)
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B.Com. (Hons.): Semester - I
**Paper BCH-1.1: Environmental
Science**

Duration: 3 hrs.

Marks: 100 (80+20)

Lectures: 65

Objectives: To provide information on environmental science, its resources and Management.

Contents:

Unit - I

The Environment: The Atmosphere, Hydrosphere, Lithosphere, Biosphere, Ecology, Ecosystem, Biogeochemical Cycle (Carbon Cycle, Nitrogen Cycle).

Unit – II

Environment Pollution: Air Pollution, Water Pollution, Soil Pollution, Noise Pollution, Thermal Pollution, Radiation Pollution, Natural Disasters and their Management.

Unit – III

Population Ecology: Individuals, Species, Pollution, Community, Control Methods of Population, Urbanization and its effects on Society, Communicable Diseases and its Transmission, Non-Communicable Diseases.

Unit- IV

Environmental Movements in India: Grass root Environmental movements in India, Role of women, Environmental Movements in Odisha, State Pollution Control Board, Central Pollution Control Board.

Unit – V

Natural Resources: Conservation of Natural Resources, Management and Conservation of Wildlife, Soil Erosion and Conservation, Environmental Laws: Water Act, 1974, Air Act, 1981, The Wildlife (Protection) Act, 1972, Environment Protection, 1986.

Learning Outcomes: After completion of this paper, students would be able to analyze the ways in which the natural environment and the society impact the establishment and continuation of business. Along with that, they would also gain knowledge about the ways and means of managing the natural resources for the benefit of both i.e. the business and the society thereby creating a win-win situation.

BOOKS FOR REFERENCE:

- ✓ *Text Book of Environmental Studies, D.K.Asthana, DrMeeraAsthana, S.Chand*
- ✓ *Environmental Studies – Sanjay Ku. Batra / KanchanBatra/ H.K.Kaur / Parul Pant – Taxmann Pub.*
- ✓ *Principles of Environmental Studies–P. C. Manoharachary & P. J. Reddy B. S. Pub., 2004*
- ✓ *Introduction to an Environmental Science–Y. Anjaneyulu, B. S. Pub. 2004.*
- ✓ *Ecology–Subramanyam & Sambamurty, Narosa Pub. House, 2000.*
- ✓ *A Text Book in Environmental Science–V. Subramaniam, Narosa Pub. House, 2000*
- ✓ *Managing Industrial Pollution –S. C. Bhatia, Mac Millan, 2003.*
- ✓ *Man and Environment–Dash and Mishra, Mac Millan*
- ✓ *Environment and Society–Mishra and Dash, Mac Millan*
- ✓ *Text Book of Environmental Science–Panigrahi and Sahu, Sadgranth Mandir.*
- ✓ *Environment and Ecology, De and De, S.Chand*
- ✓ *Environmental Management, G.N.Pandey, Vikash Publishing*

B.Com. (Hons.): Semester - I **Paper BCH 1.2: Financial** **Accounting**

Duration: 3 hrs.

Marks: 100 (80+20)

Lectures: 65

Objectives: The objective of this paper is to help students to acquire conceptual knowledge of financial accounting and to impart skills for recording various kinds of business transactions.

Contents

Unit 1. (a) Theoretical Framework

- i. Accounting as the language of business and an information system, the users of financial accounting information and their needs. Qualitative characteristics of accounting information. Functions, advantages and limitations of accounting. Branches of accounting. Bases of accounting; cash basis and accrual basis.
- ii. The nature of financial accounting principles – Basic concepts and conventions: entity, money measurement, going concern, cost, realization, accruals, periodicity, consistency, prudence (conservatism), materiality and full disclosures and Accounting Equation.

(b) Accounting Process

From recording of business transactions to the preparation of trial balance including adjustments: journal, sub-division of journal, ledger accounts, trial balance

Unit 2. Business Income

- i. Measurement of business income-Net income: the accounting period, the continuity

doctrine and matching concept. Objectives of measurement and revenue recognition.

ii. Depreciation Accounting: The accounting concept of depreciation. Factors in the measurement of depreciation. Methods of computing depreciation: straight line method and

diminishing balance method; Disposal of depreciable assets-change of method. Salient features of Accounting Standard 6 (AS- 6) issued by ICAI

iii. Inventory Accounting: Meaning. Significance of inventory valuation. Inventory Record Systems: periodic and perpetual. Methods: FIFO, LIFO and Weighted Average. Salient features of Accounting Standard 2 (AS- 2) issued by ICAI

Unit 3. Final Accounts

Capital and revenue expenditures and receipts: general introduction only. Preparation of financial statements of Sole Trade and Partnership Business with adjustments

Unit 4. Hire Purchase and Installment Systems and Accounting for Branch & Department

- i. Concepts of operating and financial lease (theory only)
- ii. Departmental Accounting and Branch Accounting including foreign branch (Theory and Problem)

Unit 5. Accounting for Partnership Firm

Accounting of Admission of partner, Retirement and Death of partner and Dissolution of the Partnership Firm Including Insolvency of partners

Learning Outcomes: The course structure of this paper would equip the students to get in-depth knowledge of financial accounting along with its practical application thereby giving an opportunity to gain easy access to this competitive business world.

Suggested Readings:

1. Anthony, R.N. Hawkins, and Merchant, *Accounting: Text and Cases*. McGraw-Hill Education.
2. Bal Ranjan Kumar, *Financial Accounting* – S. Chand
3. Bansal.K.M - *Financial Accounting* – Taxman Publication
4. Deepak Sehgal, *Financial Accounting* – Vikash Publication
5. Horngren, *Introduction to Financial Accounting*, Pearson Education.
6. Monga, J.R. *Financial Accounting: Concepts and Applications*. Mayoor Paper Backs, New Delhi.
7. Shukla, M.C., T.S. Grewal and S.C.Gupta. *Advanced Accounts. Vol.-I*. S. Chand & Co., New Delhi.
8. Maheshwari, S.N. and. S. K. Maheshwari. *Financial Accounting*. Vikas Publishing House, New Delhi.
9. Sehgal, Ashok, and Deepak Sehgal. *Advanced Accounting. Part –I*.Taxmann Applied Services, New Delhi.
10. Bhushan Kumar Goyal and HN Tiwari, *Financial Accounting*, International Book House
11. Goldwin, Alderman and Sanyal, *Financial Accounting*, Cengage Learning.
12. Tulsian, P.C. *Financial Accounting*, **S. Chand**.
8. Jain, S.P. and K.L. Narang. *Financial Accounting*, Kalyani Publishers, New Delhi

9. Gupta, Nirmal. *Financial Accounting*, Sahitya Bhawan, Agra.

10. *Compendium of Statements and Standards of Accounting*. The Institute of Chartered Accountants of India, New Delhi

B.Com. (Hons.):
Semester - I Paper BCH
1.3: Business Law

Duration: 3 hrs.

Marks: 100 (80+20)

Lectures: 65

Objective: The objective of the course is to impart basic knowledge of the important business laws along with relevant case laws.

Contents:

Unit I: The Indian Contract Act, 1872: General Principle of Law of Contract

- a) Contract – meaning, characteristics and kinds
- b) Essentials of valid contract - Offer and acceptance, consideration, contractual capacity, free consent, legality of objects.
- c) Void agreements
- d) Discharge of contract – modes of discharge including breach and its remedies.
- e) Contingent contracts
- f) Quasi - contracts

Unit II: The Indian Contract Act, 1872: Specific Contracts

- a) Contract of Indemnity and Guarantee
- b) Contract of Bailment
- c) Contract of Agency

Unit III: The Sale of Goods Act, 1930

- a) Contract of sale, meaning and difference between sale and agreement to sell.
- b) Conditions and warranties
- c) Transfer of ownership in goods including sale by non-owners
- d) Performance of contract of sale
- e) Unpaid seller – meaning and rights of an unpaid seller against the goods and the buyer.

Unit IV: Partnership Laws

The Partnership Act, 1932

- a. Nature and Characteristics of Partnership
- b. Registration of Firms
- c. Types of Partners
- d. Rights and Duties of Partners
- e. Implied Authority of a Partner
- f. Incoming and outgoing Partners
- g. Mode of Dissolution of Partnership

Unit V: The Negotiable Instruments Act 1881

- a) Meaning and Characteristics of Negotiable Instruments : Promissory Note, Bill of Exchange, Cheque

- b) Holder and Holder in due Course, Privileges of Holder in Due Course.
- c) Negotiation: Types of Endorsements

- d) Crossing of Cheque
- e) Bouncing of Cheque

Learning Outcomes: The students would be able to deal with the legal aspect of different business situations.

Suggested Readings:

1. Arora Sushma – Business Law – Taxmann Publication
2. Kuchhal, M.C. and Vivek Kuchhal, *Business Law*, Vikas Publishing House, New Delhi.
3. Tulsian, P.C, Business Law, S.Chand
4. Gogna P.P.S, Business & Industrial Law, S.Chand
5. Singh, Avtar, *Business Law*, Eastern Book Company, Lucknow.
6. Maheshwari & Maheshwari, *Business Law*, National Publishing House, New Delhi.
7. Chadha, P. R., *Business Law* Galgotia Publishing Company, New Delhi.
8. Aggarwal S K, Business Law, Galgotia Publishers Company, New Delhi.
9. GoyalBhushan Kumar and Jain Kinneri, Business Laws, International Book House
10. Ravinder Kumar, Legal Aspects of Business, Cengage Learning

B.Com. (Hons.): Semester - I Paper BCH-1.4: Micro Economics

Duration: 3 hrs.

Marks: 100 (80+20)

Lectures: 65

Objective: Objective of the course is to acquaint the students with the concepts of micro-economics dealing with consumer behaviour. The course also makes the student understand the supply side of the market through the production and cost behaviour of firms.

Contents:

Unit I: Demand and Consumer Behaviour

Concepts of revenue: Marginal and Average: Revenue under conditions of Perfect and imperfect competition, Elasticity of demand: price, income and cross. Consumer Behaviour: Indifference curve analysis of consumer behavior; Consumer's equilibrium, Price elasticity and price consumption curve, income consumption curve and Engel curve, price change and income and substitution effects.

Unit II: Production and Cost

Production iso-quants, marginal rate of technical substitution, economic region of production, optimal combination of resources, the expansion path, returns to scale using iso-quants
Cost of Production: Social and private costs of production, long run and short run costs of production.

Unit III: Perfect Competition

Perfect competition: Assumptions, Equilibrium of the firm and the industry in the short and the long-run, including industry's long run supply curve. Measuring producer surplus under perfect competition

Unit IV: Monopoly

Monopoly: Monopoly short run and long run equilibrium. Shifts in demand curve and the absence of the supply curve. Measurement of monopoly power and the rule of thumb for pricing, Horizontal and vertical integration of firms

Unit V: Imperfect Competition

Monopolistic Competition and Oligopoly: Monopolistic competition price and output decision-equilibrium. Monopolistic Competition and economic efficiency Oligopoly and Interdependence

Learning Outcomes: The students would be able to apply tools of consumer behaviour and firm theory to business situations.

Suggested Readings:

1. Ahuja, H.L, Micro Economics, S.Chand
2. Dwivedi, D.N. Micro Economics, Vikash Publication
3. Mehta P.K, Singh M. – Micro Economics – Taxmann Publication
4. Pindyck, R.S., D. L. Rubinfeld and P. L. Mehta; *Microeconomics*, Pearson Education.
5. N. Gregory Mankiw, Principles of Micro Economics, Cengage Learning
6. Browning, E.K. and J.M. Browning; *Microeconomic Theory and Applications*, Kalyani Publishers, New Delhi.
7. Gould, J.P. and E.P. Lazear; *Microeconomic Theory*, All India Traveller Bookseller, New Delhi.
8. Lipsey, R.G. and K.A. Chrystal; *Economics*, Oxford University Press.
9. Maddala G.S. and E. Miller; *Microeconomics: Theory and Applications*, McGraw-Hill International.
10. Salvatore, D. *Schaum's Outline of Theory and Problems of Microeconomic Theory*, McGraw-Hill, International Edition.
11. Bilas, Richard A. *Microeconomic Theory: A Graphical Analysis*, McGraw-Hill Book Co. Kogakusha Co. Ltd.
12. Amit Sachdeva, *Micro Economics*, KusumLata Publishers.

B.Com. (Hons.): Semester - II

Paper BCH-2.1: English Communication

Skill Enhancement Compulsory Course for Commerce

Duration: 3hrs.

Marks: 100 (80+20)

Lectures: 65

Paper: 1

The purpose of this course is twofold: to train students in communication skills and to help develop in them a facility for communicative English.

Since language it is which binds society together and serves as a crucial medium of interaction as well as interchange of ideas and thoughts, it is important that students develop a capacity for clear and effective communication, spoken and written, at a relatively young age. The need has become even more urgent in an era of globalization and the increasing social and cultural diversity that comes with it.

English, being a global language par excellence, it is important that any course in communication is tied to an English proficiency programme. The present course will seek to create academic and social English competencies in speaking, listening, arguing, enunciation, reading, writing and interpreting, grammar and usage, vocabulary, syntax, and rhetorical patterns.

Students, at the end of the course, should be able to unlock the communicator in them by using English appropriately and with confidence for further studies or in professional spheres where English is the indispensable tool of communication.

Unit 1

[20]

Introduction

1. What is communication?

2. Types of communication

- Horizontal
- Vertical
- Interpersonal
- Grapevine

3. Uses of Communication

Prescribed Reading: Chapter 1 *Applying Communication Theory for Professional Life: A Practical Introduction* by Dainton and Zelle

<http://tsime.uz.ac.zw/claroline/backends/download.php?url=L0ludHJvX3RvX2NvbW11bmljYXRpb25fVGh1b3J5LnBkZg%3D%3D&cidReset=true&cidReq=MBA563>

Unit-2

[20]

Language of Communication

1. Verbal: spoken and written

2. Non-verbal

- Proxemics
- Kinesics
- Haptics
- Chronemics

- Paralinguistics

3. Barriers to communication

4. Communicative English

Unit-3

[20]

Reading Comprehension

- Locate and remember the most important points in the reading
- Interpret and evaluate events, ideas, and information
- Read “between the lines” to understand underlying meanings
- Connect information to what they already know

Unit 4

Writing

[20]

1. Expanding an Idea
2. Writing a Memo
3. Report Writing
4. Creative Writing
5. News Story
6. Setting in Creative Writing
7. Writing a Business Letter
8. Letters to the Editor
9. Précis Writing
10. CV & Resume Writing
11. Dialog writing
12. Covering Letter
13. Writing Formal Email
14. Elements of Story Writing
15. Note Making
16. Information Transfer
17. Interviewing for news papers

Unit-5

[20]

Language functions in listening and conversation

1. Discussion on a given topic in pairs
2. Speaking on a given topic individually
3. Group Discussion
4. Interview
5. Dialogue

(Practice to be given using speaking activities from the prescribed textbook)

Grammar and Usage

1. Simple and Compound Sentences
2. Complex Sentences
3. Noun Clause
4. Adjective Clause
5. Adverb Clause
6. The Conditionals in English
7. The Second Conditional
8. The Third Conditional
9. Words and their features
10. Phrasal Verbs
11. Collocation
12. Using Modals
13. Use of Passives
14. Use of Prepositions
15. Subject-verb Agreement
16. Sentence as a system
17. Common Errors in English Usage

Examination pattern

Each reading and writing question will invite a 200 word response.

Midterm test

[20 marks]

Unit 1 (preferably short questions on types and uses of

communication) Total

20 marks

Final Semester Examination

Unit 2

One long question with choice
Two short notes with choice

01x 10 qns= 10 marks
02x 05 qns= 10 marks

Unit 3

Reading: 04 questions
(2 prose and 2 poetry questions)

04 x 05 qns= 20 marks

Unit 4

Writing: 02 questions

02x 10 qns = 20 marks

Unit 5

Grammar & Usage

02x10 qns = 20 marks

Total

= 80 marks

Grammar questions must be set in contexts; not as isolated sentences as used for practice in the prescribed textbook.

Book Prescribed:

Vistas and Visions: An Anthology of Prose and Poetry. (Ed.) Kalyani Samantray, Himansu S.

Texts to be studied

Prose

- The Last Leaf
- Ecology and Society
- How Wealth Accumulates and Men Decay
- The Open Window

B.Com. (Hons.): Semester - II

Paper BCH-2.2: Corporate Accounting

Duration: 3 hrs.

Marks: 100(80+20)

Lectures: 65

Objectives: To help the students to acquire the conceptual knowledge of the corporate accounting and to learn the techniques of preparing the financial statements.

Contents:

Unit 1. Accounting for Share Capital & Debentures

Issue of shares, forfeiture and reissue of forfeited shares- concept & process of book building, Issue of rights and bonus shares; Buy back of shares, Redemption of preference shares. Issue and Redemption of Debentures

Unit 2 Final Accounts

Preparation of profit and loss account and balance sheet of corporate entities (excluding calculation of managerial remuneration) Disposal of company profits

Unit 3. Valuation of Goodwill and Valuation of Shares

Concepts and calculation - simple problem only

Unit 4 Amalgamation of Companies

Concepts and accounting treatment as per Accounting Standard: 14 (ICAI) (excluding intercompany holdings). Internal reconstruction: concepts and Accounting treatment excluding scheme of reconstruction

Unit 5 Liquidation of Company

Meaning of liquidation, modes of winding up, consequences of winding up, statement of affairs, liquidator's final statement of account, list 'B' contributories

Learning Outcomes: This paper can provide conceptual clarity about the techniques to prepare financial statements of companies along with accounting treatment of various situations viz. floating of shares, amalgamation and liquidation of companies.

Suggested Readings:

1. Monga, J.R. *Fundamentals of Corporate Accounting*. Mayur Paper Backs, New Delhi.
2. Tulsian, P.C, *Corporate Accounting*, S. Chand
3. Shukla, M.C., T.S. Grewal, and S.C. Gupta. *Advanced Accounts*. Vol.-II. S. Chand & Co., New Delhi.
4. Maheshwari, S.N. and S. K. Maheshwari. *Corporate Accounting*. Vikas Publishing House, New Delhi.
5. Sehgal, Ashok and Deepak Sehgal. *Corporate Accounting*. Taxman Publication, New Delhi.
6. Gupta, Nirmal. *Corporate Accounting*. Sahitya Bhawan, Agra.
7. Jain, S.P. and K.L. Narang. *Corporate Accounting*. Kalyani Publishers, New Delhi.
8. Compendium of Statements and Standards of Accounting. The Institute of Chartered Accountants of India, New Delhi.

9. Bhushan Kumar Goyal, *Fundamentals of Corporate Accounting*, International Book House

B.Com. (Hons.): Semester

- II Paper BCH-2.3:

Corporate Laws

Duration: 3 hrs.

Marks: 100 (80+20)

Lectures: 65

Objectives: *The objective of the course is to impart basic knowledge of the provisions of the Companies Act, 2013 and the Depositories Act, 1996. Case studies involving issues in corporate laws are required to be discussed.*

Contents:

UNIT I Introduction

Administration of Company Law [including National Company Law Tribunal (NCLT), National Company Law Appellate Tribunal (NCLAT), Special Courts]; Characteristics of a company; types of companies including one person company, small company, dormant company and producer company; association not for profit; formation of company, on-line filing of documents, promoters, their legal position. **(As per companies Act, 2013)**

UNIT II Documents

Memorandum of association, articles of association, GDR; book building; issue, allotment and forfeiture of share, transmission of shares, buyback and provisions regarding buyback; issue of bonus shares**(As per companies Act, 2013)**

UNIT III Management

Classification of directors, women directors, independent director, disqualifications, director identity number (DIN); appointment; Legal positions, powers and duties; removal of directors; managing director, meetings of shareholders and board; types of meeting, meeting through video conferencing, e-voting. Audit Committee, Nomination and Remuneration Committee, Stakeholders Relationship Committee, Corporate Social Responsibility Committee. **(As per companies Act, 2013)**

UNIT IV Dividends, Accounts, Audit–

Provisions relating to payment of Dividend, Provisions relating to Books of Account, Provisions relating to Audit, Auditors' Appointment, Rotation of Auditors, Auditors' Report.

Winding Up - Concept and modes of Winding Up.

Insider Trading, Whistle Blowing – Insider trading; meaning & legal provisions; Whistle blowing: Concept and Mechanism.

UNIT V Depositories Law:

The Depositories Act 1996 – Definitions; rights and obligations of depositories; participants issuers and beneficial owners; inquiry and inspections, penalty

Learning Outcomes: Students would acquire knowledge about the legal framework and the ways and means to deal with the legal aspect of different situations of corporate sector.

Suggested Readings:

1. Arora & Banshal, Corporate Law – Vikash Publication
2. Gogna, P.P.S – Company Law, S. Chand
3. MC Kuchhal *Corporate Laws*, Shri Mahaveer Book Depot. (Publishers).
4. GK Kapoor & Sanjay Dhamija, *Company Law*, Bharat Law House.
5. Reena Chadha and Sumant Chadha, *Corporate Laws*, Scholar Tech Press.
6. Gowar, LCB, *Principles of Modern company Law*, Stevens & Sons, London.
7. Ramaiya, *A Guide to Companies Act*, LexisNexis, Wadhwa and Butters worth.
8. *A Compendium of Companies Act 2013, along with Rules*, by Taxmann Publications.
9. Avtar Singh, *Introduction to company Law*, Eastern Book Company

B.Com. (Hons.): Semester - II Paper BCH-2.4: Macro Economics

Duration: 3 hrs.

Marks: 100(80+20)

Lectures: 65

Objectives: *The course aims at providing the student with knowledge of basic concepts of the macro economics. The modern tools of macro-economic analysis are discussed and the policy framework is elaborated, including the open economy.*

Contents:

Unit I

Introduction – concepts and variables of macro-economics, income, expenditure and the circular flow, components of expenditure. Static macro economic analysis short and the long run – determination of supply, determination of demand, and conditions of equilibrium

Unit II

Economy in the short run – IS–LM framework, fiscal and monetary policy, determination of aggregate demand, shifts in aggregate demand, aggregate supply in the short and long run, and aggregate demand- aggregate supply analysis.

Unit III

Inflation, causes of rising and falling inflation, inflation and interest rates, social costs of inflation. Unemployment – natural rate of unemployment, frictional and wait unemployment. The trade-off between inflation and unemployment

Unit IV

Open economy – flows of goods and capital, saving and investment in a small and a large open economy, exchange rates, Mundell – Fleming model with fixed and flexible prices in a small open economy with fixed and with flexible exchange rates, interest-rate differentials case of a large economy.

Unit V

Behavioral Foundations - Investment –determinants of business fixed investment, effect of tax, determinants of residential investment and inventory investment. Demand for Money – Portfolio and transactions theories of demand for real balances, interest and income elasticity of demand for real balances, Supply of money.

Learning Outcomes: Students would be able to apply the modern tools of macro-economic analysis so as to minimize the adverse impact of macro-economic factors on business.

Suggested Readings

1. Ahuja H.L – Macro Economics – S.Chand
2. Mankiw, N. Gregory. Principles *Macroeconomics*. Cengage Learning
3. Dornbusch, Rudiger, and Stanley. Fischer, *Macroeconomics*. McGraw-Hill.
4. Dornbusch, Rudiger., Stanley. Fischer and Richard Startz, *Macroeconomics*. Irwin/McGraw-Hill.
5. Deepashree, *Macro Economics*, Scholar Tech. New Delhi.
6. Barro, Robert, J. *Macroeconomics*, MIT Press, Cambridge MA.
7. Burda, Michael, and Wyplosz. *Macroeconomics A European Text*. Oxford University Press, Oxford.
8. Vaish – Macro Economics – Vikash Publication
9. Salvatore, Dominick. *International Economics*. John Wiley & Sons Singapore.
8. Branson, William H. *Macroeconomic Theory and Policy*. HarperCollins India Pvt. Ltd.

B.Com. (Hons.): Semester - II

Paper BCH-2.5: Computerized Accounting

Duration: 3 hrs.

Marks: 100(80+20)

Lectures: 65

Objectives: To help the students to understand accounting as an information system for the generation of accounting information and preparation of accounting reports.

Contents:

Unit I – Introduction to Computer and Accounting Information System

Introduction to Computer (Elements, Capabilities, Limitations of Computer System), Introduction to Operating software, utility software and application software, Introduction to Accounting Information System (AIS) as a part of MIS

Unit II Overview of Computerized Accounting System

Introduction: Application in Accounting; Features of Computerized Accounting System, Structure

of CAS, Software Packages: Generic, Specific; Tailored.

Unit III Accounting Application of Electronic Spreadsheet

Concept of electronic Spread-sheet, Features offered by electronic spread-sheet; Application in generating accounting information – Bank reconciliation statement; asset accounting; loan, repayment of loan schedule, ratio analysis, Data representation – graphs, charts and diagrams.

Unit IV Using Computerized Accounting System

Computerised Accounting Systems: Computerized Accounts by using any popular accounting software: Creating a Company; Configure and Features settings; Creating Accounting Ledgers and Groups; Creating Stock Items and Groups; Vouchers Entry; Generating Reports - Cash Book, Ledger Accounts, Trial Balance, Profit and Loss Account, Balance Sheet, Funds Flow Statement, Cash Flow Statement Selecting and shutting a Company; Backup and Restore data of a Company

Unit V Database Management System (DBMS)

Concept and features of DBMS; DBMS in Business Application; Generating Accounting Information – Payroll.

Learning Outcome: After reading this subject the students will be able to define a computerized accounting system; distinguish between a manual and computerized accounting system; highlight the advantages and limitations of computerized accounting system and state the sourcing of a computerized accounting system.

Suggested Readings

1. Nanda Dhameja, Financial Accounting for Managerial Competitiveness – S.Chand
2. Maheswari S.N. - Introduction to Accounting – Vikash Publication

B.Com. (Hons.): Semester - III

Paper BCH-3.1: Human Resource Management

Duration: 3 hrs.

Marks: 100(80+20)

Lectures: 65

Objective: The objective of the course is to acquaint students with the techniques and principles to manage human resource of an organization.

Contents:

Unit I:

Human Resource Management: Concept and Functions, Role, Status and competencies of HR Manager, HR Policies, Evolution of HRM. Emerging Challenges of Human Resource Management;

workforce diversity, empowerment, Downsizing; VRS; Human Resource Information System;

Unit II

Acquisition of Human Resource: Human Resource Planning- Quantitative and Qualitative dimensions; job analysis – job description and job specification; Recruitment – Concept and sources; Selection – Concept and process; test and interview; placement induction.

Unit III

Training and Development; Concept and Importance; Identifying Training and Development Needs; Designing Training Programmes; Role Specific and Competency Based Training; Evaluating Training Effectiveness; Training Process Outsourcing; Management Development; Career Development.

Unit IV

Performance appraisal; nature and objectives; Modern Techniques of performance appraisal; potential appraisal and employee counseling; job changes - transfers and promotions. Compensation: concept and policies; job evaluation; methods of wage payments and incentive plans; fringe benefits; performance linked compensation.

Unit V

Maintenance: employee health and safety; employee welfare; social security; Employer Employee relations- an overview. Grievance handling and redressal Industrial Disputes causes and settlement machinery.

Learning Outcomes: This paper can enhance the capability of the students to manage the most important assets of organization i.e. human beings which is much needed to ensure growth of that organization.

Suggested Readings:

1. Bohlander and Snell, Principles of *Human Resource Management*, Cengage Learning
2. Chhabra, T.N. *Essentials of Human Resource Management*. Sun India Publication New Delhi.
3. DeCenzo, D.A. and S.P. Robbins, "*Personnel/Human Resource Management*", Prentice Hall of India, New Delhi.
4. Khanka S.S. *Human Resource Management*. S Chand.
5. Rao V.S.P - *Human Resource Management*. Vikash Publication
6. SanghiSeema, *Human Resource Management* – Vikash Publication
7. Ivancevich, John M. *Human Resource Management*. McGraw Hill.
8. Wreather and Davis. *Human Resource Management*. Pearson Education.
9. Robert L. Mathis and John H. Jackson. *Human Resource Management*. Cengage Learning.

B.Com. (Hons.): Semester - III

Paper BCH-3.2: Income Tax Law and Practice

Duration: 3 hrs.

Marks: 100(80+20)

Lectures: 65

Objective: To provide basic knowledge and equip students with the application of principles and provisions of Income Tax Act 1961.

Contents:

Unit I

Basic concept: Income, agricultural income, person, assessee, assessment year, previous year, gross total income, total income, Maximum marginal rate of tax. Permanent Account Number (PAN), Residential status; Scope of total income on the basis of residential Status Exempted income under section 10

Unit II Computation of income under different heads

- Salaries
- Income from house property

Unit III Computation of income under different heads

- Profits and gains of business or profession
- Capital gains
- Income from other sources

Unit IV Total income and tax computation

Income of other persons included in assessee's total income- Aggregation of income and set-off and carry forward of losses Deductions from gross total income, Rebates and reliefs

- Computation of total income of individuals and firms
- Tax liability of an individual and firm
- Five leading cases of Supreme Court

Unit V Preparation of return of income:

- Manually On-line filing of Returns of Income & TDS.
- Provision & Procedures of Compulsory On-Line filing of returns for specified assesses.

Learning Outcomes: This paper would provide the understanding of various provisions of Income Tax Act as well as equip the students to make practical applications of the provisions for taxation purpose.

Suggested readings:

1. Singhania, Vinod K. and Monica Singhania. *Students' Guide to Income Tax, University Edition*. Taxmann Publications Pvt. Ltd., New Delhi.
2. Ahuja, Girish and Ravi Gupta. *Systematic Approach to Income Tax*. Bharat Law House, Delhi.
3. Pagare, Dinkar. *Law and Practice of Income Tax*. Sultan Chand and Sons, New Delhi.
4. Lal, B.B. *Income Tax Law and Practice*. Konark Publications, New Delhi.

Journals

1. *Income Tax Reports*. Company Law Institute of India Pvt. Ltd., Chennai.
2. *Taxman*. Taxman Allied Services Pvt. Ltd., New Delhi.
3. *Current Tax Reporter*. Current Tax Reporter, Jodhpur.

Software

1. Dr. Vinod Kumar Singhania, *e-filing of Income Tax Returns and Computation of Tax*, Taxmann Publication Pvt. Ltd, New Delhi. Latest version
2. Excel Utility available at incometaxindiaefiling.gov.in

B.Com. (Hons.): Semester - III

Paper BCH-3.3: Management Principles & Applications

Duration: 3 hrs.

Marks: 100(80+20)

Lectures: 65

Objective: The objective of the course is to provide the student with an understanding of basic management concepts, principles and practices.

Unit 1: Introduction

Concept: Need for Study, Managerial Functions – An overview; Co-ordination: Essence of Managership, Evolution of the Management Thought, Classical Approach – Taylor, Fayol, Neo-Classical and Human Relations Approaches – Mayo, Hawthorne Experiments, Behavioural Approach, Systems Approach, Contingency Approach – Lawrence & Lorsch, MBO - Peter F. Drucker

Unit 2: Planning

- a. Types of Plan – An overview to highlight the differences b. Strategic planning – Concept, process, Importance and limitations c. Environmental Analysis and diagnosis (Internal and external environment) –Definition, Importance and Techniques (SWOT/TOWS/WOTS- UP, BCG Matrix, Competitor Analysis), Business environment; Concept and Components d. Decision-making – concept, importance

Unit 3: Organising

Concept and process of organising – An overview, Span of management, Different types of authority (line, staff and functional), Decentralisation, Delegation of authority Formal and Informal Structure; Principles of Organising; Network Organisation Structure

Unit 4: Staffing and Leading

a. *Staffing*: Concept of staffing, staffing process b. *Motivation*: Concept, Importance, extrinsic and intrinsic motivation; Major Motivation theories - Maslow's Need-Hierarchy Theory; Herzberg's Two-factor Theory, Vroom's Expectation Theory. c. *Leadership*: Concept, Importance, Major theories of Leadership (Likert's scale theory, Blake and Mouten's Managerial Grid theory) d. *Communication*: Concept, purpose, process; Oral and written communication; Formal and informal communication networks, Barriers to communication, Overcoming barriers to communication.

Unit 5: Control

a. *Control*: Concept, Process, Limitations, Principles of Effective Control, Major Techniques of control - Ratio Analysis, ROI, Budgetary Control, EVA, PERT/CPM.
b. Emerging issues in Management

Learning Outcomes: Students would be able to make use of different management principles in the course of decision making in different forms of business organizations.

Suggested Readings:

1. Chandan J.S – *Management Concepts of Strategy* – Vikash Publication
2. Pillai RSN – *Principles & Practice of Management* – S. Chand
3. Harold Koontz and Heinz Weihrich, *Essentials of Management: An International and Leadership Perspective*, McGraw Hill Education.
4. Stephen P Robbins and Madhushree Nanda Agrawal, *Fundamentals of Management: Essential Concepts and Applications*, Pearson Education.
5. George Terry, *Principles of Management*, Richard D. Irwin
6. Newman, Summer, and Gilbert, *Management*, PHI
7. James H. Donnelly, *Fundamentals of Management*, Pearson Education.
8. B.P. Singh and A.K.Singh, *Essentials of Management*, Excel Books
9. Griffin, *Management Principles and Application*, Cengage Learning
10. Robert Kreitner, *Management Theory and Application*, Cengage Learning
11. TN Chhabra, *Management Concepts and Practice*, DhanpatRai & Co. (Pvt. Ltd.), New Delhi
12. Peter F Drucker, *Practice of Management*, Mercury Books, London
13. Gupta R.N - *Principles & Practice of Management* – S. Chand

**B.Com. (Hons.): Semester
- III Paper 3.4: Business
Statistics**

Duration: 3 hrs.

Marks: 100 (80+20)

Lectures: 65

Objective: *The objective of this course is to familiarize students with the basic statistical tools used for managerial decision-making.*

Contents:

Unit 1 Statistical Data and Descriptive Statistics

Nature and Classification of data: univariate, bivariate and multivariate data; time-series and cross-sectional data

Measures of Central Tendency

a) Mathematical averages including arithmetic mean, geometric mean and harmonic mean.

Properties and applications.

b) Positional Averages

Mode and Median (and other partition values including quartiles, deciles, and percentiles)

(including graphic determination)

Unit 2

Measures of Variation: absolute and relative. Range, quartile deviation, mean deviation, standard deviation, and their coefficients, Properties of standard deviation/variance Skewness: Meaning, Measurement using Karl Pearson and Bowley's measures; Concept of Kurtosis

Probability and Probability Distributions

Theory of Probability: Approaches to the calculation of probability, Calculation of event probabilities. Addition and multiplication laws of probability (Proof not required) Conditional probability and Bayes' Theorem (Proof not required)

Unit 3 Simple Correlation and Regression Analysis

Correlation Analysis: Meaning of Correlation: simple, multiple and partial; linear and non-linear, Correlation and Causation, Scatter diagram, Pearson's co-efficient of correlation; calculation and properties (proofs not required). Correlation and Probable error; Rank Correlation

Regression Analysis: Principle of least squares and regression lines, Regression equations and estimation; Properties of regression coefficients; Relationship between Correlation and Regression coefficients; Standard Error of Estimate

Unit 4 Index Numbers

Meaning and uses of index numbers: Construction of index numbers: fixed and chain base: univariate and composite. Aggregative and average of relatives – simple and weighted

Tests of adequacy of index numbers, Base shifting, splicing and deflating. Problems in the construction of index numbers

Construction of consumer price indices, important share price indices

Unit 5 Time Series Analysis

Components of time series, Additive and multiplicative models Trend analysis, Fitting of trend line using principle of least squares – linear, second degree parabola and exponential. Conversion of annual linear trend equation to quarterly/monthly basis and vice-versa; Moving averages Seasonal variations- Calculation of Seasonal Indices using Simple averages, Ratio-to-trend, and Ratio-to-moving averages methods. Uses of Seasonal Indices

Learning Outcomes: Students would be armed with the knowledge of using different statistical tools very much required in the decision making process in any business as well as business research.

Suggested Readings:

1. Sharma J K, Fundamentals of Business Statistics – Vikash Publication
2. Levin, Richard, David S. Rubin, Rastogi, and Siddiqui. *Statistics for Management*. 7th Edition. Pearson Education.
3. Berenson and Levine. *Basic Business Statistics: Concepts and Applications*. Pearson Education.
4. Siegel Andrew F. *Practical Business Statistics*. McGraw Hill.
5. Hazarika P. Business Statistics – S. Chand
6. Vohra N. D., *Business Statistics*, McGraw Hill.
7. Spiegel M.D. *Theory and Problems of Statistics*. Schaum's Outlines Series. McGraw Hill Publishing Co.
8. Gupta, S.P., and Archana Gupta. *Statistical Methods*. Sultan Chand and Sons, New Delhi.
9. Gupta, S.C. *Fundamentals of Statistics*. Himalaya Publishing House.
10. Arora – Business Statistics – S.Chand

B.Com. (Hons.): Semester - III Paper 3.5: E- Commerce

Duration: 3 hrs.

Marks: 100 (80+20)

Lectures: 65

Objectives: To enable the student to become familiar with the mechanism for conducting business transactions through electronic means.

Contents

Unit-1

Unit I: Introduction: Meaning, nature, concepts, advantages and reasons for transacting online, categories of E-Commerce, Supply Chain Management, Customer Relations Management

Unit 2:

Planning Online-Business: Nature and dynamics of the internet, pure online vs. brick and click business; assessing requirement for an online business designing, developing and deploying the system, one to one enterprise.

Unit 3 Technology for Online-Business:

Internet, IT Infrastructure, Middle ware contents: Text and Integrating E-business applications.

Unit 4: Mechanism of making payment through internet:

Online-payment mechanism; Electronic Payment systems; payment Gateways; Visitors to website; tools for promoting websites; Plastic Money: Debit Card, Credit Card;

Unit 5: Applications in E-Commerce:

E-commerce applications in manufacturing, Wholesale, retail and service sector.

Security and Legal Aspects of E-Commerce:

Threats in E-Commerce, Security of Clients and Service-Provider; Cyber Law - Information Technology Act 2000: An overview of major provisions

Learning Outcomes: This paper would enhance the technical skills of the students to get into the business ventures using electronic means thereby providing the opportunity to gain access to a larger customer base.

Suggested Readings:

1. Pandey U.S – E.Commerce& Mobile Commerce Technology – S. Chand

B.Com. (Hons.): Semester – IV

Paper BCH- 4.1: COST AND MANAGEMENT ACCOUNTING

Duration: 3 hrs.

Marks: 100 (80 + 20)

Lectures: 65

Objective: To acquaint the students with basic concepts used in cost accounting, various methods involved in cost ascertainment.

CONTENTS:

Unit 1: Introduction

Meaning, objectives and advantages of cost accounting; Difference between cost accounting and financial accounting; Cost concepts and classifications; Elements of cost

Materials: Material/inventory control- concept and techniques, Accounting and control of purchases, storage and issue of materials. Methods of pricing of materials issues – FIFO, LIFO and Average

Unit 2: Labour and Overhead

Labour: Accounting and Control of labour cost. Time keeping and time booking. Concept and treatment of idle time, over time, labour turnover and fringe benefits. Methods of wage payment and the Incentive schemes- Halsey, Rowan, Taylor's Differential piece wage.

Overhead: Classification, allocation, apportionment and absorption of overhead. Under- and over-absorption

Unit 3: Methods of Costing

Methods of Costing: Unit costing, Job costing, Contract Costing, Process costing (excluding process losses, valuation of work in progress, joint and by-products)

Unit 4: Budgeting and Standard Costing

Budgeting and budgetary control: Concept of budget and budgetary control, objectives, merits, and limitations, Budget administration, Functional budgets, Fixed and flexible budgets, Zero base budget

Standard costing and variance analysis: Meaning of standard cost and standard costing: advantages, limitations and applications, Variance analysis – material, labour and overhead

Unit 5: Marginal Costing

Absorption versus variable costing: Distinctive features and income determination. Cost-Volume-Profit Analysis: Break-even analysis-algebraic and graphic methods. Contribution, Margin of safety and Angle of incidence

Learning Outcome: After the completion of this paper, the students will be able to have confidence in managing cost issues and also to keep a check on cost control and taking managerial decisions.

Suggested Reading:

1. Horngreen, Charles T., George Foster and Srikant M. Dattar. *Cost Accounting: A Managerial Emphasis*. Prentice Hall of India Ltd., New Delhi.
2. Horngreen, Charles T., Gary L. Sundem. *Introduction to Management Accounting*. Prentice Hall.
3. Jain, S.P. and K.L. Narang. *Cost Accounting: Principles and Methods*. Kalyani Publishers, Jalandhar.
4. Lal, Jawahar. *Cost Accounting*. Tata McGraw Hill Publishing Co., New Delhi.
5. Nigam, B.M. Lall and I.C. Jain. *Cost Accounting: Principles and Practice*. Prentice Hall of India, New Delhi.
6. Arora, M.N. *Cost Accounting – Principles and Practice*. Vikas Publishing House, New Delhi.
7. Maheshwari, S.N. and S.N. Mittal. *Cost Accounting: Theory and Problems*. Shri Mahabir Book Depot, New Delhi.
8. Singh, S. K. and Gupta Lovleen. *Management Accounting – Theory and Practice*. Pinnacle Publishing House.
9. Ustry, Milton E. and Lawrence H. Hammer. *Cost Accounting: Planning and Control*. South Western Publishing Co.

10. Barfield, Jesset T., Cecily A. Raibarn and Michael R. Kinney. *Cost Accounting: Traditions and Innovations*. Thomson Learning.

11. Lucey, T. Costing. ELST, London.
12. Garrison H., Ray and Eric W. Noreen. *Managerial Accounting*. McGraw Hill.
13. Drury, Colin. *Management and Cost Accounting*. Cengage Learning.
14. Lal, Jawahar. *Advanced Management Accounting Text and Cases*. S. Chand & Co., New Delhi.
15. Khan, M.Y. and P.K. Jain. *Management Accounting*. Tata McGraw Hill, Publishing Co., New Delhi.
16. Hansen, *Managerial Accounting*, Cengage Learning

B.Com. (Hons.): Semester - IV

Paper BCH-4.2: BUSINESS MATHEMATICS

Duration: 3 hrs.

Marks: 100 (80 + 20)

(Lectures: 65)

Objective: The objective of this course is to familiarize the students with the basic mathematical tools with emphasis on applications to business and economic situations.

Contents:

Unit 1. Matrices and Determinant

Algebra of matrices, Inverse of a matrix, Matrix Operation – Business Application Solution of system of linear equations (having unique solution and involving not more than three variables) using matrix inversion Method and Cremer's Rule.

Unit 2. Calculus I

Mathematical functions and their types- linear, quadratic, polynomial, exponential, logarithmic and logistic function. Concepts of limit, and continuity of a function, Concept and rules of differentiation, Maxima and Minima involving second order

Unit 3. Calculus II

Integration: Standard forms, Methods of integration – by substitution, by parts and by use of partial fractions, definite integration, finding areas in simple cases

Unit 4. Mathematics of Finance

Compounding and discounting of a sum using different types of rates. Types of annuities, like ordinary, due, deferred, continuous, perpetual, and their future and present values using different types of rates of interest, Depreciation of Assets. (*General annuities to be excluded*)

Unit 5. Linear Programming

Formulation of linear programming problems (LPP): Graphical solution to LPPs. Cases of unique and multiple optimal solutions, Unbounded solutions and infeasibility, and redundant constraints, Solution to LPPs using Simplex method – maximization and minimization cases.

Learning Outcome: After reading this subject the students will be able to understand basic concepts in the areas of business calculus and financial mathematics and to connect acquired knowledge with practical problems in economic practice.

Suggested Readings:

1. Arora P.N. Business Mathematics – S.Chand
2. Anthony, M. and N. Biggs. *Mathematics for Economics and Finance*. Cambridge University Press.
3. Arora S.R & Gupta K. – Business Mathematics – Taxmann Publication
4. Ayres, Frank Jr. *Theory and Problems of Mathematics of Finance*. Schaum's Outlines Series. McGraw Hill Publishing Co.
5. Budnick, P. *Applied Mathematics*. McGraw Hill Publishing Co.
6. Dowling, E.T. *Mathematics for Economics*, Schaum's Outlines Series. McGraw Hill Publishing Co.
7. Mizrahi and John Sullivan. *Mathematics for Business and Social Sciences*. Wiley and Sons.
8. Zamirudeen & Bhambri – Business Statistics – Vikash Publication
9. Wikes, F.M. *Mathematics for Business, Finance and Economics*. Thomson Learning.
10. Prasad, Bindra and P.K. Mittal. *Fundamentals of Business Mathematics*. Har-Anand Publications.
11. Thukral, J.K. *Mathematics for Business Studies*. Mayur Publications.
12. Vohra, N.D. *Quantitative Techniques in Management*. Tata McGraw Hill Publishing Company.
13. Soni, R.S. *Business Mathematics*. Pitambar Publishing House.
14. Singh J. K. *Business Mathematics*. Himalaya Publishing House
15. Hazarika P. Business Mathematics – S.Chand

B.Com. (Hons.): Semester - IV

Paper – BCH 4.3: COMPUTER APPLICATIONS IN BUSINESS

**Duration: 3 hrs.
65)**

Marks: 100(80+20)

(Lectures:

Objectives: To provide computer skills and knowledge for commerce students and to enhance the student understands of usefulness of information technology tools for business operations.

Contents:

Unit 1. Word Processing

Introduction to word Processing, Word processing concepts, Use of Templates, Working with word document: (Opening an existing document/creating a new document, Saving, Selecting text, Editing text, Finding and replacing text, Closing, Formatting, Checking and correcting spellings)Bullets and numbering, Tabs, Paragraph Formatting, Indent, Page Formatting, Header and footer, Mail Merge including linking with Access Database, Tables: Formatting the table, Inserting filling and formatting a table Creating Documents in the areas: Mail Merge including linking with Access Database, Handling Tables, Inserting Pictures and Video

Unit 2. Preparing Presentations:

Basics of presentations: Slides, Fonts, Drawing, Editing; Inserting: Tables, Images, texts, Symbols, Media; Design; Transition; Animation; and Slideshow

Unit 3. Spreadsheet and its Business Applications

Spreadsheet concepts, Creating a work book, Saving a work book, Editing a workbook, Inserting, deleting work sheets, Entering data in a cell, Formula Copying, Moving data from selected cells, Handling operators in formula, Rearranging Worksheet, Project involving multiple spreadsheets, Organizing Charts and graphs, Printing worksheet, Generally used Spread sheet functions: Mathematical, Statistical, Financial, Logical, Date and Time, Lookup and reference, Text functions.

Unit 4. Creating spreadsheet in the following areas:

Loan & Lease statement ;Ratio Analysis ;Payroll statements ;Capital Budgeting ;Depreciation Accounting; Graphical representation of data; Frequency distribution and its statistical parameters Correlation and Regression

Unit 5. Database Management System

Creating Data Tables, Editing a Database using Forms, Performing queries, Generating Reports Creating DBMS in the areas of Accounting, Employees, Suppliers and Customer

Learning Outcome: The completion of this paper will enhance students' computer abilities and skills to compete with the present technology driven business market.

NOTE:

- There shall be a practical examination of 100 Marks (Practical-80 Marks, Viva-10 Marks and Work Book- 10 Marks) and duration of Examination shall be 3 Hrs.
- Teaching arrangement need to be made in the computer Lab
- There shall be four lectures per class and 4 Practical Lab periods per batch to be thought in computer Lab.

Suggested Readings:

1. Saxena& Chopra – Computer Application in Management – Vikash Publication
2. Nagpal – Computer Fundamental – S.Chand

B.Com. (Hons.): Semester - IV

Paper BCH 4.4: INDIAN ECONOMY – PERFORMANCE AND POLICIES

Duration: 3 hrs.

Marks: 100(80+20)

Lectures: 65

Objective: This course seeks to enable the student to grasp the major economic problems in India and their solution.

Contents:

Unit 1: Basic Issues in Economic Development:

Concept and Measure of Development and Underdevelopment; Human Development

Unit 2: Basic Features of the Indian Economy at Independence:

Composition of national income and occupational structure, the agrarian scene and industrial structure

Unit 3: Policy Regimes:

- a) The evolution of planning and import substituting industrialization, (b) Economic reform and liberalization

Unit 4: Growth, Development and Structural Change:

- a) The experience of Growth, Development and Structural Change in different phases of growth and policy regimes across sectors and regions.
- b) The Institutional Framework: Patterns of assets ownership in agriculture and industry; Policies for restructuring agrarian relations and for regulating concentration of economic power;
- c) Changes in policy perspectives on the role of institutional framework after 1991.
- d) Growth and Distribution; Unemployment and Poverty; Human Development; Environmental concerns.
- e) Demographic Constraints: Interaction between population change and economic development.

Unit 5: Sectoral Trends and Issues:

- a) Agriculture: Agrarian growth and performance in different phases of policy regimes i.e. pre green revolution and the two phases of green revolution; Factors influencing productivity and growth; the role of technology and institutions; price policy, the public distribution system and food security.
- b) Industry and Services: Phases of Industrializations – the rate and pattern of industrial growth across alternative policy regimes; Public sector – its role, performance and reforms; The small scale sector; Role of Foreign capital.
- c) The Financial Sector: Structure, Performance and Reforms. Foreign Trade and balance of Payments: Structural Changes and Performance of India's Foreign Trade and Balance of Payments; Trade Policy Debate; Export policies and performance; Macro Economic Stabilization and Structural Adjustment; India and the WTO.

Learning Outcome: After the completion of this paper, the student will able to identify the key performance indicators and policies of the present economic environment of the country.

Readings:

1. Gaurav Dutt and KPM Sundarum, *Indian Economy*, S. Chand & Company.
2. Gopalji, Suman & Anisha Bakhri – *Indian Economy*, Vikash Publication
3. Mishra and Puri, *Indian Economics*, Himalaya Publishing House
4. Deepashree, "*Indian Economy, Performance and Polices*", Scholar Tech. New Delhi
5. Bettelheim. Charles *India Independent*. Chapters 1, 2 and 3.
6. Bhagwati, J. and Desai, P. *India: Planning for industrialization*, OUP, Ch 2.
7. Patnaik, Prabhat. *Some Indian Debates on Planning*. T. J. Byres (ed.). *The Indian Economy: Major Debates since Independence*, OUP.
8. Ahluwalia, MontekS. *State-level Performance under Economic Reforms in India* in A. O. Krueger. (ed.). *Economic Policy Reforms and the Indian Economy*, The University of Chicago Press.

9. Nagaraj, R. *Indian Economy since 1980: Vitrious Growth or Polarisation?* Economic and Political Weekly. pp. 2831-39.
10. Ray, S. K. *Land Systems and its Reforms In India. Sections II & III*, Indian Journal of Agricultural Economics. Vol. 51. Nos. 1 & 2.
11. Visaria, Pravin. *Demographic Aspects of Development: The Indian Experience*. Indian Journal of Social Sciences. Vol. 6. No. 3.
12. Dreze, Jean and Amartya Sen. *Economic Development and Social Opportunity*. Ch. 2. OUP.
13. Vaidyanathan, A. *India's Agricultural Development Policy*. Economic and Political Weekly.
14. Sawant, S. D. and C. V. Achuthan. *Agricultural Growth across Crops and Regions: Emerging Trends and Patterns*. Economic and Political Weekly. Vol. 30 A2-A13.
15. Krishnaji, N. *Agricultural Price Policy: A Survey with Reference to Indian Foodgrain Economy*. Economic and Political Weekly. Vol. 25. No. 26.
16. Chaudhuri, Sudip. *Debates on Industrialisation*. in T.J. Byres (ed.). *The Indian Economy: Major Debates since Independence*, OUP.
17. Chandra, Nirmal K. *Growth of Foreign Capital and its Importance in Indian Manufacturing*. Economic and Political Weekly. Vol. 26. No. 11.
18. Khanna, Sushil. *Financial Reforms and Industrial Sector in India*. Economic and Political Weekly. Vol. 34. No. 45.
19. Vaidyanathan, A. *Poverty and Development Policy*. Economic and Political Weekly.
20. Deaton, A and Jean Dreze. *Poverty and Inequality in India*. Economic and Political Weekly.
21. Planning Commission, *Task Force on Employment Opportunities*. Ch 1 and 2
22. Uma Kapila (ed), "*Indian Economy since Independence*", Relevant articles.
23. Rangarajan, C. and N. Jadhav. *Issues in Financial Sector Reform*. BimalJalan. (ed). *The Indian Economy*. Oxford University Press, New Delhi.
24. Chakravarty, Sukhamoy. *Development Planning – The Indian Experience*. Oxford University Press, Delhi.

B.Com. (Hons.): Semester - IV

Paper BCH 4.5: Entrepreneurship

Duration: 3 hrs.

Marks: 100 (80+20)

Lectures: 65

Objective: The purpose of the paper is to orient the learner toward entrepreneurship as a career option and creative thinking and behavior for effectiveness at work and in life.

Contents:

Unit 1

Meaning, elements, determinants and importance of entrepreneurship and creative behavior
 Entrepreneurship and creative response to the society' problems and at work, Dimensions of entrepreneurship: intra-preneurship, techno-preneurship, cultural entrepreneurship, international entrepreneurship, net-preneurship, eco-preneurship, and social entrepreneurship.

Unit 2

Entrepreneurship and Micro, Small and Medium Enterprises:

Concept of business groups and role of business houses and family business in India, The contemporary role models in Indian business: their values, business philosophy and behavioral orientations. Conflict in family business and its resolution

Unit 3

Public and private system of stimulation, support and sustainability of entrepreneurship, Requirement, availability and access to finance, marketing assistance, technology, and industrial accommodation, Role of industries/entrepreneur's associations and self-help groups. The concept, role and functions of business incubators, angel investors, venture capital and private equity fund.

Unit 4

Sources of business ideas and tests of feasibility:

Significance of writing the business plan/ project proposal, Contents of business plan/ project proposal. Designing business processes, location, layout, operation, planning & control; preparation of project report (various aspects of the project report such as size of investment, nature of product, market potential may be covered). Project submission/ presentation and appraisal thereof by external agencies, such as financial/non-financial institutions

Unit 5

Mobilizing resources for start-up, Accommodation and utilities, Preliminary contracts with the vendors, suppliers, bankers, principal customers; Contract management: Basic start-up problems.

Learning outcome: After the completion of this paper, student will have the entrepreneurial temper with conceptual input and practical insight as how to be an entrepreneur.

Suggested Readings:

1. SS Khanka, Entrepreneurial Development, S. Chand & Co, Delhi.
2. Kuratko and Rao, *Entrepreneurship: A South Asian Perspective*, Cengage Learning.
3. Rao, V.S.P – Business Entrepreneurship & Management – Vikash Publication
4. Desai, Vasant. *Dynamics of Entrepreneurial Development and Management*. Mumbai, Himalaya Publishing House.
5. Dollinger, Mare J. *Entrepreneurship: Strategies and Resources*. Illinois, Irwin.
6. Holt, David H. *Entrepreneurship: New Venture Creation*. Prentice-Hall of India, New Delhi.
7. Jain, Arun Kumar. *Competitive Excellence: Critical Success Factors*. New Delhi: Viva Books Limited. ISBN-81-7649-272-8.
6. Panda, ShibaCharan. *Entrepreneurship Development*. New Delhi, Anmol Publications. (Latest Editions)
7. Plsek, Paul E. *Creativity, Innovation and Quality*. (Eastern Economic Edition), New Delhi: Prentice-Hall of India. ISBN-81-203-1690-8.
8. SIDBI Reports on Small Scale Industries Sector.
9. Singh, Nagendra P. *Emerging Trends in Entrepreneurship Development*. New Delhi: ASEED.

B.Com. (Hons.): Semester - IV

Paper BCH 4.6: Personal Selling and Salesmanship (Optional-II)

Duration: 3 hrs.

Marks: 100 (80+20)

Lectures: 65

Objective: The purpose of this course is to familiarize the students with the fundamentals of personal selling and the selling process. They will be able to understand selling as a career and what it takes to be a successful salesman

Unit 1:

Introduction to Personal Selling: Nature and importance of personal selling, myths of selling, Difference between Personal Selling, Salesmanship and Sales Management, Characteristics of a good salesman, types of selling situations, types of salespersons, Career opportunities in selling, Measures for making selling an attractive career.

Unit- II

Buying Motives: Concept of motivation, Maslow's theory of need hierarchy; Dynamic nature of motivation; Buying motives and their uses in personal selling

Unit- III

Selling Process: Prospecting and qualifying; Pre-approach; Approach; Presentation

Unit- IV

and demonstration; handling of objections; Closing the sale; Post sales activities.

Sales Reports: reports and documents; sales manual, Order Book, Cash Memo; Tour Diary, Daily and Periodical Reports; Ethical aspects of Selling.

Unit V

Advertising: Meaning, Importance and Features, Modes of advertisements and their respective merits and demerits.

Learning outcome: After the completion of this paper, the students will able to identify an understand the psychology of selling and different factors that shape the buying behaviour of customers.

Suggested Readings:

1. Davar R.S – Salesmanship and Publicity – Vikash Publication
2. Sahu P.K & Rout K.C – Salesmanship & Sales Management – S.Chand
3. *Spiro, Stanton, and Rich, Management of the Sales force*, McGraw Hill.
4. Rusell, F. A. Beach and Richard H. Buskirk, *Selling: Principles and Practices*, McGraw Hill
5. Futrell, Charles, *Sales Management: Behaviour, Practices and Cases*, The Dryden Press.
6. Still, Richard R., Edward W. Cundiff and Norman A. P. Govoni, *Sales Management: Decision*
7. *Strategies and Cases*, Prentice Hall of India Ltd., New Delhi,
8. Johnson, Kurtz and Schueing, *Sales Management*, McGraw Hill
9. KapoorNeeru, *Advertising and personal Selling*, Pinnacle, New Delhi.

B.Com. (Hons.): Semester – V

Paper BCH 5.1: PRINCIPLES OF MARKETING

Duration: 3 hrs.

Marks: 100(80+20)

Lectures: 65

Objective: *The objective of this course is to provide basic knowledge of concepts, principles, tools and techniques of marketing.*

Contents:

Unit-1

Introduction: Nature, scope and importance marketing; Evolution of marketing concepts; Marketing mix, Marketing environment.

Consumer Behavior – An Overview: Consumer buying process; Factors influencing consumer buying decisions.

Unit-2

Market Selection: Market segmentation – concept, importance and bases; Target market selection; Positioning concept, importance and bases; Product differentiation vs. market segmentation;

Product: Meaning and importance. Product classifications; Concept of product mix; Branding, packaging and labeling; Product-Support; Product life-cycle; New Product Development

Unit-3

Pricing: Significance, Factors affecting price of a product; Pricing Policies and strategies;

Promotion: Nature and importance of promotion; Communication process; Types of promotion: advertising, personal selling, public relations & sales promotion, and their distinctive characteristics; Promotion mix and factors affecting promotion mix decisions.

Unit-4

Distribution: Channels of distribution - meaning and importance; Types of distribution channels; Wholesaling and retailing; Factors affecting choice of distribution channel; Physical Distribution.

Retailing: Types of retailing – store based and non-store based retailing, chain stores, specialty stores, supermarkets, retail vending machines, mail order houses, retail cooperatives; Management of retailing operations: an overview; Retailing in India: changing scenario.

Unit-5

Rural marketing: Growing Importance; Distinguishing characteristics of rural markets; Understanding rural consumers and rural markets; Marketing mix planning for rural markets.

Recent developments in marketing: Social marketing, on line marketing, direct marketing, services marketing, green marketing,

Learning outcome: After the completion of this paper, the students will be able to identify marketing components and fit them in the value chain along with the various marketing strategies.

Suggested Readings:

1. Kotler, Philip, Gary Armstrong, Prafulla Agnihotri and Ahsan UIHaque. *Principles of Marketing*. 13th edition. Pearson Education.
2. Mahajan & Mahajan – Principles of Marketing – Vikash Publication.
3. Michael, J. Etzel, Bruce J. Walker, William J. Stanton and Ajay Pandit. *Marketing Concepts and Cases*. (Special Indian Edition).
4. Rudani R.B – *Basics of Marketing Management* – S. Chand
5. McCarthy, E. Jerome., and William D. Perreault. *Basic Marketing*. Richard D. Irwin.
6. Lamb, Charles W., Joseph F. Hair, Dheeraj Sharma and Carl McDaniel. *Marketing: A South Asian Perspective*. Cengage Learning.
7. Pride, William M., and D.C. Ferrell. *Marketing: Planning, Implementation & Control*. Cengage Learning.
8. Majaro, Simon. *The Essence of Marketing*. Prentice Hall, New Delhi.
9. Zikmund William G. and Michael D'Amico. *Marketing; Creating and Keeping Customers in an E-Commerce World*. Thomson Learning.
10. Chhabra, T.N., and S. K. Grover. *Marketing Management*. Fourth Edition. Dhanpat Rai & Company.
11. The Consumer Protection Act 1986.
12. Iacobucci and Kapoor, *Marketing Management: A South Asian Perspective*. Cengage Learning.
13. Arun Kumar – Marketing management – Vikash Publication

B.Com. (Hons.): Semester – V

Paper BCH 5.2: FUNDAMENTALS OF FINANCIAL MANAGEMENT

Duration: 3 hrs.

Marks: 100(80+20)

Lectures: 65

Objective: To familiarize the students with the principles and practices of financial management.

Contents:

Unit-1

Introduction to Financial Management: Scope and objective, Time value of money, Risk and return, Valuation of securities – Bonds and Equities

Unit-2

Long Term Investment Decisions: The Capital Budgeting Process, Cash flow Estimation, Payback Period Method, Accounting Rate of Return, Net Present Value (NPV), Net Terminal Value, Internal Rate of Return (IRR), Profitability Index

Unit-3

Financing Decisions: Sources of long-term financing, Estimation of components of cost of capital. Methods for Calculating cost of equity capital, Cost of Retained Earnings, Cost of Debt and Cost of

Preference Capital, Weighted Average cost of capital (WACC) and Marginal cost of capital. Capital structure –Theories of Capital Structure (Net Income, Net Operating Income, MM Hypothesis, Traditional Approach). Operating and financial leverage, Determinants of capital

structure

Unit-4

Dividend Decisions: Theories for Relevance and irrelevance of dividend decision for corporate valuation. Cash and stock dividends, Dividend policies in practice

Unit-5

Working Capital Decisions: Concepts of working capital, the risk-return trade off, sources of short-term finance, working capital estimation, cash management, receivables management, Inventory management and payables management

Learning Outcome: After the completion of this paper, students will be able to understand finance in a better way along with giving them insight to practical management of long and short finance for real business houses.

Suggested Readings

1. Bhalla V.K – Financial Management – S.Chand
2. Horne, J.C. Van and Wackowich. *Fundamentals of Financial Management*. 9thed. New Delhi Prentice Hall of India.
3. Johnson, R.W. *Financial Management*. Boston Allyn and Bacon.
4. Joy, O.M. *Introduction to Financial Management*. Homewood: Irwin.
5. Khan and Jain. *Financial Management text and problems*. 2nd ed. Tata McGraw Hill New Delhi.
6. Pandey, I.M. *Financial Management*. Vikas Publications.
7. Chandra, P. *Financial Management- Theory and Practice*. (Tata McGraw Hill).
8. Rustagi, R.P. *Fundamentals of Financial Management*. Taxmann Publication Pvt. Ltd.
8. Singh, J.K. *Financial Management- text and Problems*. 2nd Ed. DhanpatRai and Company, Delhi.
9. Singh, Surender and Kaur, Rajeev. *Fundamentals of Financial Management*. Book Bank International.
10. Brigham and Houston, *Fundamentals of Financial Management*, 13th Ed., Cengage Learning

B.Com. (Hons.): Semester – V

Paper BCH-DSE 5.3(A): Financial Markets, Institutions and Services

Duration: 3 hrs.

Marks: 100(80+20)

Lectures:

65

Objective: To provide the student a basic knowledge of financial markets and institutions and to familiarize them with major financial services in India.

Contents

Unit-1

An Introduction to Financial System, its Components – financial markets and institutions, financial intermediation, Flow of funds matrix, financial system and economic development, an overview of Indian financial system

Unit-2

Financial Markets: Money market – functions, organization and instruments. Role of central bank in money market; Indian money market – An overview

Capital Markets – functions, organization and instruments. Indian debt market; Indian equity market – primary and secondary markets; Role of stock exchanges in India

Unit-3

Financial Institutions: Commercial banking – introduction, its role in project finance and working capital finance, Development Financial institutions (DFIs) – An overview and role in Indian economy, Life and non-life insurance companies in India; Mutual Funds – Introduction and their role in capital market development. Non-banking financial companies (NBFCs)

Unit-4

Overview of financial services industry: Merchant banking – pre and post issue management, underwriting. Regulatory framework relating to merchant banking in India

Unit-5

Leasing and Hire–purchase: Consumer and housing finance; Venture capital; Factoring services, bank guarantees and letter of credit; Credit rating; Counseling.

Learning Outcome: After the completion of this paper, the student will acquire financial literacy skill particularly by giving information about the financial system, markets, services and regulatory bodies in India.

Suggested Readings:

1. Bhole, L.M. *Financial Markets and Institutions*. Tata McGraw-Hill Publishing Company.
2. Pandian P. – *Financial Service and Markets*. Vikas Publishing House.
3. Dhanekar. *Pricing of Securities*. New Delhi: Bharat Publishing House.
4. Nibasaiya Sapna – *Indian Financial System* – S.Chand
5. Prasanna, Chandra. *Financial Management: Theory and Practice*. Tata McGraw Hill \ Publishing Company Ltd., New Delhi.
6. Simha, S.L.N. *Development Banking in India*. Madras: Institute of Financial Management and Research
7. Khan and Jain. *Financial Services*. 2nd ed. Tata McGraw Hill
8. Singh, J.K. *Venture Capital Financing in India*. Dhanpat Rai and Company, New Delhi.
9. Annual Reports of Major Financial Institutions in India

B.Com. (Hons.): Semester – V

Paper BCH-DSE 5.3 (B): BANKING AND INSURANCE SYSTEM

Duration: 3 hrs.

Marks: 100(80+20)

Lectures: 65

Objectives: To enable the students to acquire knowledge about basics of banking and insurance.

Unit-1

Concept of Bank and Banking: Historical Evolution of Banking: Origin and Development of Banking - Structure of Banking in India – Banks and Economic Development – Functions of Commercial banks (conventional and innovative functions) – Central Bank – RBI – functions – Emerging trends in Banking.

Unit-2

Types of Customers and Account holders: Procedure and practice in opening and operating the accounts of customers - individuals including minors - joint account holders - Partnership firms - joint stock companies - executors and trustees - clubs and associations

Unit-3

Introduction to insurance: Purpose and need of insurance, insurance as a social security tool - insurance and economic development - Principles of insurance - various kinds of insurance - life, marine, fire, medical, general insurance - features.

Unit-4

Life Insurance - Law relating to life Insurance; General Principles of Life Insurance Contract; Proposal and policy; assignment and nomination; title and claims; General Insurance - Law relating to general insurance; different types of general insurance; general insurance Vs life insurance – Insurance business in India.

Unit-5

Fundamentals of Agency Law: Definition of an agent; Agents regulations; Insurance intermediaries; Agents' compensation. Procedure for Becoming an Agent: Pre-requisite for obtaining a license; Duration of license; Cancellation of license; Revocation or suspension/termination of agent appointment; Code of conduct; Unfair practices. Functions of the Agent: Proposal form and other forms for grant of cover; Financial and medical underwriting; Material information; Nomination and assignment; Procedure regarding settlement of policy claims.

Learning Outcome: After the completion of this paper, the student will acquired practical knowledge of working mechanism of banking and insurance industries in India.

Reference Books:

1. Mishra S. *Banking Law and Practice – S Chand*
2. Sheldon H.P :*Practice and Law of Banking.*
3. Bedi. H.L :*Theory and Practice of Banking.*
4. Maheshwari. S.N. :*Banking Law and Practice.*
5. Shekar. K.C :*Banking Theory Law and Practice.*
6. Pannandikar&Mithami': *Banking in India.*
7. Radhaswamy&Vasudevan: *Text Book of Banking.*
8. Indian Institute of Bankers (Pub) *Commercial Banking Vol-I/Vol-II (part I&II) Vol- III.*
9. Varshaney: *Banking Law and Practice.*
10. Dr. P. Periasamy: *Principles and Practice of Insurance*
11. Himalaya Publishing House, Delhi.
12. Inderjit Singh, RakeshKatyal& Sanjay Arora: *Insurance Principles and Practices*
13. Kalyani Publishers, Chennai.
14. M.N. Mishra: *Insurance Principles and Practice, S. Chand & Company Ltd, Delhi.*
15. G. Krishnaswamy : *Principles & Practice of Life Insurance*
16. Kothari &Bahl : *Principles and Practices of Insurance.*
17. Prasad – *Banking Insurance – Vikash Publication*

B.Com. (Hons.): Semester – V

Paper 5.3BCH-DSE 5.3 (C): INDIAN FINANCIAL SYSTEM

Duration: 3 hrs.

Marks: 100(80+20)

Lectures: 65

Objectives: *To enable the students to understand the basic knowledge about the structure, organization and working of financial system in India.*

Unit-1

Financial System: Meaning and Significance-Functions of the financial system -Financial Assets- Financial markets- Classification-Financial instruments-weakness of Indian Financial System.

Unit-2

Money market: Definition-Features-Objectives-Features of a developed money market-Importance of Money market-Composition of Money market-Operations and Participants-Money market Instruments-features of Indian money market-Recent developments.

Unit-3

Primary, Secondary and Capital Markets: New issue market-meaning-functions-methods floating new issue - intermediaries in the new issue market-merchants bankers and their functions -Recent trends in new issue market - Stock Exchanges-Functions-Structure of stock exchanges-BSE-NSE- listing of securities-Advantages of listing-methods of trading in stock exchanges-on line trading-stock indices

Unit-4

Financial Institutions: commercial banks- development financial institutions- Nonbanking financial corporation's-Mutual Funds, insurance companies – Objectives and functions (only a brief outline).

Unit-5

Regulatory Institutions: RBI – Role and Functions. The Securities and Exchange Board of India-objectives-function-powers-SEBI guidelines for primary and secondary market

Learning Outcome: After completion of this paper, the student will be able to understand the structure and role of financial system, financial intermediaries and regulators in the Indian economy.

Reference Books:

1. Kohn, Meir: *Financial Institutions and Markets*, Tata McGraw Hill.
2. Bhole L.M: *Financial Institutions and Markets*, Tata McGraw Hill.

3. Desai, Vasantha: *The Indian Financial System*, Himalaya Publishing House.
4. Machiraju.R.H: *Indian Financial System*, Vikas Publishing House.

5. Khan M.Y: *Indian Financial System*, Tata McGraw Hill.
6. Varshney, P.N., & D K Mittal, D.K.: *Indian Financial System*, Sulthan Chand & Sons
7. Gordon E. &Natarajan K.: *Financial Markets & Services*, Himalaya Publishing House.
8. Pathak, V. Bharati: *Indian Financial System*, Pearson Education.

B.Com. (Hons.): Semester – V

Paper BCH-DSE 5.4 (A): FINANCIAL STATEMENT ANALYSIS & REPORTING

Duration: 3 hrs.

Marks: 100 (80+20)

Lectures: 65

Objectives: To enable the students to understand the basic knowledge about the financial statement analysis and reporting for economic decision making.

Unit-1

Introduction Concepts of financial statements – Nature of financial statements – Objectives of financial statements – Different types of financial statements: income statement, balance sheet, statement of retained earnings, fund flow statement, cash flow statement, schedules – Limitations of financial statements.

Unit-2

Analysis & Interpretation of Financial Statements: Traditional Approaches Vs. Modern Approaches to financial statement analysis – Classification of financial statement analysis: based on modus operandi and based on materials used – Techniques of financial statement analysis: Comparative Statements, Common-size Statements, Trend Ratios and Ratio Analysis – Problems encountered in financial statement analysis.

Unit-3

Ratio Analysis: Classification of ratios – Ratio formation – Ratio interpretation – Practical methods of ratio analysis: Time Series (intra firm) Analysis, Cross Sectional (inter firm) Analysis, Residual Analysis and Multivariate Analysis.

Unit-4

Multivariate Ratio Analysis: Concept, objectives, uses and limitations – Univariate analysis Vs. Multivariate ratio analysis – Application of statistical tools in financial statement analysis.

Unit-5

Corporate Reporting: Cash Flow statement Analysis (AS 3) and Statutory and Non Statutory Reports, Integrated Reporting

Learning Outcome: After the completion of this paper, the students will be able to prepare the end result of a business houses by preparation through financial statement analysis and reporting.

Suggested Readings:

1. Foster, G.: Financial Statement Analysis, Englewood Cliffs, NJ, Prentice Hall.
2. Sahaf M.A – Management Accounting – Principles & Practice – Vikash Publication
3. Foulke, R.A.: Practical Financial Statement Analysis, New York, McGraw-Hill.
4. Hendriksen, E.S.: Accounting Theory, New Delhi, Khosla Publishing House.
5. Kaveri, V.S.: Financial Ratios as Predictors of Borrowers' Health, New Delhi, Sultan Chand.
6. Lev, B.: Financial Statement Analysis – A New Approach, Englewood Cliffs, NJ, Prentice Hall.
7. Maheswari, S.N.: Management Accounting & Financial Control, New Delhi, Sultan Chand.
8. Myer, J.N.: Financial Statement Analysis, NJ, Prentice Hall. 8. Porwal, L.S.: Accounting Theory – An Introduction, New Delhi, Tata-McGraw-Hill

B.Com. (Hons.): Semester – V

Paper 5.4 (B): MERCHANT BANKING AND FINANCIAL SERVICES

Duration: 3 hrs.

Marks: 100 (80+20)

Lectures: 65

Objectives: *To enable the students to understand the basic knowledge about the financial services available in India.*

Unit-1

Merchant Banking: Nature and scope of Merchant Banking - Regulation of Merchant Banking Activity - overview of current Indian Merchant Banking scene - structure of Merchant Banking industry - primary Markets in India and Abroad - professional Ethics and code of conduct - current Development

Unit-2

Financial Services: Meaning and Definition, Role of Financial Services in a financial system. Leasing: Meaning and features. Introduction to equipment leasing: Types of Leases, Evolution of Indian Leasing Industry. Legal Aspects of Leasing: present Legislative Framework. Hire purchase: concept and characteristics of Hire purchase. Difference between hire purchase and leasing

Unit-3

Factoring: concept, nature and scope of Factoring - Forms of Factoring - Factoring vis-à-vis Bills Discounting - Factoring vis-à-vis credit Insurance Factoring vis-à-vis Forfeiting- Evaluation of a Factor - Evaluation of Factoring - Factoring in India current Developments.

Unit-4

Securitization / Mortgages: Meaning, nature and scope of securitization, securitization as a Funding Mechanism, securitization of Residential Real Estate - whole Loans - Mortgages - Graduated-payment. **Depository:** Meaning, Evolution, Merits and Demerits of Depository. **Process of Dematerialization and Dematerialization,** Brief description of NSDL and CDSL

Unit-5

Security Brokerage: Meaning of Brokerage, types of brokers. Difference between broker and jobber, SEBI Regulations relating to brokerage business in India.

Learning Outcome: After the completion of this course, the student will be able to understand the structure and function of mercantile banking and various financial services available in the present business world.

Suggested Readings:

1. M.Y.Khan, Financial Services, Tata McGraw-Hill, 11th Edition, 2008
2. Gopal C.R – Management Financial Service – S.Chand
3. NaliniPravaTripathy, Financial Services, PHI Learning, 2008
4. Machiraju, Indian Financial System, Vikas Publishing House, 2nd Edition, 2002.
5. J.C.Verma, A Manual of Merchant Banking, Bharath Publishing House, New Delhi.
6. Varshney P.N. & Mittal D.K., Indian Financial System, Sultan Chand & Sons, New Delhi.
7. Sasidharan, Financial Services and System, Tata Mcgraw Hill, New Delhi, 1st Edition, 2008.
8. Website of SEBI

B.Com. (Hons.): Semester – V

Paper 5.4 (C): FINANCIAL INSTITUTIONS AND SERVICES

Duration: 3 hrs.

Marks: 100 (80+20)

Lectures: 65

Objectives: *To enable the students to understand the financial institutions operating in India and services provided by them.*

Unit-1

Basic Theoretical Framework: The financial system and its technology; The factors affecting the stability of the financial system; Development finance vs. universal banking; Financial intermediaries and Financial Innovation; RBI-Central Banking.

Unit-2

Financial Institutions: A brief historical perspective. An update on the performance of IDBI, ICICI, IFCI and SFCs, LIC & GIC. The banking Institutions: Commercial banks - the public and the private sectors - structure and comparative performance. The problems of competition; interest rates, spreads, and NPAs. Bank capital - adequacy norms and capital market support.

Unit-3

Non-banking financial institutions: Evolution, control by RBI and SEBI. A perspective on future role, Unit Trust of India and Mutual Funds, Reserve bank of India Framework for/Regulation of Bank Credit . Commercial paper: Features and advantages, Framework of Indian CP Market, effective cost/interest yield.

Unit-4

Financial services: Asset/fund based Financial services - lease finance, consumer credit and hire purchase finance, factoring definition, functions, advantages, evaluation and forfeiting, bills discounting, housing finance, venture capital financing. Fee-based / Advisory services: Stock broking, credit rating.

Unit-5

Operations: Financial Assets/ Instruments Rights issues, issue of Debentures, issue of Equity shares - pre-issue activity, post-issue activities. The regulatory framework: SEBI and Regulation of Primary and Secondary Markets, Company Law provisions.

Learning Outcome: *After completion of this paper, the students will be able to understand the role and benefits of financial institution and services.*

Book References

1. M.Y.Khan, Financial Services, Tata McGraw-Hill, New Delhi, 2004.
2. Harsh V.Verma, Marketing of Services, Global Business Press, 2002
3. Sames L .Heskett, Managing In the Service Economy, Harvard Business School Press, Boston, 2001.
4. M.Y.Khan, Indian Financial System, 4/eTataMcGraw-Hill, New Delhi, 2004
5. Frank.J.Fabozzi& Franco Modigliani, Foundations of Financial Markets and Institutions, 3/e, Pearson Education Asia, 2002.
6. H.R Machiraju, Indian Financial Systems, Vikas Publishing House Pvt. Ltd.2002.
7. Meir Kohn, Financial Institutions and Markets, Tata McGraw-Hill, New Delhi, 2003.
8. Pathak: Indian Financial Systems Pearson Education
9. NibasaiyaSapna – Indian Financial System – S. Chand

B.Com. (Hons.): Semester - VI

Paper BCH 6.1: AUDITING AND CORPORATE GOVERNANCE

Duration: 3 hrs.

Marks: 100 (80+20)

Lectures: 65

Objective: *To provide knowledge of auditing principles, procedures and techniques in accordance with current legal requirements and professional standards and to give an overview of the principles of Corporate Governance and Corporate Social Responsibility*

Unit-1

Auditing: Introduction, Meaning, Objects, Basic Principles and Techniques; Classification of Audit, Audit Planning, Internal Control – Internal Check and Internal Audit; Audit Procedure – Vouching and verification of Assets & Liabilities

Unit-2

Audit of Limited Companies: Company Auditor- Qualifications and disqualifications, Appointment, Rotation, Removal, Remuneration, Rights and Duties Auditor's Report-Contents and Types. Liabilities of Statutory Auditors under the Companies Act 2013

Unit-3

Special Areas of Audit: Special features of Cost audit, Tax audit, and Management audit; Recent Trends in Auditing: Basic considerations of audit in EDP Environment; Standard on Auditing(SA); Relevant Case Studies/Problems;

Unit-4

Corporate Governance: Conceptual framework of Corporate Governance, Corporate Governance Reforms. Major Corporate Scandals in India and Abroad: Common Governance Problems Noticed in various Corporate Failures. Codes & Standards on Corporate Governance

Unit-5

Corporate Social Responsibility (CSR): Strategic Planning and Corporate Social Responsibility; Corporate Philanthropy, Meaning of CSR, CSR and CR, CSR and Corporate Sustainability, CSR and Business Ethics, CSR and Corporate Governance, Environmental Aspect of CSR, CSR provision under the Companies Act 2013, CSR Committees

Learning Outcome: At the end of the paper student will have detail knowledge about principles and techniques of audit in accordance with current legal requirement and as per the guidelines of different statutory authorities.

Suggested Readings:

1. Gupta, Kamal and Ashok Arora. *Fundamentals of Auditing*. Tata Mc-Graw Hill Publishing Co. Ltd., New Delhi.
2. Gadada Siddheswar T & Rachchh Gunvantrai – Introduction to Auditing – Vikash
3. Jha, Aruna. *Auditing*. Taxmann.
4. Tandon, B. N., S. Sudharsanam and S. Sundharabahu. *A Handbook of Practical Auditing*. S. Chand and Co. Ltd., New Delhi.
5. Ghatalia, S.V. *Practical Auditing*. Allied Publishers Private Ltd., New Delhi.
6. Singh, A. K. and Gupta Lovleen. *Auditing Theory and Practice*. Galgotia Publishing Company.
7. Alvin Arens and James Loebbecke, *Auditing: an Integrated Approach*
7. Ravinder Kumar and Virender Sharma, *Auditing Principles and Practice*, PHI Learning
Christine A Mallin, *Corporate Governance (Indian Edition)*, Oxford University Press, New Delhi.
8. Bob Tricker, *Corporate Governance-Principles, Policies, and Practice* (Indian Edition), Oxford University Press, New Delhi.
9. The Companies Act 2013 (Relevant Sections)
10. MC Kuchhal *Corporate Laws*, Shri Mahaveer Book Depot. (Publishers). (Relevant Chapters)
11. Relevant Publications of ICAI on *Auditing (CARO)*.
12. Khanka – Business Ethics & Corporate Governance – Vikash Publication

B. Com.: Semester VI

Paper BCH 6.2: INDIRECT TAXES

Duration: 3 hrs.

Marks: 100 (80+20)

Lectures: 65

Objective: To provide basic knowledge and equip students with application of principles and provisions of Service Tax, VAT, Central Excise, and Customs Laws.

Contents:

Unit-1

Service tax – concepts and general principles, Charge of service tax and taxable services, Valuation of taxable services, Payment of service tax and filing of returns, Penalties, CENVAT Credit.

Unit-2

VAT – concepts and general principles, Calculation of VAT Liability including input Tax Credits, Small Dealers and Composition Scheme, VAT Procedures

Unit-3

Central Excise Law in brief – Goods, Excisable goods, Manufacture and Manufacturer, Valuation, CENVAT, Basic procedures, Export, SSI, Job Work

Unit-4

Basic concepts of customs law, Territorial waters, high seas, Types of custom duties – Basic, Countervailing & Anti- Dumping Duty, Safeguard Duty, Valuation, Customs Procedures, Import and Export Procedures, Baggage, Exemptions

Unit V

Emerging Issues in Indirect Taxes: Goods and Services Tax (GST) – Scope of GST, Modalities of GST

Learning outcome: After completion of this paper, the students will have an insight to the taxation on production and distribution of goods and provision of services along taxation mechanism of international trade.

Suggested Readings:

1. Singhania Vinod K. and Monica Singhania, *Students' Guide to Indirect Taxes*, Taxmann Publications Pvt. Ltd., Delhi.
2. V.S. Datey. *Indirect Tax Law and practice*, Taxmann Publications Pvt. Ltd., Delhi, Latest edition.
3. Sanjeev Kumar. *Systematic Approach to Indirect Taxes*, Latest edition.
4. S. S. Gupta. *Service Tax -How to meet your obligation* Taxmann Publications Pvt. Ltd., Delhi, Latest edition.

5. GrishAhuja& Dr. Ravi Gupta, Indirect Taxes, Flair Publication Pvt. Ltd.

B.Com. (Hons.): Semester - VI
Paper BCH-DSE 6.3 (A): CORPORATE TAX PLANNING

Duration: 3 hrs.

Marks: 100 (80+20)

Lectures: 65

Objective: To provide Basic knowledge of corporate tax planning and its impact on decision-making.

Contents:

Unit-1

Tax planning, tax management, tax evasion, tax avoidance, corporate tax in India, Types of companies, Residential status of companies and tax incidence, Tax liability and minimum alternate tax, Tax on distributed profits

Unit-2

Tax planning with reference to setting up of a new business; Locational aspect, nature of business, form of organization; Tax planning with reference to financial management decision; Capital structure, dividend including deemed dividend and bonus shares; Tax planning with reference to sale of scientific research assets

Unit-3

Tax planning with reference to specific management decisions; Make or buy; own or lease; repair or replace; Tax planning with reference to employees' remuneration; Tax planning with reference to receipt of insurance compensation; Tax planning with reference to distribution of assets at the time of liquidation.

Unit-4

Special provisions relating to non-residents; double taxation relief; Provisions regulating transfer pricing; Advance rulings; Advance pricing agreement

Unit-5

Tax planning with reference to business restructuring: - Amalgamation, Demerger, Slump sale, Conversion of sole proprietary concern/partnership firm into company, Conversion of company into LLP, Transfer of assets between holding and subsidiary companies.

Learning outcome: After learning the subject, the students will be able to understand the taxation of the corporate house.

Suggested Readings:

1. Singhania, Vinod K. and Monica Singhania. *Corporate Tax Planning*. Taxmann Publications Pvt. Ltd., New Delhi.
2. Ahuja, Girish. and Ravi Gupta. *Corporate Tax Planning and Management*. Bharat Law House, Delhi.

3. Acharya, Shuklendra and M.G. Gurha. *Tax Planning under Direct Taxes*. Modern Law Publication, Allahabad.
4. Mittal, D.P. *Law of Transfer Pricing*. Taxmann Publications Pvt. Ltd., New Delhi.
5. IAS – 12 and AS – 22.

B.Com. (Hons.): Semester - VI

Paper BCH-DSE 6.4: BUSINESS RESEARCH METHODS AND PROJECT WORK

Duration: 3 hrs.

Marks: 100(50+50)

Lectures: 65

Objective: *This course aims at providing the general understanding of business research and the methods of business research. The course will impart learning about how to collect, analyze, present and interpret data.*

Section A: Business Research Methods

50 Marks

Unit-1

Introduction: Meaning of research; Scope of Business Research; Purpose of Research –Exploration, Description, Explanation; Unit of Analysis – Individual, Organization, Groups, and Data Series; Conception, Construct, Attributes, Variables, and Hypotheses.

Unit-2

Research Process: An Overview; Problem Identification and Definition; Selection of Basic Research Methods- Field Study, Laboratory Study, Survey Method, Observational Method Existing Data Based Research, Longitudinal Studies, Panel Studies

Unit-3

Measurement: Definition; Designing and writing items; Uni-dimensional and Multi-dimensional scales; Measurement Scales- Nominal, Ordinal, Interval, Ratio; Ratings and Ranking Scale, Thurstone, Likert and Semantic Differential scaling, Paired Comparison; Sampling –Steps, Types, Sample Size Decision; Secondary data sources

Hypothesis Testing: Tests concerning means and proportions; ANOVA, Chi-square test and other Non-parametric tests; Testing the assumptions of Classical Normal Linear Regression.

Section B – Project Report

Marks

50

Unit-4

Report Preparation: Meaning, types and layout of research report; Steps in report writing; Citations, Bibliography and Annexure in report; JEL Classification

Note:

1. There shall be a written examination of 50% Marks on the basis of Unit I to III.
2. The student will write a project report under the supervision of a faculty member assigned by the college/institution based on field work. The Project Report carries 50% Marks and will be evaluated by University appointed examiners.

Learning Outcome: After completion of this paper, the students will be able to assess and apply a range of research method on a practical project.

Suggested Readings:

1. Chawla Deepak – Research Methodology – Vikash Publication
2. Upagade&Shende – Research Methodology – S.Chand

B.Com. (Hons.): Semester - VI
Paper 6.4 (B): FUNDAMENTALS OF INVESTMENT

Duration: 3 hrs.

Marks: 100 (80+20)

Lectures: 65

Objective: To familiarize the students with different investment alternatives, introduce them to the framework of their analysis and valuation and highlight the role of investor protection.

Contents

Unit-I:

The Investment Environment - The investment decision process, Types of Investments – Commodities, Real Estate and Financial Assets, the Indian securities market, the market participants and trading of securities, security market indices, sources of financial information, Concept of return and risk, Impact of Taxes and Inflation on return.

Unit-II:

Fixed Income Securities - Bond features, types of bonds, estimating bond yields, Bond Valuation types of bond risks, default risk and credit rating.

Unit-III:

Approaches to Equity Analysis: Introductions to Fundamental Analysis, Technical Analysis and Efficient Market Hypothesis, dividend capitalization models, and price-earnings multiple approach to equity valuation.

Unit-IV:

Portfolio Analysis and Financial Derivatives: (a) Portfolio and Diversification, Portfolio Risk and Return. (b) Mutual Funds. (c) Introduction to Financial Derivatives, Financial Derivatives Markets in India.

Unit-V:

Investor Protection – Role of SEBI and stock exchanges in investor protection; Investor grievances and their redressal system, insider trading, investors' awareness and activism.

Learning outcome: After completion of this paper, this paper will educate the students about various aspect of investment in detail along with understandability of stock market operation, focusing on need for common investor protection.

Suggested Readings

1. Bhalla – Fundamentals of Investment – S.Chand
2. Pandian P. – Security Analysis & Portfolio Management – Vikash Publication

3. Jones, C.P., *“Investments Analysis and Management”*, Wiley, 8thed.

4. Prasanna, Chandra., *“Investment Analysis and Portfolio Management”*, Tata McGraw Hill.
5. Rustogi, R.P., *Fundamentals of Investment*, Sultan Chand & Sons, New Delhi.
6. Vohra, N.D., and B.R. Bagri, *“Futures and Options”*, McGraw Hill Publishing
7. Mayo, *An Introduction to Investment*, Cengage Learning.

B.Com. (Hons.): Semester - VI
Paper 6.4 (C): FINANCIAL MARKET OPERATIONS

Duration: 3 hrs.

Marks: 100 (80+20)

Lectures: 65

Objective: This course aims at acquainting the students with the working of Financial Markets in India.

Unit-1

An overview of financial markets in India: Money Markets: Indian money markets composition and structure; (a) Acceptance houses, (b) Discount houses, and (c) Call money markets; Recent trends in India money markets.

Unit-2

Capital Market: Security market – (a) New issue market. (b) Secondary market: Functions and role of stock exchange: listing procedure and legal requirements: Public Issue – pricing and marketing: Stock exchanges – National Stock Exchange and over-the-counter exchanges.

Unit-3

Securities Contract and Regulations Act: Main provisions. Investors Protections: Grievances concerning stock exchange dealing and their removal: Grievances cells in stock exchanges: SEBI: Company Law Board: Press: Remedy through courts.

Unit-4

Functionaries on Stock Exchanges: Brokers, Sub brokers, market makers, jobbers, and NRIS.

Unit-4

Financial Services: Concept, functions, and types. Financial Services: Meaning and Definition, Role of Financial Services in a financial system. Leasing: Meaning and features. Introduction to equipment leasing: Types of Leases, Evolution of Indian Leasing Industry. Legal Aspects of Leasing: present Legislative Framework. Hire purchase: concept and characteristics of Hire purchase. Difference between hire purchase and leasing, SEBI guidelines: Credit rating

Learning Outcome: After completion of this paper, the student will be able to understand the nature and role of the main financial markets within the domestic and global environment.

Suggested Readings:

1. Chandler M. V. and Goldfeld S. M: Economics of Money and Banking: Harper and Row, New York.
2. Vaish M.C – Monetary Theory – Vikash Publication
3. Gupta Suraj B: Monetary Economics: S. Chand and Co., New Delhi
4. Gupta Suraj B: Monetary Planning in India: Oxford, Delhi.
5. Bhole I. M.: financial Markets and Instructional: Tata

**MASTER OF ARTS IN
SOCIAL WORK
(2018 - 2019)**

**Nayagarh Autonomous College
Nayagarh**

**COLOUR SCHEME OF MAPPING THE SYLLABI FOR
ENTREPRENEURSHIP, EMPLOYABILITY AND SKILL
DEVELOPMENT**

	Skill Development
	Employability
	Entrepreneurship
	All the three
	Skill Development and Employability
	Skill Development and Entrepreneurship
	Employability and Entrepreneurship

**UTKAL UNIVERSITY REGULATION
For the
M.A. in SOCIAL WORK (MSW) EXAMINATIONS
(Semester Scheme)**

REGULATIONS

1. Introduction:

1.1. The two year post graduate degree course leading to the Master of Arts in Social Work (MSW) of Utkal University shall be spread over a period of two academic years. Each academic year comprises of two semesters namely the Odd and Even Semester.

1.2. A candidate for the Master of Social Work shall be required to pass the following

examinations.

- End Semester Examination – I
- End Semester Examination – II
- End Semester Examination – III
- End Semester Examination – IV
- Internal Assessment for Fieldwork in semesters I – IV
- External Examination for Fieldwork in semesters I – IV
- Internal Assessment for Dissertation in semester IV
- External Examination for Dissertation in semester IV

- 1.3. A candidate shall be eligible to appear for the oncoming semester courses subsequent to the first semester University examinations respectively irrespective of declaration of the results in the previous semester but.
- 1.4. Candidate who fails in the odd semester examinations shall be eligible to appear for the examination in which s/he has failed in the next odd semester and vice versa.
- 1.5. Students who have failed in a semester or are desirous to improve their performance will be allowed a single chance in the subsequent semester examination of the following year. Thus in no case the course completion will go beyond three years.

- 1.6. A candidate for the Master of Arts in Social Work Examination shall be required to enroll himself / herself under these conditions as a student in one of the colleges affiliated to this University.

2. Admission Criteria:

- 2.1. Any person who has passed the Under Graduate Degree in any subject with a minimum of 50% marks (General candidates) and 45% marks (SC/ST/OBC candidates) from an examination conducted by a recognized University is eligible to be admitted to the 1st Semester of this course. Students from SC/ST/OBC background have to apply with valid caste certificate.

3. Duration:

- 3.1 Odd semester shall be from July to December (I and III Semesters).
- 3.2 Even semester shall be from January to June (II and IV).
- 3.3 There shall be not less than 90 working days for each semester. This excludes the days for the conduct of University end semester examinations and other holidays.
- 3.4 A student would be required to complete the course within a maximum of three (Ref. 1.5 above) academic years from the date of admission.

4. Course:

Each course is well designed under lectures / tutorials / fieldwork / seminar / assignments / report writing so that it achieves the goals of effective teaching and learning needs of the students.

5. Contents in the Courses of Study:

- 5.1 The Master of Social Work programme of study consists of a number of contents. The term 'course' is applied to indicate a logical part of the subject matter of the programme and is invariably equivalent to the subject matter of a 'Paper' in the conventional sense. The following are the various categories of courses suggested for the Master of Social Work programme.
- 5.2 There are six Foundation papers.
- 5.3 Core compulsory papers comprise of twenty two courses. These are compulsory for all students.

- 5.4 There are eleven elective courses spread over two semesters III and IV. Out of the given electives student can choose any two of his or her interest for study in the respective semester.

6. Attendance:

Students must have 75% of attendance in each theory paper and 100% attendance in fieldwork and in related assignments. This is mandatory for appearing in the examination.

7. Examinations:

- 7.1 There shall be examinations at the end of each semester.
- 7.2 Examination for odd semesters shall be conducted in the month of November – December.
- 7.3 Examination for the even semesters shall be held in the month of May – June.
- 7.4 A candidate who does not pass the examination in any of the papers shall be permitted to appear in such failed papers in the subsequent examination to be held either in November – December or May – June as the case may be.

8. Pass Marks and Classification of Successful Candidates

- 8.1 Aggregate marks for passing the examination of the Degree of Master of Arts in Social Work (MSW) shall be the sum total of the aggregate of all the four semester Examinations taken together.
- 8.2.1 Divisions will be awarded on the basis of Utkal University Regulations for the M.A. Examination.
- 8.2.2 A candidate to be considered as Pass has to secure a minimum of 50% marks in the Field Work. Each of the field-work components namely Observation Visits, Concurrent Field Work in Community and Agency settings, Rural Camp and Block Placement has to be compulsorily completed to be considered as Pass.
- 8.3.a If a candidate is marked absent in a sitting(s) of an examination, such a candidate shall have to reappear in that paper (s) of the course in order to be considered as having completed the course.

.b If a candidate does not complete the requisite field-work days in a semester and does not appear for Field Work evaluation, Field Work Seminar and Viva Voce then he/she will be considered as not having completed the course and thereby ineligible to receive the M.A. degree.

8.3.b A candidate failing to secure a minimum of 30% in any Compulsory and a minimum of 50% in the Practical (Field Work - Ist, IInd & IIIrd & IVth) either in the First, Second, Third or Final examination of this University may be allowed to appear in those papers in not more than one chance (examination) immediately following that examination for which he/she was registered, in order to clear the back paper(s) on the payment of prescribed fees.

COURSE STRUCTURE UNDER THE SEMESTER SYSTEM – MSW

Semester – I

Paper	Course Code	Course Title	Credit	Total Instruction Hours	Marks
01	SWFC – 01	Foundations of Social Work: History, Philosophy, Ethics, and Theories in Social Work	4	60	100
02	SWFC – 02	Social Science Concepts I: social structure, social institutions and social change	4	60	100
03	SWFC – 03	Social Science Concepts II: Political Judicial and Economic System,	4	60	100
04	SWFC – 04	Social Science Concepts III: Poverty, Inequality and Social Exclusion	4	60	100
05	SWFC – 05	Social Science Concepts IV: Psychological Concepts, Human Behavior and Relationships	4	60	100
06	SWFC – 06	Orientation Visit Group Lab Concurrent Field Work	8	120	200
TOTAL			28	420	700

Semester – II

Paper	Course Code	Course Title	Credit	Total Instruction Hours	Marks
07	SWCP - 01	Working with Individuals	2	30	50
08	SWCP - 02	Working with Groups	2	30	50
09	SWCP - 03	Working with Communities	4	60	100
10	SWCP - 04	A Human Rights Approach to Social Work Practice	4	60	100
11	SWCP - 05	Social Welfare Administration	4	60	100
12	SWCP - 06	Social Work Research and Statistics	4	60	100
13	SWCP - 07	Concurrent Field Work + Rural Camp	8	120	200
TOTAL			28	420	700

Semester – III

Paper	Course Code	Course Title	Credit	Total Instruction Hours	Marks
14	SWCP - 08	Child Protection and Child Rights	4	60	100
15	SWCP - 09	Social Work with Women: Issues of gender and development	4	60	100
16	SWCP - 10	Ethnic Sensitive Social Work Practice in India	4	60	100
17	SWCP - 11	Rights of persons with Disabilities and their Rehabilitation.	4	60	100
18	SWCP - 12	Community Health and Social Workers	4	60	100
19	SWCP - 13	Social Management	4	60	100
20	SWCP - 14	Concurrent Field Work	8	140	200
21	SWEP – 01 SWEP – 02 SWEP – 03 SWEP - 04 SWEP - 05 SWEP - 06 (Any One)	School Social Work Working with Women Working with Alcoholics and Substance Abusers Correctional Social Work Counseling in Social Work Social Work with the Elderly	2	30	50
TOTAL			34	530	850

Semester – IV

Paper	Course Code	Course Title	Credit	Total Instruction Hours	Marks
22	SWCP - 15	Development Theories and Strategies: Issues Challenges and Responses	4	60	100
23	SWCP - 16	Social Work Practice in Rural Areas	4	60	100
24	SWCP - 17	Social Work Practice in Urban Areas: Migration, Unorganized Labour and Livelihoods	4	60	100
25	SWCP - 18	Social Policy, Planning and Implementation	4	60	100
26	SWCP - 19	Development Communication	4	60	100
27	SWCP - 20	Sustainable Agriculture	4	60	100
28	SWCP - 21	Dissertation: Research Project	4	70	100
29	SWCP - 22	Concurrent Field Work + Block Placement	2	340	100
30	SWEP - 07 SWEP - 08 SWEP - 09 SWEP – 10 SWEP – 11 (Any One)	Entrepreneurship Development NGO Management Project Management Disaster Management People Centred Advocacy.	2	30	50
TOTAL			34	740	850

Examination Question Paper Pattern:

There shall be three types of questions – Essay / Descriptive, Short Answer & Objective.

Distribution of Marks for courses carrying 100 Marks:

Five Essay type questions carrying 12 Marks each

(Out of a choice of seven) (Answer in 700 – 1000 Words) 5 x 12 Marks = 60 Marks

Four short type questions carrying 6 Marks each

(Out of a choice of six) (Answer in 150 – 200 Words) 4 x 6 Marks = 24 Marks

Eight objective type questions carrying 2 Marks each

(Out of a choice of ten) (Answer in one or two sentences) 8 x 2 Marks = 16 Marks

Social Work Practice (Fieldwork):

Fieldwork is an integral component of the course of Master of Social Work. A student shall have to undertake his/her fieldwork for 20 hours in every week in the semester. Students shall do the fieldwork under the guidance of a faculty supervisor. Fieldwork is mandatory for all students of social work.

Field Work Schedule:

Sl. No.	Semester	Field Practicum Component	Duration	Credits
1	SWFC - 06 MSW(I)	1. Observation Visit	10 Organizations	2
		2. Concurrent Fieldwork (Community Placement)	20 hrs/week (16 hrs in the field + 4 hrs report writing)	6
2	SWCP- 07	1. Concurrent Fieldwork (Community Placemen)	20 hrs/week (16 hrs in the field +	6

	MSW (II)		4hrs report writing).	
		2. Rural Camp	10 days	2
3	SWCP- 14 MSW (III)	1. Concurrent Fieldwork (Agency Placement)	20 hrs/week (16 hrs in the field + 4hrs report writing).	8
4	SWCP- 22 MSW (IV)	1. Concurrent Fieldwork (Agency Placement)	20 hrs/week (16hrs in the field + 4 hrs report writing).	2
		2. Block Placement	One Month before the end of the semester	2

Evaluation of Fieldwork: Regulation of Fieldwork:

At the end of each semester, the Chairman of the Board of studies shall call for the submission of the Field Work Attendance Record of the students, Field Work Report files of the students, the Fortnightly Reports on the students and the Self Evaluation Report of the students. This is to facilitate the external examiners to mark the performance.

Fieldwork carries 200 marks in Semester1, 2&3 and 100 marks in Semester 4. It is divided into internal and external.

The internal evaluation carries 50% marks and it shall be evaluated by the Faculty Supervisor on the basis of field-work records, practical fieldwork and reports.

The external carry 50% marks and it shall be evaluated by the external examiners on the basis of fieldwork seminar and practical knowledge gained by the student. The external examiner shall be any person authorized by the Chairman of the Board of studies for Social Work of Utkal University.

The minimum pass mark in the fieldwork shall be 50% in both the internal and the external examinations taken together in each semester. Both these marks together will comprise the university mark for field-work.

Field Work Assessment: [SL. No. 1 and 2 will be evaluated internally. Sl. No.3, 4 & 5 will be evaluated by an external examiner appointed by the Utkal University]

Sl. No.	Criteria for Assessment	Weightage In %
1	Field Work Reports	25%
2	Fortnightly Reports by Faculty	25%
3	Self-Evaluation Report by student	25%
4	Field Work Seminar	15%
5	Viva Voce	10%
	Total	100%

Evaluation of the Dissertation:

Students to practice Social Work Research Methodology shall submit a Dissertation in any area of their interest by working on a research project under the supervision of a faculty supervisor.

Total marks assigned for project work shall be 100. This total mark is distributed equally among internal and external evaluations. The internal marks of 50 and external marks of 50 shall be calculated in the basis of the Objective, Methodology, Analysis, Findings, Presentation and Viva-Voce. It is mandatory that it be the original work of the student.

HARD CASE RULE

The Hard Case Rule mentioned on the item No.5.2.4 (I,II,&III) in the correction ship No-1222 of Utkal University as amendments to the Regulation governing 2 Years Degree Course (Master of Arts, Science, Commerce Examinations) effective for the students admitted to such courses during the Academic 2002-2003 and 2003-2004,

shall be applicable to all the Compulsory and theory papers of Ist, IInd Year Examinations while computing the Final result of Master of Social Work Examinations. In case of any new regulation added to the Hard Case Rule by the University for 2 year Degree Course (Master of Arts, Science, Commerce Examinations) shall be applicable to the 2 years Degree Course of Master of Social Work.

REGULATION FOR FIELD-WORK

Introduction:

The student of the M.A in Social Work through field work practice is supposed to be committed to the people and social institutions in which they are placed. They are expected to serve individuals, families and communities through effective practice guided by qualified field-work supervisors (with MSW degrees) and by the social-work faculty in each college affiliated to this university.

Goals of Field Work:

1. To critically assess their own roles in field-work by conducting themselves ethically and professionally and by utilizing supervision & self-reflection.
2. To develop knowledge, skills and values required to engage in quality practice with individuals, families, groups, organizations and communities.
3. To demonstrate their ability to engage practically in problem solving as change agents in a variety of settings.
4. To demonstrate knowledge and ability to apply social theories and theories of human behavior and conceptual frameworks to assess, intervene and evaluate social work practice in the individuals, families and groups.
5. To recognize and understand various forms of discrimination and oppression as they apply to members of diverse groups and communities and advocate for social and economic justice for individuals, families, groups and communities.

Semester – I:

Observation Visits: 10 social work / welfare agencies have to be compulsorily visited. In each observation visit to an agency of community organization the student must be exposed to different field Situations. This observation visit will provide an opportunity to have an exposure and orientation to the services being offered by various Organisations/ Social institutions/ Agencies and open communities such as slums / rural settings as a response to community member's needs.

Understanding the Community: To understand the dynamics of the communities specifically the slum and the rural setting. This would imply comprehending the Socio-Cultural dynamics, economic and health status, being familiar with the problems of the communities, their causes, and observing how the people respond to such situations.

Semester – II:

Work with Individuals: Students shall be placed in slums or villages. They need to identify any issue affecting an individual and apply the principles and process of social case work. Similarly two separate case work should be done. The report should reflect learning derived from these two case work.

Work with Groups: Students shall be placed in slums or villages. They need to identify groups, study them well and carefully identify dysfunction if any in them and apply the principles and process of social group work.

Students may also start new groups such as Self Help Groups, children groups, Youth Clubs, integrated groups for person with disabilities, widows groups, senior citizens, adolescent girls group, study groups and etc. The purpose of this group formation is to learn group interaction, goal setting and group dynamics. The students should demonstrate principles and processes of group work. The reports should reflect on the learning derived out of it.

Community Organisation: Students shall be placed in a slum or village in a team of 4. Students shall be trained to demonstrate the skills and process of community organization. Each team shall identify a community issue along with the participation of the people and organize a programme that aims at resolving the community issue. The purpose of this fieldwork is to ensure students learning on community organization through demonstration and also for the students to learn to work in a team.

Rural Camp: All students shall compulsorily participate in a rural camp. This camp provides ample opportunity to learn about the community through experiences of living with them. It is to be a continuous 10 days camp and students and teachers are expected to stay in the rural area for all the 10 days continuously.

Semester – III:

Understanding Formation and Management of Social Welfare Agencies: Each student shall be linked with an agency promoting social welfare. These agencies may be either Governmental or Non-Governmental or Privately managed Corporate houses. Reports of students should reflect on their learning related to the above mentioned areas. Daily Report, Consolidated fieldwork report should be submitted by every student individually. Students will work under a Faculty Supervisor and Agency Supervisor.

- To provide an opportunity to work with social welfare agencies.
- To understand the agency as an organization, its structure, functions, activities sources of funding and management.

Semester – IV:

Students shall be directed to learn about the formation, legal formalities, taxation related formalities, project formulation, resources mobilization techniques, project management, Documentation, POSDCORB, Evaluation, Need Analysis, Problem Tree Analysis, Logical Frame Analysis and so on.

- To develop an understanding of the problem and opportunities in an organisational setting.
- To develop an understanding of the problems and opportunities of the organisation and the methods they adopt to respond to their environment.

Block Placement (On the Job Training): The students of Social Work will be assigned an agency. This agency setting should be located anywhere within or out of the State. Students will work in the agency and obtain on the job training experience. This training lasts for a continuous 25 days prior to the semester examination. It is compulsory for all.

Course Title: HISTORY, PHILOSOPHY, ETHICS AND THEORIES IN SOCIAL WORK

Course Code: SWFC – 01

Level: MSW (I)

Objectives:

- To understand the historical development of the philosophy of Social Work and its emergence as a profession.
- To understand the ethical and value base of Social Work.
- To bring clarity to the basic concepts of Social Work.
- To briefly introduce Social Theory relevant to Social Work practice.

Unit I: History and Evolution of Social Work Practice

History of Social Welfare in the West (UK and USA): The Elizabethan Poor Law (1601), Charity Organisation Society (1869) Settlement House Movement, The Poor Law Commission of (1905), Beveridge Report (1941); The development of Social Work as a profession; Development of the definition of Social Work; (From Charity to Human Rights and Social Justice); History of Social Work education in India: YMCA School of Social Work Lucknow, TISS Mumbai, Delhi School of Social Work

New Delhi; Voluntary Social Work in India.

Unit II: Philosophy of Social Work and Social Work Ethics

The Traditional religious doctrine of Charity; Scientific Naturalism; Liberalism; Scientific Charity; The ideological base of the Welfare state. (with specific reference to the Indian Constitution); Gandhian ideals in Social Work Practice in India; Ambedkar's ideals in Social Work Practice in India; Professional Code of Ethics: IFSW and IASSW code of Ethics; The meta-ethical dimension of Social Work Ethics; Ethical Dilemmas in specific contexts.

Unit III: Basic Concepts in Social Work

Social Work: Concepts, Definitions, Objectives & Functions, and Methods; Contributions of Social Sciences to Social Work; Traditional Social Work and

Radical Social Work; Social Service and Social Welfare Service; Social Welfare and Social Security; Social Reform and Social Justice ; Human Rights and Human Development; Social Inclusion & Empowerment; Social Change and Social Development; Social Action and Social Movements

Unit IV: Theories relevant to Social Work Practice

Social Welfare Theory: Emile Durkheim, Herbert Spencer and Max Weber; Social Justice Theory: Distributive and Retributive Justice, Rawls Theory of Justice, Nozick's Theory of Social Justice; Radical and Marxist perspective in Social Work: L. Althusser; Anti-discriminatory and Anti-oppressive Perspective; Communication Theory: J. Habermas, Erving Goffman; Critical Theory: J. Adorno; Structure Theory: Anthony Giddens & P. Bourdieu; The Ecological Perspective; The Generalist Perspective.

Reading List:

- Beilharz, Peter (Ed) (1991): Social Theory: A Guide to Central Thinkers.
- Elliot, Anthony (Ed) (2010): The Routledge Companion to Social Theory.
- Payne, Malcolm(1997), Modern Social Work Theory and Social Work Practice.
- Mulally, Robert P. (1993), structural Social Work: Ideology, Theory and Practice.
- Reamer, G.G.(2013), Social Work Values and Ethics.
- Hugman, Richard and Smith, David(Ed)(1995) Ethical Issues in Social Work.
- Tnattner, Walter I. (1998) From Poor law to Welfare State: A History of Social Welfare in America.
- Reisch, Michael (2002), The Road not Taken: A History of Radical Social Work in the United States.
- Zastow, C(2009) Introduction to Social Work and Social Welfare: Empowering People.
- Pierson, John(), Understanding Social Work: History and Context.
- Hering.S and Waaldijk (Eds); History of Social Work in Europe(1900-1960)
- Basanquet, Helen Dendy, Social Work in London, 1869-1912; A History of the Charity Organization Society.
- Queen, S.A, Social Work in the Light of History.

Course Title: SOCIAL SCIENCE CONCEPTS - I: SOCIAL STRUCTURE, SOCIAL INSTITUTIONS AND SOCIAL CHANGE

Course Code: SWFC – 02

Level: MSW (I)

Objectives:

- This introductory course seeks to familiarize the students with Sociology as a social science and the basic concepts necessary in understanding the social and cultural processes. It is organized in such a way that even students without previous exposure to sociology could acquire an interest in the subject and follow it. Understand the role of individual in the society and importance of various social Institutions and their impact. Get a scientific insight about the social structure, stratification and issues related to caste & class. Develop clarity about social issues and challenges in the social work field.

Unit – I: Basic Concepts

- Sociological Concepts: Society, Community, Association and Institution, social organisation.
- Social Group: Meaning, Types: Primary, Secondary, In-group - Out-group, formal and informal group, pressure group and reference group.
- Tradition: Little Tradition and Great Tradition, Parochialisation and Universalization.

Unit - II: Social structure and culture

- Concept of Social Structure and function.
- Social stratification: varna, caste, class, occupation, tribe and gender.
- Social Interaction and Social Processes: Associative and Dissociative Social Processes
- Culture: definition and types, norms & values, patterns of culture, culture and personality.

Unit - III: Social institutions and Socialisation

- Marriage and Family: Characteristics, types and functions, Rules of Marriage.

- Kinship: Meaning, Definition, Types, Functions.
- Social Process: Socialisation, Acculturation, Enculturation, Assimilation, Resocialisation, Anticipatory, Adult socialisation and agency of socialisation.
- Status and Role: Multiple Roles, Role Set, Status Set, Role Conflict.

Unit – IV: Social change and Mobility

- Concepts, processes and theories of social change,
- Meaning and nature of Social change,
- Factors of social change: Sanskritisation, Westernisation, Modernisation, Orthogenetic and Heterogenetic factors of social change; Social Mobility: Horizontal & Vertical,

Reading List:

- Abraham Francis, Contemporary Sociology, Oxford University Press, 2006.
- Ahuja Ram, Indian Social System, Rawat Publication, Jaipur, 1993
- Ahuja Ram, Social Problems in India, Rawat Publication, Jaipur, 1997
- Ahuja Ram, Society in India, Rawat Publication, New Delhi, 2010
- Kuppaswamy, Social Change in India, 1998
- Beteille, Andre, *Sociology: Essays on Approaches and Method*, New Delhi: OUP, 2002
- Bose, N.K. 1967, Culture and Society in India, Bombay: Asia Publishing House.
- Bottomore, T.B.: *Sociology: A Guide to Problems and Literature*, Blackie and Sons, Bombay, 1986.
- Desai, A.R. (Ed), *Rural Sociology in India*, Popular Praakashan, 2008
- Dube S C, *Indian Society*. New Delhi: NBT 1995
- Dube, S.C. 1995, *Indian Village* (London : Routledge)
- Dumont L, *Homo Hierarchicus : The Caste System and its Implications*, Chicago University Press, 1970
- Gupta Dipankar (ed). *Social Stratification*, New Delhi: Oxford University Press, 1991

- Jodhka, S.S. (ed), *Village Society*, New Delhu: Orient BlackSwan, 2012
- Karve, Irawati, 1961 : *Hindu Society : An Interpretation*(Poona : Deccan-College)
- Kothari, Rajni, *Caste in Indian Politics in Manoranjan Mohanty* (ed.) *Class, Caste, Gender: Readings in Indian Government and Politics*, New Delhi, Sage. 2004
- Maclver & Page, *Society, Introductory Analysis*, MacMillan, Delhi, 2001.
- Madan & Majumdar, *An Introduction to Social anthropology*, Mayur, 1999.
- Madan, Vandana. *Village in India*, India: OUP, 2003.
- Mandelbaum David,G, *Society in India*, Popular Prakashan, 2008
- Mukherjee Ramakrishna, *Sociology of Indian Sociology*, Allied Publishers, 1979
- Satish Deshpande, "*Contemporary India A Sociological View*", Viking Publishers, New Delhi, 2003.
- Singer Milton, B, *When a Great Tradition Modernises. An Anthrapological Approach to Indian Civilization*, Praeger Publishers, 1972
- Srinivas, M.N, *Caste and its New Avatar*, Penguin, 1996
- Srinivas, M.N. 1963: *Social Change in Modern India* (California, Berkeley: University of California Press).
- Srinivas, M.N. *Caste in Modern India and Other Essays*, Bombay Asia Publishing House, 1962
- Uberoi, Petricia, *Family Kinship and marriage in India*, OUP, 2005

Course Title: SOCIAL SCIENCE CONCEPTS II: POLITICAL JUDICIAL AND ECONOMIC SYSTEM

Course Code: SWFC - 03

Level: MSW (I)

Objectives:

1. To impart knowledge about the political institutions that regulate people's life and promote their interests.
2. To Understand the basic economic concepts, principles, theories & its application in social work profession.
3. To Understand and analyze economic problems on social work perspective.

Unit - I: System of Governance

- Indian Constitution: Objective(Preamble) Characteristic Features and Amendment Process, Fundamental Rights, Fundamental Duties and Directive Principles of State Policy.
- Indian Political System: Parliamentary Democracy, Federalism and Issue of State Autonomy, Coalition Government and Role of Bureaucracy in Administration.
- India- A Welfare State: Social Policy and Social Legislation, Increasing Partnership between Government Agencies and Private Voluntary Organization.
- Judiciary: Judicial Review, Judicial activism and P.I.L.

Unit – II: Social structure and Democratic Process

- Features of Indian Democracy: Multiparty System, Role of National Parties, Regional Parties and Pressure Groups.
- Grassroots Democracy: Panchayati Raj System and Empowerment
- Issues Concerning Religion, Language, Caste, Problem of Gender, Illiteracy and Reservation.
- Institutions: Bureaucracy, National Planning, Election and Participation.
- Socio-Political Movements: Peasant Movement, Trade Union Movement, Tribal Movement, Women's Movement, and Dalit Movement

Unit – III: Development Economic

- Development Economics: Meaning Nature and Significance, Contemporary Development, Problems: Poverty and Inequality.
Economic Systems: Capitalism, Socialism, Mixed Economy – Definitions, Features, Advantages and Disadvantages.
- Rural and Urban economy: Nature and structure of rural economy; rural financial structure-formal and informal; Regional Rural Banks Policy and Planning concerning development of rural area.
Urban economic growth: State and local policies; and urban poverty-policy responses.

Unit – IV: Indian Economy and Financial Institutions

- Indian economy: Nature and Characteristics
Inflation and Over population: Meaning, magnitude, causes and consequences;
Programmes for alleviation of poverty and unemployment.

- Economic Planning and Reforms: Rationale, Features and Objectives; Globalization, Privatization and Liberalization and their impact on Agriculture and Marginalized sections of India.
Meaning and concept of Free trade, Special Economic Zone and its impact on Indian social concerns.
- Financial Institutions: National and International Financial Institutions and their Role in Social Welfare- World Bank, International Monetary Fund (IMF), Reserve Bank of India (RBI), World Economic Forum, NABARD, Commercial Banks; Role of Non Bank Financial Institutions; and National and International Funding agency for social development.

Reading List:

- Kashyap Subhash(ed), 1993, Perspective on the Constitution, Shipra Publication, Delhi.
- Basu D. D., 1992, Introduction to the Constitution of India, Prentice Hall of India Pct. Ltd., New Delhi.
- Kaushik Sushila, 1993, Women and Panchayati Raj, Har Anand publication, New Delhi.
- Kulkarni P.D, Social Policy and Social Development in India.
- Reed Elaw, Social Welfare Administration.
- ND Kumble, Ashish, Deprived Castes and Their Struggle for quality, Publishing House, New Delhi.
- Murthy(ED),Planning for Change- Council for Social Development , Aspects of Social Development.
- Setty Krishna, K.R. Chaitanya, Fundamental Rights and Socio Economic Justice in the Constitution, Publishing House, Allahabad.
- Singh M.P. and Roy Himanshu, Indian Political System, Structures, Policies, Development, 1995, Jnanada Prakashan (P & D), New Delhi.
- Misra & Puri : Advanced economic theory
- Mitchell A Seligson & John T Passé Smith, Development & Underdevelopment- The political economy of global inequality
- Agarwal A.N., Indian economy- Problems of development & planning
- A Vaidyanathan : India's economic reforms & development
- Patel Surendra J: Indian economy towards the 21st century

- Lekhi R.K.: The Economics of Development and Planning
- Dhar P.K.: Indian Economy: Its Growing Dimensions
- Datt Rudra & KPM Sundharam: (2004), Indian Economics Theory: S, Chand & Co New Delhi.
- K.G Karmakar, Rural Credit And Self Help Groups: Microfinance Needs and Concepts in India: Sage publication.
- Thakur S.N., (1988): Economic theory of profile of Indian Economy: Deep & Deep Publication, New Delhi.

Course Title: SOCIAL SCIENCE CONCEPTS III: POVERTY, INEQUALITY AND SOCIAL EXCLUSION

Course Code: SWFC – 04

Level: MSW (I)

Objectives:

- To develop clarity and understanding on the various perspectives about the concept of poverty, Inequality and social exclusion.
- To discuss policy interventions that aim to reduce poverty, inequality and exclusion.

Unit – I: Understanding Poverty

- Concept of Poverty, Different types of poverty: relative, absolute, material and social; culture of poverty, theories of poverty; Deprivation.
- Poverty Measurement: Indicators of poverty, PQLI, HDI, Poverty lines.
- Anti-poverty programmes in India.

Unit – II: Understanding Inequality

- Equality, inequality, capability, post-industrial structuralism, norm of structural exclusion, inequality and globalization;
- Bases of inequality in India: religion, caste, ethnicity, gender, disability, merit, region, language, culture, migrants.
- Diversity & Inequality: Socio-cultural and geological analysis

Unit – III: Understanding Social Exclusion

- Definitions and Concepts, Evolution of the concept of Social Exclusion; Dimensions of Social Exclusion, Theories of Social Exclusion;
- Social Exclusion and the role of: Religion, Race, Caste, Ethnicity; Gender; and Disability.
- Relationship of Social Exclusion and Discrimination

UNIT – IV:

- Social policy response to combat Poverty. Inequality and Social Exclusion in India.
- The role of social work in addressing issues of poverty, inequality and social exclusion.

Reading List:

- Sen, Amartya 2000 Social Exclusion: Concept, Application and Scrutiny. Social Development Papers NO.1. Asian Development Bank.
- Sen, Amartya "Poverty as Capability Deprivation," chapter 4 in Development as Freedom, OUP, 2000.
- Sullivan, Elizabeth 2002 Social Exclusion, Social Identity and Social Capital: Reuniting the Global, the Local and the Personal. De Montfort University, UK.
- Silver, Hilary and S.M. Miller 2003 Social Exclusion: The European Approach to Social Disadvantage. Indicators.2.2: 1-17.
- Haan, Arjan de 2001 Social Exclusion: Enriching the Understanding of Deprivation. Institute of Development Studies and Poverty Research Unit, University of Sussex. Sussex. UK
- O'Brien, D, Joanna Wilkes, Arjan de Haan, Simon Maxwell Poverty and Social Exclusion in North and South. Institute of Development Studies and Poverty Research Unit, University of Sussex. Sussex. UK.
- Kabeer, Naila 2006 Social Exclusion and the MDGs. The Challenge of 'Durable Inequalities' in the Asian Context. Institute of Development Studies and Overseas Development Studies Institute.
- Beall, Jo 2002 Globalization and Social Exclusion in Cities: Framing the Debate with Lessons from Africa and Asia. Development Studies Institute, LSEP, London.
- Chebolu, Radha Mohan 2007 Corporate Quotas: The Myth Action'. Pravartak. 2:2: 159-165.
- Saith, Ruhi 2001 Social Exclusion: The Concept and Application to Developing Countries. QEH Working Paper Series -72.
- Loury, G.C 2000 Social Exclusion and Ethnic Groups: The Challenge to Economics. Annual World Bank Conference on Development Economics 1999. The International Bank for Reconstruction and Development! The World Bank.

- Jenkins, Robert 2006 Social Exclusion of Scheduled Caste Children from Primary Education in India; UNICEF India. New Delhi.
- Sen, Amartya 1992 Inequality Re-examined, New Delhi Oxford University Press.
- Byrne, David 1999 Social Exclusion. Buckingham: Open University Press.

Course Title: SOCIAL SCIENCE CONCEPTS IV: PSYCHOLOGICAL CONCEPTS, HUMAN BEHAVIOUR AND RELATIONSHIPS

Course Code: SWFC – 05

Level: MSW (I)

Objectives:

- To understand the concept of human behavior
- To understand the basic concepts and factors of human behavior
- To understand the relevance of psychology in social work
- To understand the concept of personality and its application in social work education

UNIT – I: Nature and Scope of Psychology

Meaning and definition of psychology – Schools of psychology: Structural, Functional and Behaviourist, Importance of psychology in social work practice, Factors influencing Human Behaviour-Heredity, Environment and Self

UNIT – II: Human growth and development

Human growth and development: Meaning and principles; Social, Emotional, Cognitive and Physical Stages in Life Span approach from Conception to Old Age: characteristics, needs, tasks and problems at each stage.

UNIT – III: Personality

Meaning of personality, Theories of personality: Trait and Type theories; important concepts of the contributions of Freud, Jung, Adler, Maslow and Ericson: factors influencing personality Development Psychological Processes in Behaviour: Perception, Emotion, Motivation, Attitude; Processes of Adjustment: Concept and Factors; Coping Mechanism, Defence Mechanism

UNIT – IV: Theories of Human Development

Psychoanalytic theory: Psycho-sexual theory by Freud, Psycho-social theory by Erickson.

Behavioural theory: Classical conditioning by I P Pavlov, Operant.

Humanistic theory: Abraham Maslow and Carl Rogers, Alfred Adler. Cognitive theory: Jean Piaget's theory

Reading List:

Davidoff.L.L.: Introduction to Psychology, Auckland; McGraw Hill Inc:1881

Morgan, C.T.& King, R.A:Introduction to psychology New York.

Weix;J.R& Schopler J: McGraw Hill;7th Ed.,1986.

Munn,N.A.:psychology-The fundamentals of human Behaviour;London;

Hurlock E. B: Developmental psychology, New Delhi, Tata McGraw Hill 5th Ed.1971

Rayner, Eric: Human Development, London; George Allen and Unwin, 1978.

Sareswathi T.S, Dutta R: Development psychology in India, Delhi; Sage publications, 1987.

Kuppusamy B: An Introduction to social Psychology; Bombay; Media Promoters and pub.Pvt.Ltd., 1980.

Coleman, J.C: Abnormal Psychology and Modern Life

Fair-weather George W.: Social Psychology Treating in Mental Illness, Sydney, John Wiley and Sons

Course Title: WORKING WITH INDIVIDUALS

Course Code: SWCP – 01

Level: MSW (II)

Objectives:

- To develop theoretical knowledge and understanding about working with individuals
- To critically examine the application of social case work method in human

personality and development.

Unit - I: Basics of Case Work

Social Case Work: nature, assumptions, values and principles. Components of social case work: person, place, problem & process. History of social case work.

Unit – II: Client Worker Relationship

Need and importance of Relationship: nature and ways to establish. Psychoanalytical theory. Ego - functions and defense mechanisms. Concept of Human needs, stress, social role and adaptation

Unit – III: Process of Case Work

Process of social case work- study, assessment, goal formation, planning, treatment, evaluation, termination. Techniques of social case work: interviewing, support, encouragement, clarification, correcting perception, reality orientation; resource mobilization, home visit, interpretation, topical shift, logical reasoning, crisis intervention, burnout. Transference and Counter-Transference and its use in case work. Supportive techniques. Referral: its use in social case work. Recording: types and format.

Unit – IV: Models of Case Work

Models of social case Work practice: Problem solving, Psycho- social, Task oriented. Rational Emotive Therapy in social case work. Discussion on role of case worker from the records in school, family and marriage settings. Presentations and discussions on cases and practical questions.

Readings List:

Banarjee, G.R. TISS Series 23. Papers on Social Work: An Indian Perspective; Tata Institute of Social Sciences, Mumbai. TISS(Series 23).

Batra, Sushma & Marlin Taber, 1996. Social strains of Globalization in India, Mittal Publication, New Delhi.

Biestek, F.P. 1970. The Case Work Relationship: London: Unwin University Books, Impression.

Bogo, Mario, 2006-07. Social Work Practice: Concepts, Processes and Interviewing. Columbia University Press-2006. Indian Reprint by Rawat Publication : New Delhi,2007.

Friedlander, W.A. 1964. Concepts and Methods of Social "Work, New Delhi: Prentice Hall of India Pvt. Ltd.

Fisher, J, 1978. Effective Case Work Practice: An Effective Approach, New York McGraw Hill Book Co.

Florence, H., 1964. Case Work: A Psycho social therapy, Random House, New York.

Farard, M.L. & N.K. Hunnybun, 1962 The Case Work's use of relationship London, Tavistock. Pub.

Goldstein, H., 1970. Social Work Practice: A Unitary Approach, Carolina: Univ. of S. Carolina Press.

Grace, Methew, 1992. Introduction to School Case Work, Tata Institute of Social Sciences, Mumbai.

Hamilton, G., 1946. Principles of Social Case recording, New York: Columbia University Press.

Himilton, Gordon, 1959. Theory & Practice of Social Case Work, New York: Columbia University Press, VI Ed.

Husband. E.(ed) New Developments in Social Case Work Reading in Social Work, Vol. III, London: Georque Allen & unwin Ltd.

Mishra, P.D., 1985. Samajik Vijyaktik Sewa Karya (Hindi) Uttar Pradesh Hindi Sansthan, Lucknow.

Perlman, 1957 Social Case Work-A Problem solving Process, Chicago: The University of Chicago Press, V Impression.

Pathak, S.H. 1966. Records in Social Case Work, Delhi School of Social Work, Delhi.

Pinkus, Helen, 1971. Case Records for Teaching Purposes, Faculty as social Work, M.S. University, Baroda.

Roberts R.W. Nee, R.H. 1972 Theories of Social Case Work, the Uni. Of Chicago Press, Chicago, London.

Reid, W.K. & Anne W. Shyne, 1969 Brief and Extended Case Work: New York: Columbia Uni. Press.

Scott Briar and Henry Miller, 1971 Problems and issues in social Case Work: Columbia University Press, New York.

Timmis, N., 1964. Social Case Work: Principles and Practice, London; Rout ledge and Kegan Paul.

Timmis, N., 1972. Recording in Social Work, London, Rout ledge & Kegan Paul.

Terner, F (Ed) 1974. Social Work Treatment, New York: The Free Press.

Upadhyay, R.K. 1991. Samajik Vijyaktik Karya (Hindi) Haryana Sahitaya Academy, Chandigarh.

Upadhyay, R.K. 1993. Indian Philosophical Concepts in Clinical Social work, Kurukshetra Press, Kurukshetra.

Upadhyay, R.K. 2003. Social Case Work, Rawat publications, New Delhi, Jaipur.

Course Title: WORKING WITH GROUPS

Course Code: SWCP – 02

Level: MSW (II)

Objectives:

- To understand theoretical knowledge of social group work.
- To understand group work as an instrument of change/development in individual in groups.
- To understand the relevance of group work in different settings.

Unit – I: Social Group Work:

Definition, objectives and scope - Models of Social Group Work- Historical Development of Group Work, Principles of Group Work, Values, Significance, Limitation of social group work practice in India.

Social Groups and Development: Definition, Characteristics, Types of Groups and Functions of a Group - Basic Human Needs met by Groups at Different Stages of Group Development - Group Process : Bond, Acceptance, Isolation, Rejection, Sub- Group Formation, Withdrawal, Behaviour Contagion, Conflict and Control.

Unit – II: Approaches to the Practices of Group Work:

Group Therapy, Group Psychotherapy, Use of Home Visits and Collateral Contacts. Leadership: Concepts, Definition, Characteristics, Functions, Qualities of Leader, Types and Theories of Leadership, Training for Leadership - Sociometry and Sociogram - Group Work Supervision: Meaning, Purpose and Functions. Skills of social group worker.

Unit – III: Group Work Programme Planning:

Meaning and Definition of Programme, Principles and Process of Programme Planning and the place of Agency in Programme Planning - Programme Laboratory: Values and Techniques (Games, Singing, Dancing, Dramatics, Street play, Puppetry, Group Discussions, Excursion, Psychodrama, Socio drama, Role play, and Brain Storming); Rural Camp: Planning, Organizing, Executing, Evaluating and Reporting.

Unit – IV: Group Work Recording:

Meaning, Purpose, Principles, types of group work recording; Steps and Criteria for Good Group Work. Application of Group Work Methods in Different Settings: Community Settings, Medical and Psychiatric Settings, De-Addiction Centres, Correctional Institutions, Schools, Industries, Physically Handicapped and Aged Homes.

Reading List:

Alissi, A.S.1990 Perspectives on Social Group Work Practice: A Book of Readings, New York, The Free Press.

Balgopal, P.R. and Vassil. Groups in social Work- An Ecological Perspective, New York, Macmillan Publishing Co. Inc.

Bhatt, P.M.1970 Records of Group Work Practice in India, faculty of Social Work, M.S. University, Baroda.

Brandler S & Roman CP 1999 Group work, Skills and Strategies for Effective Interventions, New York. The Haworth Press.

Brandler S & Roman CP 1991. Group work, Skills and Strategies for Effective Interventions, New York. The Haworth Press.

Garland, J.A.(Ed) 1992. Group Work Reaching Out: People, Places and Power, New York, The Haworth Press.

Garwin, C 1987. Contemporary Group Work, New York Prentice- Hall Inc.

Golpelwar, Banmala, 2007 social Group Work, Indian Institute of Youth welfare, Nagpur.

Kemp, C.G. 1970. Perspectives on the Group Process, Boston: Houghton Mifflin C.

Klein, A.F.1970. Social Work Through Group Process,: School of Social Welfare- Albany: State University of New York.

Konopka, G 1963. Social Group Work: A Helping Process, Englewood Cliff, NJ Prentice Hall, Inc.

Kurland, R & Salmon, R 1998. Teaching a Methods Course in Social Work with Groups Alexandria: Council on Social Work Education.

Middleman, R, R 1968. The Non- Verbal Methods in Working with Groups.

Northen, H 1969. Social Work with Groups, New York: Columbia University Press.

Pepell, C.P & Rothman B. Social Work with Groups, New York: The Haworth Press.

Sundel, M, Glasser, P sari, Individual change Through Small R., Vinter, 1985 Groups. The Free Press.

Samuel, T. Gladhing 1999. Group Work: A Counseling Specility, Simon& Schaster, NJ Printice Hall Inc.

Siddiqui H.Y.2005. Group Work, theories and Practice, Rawat Publication New Delhi.

Toseland RW 1998. An introduction to Group Work Prectice, New York Macmillan Publication Co.

Trecker, Harleigh B 1990. Social Group Work: Principles and Practice, New York: Association Press.

Wilson, G. Ryland, G 1949. Social Group Work Practice, Boston: Houghton Mifflin, Co

Course Title: WORKING WITH COMMUNITIES

Course Code: SWCP– 03

Level: MSW (II)

Objectives:

- To provide theoretical and conceptual understanding of community organization as a method in social work.
- To practice and critically examine the steps and process of community organization in various community setting.

Unit – I: Community and Community Organisation

Community: Concept, characteristics, types and functions. Understanding of community organisation practice: Definition, values, ethics and principles; Historical development of community organisation practice; Community organization as a method of social work intervention; Role and skills of Community Organizer

Unit – II: Models and Strategies of Community Organization

Models and Strategies of Community Organization - Locality Development Model - Social Planning Model - Social Action Model - Select methods of public interest mobilization, litigation, protests and demonstrations, Dealing with authorities, Public Relations, Planning, Monitoring and Evaluation - Roles in different models attributes and attitude.

Unit – III: Community Organization Practice in the Context of Various Settings

Health, Education, Residential institutions, Livelihood and work, Natural resource management, Sustainable development, Working with tribal and Dalit populations, in rural and urban communities, Displaced population and rehabilitation, Community organization in disaster preparedness and response, Peace building and national integration .

Unit – IV: Social Action

Social work and social action, History of social action in India, Radical or emancipatory social work; Rights based approach, Different forms of protest, various contributions to the theory of social action (Lees, Saul Alinsky, Paulo Friere, Mahatma Gandhi's (Sarvodaya and Siddique) Strategies for social action from various social movements.

Reading List:

- Gangrade, K. D. 1971. Community Organization in India, Mumbai; Parkashan, 1971.
- Karamer, R.M. & Spech, H. Reading in Community Organization Practice-Hall Inc. Englewood Cliffs, 1983.
- Murphy C. G.: Community Organization Practice, Boston; Houghton Mifflin Co. Ross, 1954
- Patil, S.H. Community Dominance & Political Modernization; Mittal Publication; New Delhi; 2002.
- Rashmi Dewas & R. Community Participation & Empowerment in Primary Education; Mittal Publication New Delhi; 2003.
- Sengupta, P.K.; Community Organization Process in India, Kiran Publishers, 1976.
- Selgen, S. Empowerment & Social Development Issues in Community Participation; Mittal Publication: New Delhi; 2005.
- Speech, H & Karmer: R.M; 1969 Reading in Community; Englewood Cliffs: Prentice Hall.
- Surya Rao: Under Development with community initiative retrospect & prospect: mittal Publication: New Delhi, 2000.

- Zastrow Charles: 1978. Introduction to social Welfare Institution Social Problems, services & Current Issues (Social work Community Practices Part-3 Chapter-10) Ontario: The Dorsey Press.
- Butcher H. 2007: Critical community Practice.
- Kothari M 2006: Development and Social Action, Rawat Publication, New Delhi.
- Grundy M : Community Work, Rawat Publication, New Delhi,
- Siddiqui. H.V., Social Action in India.

Course Title: A HUMAN RIGHTS APPROACH TO SOCIAL WORK PRACTICE

Course Code: SWCP – 04

Level: MSW (II)

Objectives:

- To understand Human Rights and engage in critical self-reflection and correction for professional development.
- To recognize the extent to which a culture's structures and values may oppress, marginalize, exclude and enhance power and privilege.
- To engage in processes that advance social and economic justice.
- To critically analyse how the intersection of Human Rights Values with Social Work influences practice

UNIT I: Introduction to Human Rights

- Historical evolution and normative framework of the Universal Human Rights System: The UN Charter, Universal Declaration of Human Rights, the ICCPR and ICESCR.
- The generations of Rights
- UN vs National perspectives: Issues of cultural relativism: Rights and Duties, Rights of Indigenous Peoples and Rights of the Scheduled Tribes, Racial discrimination and Caste based discrimination, Right to Self-determination.

UNIT II: Human Rights in the Indian Constitution: Interpretation and Application

- The Preamble, the Fundamental Rights and the Directive Principles of State Policy;
- Special provisions for vulnerable groups: Scheduled Castes, Scheduled Tribes, Women, Religious, cultural and linguistic minorities.

- Role of the Judiciary in responding to Human Rights issues in India: The case of Niyamgiri, Reservations to OBCs, Women's issues, etc
- Role of the National Commissions on: Human Rights, Women, Scheduled Castes, Scheduled Tribes, Minorities, Backward Classes.
- Role of Human Rights NGOs.

UNIT III: Monitoring Human Rights

- Who monitors human Rights?: Social Work Professionals, Medical Professionals, the Police, Lawyers and Judges;
- How to monitor? : prisons, trials, hospitals, cemeteries, vulnerable groups;
- How to investigate? : practical steps on gathering evidence;
- How to report? : How to write a report, How to take a statement, How to collate evidence;
- Commissions of Enquiry; the NHRC
- International and National Reporting and Complaints Procedure.

UNIT IV: Human Rights in Social Work Practice

- The elements of the Human Rights approach and its value to Social Work: Respecting principles of Equality and non-Discrimination; incorporating the Gender perspective.
- The Right to Development: Application to International Agencies and NGOs; ensuring participation of service users; accountability of service providers and empowerment of all stakeholders.
- Applying Human Rights approach to Advocacy in the context of Social Work: Legislation; funds to respond to identified social needs; follow-up; public campaigns; networking.

Reading List:

- Youth for Human Rights (2010). What are human rights?
<http://www.youthforhumanrights.org/what-are-human-rights.html>
- Ife, J. (2001). Local and global practice: Relocating social work as a human rights profession in the new global order. *European Journal of Social Work*, 4(1), 5-15.

- United Nations. (1948). The Universal Declaration of Human Rights. Retrieved from <http://www.un.org/en/documents/udhr/>
- United Nations. (1994). Human rights and social work: A manual for schools of social work
 - and the social work profession. Geneva: United Nations Centre for Human Rights.
- Ife, J. (2012). Human Rights and Social Work: Towards Rights based Practice, CUP: London.
- Reichert, E. (2011). Social Work and human Rights: A Foundation for policy and practice, Columbia University Press.
- Lundy, Colleen (2011). Social Work, Social Justice and Human Rights: A Structural Approach to Practice. University of Toronto Press.
- Mullaly, Bob. () Challenging Oppression and Confronting Privilege, OUP.
- Wronka, Joseph. M. () Human Rights and Social Justice: Social Action and Service for the Helping and Health Professions, Sage publications.
- Hokenstad, Healy, M. and Segal, Uma A (2013). Learning to Teach, Teaching to Learn.

Course Title: SOCIAL WELFARE ADMINISTRATION

Course Code: SWCP – 05

Level: MSW (II)

Objectives:

- To have conceptual clarity about social welfare Administration.
- To understand the principles, structure and functioning of the social welfare Administration system in India.
- To understand the role of voluntary agencies/NGOs in social welfare administration.

Unit – I: Concept: Administration

- Evolution, Meaning Nature, Bureaucratic Human Relations, Philosophy of Social

Welfare Administration, Distinction between Welfare Administration and Public Administration.

- Structure of Social Welfare Administration in India: Departmental Administration in the Government of India; Ministry of Social Justice and Empowerment; Ministry of Women & child Development; Ministry of Rural Development; etc.

Unit – II: Principles and Techniques

- Planning: meaning and process.
- Organizing: Meaning, types of organizational structure, Delegation and Decentralization, Personnel Policy of the organization.
- Staffing: Recruitment and selection process, Terms and conditions of service Probation, confirmation, promotion, Human Relations in Social Welfare Agencies,
- Budgeting: Formulation, controlling mechanism, Problems of budgeting in welfare agencies.
- Commitment of Personnel.

Unit – III: Voluntary Agencies/NGOs

- Voluntary agencies/NGOs in Social Welfare: mandate, role and functioning.
- Administrative structure of voluntary Agencies/NGOs: General Body, Board of Management / Executive Committee, Directors, Secretary Policy formulation, Fund raising, public relations, challenges.
- Voluntary Organizations in the Welfare Section: Helpage India, Child Relief and you, Spastic Society of Northern India, etc.

Unit – IV: Institutions of Social Welfare

- Structure & functions of Central Social Welfare Board.
- State Social Welfare Advisory Board.
- Rehabilitation Council of India
- National Commission for Scheduled Tribes, National Commission for Scheduled Castes, National Commission for Minorities, etc.
- National Institute of Social Defense.

- National Institute of Public Cooperation & Child Development (NIPCCED) etc.
- Welfare Schemes of the various departments of the government of Odisha and the Department for SC,ST, OBC and Minorities Development.

Reading List:

- Choudhry Paul, Social Welfare Administration
- Sharma Urmila & Sharma S K: Public Administration, Atlantic Publishers and Distributors New Delhi.
- Arora Ramesh K. and Goyal rajni, 1995, Indian Public Administration Institutions and Issues: Viswa Prakashan, New Delhi.
- Ramachandran Padma, 1996, Public Administration in India: National Book Trust New Delhi.

Course Title: SOCIAL WORK RESEARCH AND STATISTICS

Course Code: SWCP-06

Level: MSW (II)

Objectives:

- To develop understanding about the components involved in the social work research methodology.
- To improve the ability to link between practice, research, theory and their role in enriching one another.
- To make students understand the importance of statistical tools and techniques and help them to arrive at better research conclusion.

Methods of Social Work Research

Unit-I

Social Work Research: Meaning and Objective. Ethical, Political and cultural context of Social Work research. Social Work research fields: professional practices research, contextual research, system research, trend research, community based participatory research. Qualitative vs. Quantitative research. Research process:

Feasibility issues influencing the research process. Research problems, questions, variables and hypotheses: Conceptualisation and operationalization. Critiquing knowledge bases and reviewing the literature.

Unit-II

Research Design: Matching design to purpose. Designs for evaluating policies, programs & practices: Single Subject Design, Case studies, Survey design, Experimental and Quasi experimental design. Finding research subjects: Sampling: Probability and non probability sampling. Sources of data and data collection techniques: Observation, Interview, Questionnaire, Focus Group Discussion, Brain storming, Delphi method and Projective techniques. Writing research abstract and research report: components of research report.

Methods of Data Analysis

Unit-III

Qualitative Analysis: Thematic analysis, Content analysis, Triangulation, *Phenomenology, and Hermeneutical Analysis*. Quantitative Analysis: Choosing and Understanding Statistical Tests: Levels of Measurement, Descriptive Statistics- Measures of Central Tendency: Mean Median and Mode, Measures of Dispersion: Standard deviation and variances.

Unit-IV

Inferential Statistics and Hypothesis Testing: Correlation and regression analysis, hypothesis testing and test of significance. Bi-variate Statistics: t-tests, ANOVA and Chi Square. Introduction to SPSS for analyzing quantified data. Critical Reflections in Data Analysis: looking for anomalies, discussing findings, analyzing limitations and biases of the study and considering future directions for research.

Reading List:

Anderson, J. Durston H. S & Pooram (1992) Thesis and Assignment Writing; Wiley Eastern Ltd, New Delhi.

Baper, L.T. (1998) Doing Social Research, McGraw Hill, Singapore.

Bryman, Alan & Duncan Cramer (1990) Qualitative data analysis for Social Scientists, Rutledge, London.

Denzin, K Norman & Lincoln, S Yuonna., (1998), Collecting and Interpreting Qualitative Materials, Sage publications, New Delhi.

Denzin, K Norman & Lincoln, S Yuonna.(2000), Hand book of qualitative research, Sage publications, Thousand Oaks.

Gupta, S. P (1992) Elementary Statistical methods sultan chand & sons, New Delhi.

Goode & Hatt (1981) Methods in Social Research, McGraw Hill, New Delhi.

Laldas, D.K (2000) Practice of Social Research, Rawat, Jaipur.

Nachmias & Nachmias (1981) Research methods in the Social Sciences; St. Martin"s press, New York.

Richard, G., et al, (2003) Scaling Procedure –issues and applications, Sage, Thousand Oaks.

Rubin & Bobbie (1993) Research Methods for Social Work, Brooks/Cole publishing Company, California.

Fundamentals of Research Methodology and Statistics by Y. K Singh , New Age International

C.R.Kothari, Research Methodology.

Mukarji Nath Ravindra, Social Research and Statistics, Vivek Prakashan, Delhi.

Kapoor B.K. & Gupta, S.C., Fundamental of Statistics, S. Chand Publication, New Delhi.

Ramchandran, P. Social Work Research And Statistics, Bombay : Allied Publishers

Gupta, S.P, Statistical Methods, Sultan Chand & Sons

Swain A.K.P.C, A First Course in Statistics With Applications, Kalyani Publishers

Patri, D., Statistical Methods, Kalyani Publishers

Bhatnagar, O.P. Reserach Methods And Measurements In Behavioral And Social Sciences, New Delhi, Agri Cole Publishing Academy

Dwivedi R.S. Research Methods in Behavioral Sciences. Delhi, Macmillan

D'cruz, Jones, Social Work Research

Ahuja Ram, Research Methods

SPSS for Social Scientists By Robert L. Miller, Ciaran Action, Deirdie A. Fullerton And John Maltby.

The SPSS Book: A Student Guide To The Statistical Package For The Social Sciences By Matthew J Zagumny

SPSS For Windows Step-By-Step: A Simple Guide And Reference By Paul Mallery And Darren George

Discovering Statistics Using SPSS by Andy Field

Drake, Brett, and Melissa Jonson-Reid. 2007. *Social work research methods: From conceptualization to dissemination*. Boston: Allyn and Bacon.

Grinnell, Richard M., and Yvonne A. Unrau, eds. 2007. *Social work research and evaluation: Quantitative and qualitative approaches*. 8th ed. New York: Oxford Univ. Press.

Rubin, Allen, and Earl R. Babbie. 2007. *Essential research methods for social work*. Belmont, CA: Thomson Brooks Cole.

Rubin, Allen, and Earl R. Babbie. *Research Methods for Social Work*. 6th ed. Belmont, CA: Thomson Brooks Cole, 2008.

Light, R. J., and D. B. Pillemer. 1984. *Summing up: The science of reviewing research*. Cambridge, MA: Harvard Univ. Press.

Course Title: CHILD PROTECTION AND CHILD RIGHTS

Course Code: SWCP – 08

Level: MSW (III)

Objectives:

- To understand the situation of children in India
- To understand the national & international efforts for child welfare
- To know the child related laws.
- To know the programmes & services for child welfare
- To understand & acquire the skills for working with children

Unit – I: Child Rights

Concept of Child Welfare and Child Rights; Demographic profile of the child in India, UN convention on the Rights of the Child, National Policy for Children(1974), National Policy on Education(1986), National Nutrition Policy (1993), National Charter for Children (2004), National Plan of Action for Children (2005) Changing trends in child welfare and protection services.

Unit - II: Problems of the Child and the response of Social Work

Social Work with: Street children, destitute, delinquent, abandoned, orphaned, child with disabilities, sexually abused child, child labour, child trafficking, children affected by natural calamity, HIV/AIDS affected and infected children, child prostitute, children in

poverty, the girl child, truant children, runaway children.

Health Problems: Causes of infant mortality and morbidity; Common childhood diseases; Development delay; Child Nutrition; Nutritional problems: PEM, Micro-nutrient deficiencies disorders, Mineral and vitamin deficiencies, Nutritional guidelines on infant and young child feeding.

Unit – III: Legal Provisions for child protection

The Constitution of India: Articles 14,15,15 (3),19 910 9a0, 21,21 (a),23,24,39(e),39(f); The Indian Penal Code, 1860: Feticide (Section 315 and 316), Infanticide (section 315), Abatement of Suicide (section 305), Exposure and Abandonment (section 317), kidnapping and Abduction (section 360 to 369),Procurement of Minor Girls (section 366-A), Selling of girls for Prostitution (section 372,373), Rape (Section 376), Unnatural sex(section 377); The Pre-natal diagnostic Techniques (Regulation and Prevention of Misuse) Act, 1994; The Juvenile Justice (Care and Protection of Children) Act, 2000; The Immoral Traffic (Prevention) Act, 1956; Child Labour (Prohibition and Regulation) Act, 1986; The Prohibition of child Marriage Act, 2006; The Commission for the Protection of child Rights Act, 2005; Protection of Children Against Sexual Offences Act,2012.

Unit - IV: Social work practice with children

Child guidance clinics; School social work; Child counselling; Life skills training; Child help lines; Adoption services; International and national NGOs working with children: UNICEF, CARE, CRY, SOS-Children's Villages.

Reading List:

- Banerjee, B. G. (1987) Child Development and Socialisation, New Delhi : Deep & Deep Publication
- Baroocha, Pramila Pandit (1999) Hand book on Child, New Delhi : Concept Publishing Com.
- Bhalla, M. M. (1985) Studies in Child Care, Delhi : Published by NIPCCD
- Bhangana. Vinita (2005) Adoption in India.
- Chaturvedi, T. N. (1979) Administration for Child Welfare, Admin, New Delhi : Indian Institute of Pub.
- Choudhari, D. Paul (1980) Child Welfare / Development, Delhi : Atma Ram & Sons.
- Deshpabhu, Rashmi (2001) Child Development & Nutrition Management, Jaipur : Book Enclave
- Ghathia, Joseph (1999) Child Prostitution in India, New Delhi : Concept Publishing Company
- Hugh, Jolly (1981) Diseases of Children, Oxford, London, Edinburgh : The English Language book society and Blackwell Scientific Publications

- Hurlock, Elizabeth B. (1968) Child Development, New Delhi : Tata McGraw Hill Pub; Com; Ltd.
- Rani, Asha (1986) Children in Different situations in India- A Review, TISS.
- UNICEF, State of Worlds Children Annual Report
- Venkatesan S.(2004) Children with Developmental Disabilities.

Course TITLE: SOCIAL WORK WITH WOMEN: ISSUES OF GENDER AND DEVELOPMENT

Course Code: SWCP – 09

Level: MSW (III)

Objectives

- Develop an ability among students to analyze the position of women in rural and tribal society and the role of the social worker thereof.
- To develop an understanding of problems specific to women.
- To be introduced to legislative protection of women.
- To understand the concept of gender in various areas of social work practice.

UNIT-I: Construction of Gender

- Socio-Cultural Concepts: Gender, Sex, Patriarchy, Masculinity and Feminism.
- Women and Society: Status of Women in Indian society (Urban, Rural, Tribal and Dalits):
- Role of Women in Socio- Economic life: Family, Marriage, Religion, Caste, Tribe, Economy, Health and Education, Environment , Women and Media

UNIT-II: Issues and Challenges of Women in India and Odisha

- Problems of Women: Dowry, Domestic Violence, Crime against Women, Immoral Trafficking, Prostitution etc.
- Maternal Health Issues: Maternal Morbidity, Maternal Mortality, Infant Mortality, Female foeticide, Women's reproductive health and rights; and Changing concepts of Motherhood: Surrogate motherhood; Family Planning: Objectives and methods.
- Community based mental health programmes with a focus on mental health needs of women.

UNIT-III: State and Women

- Social Legislation for Women : Property Rights Act under the Hindu Succession Act,1956(Sect 6,14,15,16), Property Rights of Muslim Law, Dowry Prohibition Act,1961, Family Courts 1984, The Pre-conception and Pre-natal Diagnostic Techniques(Prohibition of Sex Selection) Act 1994, The

Protection of Women from Domestic Violence Act,2005, The Indecent Representation of Women(Prohibition)Act, 1986

- Social Policies regarding Women: National Health Policy, National Education Policies,
- Provisions, Schemes and Programmes for women empowerment.

UNIT-IV: Women's Development and Social Work

- Concept of engendering Social Work and the role of the Social Worker.
- Applications of Social Work methods for Women empowerment and Development.
- Political Empowerment of Women: Participation of Women in National Movements; Women in National and Regional politics, Panchayati Raj Institutions and Urban Local bodies.

Reading List:

- Brook E and Davis, Ann (1985) Women, The family and Social Work, London.
- Samanta, R.K (2005) Empowering Rural Women and Issues, Opportunities and Approaches, B.R world of books
- Saxena,S(2005) Crimes against Women and Protective laws, Deep and Deep Publications, Pvt.Ltd. New-Delhi
- Paul chowdhry, D Women welfare and Development(A Source Book) Inter-India Publication, New-Delhi 1991
- Agarwal Sushila, Status of Women, Print well Publisher, New-delhi.
- Bodra Gomati, Empowerment of Tribal Women
- Baig, Tara Ali Women In India, Ministry of information and Broadcasting, Govt. Of India Publication Division, New Delhi
- Agrawal Bina, Gender And Legal Rights in Landed Property in India, Kali for Women.
- Bhargava V. Durvar, Mental Health from a Gender Perspective, Sage publication.
- Gore,M.S: Urbanisation & family Change, popular Prakashan, Bombay, 1986.
- Agarwal, R.K. Hindu Law-central Law Agency, Allahabad.
- Adhikari, A.K and Pramanik: Gender inequality and Women's empowerment, Abhijeet Publication,2006
- Sikligar, P.C:Empowerment of Tribal Women, Jaipur Mangal Deep Publications,2006.

Course Title: ETHNIC SENSITIVE SOCIAL WORK PRACTICE IN INDIA

Course Code: SWCP - 10

Level: MSW (III)

Objectives:

- To tune Social Work Practice to the values and dispositions related to the social background of the client and the behavior of the larger social system, to work towards social justice and human liberation.

UNIT – I: What is Ethnic Sensitive Practice (ESP) in Social Work?

- Definition, conceptual formulation and perspectives on ethnic sensitive practice.
- Assumptions and principles for ethnic-sensitive practice.
- The layers of understanding in ethnic sensitive practice.
- Ethnic sensitive practice with displaced populations, migrants, families, communities, students, etc.

UNIT – II: The Ethnic Scenario in India

- The Schedule Tribes (ST), particularly vulnerable tribal groups (PVTGs) and Denotified Tribes: Demographic profile, their education, health, employment and economic status.
- The Scheduled Castes (SC) and other Backward Castes (OBC): Demographic profile, their education, health, employment and economic status.
- An analysis of the caste system, and the practice of untouchability.
- Ethnic based discrimination in India with respect to public services, government schemes and employment programmes etc.
- An analysis of industrialization, urbanization, liberalization, privatization, globalization, development projects and their impact on STs and SCs land alienation, loss of forest rights, displacement, socio-cultural loss, poverty and impoverishment, indebtedness, psychological issues.

UNIT – III: Constitutional Safeguards Legal Provisions and Policies

- The Preamble, The Directive principles of state policy ensuring social safeguards: Articles 17,23,24,25,(2)(b); Economic safeguards: Articles 46, 23, 24, 244, 275(I), fifth schedule, sixth schedule; Education and cultural safeguards: Articles 15 (4), 29 (i), 350 A; Political safeguards: Articles 164 (I), 330, 332, 334, 371 A, 371 B, 371 C, 371 C, 371 F, 371 G, 371 H. Service Safeguards; Article 16 (4), 16(4a), 335, 320 (4); To ensure these safeguards Articles 338 and 338A provide for two statutory commissions: The National commission for Scheduled Castes and the National Commission for Scheduled Tribes.
- Protective Legislations: The Protection of Civil Rights (PCR) Act 1955; The Scheduled Castes and Scheduled Tribes (Prevention of Atrocities): POA Act, 1989; The Orissa Scheduled Areas Transfer of immovable property (by ST) Regulation (1956); The Orissa Land Reforms Act (1960)
- Schemes of the Ministry of social justice and empowerment; Scheduled Caste Sub Plan (SCSP) and Schedule Tribe Sub Plan (STSP) introduced since the sixth Five Year Plan.

UNIT – IV: Strategies for Social Workers to Work for Social Justice and Rights

- Identifying the sources and dynamics of injustice, discrimination and oppression.
- Adopting the layers of understanding in ESP in all fields of social work practice.
- Adopting 'radical' change oriented methods such as: advocating human rights, affirming core social work values, affirming politics of social justice and human liberation, facilitating critical consciousness, participatory-democratic egalitarian social movements.

Reading List:

- Denove.W and Schlesinger E.G, (1999) Ethnic-Sensitive Social Work Practice.
- Yil. David. G, (1998), Confronting Injustice and Oppression.
- Thorat S.K. (2009) Dalits in India: Search for a Common Destiny.
- Thorat S.K. and Newman Kathernic S., (2010) Blocked by Caste: Economic Discrimination and Social Exclusion in Modern India.
- Constitution of India

- Website of Ministry of Social Justice and Empowerment, Government of India.
- Munshi. Indra, (2007) Adivasi Life Stories: Contexts, Constraints, Choices, Rawat Publication.
- Jain, P.C. 1991. Social Movements among Tribals, New Delhi: Rawat Publications.
- Singh K.S. (ed.). Tribal Movements in India, Vol. I & II;
- Singh, J.P. & Vyas. M.N. Tribal Development: Past Efforts and New Challenges.
- Alinsky Saul, Rules for Radicals. Vintage Books Edition, 1972
- VirginiusXaxa (2003), "Tribes in India," The Oxford India Companion to Sociology and Social Anthropology, (Ed) Veena Das, New Delhi: Oxford University Press,
- Baviskar, Amita. 1997. "Tribal Politics and the Discourses of Environmentalism," Contributions to Indian Sociology, Volume 31, Number 2.
- Abbi, Anvita. 2102. Chapter 13, "Declining Adivasi Knowledge Systems and Killing of Linguistic Diversity," Social Exclusion and Adverse Inclusion: Development and Deprivation of Adivasis In India, (Editors) Dev Nathan and VirginiusXaxa, Oxford University Press, 2012.
- Jean Dreze, Meera Samson and Satyajit Singh. 1997. Chapter 2, "Resettlement Politics and Tribal Interests," Dam and the Nation: Displacement and Resettlement in the Narmada Valley. New Delhi: Oxford University Press.
- Dev, Nathan. 2012. Chapter 17, "Displacement and Reconstruction of Livelihoods," and Chapter 18, "Community Representatives" Views on Development Processes," Social Exclusion and Adverse Inclusion: Development and Deprivation of Adivasis in India, (Editors) Dev Nathan and VirginiusXaxa, Oxford University Press, 2012.
- Xaxa, Virginius. 2008 "Protective Discrimination: Why the Scheduled Tribes Lag Behind the Scheduled Castes," State, Society and Tribes, New Delhi: Pearson Education.

Course Title: RIGHTS OF PERSONS WITH DISABILITIES AND THEIR REHABILITATION

Course Code: SWCP – 11

Level: MSW (III)

Objectives:

- To facilitate basic understanding about person living with disability
- To disseminate information about the variety of policies and programmes targeting to include persons with disabilities.
- To develop understanding on the possible rehabilitation measures.
- To develop insight into the workable models of interventions for inclusion of persons with disabilities.

UNIT – I: Understanding Disability

- Definition, types, magnitude and causes of disabilities.
- Approaches towards disability; medical, psychological, economic-vocational, socio-political, human rights and capabilities.
- Examining the impact of disability on the quality of life of persons with disabilities in the context of their family, society and environment.
- Issues related to their daily living, education, sexuality, integration, employment, interpersonal relationships, marriage and the need for social work intervention.

UNIT – II: Role of the Social Worker in the Rehabilitation and Inclusion of the Disabled

- Assessment treatment and rehabilitation of persons with disabilities through a multi-disciplinary team including the social worker.
- Inclusion of persons with disabilities in schools and educational institutions.
- Skill development and vocational rehabilitation of persons with disabilities.
- Equality of opportunity and treatment in employment and occupation of persons with disabilities.

UNIT – III: International Initiatives and National Legislations and Policies for the Empowerment of persons with disabilities

- UN Initiatives: UN convention on the rights of persons with disabilities 2006; Un standard rules on the equalization of opportunities for persons with disabilities (1993); and Darter Framework for Action.
- ILO Initiatives for enhancing support to vulnerable groups including the disabled: Global employment agenda(2003); Declaration on social justice for fair globalization 92008); Global jobs pact (2009); ILO code of practice on managing disability in the workplace (2002)
- National Legislations: Rehabilitation Council of India Act, 1992; Persons with disabilities (equal opportunities, Protection of rights and full participation Act, 1995; National Trust for Welfare of Persons with Autism, Cerebral Palsy, Mental Retardation and Multiple Disability Act, 1999; The Rights of Persons with Disabilities Bill, 2011.
- National Policies:
 - National Policy for Persons with Disabilities (2006): Physical rehabilitation, Educational rehabilitation and Economic rehabilitation.
 - Guidelines for: Issue of disability certificates; evaluation of various disabilities and procedure for certification; space standards for barrier free built environment for disabled and elderly persons.
 - Identified posts for persons with disabilities -2007.

UNIT – IV: Role of Social Work

- Intervention strategies at individual level: counselling, building support groups, assertiveness training;
- Intervention strategies at family level: Parent counselling, parent training and family crisis intervention.
- Intervention strategies at community level: Community education, community based rehabilitation
- Intervention strategies at policy making level: Advocacy in legislative and policy making bodies; research and influencing public opinion.

Reading List:

- Ministry of Social Justice and Empowerment;
http://www.socialjusticenic.in/policies_acts3.php

- Bhumali.Anil,(2009) Rights of disabled women and children in India, serials publications, New Delhi.
- Hans. Asha and patri.A (2003) Women Disability and Identity sage, New Delhi
- Mukhrjee, Manjumohan(2006) Problems of Disabled People, Associated Publishes, India.
- Kanna. G.N. (2001), Disability Studies in India-Retrospect's and prospects Gyan Publishing house, New Delhi.
- Buckup, s. (2009), The Piece of exclusion; The economic consequences of excluding people with disabilities from the world of work. Employment sector working paper No. 43 (genevalLO)
- O'Reilly, A. (2007) The right to decent work of persons with disabilities (geneva ILO)
- Davis, Lennard. J. (1999) The Disability Studies Reader, Routage, NY
- Shapiro, Joseph P. (1993) No Pity: People with Disabilities Forging a New civil Rights Movements.

Course Title: COMMUNITY HEALTH AND SOCIAL WORKERS

Course Code: SWCP – 12

Level: MSW (III)

Objectives:

- To understand the basic concepts related to Health and its importance.
- Identify and understand the changing health needs of ever-changing community and organize relevant effective interventions for amelioration of health problem.
- To develop students' appreciation and a commitment to healthy and socially just ways of living.
- To develop student's knowledge and understanding about ways of enhancing personal and community health and wellbeing.

UNIT – I: Concepts of Health & Nutrition

- Definition & type (Physical & Mental) of health and its dimensions; appreciation of health as relative concept; determinants of health, changing concepts of health.
- Characteristics of agent, host and environmental factors in health and disease.
- Health situation in India and Odisha-especially the demography, mortality and morbidity profile and the existing health facilities in health services.
- Mental Health- concept, community based mental health programmes.
- Nutrition- definition, concept, balance diet nutritive values and food items.
- Genetically Engineered and modified foods.

- Nutritional Assessment and monitoring.

UNIT – II Epidemiology

- Epidemiology: definition, concepts and its role in health and disease, public health-concept & importance
- Definition of the terms used in describing disease, transmission and control.
- Epidemiology of specific diseases: Communicable and non-communicable diseases, symptoms causes and prevention of disease caused by virus: measles, chickenpox, polio, & leprosy, disease caused by bacteria: diphtheria, typhoid, tuberculosis, plague, dengue, hepatitis. disease caused by parasites: Malaria, scabies, intestinal worms. Preventive & Social Medicine: concept, meaning, programmes for controlling communicable diseases.

UNIT – III Environmental Health

- Awareness of the concept of safe and wholesome water.
- Awareness of the requirements of a sanitary source of water.
- Understanding the methods of purification of water on small scale with stress on chlorination of water.
- Disposal of solid waste, liquid waste, both in the context of urban and rural conditions in the country.
- Problems in the disposal of refuse, sullage and sewage.
- Role of social worker in environmental health.

UNIT – IV Community Health and Role of Social Work

- Primary Health Care Services: organizations & functions
- Medical Social Work: meaning nature & scope
- Health Care in Rural and Urban areas of Odisha:
- Role & Functions of Social Worker in hospital setting and community health: individual, family and community level; communication tools and techniques.

Reading List:

- Park J. E. and Park K.: Textbook of Preventive and social Medicine Banarasi Das Bharat Publishers, Jabalpur.
- Bedi, Yash Pal (1979) Social Preventive Medicine, Atma Ram and Sons; New Delhi.
- VHAI – State of India's Health.
- Shah. Ghanshyam (1997) Public Health and Urban Development, Sage; New Delhi.

- Werne. David (1994) where there is no Doctor, VHAJ.
- Sinha. A.K, (ed) (1997) Human Health and Environment, Vol. I & II, APH Publishers: New Delhi.
- John Webb (2002) Medical Social Work: The Reference Book, Trafferd Publishing.
- Gehlert, Sarah and Browne. Teri (Ed) (2011) Handbook of Health Social Work Wiley Publication.

Course Title: SOCIAL MANAGEMENT

Course Code: SWCP – 13

Level: MSW (III)

Objectives:

- To understand the eco system of communities and their market landscape to help community based organizations engage with a market based economy.
- To help build the capability needs of communities towards self reliance through sustainable community enterprises.
- To help gain fundamental principles of Management.

Unit I: Understanding the community and deciphering the market

- The village social structure: relationship between social groups, communication patterns, processes of exclusion and inclusion, culture and Social value base.
- Identifying community resources: social capital, natural resources, common- property resources, education, health & employment status.
- Institutions in the community: Social institutions, formal community based institutions for eg: clubs, SHGs, village Council, etc; PRI; Administrative Structure from Block to District level; Educational Institutions; Health and Medical Institutions
- The local market economy: Money Lenders, Small & Large traders, entrepreneurs, corporations and companies; key factors of Local Market Economy: Market Boundaries; Market Values; Market Values Chains.
- Need Assessment and mapping of village resources, producers and institutions study of the community.

Unit II: Operations and Marketing Management

- Operations Management in the context of community based enterprises- organizations: product design, process selection and design, capacity decisions, location and layout decisions, sowing, transformation and storage, quality of inputs and finished products, material handling and logistics.
- Farm, Forest and Livestock resources and their conversion to products: process & risks involved. Tools for process mapping and mapping a supply chain.
- Agricultural Products: Types and issues, value addition, pricing and distribution; Agricultural Product Buyers: Retail and Wholesaler, Consumers, Customers and key buyer characteristics.
- Key aspects of sales, marketing and planning; Negotiation and selling techniques.

Unit III: Accounting and Finance

- Accounting: Need, Meaning and objectives; role of an accountant; uses of accounting information; Origin and analysis of business transactions; accounting equation.
- Financial Statements: Balance sheet, Income statement; Recording business transactions: Double entry system, the T-accounts, principles and conventions of accounting, journal entries.
- Books of accounts: Cash book, ledger, sales register, etc; posting of transactions in books
- Trial balance: closing and balancing of accounts; locating and correcting errors; preparation of balance.
- Bank transactions and bank reconciliation: need for reconciliation, causes of difference in passbook and cash book balance, procedure for bank reconciliation statement.
- Distribution of profit: determination of distributable surplus; basis of distribution.

Unit IV: Planning and Budgeting

- Levels of Planning: Village level, cluster level community enterprise / organization level
- Planning for distribution of responsibilities among community based leaders / coordinators / facilitators.
- Planning for Product basket, their local value addition for greater shelf-life and for sale in local markets.
- Planning for marketing.
- Developing proposals considering resources, cost and time budget.
- Planning for Resource Generation: Internal resource generation and from external institutions Government Departments, Banks, Public and Private, NGOs and INGOs
- Planning for improving technical capabilities.

- Planning for allied services like Health, Education, etc.

Reading List:

- Implementing Community Enterprise system for Sustainability of Agricultural Communities: A Manual, Nayak, Amar KJR (2012)
- A Proposal for Holistic Development at a GP Level for Long Term sustainability of Small and Marginal Farmers/Producers in the GP. Amar KJR Nayak (2011)
- Ongoing Programmes & Schemes of the State Government and the Central Government, Rabindra Kumar Gouda (2012)

Course Title: SOCIAL WORK IN SCHOOLS

Course Code: SWEP – 01

Level: MSW III

Objectives:

- To understand the Rights of the Child in the context of schools.
- To acquire necessary understanding and skills to work with children in schools.

UNIT I: Conceptual framework for Social Work Practice in Schools

- Conceptual Perspectives: Social Learning Theory, General Systems Theory, Ecological Perspective
- Models of intervention: Traditional Clinical Model, The School Change model, The Community School Model, Social Interaction Model, School-Community- Pupil Relations Model

UNIT II: Context of Social Work Practice in Schools: Legislations and Policies

- UN Rights of the Child, Commission for Protection of Child Rights Act, 2005
- Constitution of India, Article 21 A, National Policy on Education (1986), National Curriculum Framework for School Education (2000), Right to Education Act (2009)
- Constitutional provisions for the education of SC, ST and religious, cultural and

linguistic minorities, policies and programmes of the Government.

- Inclusive Education policies in the V Year Plans, Integrated Education for Disabled Children (IEDC), District primary Education Programme (DPEP), Sarva Shiksha Abhijan (SSA)

UNIT III: Social Justice Issues in School

- Dealing with stereotype, bias and discrimination;
- Intervention for the vulnerable populations i.e., Challenged children, SC, ST and minority;
- Dealing with the 'Achievement gap' i.e, difference in performance between students of vulnerable and privileged backgrounds.

UNIT IV: The Role of the Social Worker

- Services to students: Dealing with social or behavioural problems (Depression, Truancy, Aggression, Trauma, Substance Abuse, Sexual Activity), poor attendance, drop-out, poor performance, offences against children.
- Services to teachers: Teacher support groups, teacher training, teaching stress;
- Services to families: Providing parent support, consultation, parenting skill classes, family programming; organizing financial support for vulnerable families;
- Services to the community: Community outreach, community involvement, village Education Councils.

Reading List:

- Allen- Meares, P., Washington, R. O., & Welsh, B. L. (1996). Social Work Services in schools. 2nd ed. Boston: Allyn & Bacon.
- Dupper. David, (2003). School Social Work: Skills and Intervention for Effective Practice, John Wiley and Sons, NJ.
- Bye. Lynn and Alvarez. Michelle (2006). School Social Work: Theory to Practice, Cengage Learning.
- Germaine. Carel B and Bloom Martin (2008). Human Behaviour in the Social Environment: An Ecological View. Columbia University Press, New York.
- Greene. Roberta R,(2010) Human Behavior Theory and Social Work Practice (Modern Applications of Social Work), Transaction Publishers, New Brunswick, New Jersey.
- Journal of School Social Work(JSSW), Chennai, India.

- NCPCR, Protection of Children against Corporal Punishment in Schools and Institutions,
- http://www.ncpcr.gov.in/Reports/Protection_of_Children_against_Corporal_Punishment_in_Schools_and_Institutions_December_2008.pdf
- NCERT (2000). *Assessment of Needs for Inclusive Education: Report of the First Regional Workshop for SAARC Countries*. New Delhi: NCERT
- Mohapatra, C. S. (2004). *Disability Management in India: Challenges & Commitments*. New Delhi: National Institute for the Mentally Handicapped (NIMH) and the Indian Institute of Public Administration.
- Mishra, A. (2000). "India: Special Education", in C.R. Reynolds, and F.E. Janzen (eds), *Encyclopedia of Special Education: A Reference for the Education of the Handicapped and other Exceptional Children and Adults*, 2e. USA: John Wiley and Sons
- Ministry of Social Justice and Empowerment of India. *Annual Report* (latest), New Delhi: GOI
- Ministry of Human Resources Development (MHRD). *Annual Report* (latest). New Delhi: GOI
- Ministry of Human Resources Development (2000). *Sarva Shiksha Abhiyan : Framework for Implementation*, Department of Elementary Education & Literacy, New Delhi; GOI
- Five Year Plans: <http://www.planningcommission.nic.in/plans/planrel/fiveYr/7th/vol2/7v2ch10.html>.
- Department of Education (1986). *National Policy on Education*, 1986. New Delhi: MHRD, GOI
- Department of Education (2000). *Sarva Shiksha Abhiyan: A Programme for Universal Elementary Education*. New Delhi: MHRD, GOI.

Course Title: WORKING WITH WOMEN

Course Code: SWEP – 02

Level: MSW III

Objectives

- Develop an ability among students to analyze the position of women in rural and tribal society
- Acquire understanding on problems relating to women

- Develop in them a critical understanding about the schemes related to women

Unit-1

Status of women in rural and tribal community - in the context of family

marriage, religion and economy. Sexual division of labor its impact on health, education, illiteracy, adjustment, malnutrition, early marriages.

Unit-2

Problems relating to women – dowry, domestic violence, crimes against women, female feticide, child prostitution, exploitation and abuse of domestic female lab our.

Unit-3

Women in local self government with special reference to women in decision making. Impact of 73 amendment, development schemes and women's situations, case studies of DRDA, ICDS, SHGs.

Unit -4

Role of media in projecting the images of women, women in the media- print media, radio, films, television, and advertisement and publicity, Media and self employed women

Reading List:

- Paul chowdhry, D. Women welfare and development (A source book) ; Inter-India Publication, New Delhi -1991
- Sushila Agarwal , Status Of Women Printwell publishers, Jaipur, 1988
- Pandit, S.K. Women in Society, Rawat Publications, New Delhi 1998
- Brook E and Davis, Ann (1985) Women, The family and Social Work, London.
- Samanta, R.K (2005) Empowering Rural Women and Issues, Opportunities and Approaches, B.R world of books
- Saxena, S(2005) Crimes against Women and Protective laws, Deep and Deep Publications, Pvt.Ltd. New-Delhi
- Paul chowdhry, D Women welfarae and Development(A Source Book) Inter-India Publication, New-Delhi 1991
- Agarwal Sushila, Status of Women, Print well Publisher, New-delhi.
- Bodra Gomati, Empowerment of Tribal Women
- Baig, Tara Ali Women In India, Ministry of information and Broadcasting, Govt. Of India Publication Division, New Delhi
- Agrawal Bina, Gender And Legal Rights in Landed Property in India, Kali for

Women.

- Bhargava V. Durvar, Mental Health from a Gender Perspective, Sage publication.
- Gore, M.S: Urbanisation & family Change, popular Prakashan, Bombay, 1986.
- Agarwal, R.K. Hindu Law-central Law Agency, Allahabad.
- Adhikari, A.K and Pramanik: Gender inequality and Women's empowerment, Abhijeet Publication, 2006
- Sikligar, P.C: Empowerment of Tribal Women, Jaipur Mangal Deep Publications, 2006.

Course Title: Working with Alcoholics and Substance Abusers

Course Code: SWEP – 03

Level: MSW (III)

Objectives:

- To facilitate basic understanding about substance abuse
- To disseminate information about addiction to alcohol.
- To develop understanding about the role of social worker in rehabilitation.
- To develop insight into the role of counseling among alcoholics and substance abusers.

UNIT – I: Basics on Substance Abuse

- Substance abuse and dependence: Meaning, Definition, nature and extent of the problem in India and Odisha.
- Types of Addictive Substances: Natural, Synthetic, Narcotics, Stimulants and depressants.
- Symptoms, short term and long term impact of substance abuse.

UNIT – II: Addiction to Alcohol

- Alcohol dependence and Alcoholism: Causes, symptoms, long-term and short-term effects.
- Impact of Alcoholism on Individual, Community and Family.
- Concept of social drinking, alcoholic and relapse.

- Phases of alcohol addiction.
- Social and economic implications of addiction.
- Alcoholism among Youth-causes and remedies.

UNIT – III: Role of Social Workers in rehabilitation

- Role of Social Worker in Preventive, curative and Rehabilitative services for substance abusers.
- Multidisciplinary Approach services for substance abusers.
- Legislation Provisions and Government programmes to control drug abuse in India.

UNIT – IV: Role of counseling

- Concepts of counselling and its association with addiction; approaches to counseling: Psychoanalytical, client centred therapy. Indigenous approaches of help and self help: Yoga, Meditation, Attitude and Values, Counselling as an treatment method for substance abusers.

Reading List:

- Chopra, R.N. and Chopra, F.C., 1965: Drug Addiction with Special Reference to India, New Delhi Council of Scientific and Industrial Research.
- National Institute of Social Defence, Govt. of India, 1992: Drug Abuse.
- Single, Eric. Et. Al, 2003: International Guidelines for Estimating the Costs of Substance Abuse and Addiction.
- Delaney and Eisen Berg, 1973: The counseling Process.
- Singh, Chandra Paul, 2000 Alcohol and Drug Dependence Among Industrial Worker, Delhi Shipra Publications.
- Kaur, Ravneet and Gulati, J.k., 2007: Drug Abuse: Trends and issues, International Marketing Conference on Marketing & Society, IIMK.
- Ahuja, R, College Youth and Drug Abuse: A Sociological Study of Nature and Incidence of Drug Abuse among College and University Students, University of Rjasthan Jaipur

- Gupta, R. Punjab a drugged State, Meditrack.
- Chopra, L.C. and R.N., Chopra 1957,; The use of Cannabis Drugs in Inda. Bulletin on narcotics (United Nations Publication)
- Mohan, D.A.K. Pravakar and P.N. Sharma: Prevalence and pattern of drug abuse among Delhi University students, Indian Journal of Medical Research.
- Ropar, C 2006: Social Use, abuse and addiction-site of the author University of Tekas, Austin.
- Horgan C. Substance abuse: The Nation's number one health Problem, Princeton NJ; The Robert Wood Johnson Foundation.

Course Title: CORRECTIONAL SOCIAL WORK

Course Code: SWEP – 04

Level: MSW (III)

Objectives:

- To understand crime and delinquency as a social problem.
- To study and understand the basic elements of correctional methods and approaches.
- To gain knowledge of legal provisions.
- To study and identify the practices of non-institutional services.
- To acquire skills of correctional social work and understand the role of professional social workers in correctional institutions.

Unit- 1: Crime in the context of Social problem

- Crime: Concept, Theories of Causation, Classification of crime and approaches to deal with crime and criminals.
- Crime in India and Odisha: crime against women, crime against children, Atrocities against Scheduled Castes and Scheduled tribes; Emerging patterns and trends.
- Juvenile Delinquency: Concept, Demography, Theories of causation and approaches to delinquency prevention.

Unit- 2: Criminology and Criminal Justice System

- Concept of criminology; Social, Psychological and Legal approaches
- Courts and correctional administration. Hierarchy of courts functions and powers. Lok Adalats, Lokayukta, Legal Aid, Functions of Law Commission. Analysis of the Criminal Justice System: Police, Judiciary, Prisons and Correctional Services.

Unit -3: Correctional Administration and Services

- Institutional services: Prison, observation homes, special homes, beggar homes, rescue homes, short-stay homes, protective homes, half-way homes, de-addiction centers.
- Community based corrections and non-institutional services: Early diversion and de-institutionalization, probation and parole, adoption, foster care, child guidance centers, family counselling, crisis intervention, after-care rehabilitation and reintegration of offenders; community po.

Unit- 4: Correctional Social Work

- Definition, history, philosophy: Retribution, Restitution, General Deterrence, Special Deterrence Incapitation, Just Desserts ,objectives, methods and approaches of contemporary correctional social work: Probation and Parole, Alternative to Capital Punishment.
- Correctional Social Work in India; role of professional social workers in correctional institution, crime prevention and rehabilitation of offenders: supervision, surveillance and counselling; skills unique to correctional social work; limitations of correctional social work.

Reading List:

- Gupta, M.C. & K. Chockalingam, J. Guha Roy (2001) Child Victims of Crime: Problems and Perspectives. New Delhi, Gyan Publishing house.
- Ahuja Ram. (1996) Youth and Crime. Jaipur, Rawat Publications.
- Tripathy, P. C. (2000) Crime against Working Women, APH Publishing Co., New Delhi.
- Dabir, Neela & Nigudjar, Mohua. (2005) Children in Conflict with Law. Mumbai, TISS.
- Coleman, Clive. (2000) Introducing Criminology, Willan Publication, UK

- Ahuja, Ram. (2000) Criminology, Rawat Publication, New Delhi
- Siegal, Larry J. (2000) Criminology, Wadsworth Thomson Learning, New Delhi
- Schmalleger, Frank. (1999) Criminology Today: An Integrative Introduction 2nd edition, Prentice Hall, New Delhi
- Alan Vand, K. Criminal Justice System – Readings
- Mehraj-ud-din, Mir, (1984) Crime and Criminal Justice System in India, Deep & Deep Publications, New Delhi
- Choudhuri, Mrinmaya. (1995) Languishing for Justice: Being a Critical Survey of Criminal Justice System, Datt Sons, Nagpur
- Chakrabarti, N. K. [Ed.] (1997) Administration of Criminal Justice (Vol.1.). New Delhi. Deep and Deep Publications.
- Robert M Carter, Daniel Glaser, Leslie T Wilkins, (1985) Correctional Institutions, Harper & Row Publishers Inc.
- Siddique, A. (1983) Criminology, Lucknow, Eastern Book Co.
- Smykla, J. Community based Corrections.
- Bartollas Clemens, (1985) Correctional Treatment: Theory and Practice, Prentice hall, New Jersey
- Panakal, J. J & Gokhale, S. D. (1989) Crime and Corrections in India, Mumbai, TISS

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Course Title: COUNSELLING IN SOCIAL WORK

Course Code: SWEP – 05

Level: MSW (III)

Objectives:

- To develop a holistic understanding of counseling as a tool for help
- To acquire knowledge of various approaches, their theoretical under-pinning for goals, values, process and techniques
- To develop skills of application to real life situations
- To develop ability to recognize and synthesize attitudes and values the enhance investment of self in the counselor's role

- To develop ability to use the tools/scales in various settings

Unit – I:

Introduction to Counseling: Meaning, Definition, Need and importance of counseling and professional counseling. Basic principles of Counseling: Participation, Individualization, Confidentiality, communication, acceptance, self confidence, self awareness and other principles governing the counseling relationship. Components of effective counseling: Personality of the counselor's skills – Role and functions of the counselors in schools, industries, family, hospital and rehabilitation institution

Unit – II:

Types of counseling – Individual and group Counseling, Family Counseling, Marital Counseling, Student Counseling and Industrial Counseling, E-Counseling: concept, conditions and importance of E-counseling; Techniques of group counseling, strategies and structure – barriers to effective counseling sessions; Counseling evaluation.

Unit – III:

Theories of counseling: Psychoanalytic, Adlerian, Client centered, Behavioural, Rational emotive, Reality, Gestalt, Transactional analysis and eclectic Theories.

Unit – IV:

Counseling process, Interview and its significance in counseling – Use of observation in counseling and understanding of emotions in counseling. Transference and counter transference. The following standardized tests must be practiced in counseling settings. Personality, intelligence, interpersonal relations, stress, anger, self esteem, anxiety, assertiveness, depression, adjustment, mental health and family intensive. Counseling in different settings: HIV/AIDS counseling, Alcohol and Substance dependence counseling and Trauma counseling.

Reading List:

- Burnett. J. : Counseling with young people
- Fred Machinery : Counseling for personal Adjustment
- Shestroi Everlett, Brammer M. Lawrence : The dynamics of counseling process.
- Tpbbert, E.L. Introduction to counseling

- Colin Fertham, Controversis in psycho therapy and counseling, Sage publications, New Delhi, 1999.
- Kathryn Geldard & David Geldard, Counseling Children, A practical Introduction, Sage publication, New Delhi, 1997.
- Fullmer, D.W. & Bernard H.W: Counseling content and process
- Harms E & Schreiber : Handbook of counseling Techniques
- Kennedt. E : On becoming a counselor – A basic Guides for non-professional counselors, Macmillan, New Delhi.
- Development theories of E.B. Harlock and Robert kegan Psychological theory(Eric Erickson, Need Hierarchy (Maslow's) Cognitive theory (Jean Piaget)

Course Title: SOCIAL WORK WITH THE ELDERLY

Course Code: SWEP – 06

Level: MSW (III)

Objectives:

- To study the basic characteristics about the elderly population
- To understand the development tasks associated with the elderly population.
- To know the various services provided at institution dealing with the elderly.
- To link social work methods in promoting welfare among the elderly.

UNIT – I: Basics about elderly

Gerontology – Definition and scope. Status of Elders in India & Odisha:- Demographic, social, cultural and economic aspects. Needs and problems of elders. Role of elders in family. Issues of Elderly in health, occupation, income retirement planning, property rights, gender issues and family supports. Constitutional guaranteed rights and policy on older persons.

UNIT – II: Developmental tasks

Developmental tasks in elderly: Issues in health care, changes in family structure, coping with aging process, challenges due to changing physiological, economic, safety, status

in the family and other issues, Healthy aging, quality of life, coping with demise of the life partner, bereavement, resolving one's death, and any other.

UNIT – III: Developmental services for the elderly

Institutional care settings for elderly: General hospitals, geriatric wards, home based care, homes for the aged, nursing homes, Day care centres, hobby centres, elder helpline, facilities for homeless elderly. Constitutional guaranteed rights and National policies on older persons. Role of National and International agencies providing developmental services to elders.

UNIT – IV: Social Work Interventions for the elderly

- Role of Social Worker in providing the legal and governmental welfare services to elders.
- Social Work intervention through Social Case Work, Social Group Work, Community Organisation and Social Welfare administration.

Reading List:

- Bali . P. Arun, 2001 Care of the Elderly in India. Shimla, Indian Institute of Advanced Studies.
- Chatterjee, S.C., Patna, Discourses on aging and Dying. New Delhi, and K.P., Charian, V. 2008., Sage Publications
- Dandekar, Kumudini. 1996 The Elderly In India, New Delhi, Sage Publications.
- Desai, Murli and Raju, Gerontological Social Work in India – Some Siva (Ed.) 2000. issues and Perspectives. Delhi, BR Publishing House,.
- Dey, A. B (Ed.) 2003 Ageing in India: Situation Analysis and Planning for the Future. New Delhi / WHO and AIIMS.
- Emmatty, Leena. M. 2008 An insight into Dementia Care in India. New Delhi, Sage Publications.
- Hurlock, Elizabeth. 1981 Developmental Psychology. 5th Edition. New Delhi, Tata McGraw Hill Publications.
- Khan M.Z. 1989 Voluntary Welfare Services for the Aged, Dept. of Social Work, New Delhi, Jamia Milia Islamia.

- Rajan, Irudaya.S., India's Elderly, New Delhi, Sage Publications. 1999.

JOURNALS.

- Indian Journal of Gerontology, C-207, Manu Marg, Tilak Nagar, Jaipur.
- R & D Journal of Helpage India . C-14, Qutab Institutional Area, New Delhi.

Course Title: DEVELOPMENT THEORIES AND STRATEGIES: ISSUES CHALLENGES AND RESPONSES

Course Code: SWCP –15

Level: MSW (IV)

Objectives:

- To be acquainted with the development discourse.
- To gain a critical understanding of the theories, models and approaches to development.
- The role of the state and the response of non-state actors to development.

Unit – I: What is Development?

- The concepts of: development, growth, human development, social development and sustainable development.
- Core values of development; Measuring development: per capita income, PQLI, choice and access, HDI, seer's criteria.
- Development and colonialism: continuity and divergence; persistence of global inequalities and dominance.

Unit - II: Theories and Models of Development

- Modernization Theory;
- Dependency Theory;
- Neoliberalism;
- Developmental State;
- Post Development

Unit - III: Theories and Approaches to Development

- Human Development;
- Capabilities Approach;

- Women, Gender and Development: WID, WAD, GAD.
- Participatory Development;
- Good Governance;
- Institutional Turn

Unit - IV: The Role of NGOs and Civil Societies and Social Movements in Development

- The failure of state-market-international aid institutions.
- NGO's and new-liberalism; Relationship of NGOs with INGOs; NGOs and the State; NGOs and the gap between theory and praxis.
- The role of Civil society in development and its relationship with the state in the Indian Context.
- The challenge of social movement to development in India.
- The Social worker as scholar- activist-practitioner.

Reading List:

- Cohen, Michael and Robert Shenton. 1995. "The Invention of Development." Pp. 27-43 in Jonathan Crush(ed), Power of Development. London and New York: Routledge.
- Esteva, Gustavo. 1991. "Development." Pp. 1-23 in Wolfgang Sachs (ed), The Development Dictionary. London: Zed Books
- Rist, Gilbert. 2002. "Definitions of Development." Pp. 8-24 in The History of Development: From Western Origins to Global Faith. London and New York: Zed Books.
- Seers, Dudley. 1972. "What are we trying to Measure?" Journal of Development Studies 8(3):21-36
- Myrdal, Gunnar. 1974. "What is Development?" Journal of Economic Issues 8(4):729-736.
- Wallerstein, I. 1984. "The Development of the Concept of Development." Sociological Theory 2:102-116
- Kothari, Uma. 2005. "From colonial administration to development studies: a post-colonial critique of the history of development studies," Pp. 47-66 in Uma Kothari (ed), A Radical History of Development Studies: Individuals, Institutions and

Ideologies. London: Zed Books

- Cooke, Bill. 2003. "A new continuity with colonial administration: participation in development management." *Third World Quarterly* 24(1):47-61
- Deutsch, Karl. 1961. "Social Mobilization and Political Development." *The American Political Science Review* 55(3):493-514.
- Lerner, Daniel. 1958. *The Passing of Traditional Society: Modernizing the Middle East*. New York: The Free Press.
- Levy, Marion. 1965. "Patterns (Structures) of Modernization and Political Development." *Annals of the American Academy of Political and Social Science* 358:29-40.
- Bernstein, Henry. 1971. "Modernization Theory and the Sociological Study of Development," *Journal of Development Studies* 7(2):141-60.
- Eisenstadt, S. N. 1974. "Studies of Modernization and Sociological Theory." *History and Theory* 13(3):225-252.
- Huntington, Samuel. 1971. "The Change to Change: Modernization, Development and Politics." *Comparative Politics* 3(3):283-322.
- Tipps, D. C. 1973. "Modernization Theory and the Comparative Study of Societies: A Critical Perspective." *Comparative Studies in Society and History* 15(2):199-226
- Amin, Samir. 1972. "Underdevelopment and dependence in Black Africa: Origins and Contemporary Forms," *Journal of Modern African Studies*. 10(4): 503-524.
- Cardoso, Fernando Enrique. 1972. "Dependency and development in Latin America." *New Left Review* 74(July/August):83-95.
- Frank, Andre Gunder. 1969. "The development of underdevelopment" *Monthly Review* 18(4):17-31.
- Chilcote, Ronald H. 1974. "Dependency: A Critical Synthesis of the Literature." *Latin American Perspectives* 1(1):4-29.
- Friedmann, H. and J Wayne. 1977. "Dependency Theory: A Critique." *Canadian*

Journal of Sociology. Vol. 2, No. 4.

- Frank, Andre Gunder. 1974. "Dependence is Dead, Long Live Dependence and the Class Struggle: An Answer To Critics." *Latin American Perspectives*. 1(1):87-106.
- Smith, Tony. 1979. "The Underdevelopment of Development Literature: The Case of Dependency Theory." *World Politics*. 31(2):247-288.
- Harvey, David. 2005. *A Brief History of Neoliberalism*. Oxford: Oxford University Press. (Read pages 1-6.)
- Lal, Deepak. 1985. "The misconceptions of 'development economics'." *Finance and Development* 22(2):10-13.
- Peet, Richard. 2003. "Globalism and Neoliberalism." Pp. 1-23 in *Unholy Trinity: The IMF, World Bank and*
- WTO. London and New York: Zed Book
- Evans, Peter. 1995. *Embedded Autonomy: States and Industrial Transformation*. Princeton, NJ: Princeton University Press. (Read pages 3-127, 227-250.)
- Amsden, Alice. 1989. *Asia's Next Giant: South Korea and Late Industrialization*. New York: Oxford University Press.
- Wade, Robert. 1990. *Governing the Market: Economic Theory and the Role of Government in Taiwan's Industrialization*. Princeton, NJ: Princeton University Press.
- Ó Riain, Seán. 2000. "The flexible developmental state: globalization, information technology and the 'Celtic Tiger'." *Politics and Society* 28(2):157-193.
- Ferguson, James. 1994. *The Anti-Politics Machine: Development, Depoliticization, and Bureaucratic Power in Lesotho*. Minneapolis, MN: University of Minnesota Press
- Nederveen Pieterse, Jan. 2000. "After Post-Development." *Third World Quarterly* 21(2):175-91
- Haq, Mahbubul. 1998. "The Human Development Paradigm" and "The Advent of the Human Development
- Report." Pp. 13-45 in *Reflections on Human Development*. Delhi: Oxford University Press.

- United Nations Development Programme. 2010. Human Development Report 2010: 20 years on: Pushing the frontiers of human development. New York: UNDP and Oxford University Press.
- Sen, Amartya. 1999. Development as Freedom. New York: Anchor Books
- Kabeer, Naila. 1994. Reversed Realities: Gender Hierarchies in Development Thought. London: Verso. (Read pages 1-68.)
- Rathgeber, Eva. 1990. "WID, WAD, GAD: Trends in Research and Practice." The Journal of Developing Areas 24:489-502
- Cleaver, Frances. 2001. "Paradoxes of Participation: Questioning Participatory Approaches to Development."
- Journal of International Development 11:597-612.
- Hickey, Sam and Giles Mohan. 2005. "Relocating Participation within a Radical Politics of Development."
- Development and Change 36(2):237-262.
- Mohan, Giles and Kristian Stokke. 2000. "Participatory development and empowerment: the dangers of localism."
- Third World Quarterly 21(2):266-280
- Abrahamsen, Rita. 2000. Disciplining Democracy: Development Discourse and Good Governance in Africa.
- London: Zed Books.
- Andrews, Matt. 2008. "The Good Governance Agenda: Beyond Indicators Without Theory." Oxford Development Studies. 36(4):379-407.
- Evans, Peter. 2004. "Development as Institutional Change: The Pitfalls of Monocropping and the Potentials of Deliberation." Studies in Comparative International Development 38(4):30-52.
- Hyden, Goran. 2008. "Institutions, power and policy outcomes in Africa." Discussion Paper No. 2, Africa
- Power and Politics Programme (APPP), London.

- Portes, Alejandro. 2006. "Institutions and Development: A Conceptual Reanalysis." *Population and Development Review* 32(2):233-262.
- Dill, Brian. 2010. "Community-Based Organizations (CBOs) and Norms of Participation in Tanzania: Working
- Against the Grain." *African Studies Review*
- Evans, Peter. 2005. "The Challenges of the 'Institutional Turn': Interdisciplinary Opportunities in Development Theory." Pp. 90-116 in Victor Nee and Richard Swedberg (eds), *The Economic Sociology of Capitalist Institutions*.
- Princeton, NJ: Princeton University Press
- Raka Ray, Mary Fainsod Katzenstein (ed) 2005. *Social Movements in India: Poverty, Power, and Politics*, Rowman and Littlefield Publishers Inc.
- Shah, Ghanshyam (2004) *Social Movements in India; A review of literature*, Sage, India.
- Srivastava, S.K. (1988) *Social Movements for Development*, South Asia Books
- Rajagopal (2007) *International Law from Below: Development, Social Movements and Third World Resistance*, CUP

Course Title: SOCIAL WORK PRACTICE IN RURAL AREAS

Course Code: SWCP – 16

Level: MSW (IV)

Objectives

- To understand the issues faced by social workers in rural areas.
- To understand the skills necessary to practice in rural settings.
- To be acquainted with government plans and programmes for rural development in Odisha.

Unit – I: Rural Community Characteristics

Resources: natural resource, human resource, economic resources; Demography; Social structure; power structure; Political structure; Structure of rural economy; Governance structure; Presence of industries and external agencies; Indigenous knowledge systems; Needs of Rural communities: poverty landlessness, indebtedness, unemployment, migration, ill health, illiteracy, social exclusion, discrimination,

agriculture, forests.

Challenges to Rural Communities: Urbanization; deteriorating agriculture; changing land use SEZ; corporatization of agriculture and marginalization of small land holders; issues arising out of globalization.

Unit - II: Rural Development

Concept: nature, scope and significance; Approaches to Rural Development: Rural reconstruction approach, community development approach, sectoral development approach, area-specific and target group-oriented approach, economic development with social justice approach: Integrated rural development approach.

Rural local self government: Origin and development of the Panchayati Raj system in India; Salient features of 73rd Constitutional Amendment; Issues of Panchayati Raj: reservation, financial management, participation of political parties; Panchayati Raj institutions in Odisha- structure and functions. Five Year Plans and Rural Development Programmes. Poverty alleviation programmes in rural areas- MGNREGA, NRLM etc. Role of NABARD in Rural Development.

Unit - III: The Tribal Development Issue

Concept of Tribes, Indigenous peoples and Aborigines; Situational Analysis of Scheduled Tribes in Odisha: land, food security, employment/livelihood, displacement, migration, human development indices.

Scheduled Areas: Issues and Governance; Overview from Panchsheel, Tribal Sub- Plan and Special Component Plan; Other Significant Acts regarding Forest Rights, Resettlement and Rehabilitation.

Unit - IV: Response of Social Work

Building sustainable communities: identifying strengths, weaknesses and threats; Generalist Model of Social Work Practice: work with individuals, families, systems, clusters at the communities level; Cultural Competency: understanding the value system, diversity, cultivating sensitivity, gaining trust and building relationships; Advocating Social Justice: working with the oppressed and marginalized, reducing stereotypes/discrimination based on gender, caste, ethnic background; Political advocacy: analysing policies and programmes, working for reform of polices, increasing access and better service delivery of public services.

Reading List:

- Dubey, S.C. 1995. India's Changing Villages;

- Ganguli, B.N. 1973. Gandhi's Social Philosophy. Delhi: Vikas Publishing House;
- Gore, M.S. 1993. The Social Context of Ideology: Ambedkar's Social & Political Thought. New Delhi: Sage
- Kumar, Girish 2006, Local Democracy in India: Interpreting Decentralization, Sage Publications;
- Prasad, B. 2003. Rural Development: Concept, Approach and Strategy
- Sainath, P. One Hundred years of Drought
- Pandey, A.K. 1997. Tribal Society in India, New Delhi. Manak Publishing Ltd
- Agrawal, A.N. 2001. Indian Economy; Nature, Problems and Progress, Vikas Biraj Prakash, New Delhi
- Chamber. Robert, 1983, Rural Development: Putting the last First, Harlow, Longman.
- Datt and Sundaram, 2002, Indian Economy, S.Chand and Co, New Delhi.
- Desai, A.R., 1995 Rural Sociology in India, ISAE, Bombay
- Dube, S.C., 1965 India's changing Villages, RKP, London
- Dubashi, P.R., 2000 Rural development Administration in India, Mumbai.
- Riley John. M, 1995. Stakeholders in Rural Development, Sage: New Delhi
- Sachinanda and Purendu, 2001, 2001, Fifty years of Rural Development in India, Firma KLM Pvt. Ltd, Kolkata.

Course Title: SOCIAL WORK PRACTICE IN URBAN AREAS: MIGRATION, UNORGANISED LABOUR AND LIVELIHOODS

Course Code: SWCP-17

Level: MSW (IV)

Objectives:

- Sensitize the students to the need and problems of urban communities;
- Develop a critical understanding among the students about the programmes of urban development

Unit - I:

Urban Communities - Features and characterization; Concept of Urban, Urbanism
Urbanization – concept, causes and factors responsible for Urbanization; Urbanization
in India – Historical development, Characteristics of clusters town, city, metropolis,
suburbs, Satellite town, etc, Classification of cities. Growth of Urban settlement.

Urbanization and its impact on socio – economic development. Urbanization and
structure of Caste. Concept of Slums Dwellers, Pavement Dwellers and Refugees, their
characteristics and Problems. Changing Face of Urban communities: Infrastructural
development, Growing heterogeneity, merging of fringe villages, the “global city” and
socio-cultural and economic implications. Issues, Implications and Challenges

Unit - II:

Urban Problems – Congestion and overcrowding, Housing and slums, Environment
pollution, lack of inadequate civic amenities, etc. - causes, magnitude, impact, etc.,
Measures for alleviating these problems.

Urban Development – Meaning, need, scope and Historical evolution; planning policy
and programmes viz; slum clearance and slum improvement, Housing and Urban
development corporation; Major urban development authorities in Odisha. Urban
Community Development Programmes.

Unit – III:

Urban Informal sector Organised and Unorganised labour: Unorganised labour issues:
Migrant workers, Debt Bondage and child labour, Wage Structure and Components of
Wages of the unorganised labour, International and national labour scenario - ILO, WTO,
Privatization and role of the State: Social Security Programmes for the unorganised
labour.

Concept of Migration and characteristic of Migrants, Impact of Migration, Pattern of
Migration to cities in India.

Unit - IV:

Concept and scope of livelihood, caste and traditional livelihoods; natural resource crisis
and its impact on the livelihood of people: ecological, socio-cultural and economic
dimensions; Gender, caste and age implications on livelihood. Urban poverty and
livelihood issues; Social Work with urban communities – recent developments and future

perspectives.

Reading List:

- Aziz Abdul: Urban Poor and Urban Informal Sector, Ashish Publishing House, New Delhi, 1984.
- Bharadwai, R.K: Urban Development in India, National Book Trust, New Delhi, 1962.
- Bose Ashish: Studies in India's Urbanization (1901 to 1971), Tata McGraw Hill, New Delhi, 1973.
- Cullingworth, J.B: Problems of Urban Society, Vol 1 The Social Framework of Planning, London – George Allen and Unwin Ltd, 1973.
- Desai A.R and Pillai, S.D.(Eds): Slums and Urbanization, Popular Prakashan, Bombay.
- Diddee, Jaymala and Rangaswamy, Vimla (Eds): Urbanization – Trends Perspectives and Challenges, Rawat Publications, Jaipur 1993.
- Gangrade, K.D.: Community Organization in India, Popular Prakashan, Bombay, 1971.

Course Title: SOCIAL POLICY, PLANNING AND IMPLEMENTATION

Course Code: SWCP -18

Level: MSW (IV)

Objectives:

- Gain knowledge of policy analysis and the policy formulation process.
- Acquire skills in critical analysis of social policies and development plans.
- Develop an understanding of social policy in the perspective of national goals as stated in the Constitution, particularly with reference to fundamental right; and the directive principles of state policy.
- Critically understand the concept, content and process of social development.
- Develop the capacity to identify linkages among social needs, problems development issues and policies.
- Locate strategies and skills necessary for social development and reinforce

values of social justice, gender justice and equality.

Unit - I: Social Policy and Constitution: Concept of social policy, sectoral policies and social services- Relationship between social policy and social development-Values underlying social policy and planning based on the Constitutional provisions(i.e. the Directive Principles of State Policy and Fundamental Rights) and the Human Rights- Different models of social policy and their applicability to the Indian situation.

Unit - II: Sectoral Social Policies in India: Evolution of social policy in India in a historical perspective- Different sectoral policies and their implementation, e.g. Policies concerning education, health, social welfare, women, children, welfare of backward classes, social security, housing, youth, population and family welfare, environment and ecology, urban and rural development, tribal development and poverty alleviation.

Unit - III: Social Planning: Concept of social planning- Scope of social planning- the popular restricted view as planning for social services and the wider view as inclusive of all sectoral planning to achieve the goals fo social development-Indian planning in a historical perspective- The constitutional position of planning in India. The legal status of the planning commission- Coordination between centre and state, need for decentralization- Pancyati Raj, people participation.

Unit - IV: Social Policy Implementation and Social Work:

- Role of social policy in the Indian Development process: land reforms, PDS, employment, education, reservations.
- The social policy implementing structure in India; the lack of an integrated approach or convergence of development schemes and programmes.
- Role of social workers in social policy implementation.
- Do social workers have a major impact on social policy Implementation?

Reading List:

- Bagci, A.K. 1982 Political Economy of Underdevelopment, Cambridge; Cambridge University Press.
- Bandyopadhyay, D.1997 “People’s Participation in Planning: Kerala Experiment”,

Economic and Political Weekly, Sept. 24, 2450-54.

- Bhanti, R. 1993 Social Policy and Development in Rajasthan, Udaipur: Himnashu Publication.
- Bujmer, M,et.al., 1989 The Goals of Social Policy, London: UnwinHyman.
- Chakraborty,S.1987 Development Planning- Indian Experience, Oxford: Claredon Press.
- Dandekar, V.M. 1994 “ Role of Economic Planning in India in the 1990s & Beyond”, Economic and Political Weekly, Vol.29,No.24,1457-1464.
- Desai, V.1988 Rural Development (Vol.I) Mumbai: Himalaya Publishing House.
- Dimitto, D.M. 1991 Social Welfare: Politics and Public Policy, New Jersey: Prentice-Hall.
- Ganapathy, R.S. and Others 1985 Public policy and Policy Analysis In India, Delhi: Sage Publications.
- Ghosh, A. 1992 Planning In India: The Challenge for the Nineties, New Delhi: Sage Publications.
- Government of India Five Year Plan Documents (latest), New Delhi.
- Gupta, S.P. 1993 “ Planning and Liberalization”, Economic and Political Weekly, Vol.28 No.43, Oct.23,2349-2355.
- Jacob, K.K. 1992 Social Development Perspectives Hebsur, R.K. (Ed.) Social Intervention For Justice, Bombay: TISS.
- Huttman, E.D. 1981 Introduction to Social Policy, New York: McGraw-Hill.
- International Labour Office. 1973 Multinational Enterprises and Social Policy, Geneva, ILO.
- Jones, K.Et.al.,1983 Issues in Social Policy, London: ROutledge & Kegan paul.
- Joshi, P.C. 1976 Land Reform in India Kahn, A.E. 1973 Social Policy and Social Services, New York: Random House.
- Kulkarni, P.D, 1979 Social Policy and Social Development in India, Madras: Association of Schools of Social Work in India.
- Kulkarni, P.D.1952 Social Policy in India, New York: McGraW- Hill Book

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- Kulkarni, P.D. 1975 Social Policy in India, Bombay, Tata Institute of Social Sciences.
- Leonard, P. 1997 Postmodern Welfare: Reconstructing an Emancipatory Project, London: Sage.
- Lindblom, C.E. 1980 The Policy-making Process, New Jersey; Prentice-Hall.
- Livingstone, A. 1969 Social Policy in Developing Countries, London: Routledge & Kegan Paul.
- Madison, B. Q. 1980 The Meaning of Social Policy, London: Croom Helm.
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- Macpherson, S. 1982 Social Policy in the Third World, New York: John Wiley and Sons.
- Mathur, K. Bjorkman Top Policy Makers in India, New Delhi: Concept Publishing Co.
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- Mishra, R. 1977 Society and Social Policy, London: Macmillan Ltd.
- Mukherjee, N. 1993 Participatory Rural Appraisal; Methodology and Applications, New Delhi: Concept Publishers.
- Mundle, S. 1993 participatory Rural Appraisal: Methodology and Applications, New Delhi: Concept Publishers.
- Milliard, M. and Spicker. 1998 Social Policy in a Changing Society, London: Routledge.
- Philips, D.R. and Health and Development, London: Routledge and Verhasselt Yola (Eds) 1994 Kegan Paul.
- Rao, D.B. (Ed.) 1998 World Summit for Social Development Rao, V. "Social Policy: The Means and Ends Question" Indian Journal of Public Administration, Vol.50 No.1 Jan.-March, 1994.
- Rao, V. and Mander, H. An Agenda for Caring: Intervention for the Marginalized, New Delhi: VHAJ.
- Rastogi, P.N. 1992 Policy Analysis and Problem-Solving for Social Systems, New

Delhi: Sage Publications.

- Roychaudhury, T. 1982 The Cambridge Economic History of India, Vol.I&II, New Delhi: Cambridge University.
- Roy, Sumit 1997 “Globalisation, Structural Change and Poverty”, Economic and Political Weekly, Aug. 16-23, 2117-2132.
- Sachs, W. 3997 Development Dictionary Singh, R.R. (Ed.) 1995 Whither Social Development? New Delhi: ASSWI.
- Singh, Y 1972 Modernization of Indian Tradition, Delhi: Thomas Press. Spicker, Paul 1998 Principles of Social Welfare: An Introduction to Thinking About the Welfare State, London:Routledge. The Probe Team. 1999 Public Report on Basic Education in India New Association with Centre for Delhi: Oxford University Press. Development Economics
- Upadhyay, S.B. 1992 Urban Planning, Jaipur: Printwell. UNDP Human Development Reports, Oxford University Press.
- Vyasulu, V. Vani, B.P. 1997 “Development and Deprivation in Karnataka”, Economic and Political Weekly, Nov. 15 2970-2974.
- Weimer. D.L. and Policy Analysis: Concepts and Practice, New Vining, A.R. 1994 Jersey: Prentice-Hall.
- World Bank World Development Reports (Annual), Oxford University Press.
- Yadav, C.S. (Ed) 1986) Urban Planning and Policies- Part A, New Delhi: Concept Publishing Co. Encyclopedia of Social Sciences Encyclopedia of Social Work.
- De Haan, Anjan (20130 “The Social Policies of Emerging Economics: Growth and Welfare in China and India” IPC-JG working Paper No.110. Brasilia, International Policy Centre for Inclusive Growth.

Recommended Journals/Periodicals

- Alternatives; Development and Change; Economic and Political Weekly.

Course Title: DEVELOPMENT COMMUNICATION

Course Code: SWCP - 19

Level: MSW (IV)

Objectives :

- To study the basic issues in Communication.
- To learn about various channels of Communication
- To understand the channels of mass communication reaching to rural audience.

Unit : I

Development: meaning, concept, process and models of development – theories – origin – approaches to development, problems and issues in development, characteristics of developing societies, development dichotomies, gap between developed and developing societies. Development issues on national and regional and local level.

Unit : II

Development communication : meaning – concept – definition – philosophy – process – theories – role of media in development communication – strategies in development communication – social cultural and economic barriers – case studies and experience – development communication policy – strategies and action plans – democratic decentralization.

Unit : III

Communication with Individual Group, Traditional Communication: Streets play, Puppetry show & Folk media, Rural communication messages Development support communication: population and family welfare – health- education and society – environment and development – problems faced in development support communication.

Unit : IV

Writing development messages for rural audience: specific requirements of media writing with special reference to rural press, radio and television. Problems of Rural

Journalism, Farm Journals, Rural Press, Press Conference, Radio rural Forum, Role of Community Radio in Rural Communication.

Reading List:

Fernandes, Walter : Development with People, Indian Social Institute, New Delhi, 1988.

Jayaweera N. & Amunugama S. : Rethinking Development Communication, AMIC, Singapore, 1988.

Kumar, Kevel J. : Communication and Development : Communication Research Trends, Vol. 9, No.3, 1988.

Hoogvelt Ankie : The Third World in Global Development, Macmillan, London, 1982.

Hornik, Robert C : Development Communication : Information Agriculture and Nutrition in Third World, Longman, London/NY , 1988.

Melkote Srinivas : Communication for Development in the Third World – Theory and Practice, Prentice – Hall, New Delhi, 1991.

Sondhi, Krishan : Communication, Growth and Public Policy Breakthrough, New Delhi, 1983.

Schramm, Wilbur : Mass Media and National Development, Stanford UP, Stanford, 1964.

Course Title: SUSTAINABLE AGRICULTURE

Course Code: SWCP - 20

Level: MSW (IV)

Objectives:

- To Understand the Indian Agricultural Policy and the Crisis in Agriculture.
- To be acquainted with sustainable agricultural practices.
- To effectively respond to the problem of food and nutritional security at the level of the farmer/community.

Unit-I: Principles & Policy for Sustainable Agriculture

Social Work in Rural-Agro ecological Communities;

History & Evolution of Agricultural Practices;

Principles of Sustainable Agriculture;

Policy & Practice of Sustainable Agriculture;

Principles of Industrial Agriculture;

Policy & Practice of Industrial Agriculture.

Unit-II: Soil Health & Water Management Soil Health:

On Farm Biomass;

Cattle Dung;

Earth Worm;

Soil Health Enhancement Techniques;

Organic Carbon Measurement.

Water Management:

In-situ water conservation;

Methods to reduce flow of rain water;

Mulching;

Moisture Management.

Unit-III: Seeds & Cropping Pattern Seeds:

Seed in the context of a micro-ecosystem;

Significance of Diversity in Seed;

Types of Seeds;

Politics of Seed Control;

Techniques of preserving seeds with Farming Communities.

Cropping Pattern:

Multiple cropping patterns & Soil Health;

Soil-climate & cropping patterns;

Cropping Patterns as enhancing photosynthesis process.

Unit-IV: Integration & Ecological Agriculture

Integration of Agriculture:

Interrelated Activities of Agriculture;

Stages of Integration;

Processes of Integration;

Programs available for Integration.

Ecological Agriculture:

Principles of Ecological Agriculture;

Transition from Integrated Agriculture to Ecological Agriculture.

Reading List:

Randhawa M.S, A History of Agriculture in India, Vol. I, II, III & IV, ICAR.

Asian Agri-History Foundation (1999), Krishi Parashara, ISRISAT.

Subramaniam. C (1995) Hand of Destiny: The Green Revolution (Vol.2) Bharatiya Vidya Bhavan.

Shina Vandana, The Violence of the Green Revolution.

Roy. B. C, Chattopadhyay, G.N, And Tirado.R; Subsidising Food Crisis.
www.greenpeaceindia.org.

Howard. Albert, An Agricultural Testament, Other India Press.

Howard. Albert & Wad. Yeshwant D, The Waste Products of Agriculture- Their utilization as humus.

Howard. Albert and Berry. Wendell (1945), Soil and Health,
<http://www.journeytoforever.org/>

Fukuoka. M. (2009) The One Straw Revolution, OIB

Fukuoka. M. (1996). The Road Back to Nature: Regaining the Paradise Lost, OIB.

Dabholkar. S. A. (2001) Plenty for All, OIB.

Save. Bhasker, The Great Agricultural Challenge, OIB.

Green Foundation, Janadharya Seed Savers.

Green Foundation, Seed to Food.

Alvares. Claude (2009), The Organic Farming Sourcebook, Other India Press.

Course Title: DISSERTATION

Course Code: SWCP - 21

Level: MSW (IV)

Dissertation

The student has to prepare and submit a dissertation under the guidance of a faculty. The student should exhibit ability to review relevant literature formulate a research question, choose appropriate methodology, develop data collection tools, analyze and interpret data and prepare the research report. The length of the dissertation excluding contents and Bibliography should not exceed ten thousand words.

Evaluation Criteria

Sl. No.	Item		Weightage
1	Choice of Topic Review of relevant literature	Scope, Research Potential Comprehension, quality, quantity	10
2	Objective and Hypothesis/Question	Relevance, clarity, relation to topic Research Design/Methodology Appropriateness, selection of variables sample and description	20
3	Tools Used	Appropriateness, use	10
4	Data analysis and interpretation	Scheme, Application of Statistical techniques, use of tables and figures relating findings to objectives and literatures, discussion on findings	20
5	Summary	Synthesis of findings Implications	10
6	Report Presentation	Cauterization, chapter size, structuring of paragraphs vocabulary, clarity, coherence, Bibliography	10
7	Viva-voce	Ability to explain the research process & defend research work	20
Total			100

Course Title: ENTREPRENEURSHIP

Course SWEP - 07

Level: MSW (IV)

Objectives

- To familiarize Social Work students to entrepreneurship
- To give them basic skills and competencies to encourage entrepreneurship through their Social Work practices.

Unit – I : What is Entrepreneurship?

Entrepreneurship- conceptual issues; Entrepreneurship and Development: Entrepreneurship motivating factors, competencies, performance and reward. Status of entrepreneurs in India, problems and concerns of entrepreneurs

Unit – II : How to be an Entrepreneurship?

Opportunity scouting and idea generation: creativity and innovation; the process of setting up a small business: Preliminary screening and detailed study of the feasibility of the business idea: financing/non-financing support agencies; Schemes of assistance from government and non-governmental agencies, policies/programs and procedures and the available schemes

Unit-III : Management Roles of an Entrepreneur

Management roles and functions in a small business; Designing and re-designing business process, location, layout, operations, planning and control. Issues of quality, productivity and environment; Managing business growth; Issues in marketing sales and distribution. Consortium marketing; competitive bidding/tender marketing negotiating with principal customers. Marketing Assistance, Subsidies and other Fiscal and monetary Incentives. National state level and grass-root level financial and non-financial institutions in support of small business development.

Unit – IV : Accounting

Principles of double-entry book-keeping: Journal entries, cash-book, pass book, and Bank Reconciliation Statement ledger account trail balance and preparation of final accounts: Trading and Profit and Loss Account; Balance-sheet. Brief introduction to Single-Entry system of record keeping. Sources of risk/venture capital, fixed capital, working capital and a basic awareness of financial services such as leasing and factoring

Reading list:

Sivakama Sundari, S. Entrepreneurship Development of Rural Women (Vol.I) Asian and Pacific for Transfer of technology, New Delhi.

Heggade, O.D. Developing rural women entrepreneurship, Mohit publications, New Delhi

Santhawali, A.Y. Entrepreneurship Development – Publications, Jaipur.

Bhide, Amar V. The Origin and Evolution of New Business, Oxford University Press, New York, 2000

Dollinger M.J., 'Entrepreneurship strategies and Resources', 3rd edition, Pearson Education, New Delhi 2006

Desai, Vasant Dr. (2004) Management of small scale enterprises New Delhi: Himalaya Publishing Company

Taneja, Gupta, Entrepreneur Development New Venture Creation: 2nd edition Galgotia Publishing Company

Holt, David H., Entrepreneurship: Strategies and Resources, Illinois , Irwin, 1955.

Panda, Shiba Charan, Entrepreneurship Development, New Delhi, Anmol Publications

Patel, V.G., The Seven Business Crises and How to Beat Them, Tata-Mcgraw, New Delhi, 1995

SIDBI Report on Small Scale Industries Sector[latest edition]

Verma, J.C., and Gurpal Singh, Small Business and Industry-A Handbook for Entrepreneurs, Sage, New Delhi, 2002

Course Title: NGO MANAGEMENT**Course Code: SWEP – 08****Level: MSW (IV)****Objectives:**

- To understand the role of NGOs in society
- To gain clarity about the operating environment of NGOs
- To understand the issues involved in the internal management of NGOs

Unit I: Introduction to NGOs

Definitions, History, Roles in Society; Description of the NGO sector; Theoretical Perspectives on Organization and Management of NGOs.

Unit II: The legality of NGOs in India

Societies Registration Act, 1860, Indian Trust Act, 1882, Cooperative Societies Act, 1912, Company Act, 1956 (Some Relevant Part), FCRA: Foreign Contribution Regulatory Act, Income tax Act 1961, Income Tax Exemption: Under Sections 11 and 12, Rebate under Sections 80G and 35AC of Income Tax Act.

Unit – III: The operating environment of NGOs

Understanding the environment in which NGOs function: Economic, Political, Socio-Cultural and Ideological macro level forces that influence NGOs, Globalization and Foreign aid system. Principal Players and their Relationships: Governments, Markets, NGOs, Donors; Importance of partnerships.

Unit – IV: Internal Management of NGOs

Governance structure, Vision and Mission; Internal management needs of a NGO; strategies/plans for action; Managing Resources: Human and Financial; Measuring performance, participation, evaluation; Accountability to multiple stakeholders; Ethical issues faced by NGO managers; Scaling up and sustainability of NGOs; creating a learning environment

Reading List:

Lewis, David. 2007. The Management of Non-Governmental Development Organizations, second edition. New York: Routledge.

Edwards, M. and Fowler, A. (2003) The Earthscan Reader on NGO Management. London: Earthscan Publications, Ltd.

Salamon, L.M. 1994. The Rise of the Nonprofit Sector. *Foreign Affairs* 74 (3): pp. 109–122

Lewis, D. 2007. *Advocacy and Service Delivery: Managing the Main NGO Activities in The Management of Non-governmental Development Organizations, Second Edition*

Fowler, A. 1997. *Understanding International Development in Striking a Balance: A Guide to Enhancing the Effectiveness of Non-governmental Organizations in International Development* London: Earthscan Publications, Ltd.,

Course Title: PROJECT MANAGEMENT

Course Code: SWEP – 09

Level: MSW (IV)

Objectives:

- To understand the fundamentals of Project management and how to initiate, plan, execute and close a project.

Unit - I: Fundamentals of Project Management

What is a Project? Definition, meaning, principles and types; What is project management? meaning, coverage and scope; Who is the project manager?; Project phases and knowledge areas. Planning and its importance; who should be involved in planning?

Unit - II: Initiating Projects and Project Identification

How to get a project started; Setting a mandate, finding a project sponsor and creating a project team: team dynamics and running meetings.

Project Identification: Needs assessment: listening, interviewing, focus group discussions, community mapping; Capacity assessment: human, social, natural, physical, economic, cultural

Unit - III: Planning and Executing Projects

Work Breakdown Schedule (WBS), Project estimating and scheduling techniques-sequencing tasks, identifying the path of the project, considering resources; Risk planning methods; Cost planning; Communications plan; final project plan.

Team management; identifying and involving all stakeholders, user groups, interest groups, beneficiaries, decision makers; Primary and Secondary stakeholders; levels of participation;

Unit - IV: Closing a Project

Closing of a successful project; stakeholder acceptance; writing a final report; Techniques of identifying lessons learned and their analysis; acknowledging successes and failures; and identifying areas for further projects.

Reading List:

Verzuh, Eric. The Fast Forward MBA in Project Management. Published by John Wiley and Sons, Inc.

Project Management Body of Knowledge, 5th Edition. Published by Project Management Institute (PMI)

Blackman, Rachel. 2003. Project Cycle Management. UK: Tearfund.

Preskill, Hallie and Russ-Eft, Darlene. 2005. Building Evaluation Capacity. London: Sage Publications.

Capezio, Peter. 2000. Powerful Planning Skills. Mumbai: Jaico Publishing House.

Smith, Steve. 2002. Plan to Win. New Delhi: Kogan Page India Pvt. Ltd.

Dale, Reidar. 2001. Evaluation Frameworks for Development Programmes and Projects. New Delhi: Sage Publications.

Loehle, Craig. 2000. Thinking Strategically. New Delhi: Foundation Books.

Padaki, Vijay. 1995. Development Intervention and Programme Evaluation. New Delhi: Sage Publications.

Course Title: CLIMATE CHANGE, DISASTER MANAGEMENT AND REHABILITATION

Course Code: SWEP –

10 Level: MSW (IV)

Objectives:

- To understand the challenges of Climate change
- To gain a comprehensive understanding of the Disaster Management Cycle.
- To get acquainted with Disaster Management Policies and Laws in India.

Unit I:

- **Climate Change:** Concept, nature and severity of climate change. Causes of climate change. Impact of climate change: globally in general and Odisha in particular. Greenhouse effect, climate change and disaster.
- **Disaster Management:** Definition, Types of disaster (natural and manmade disaster) mining disaster, tropical cyclone, storms, floods, lightning, forest fire, tsunami and earthquakes.

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Unit II:

- **Concepts associated with Climate Change and Disasters:** air pollution

and acid rain, ozone depletion, bio-diversity extinction, de-forestation and loss of biological diversity, land degradation, deserts and desertification, groundwater over exploitation, dryness and wildfires, population growth and explosion, habitat related problems.

- **Social Systems, Ecological Networks and Disasters:** a socio-political ecology of disasters, nature of human communities, community as an ecological network.

Unit III:

- **Disaster Management Cycle:** Disaster phase, Response phase, Recovery phase, Risk reduction phase, Preparedness phase.
- **The Process of Disaster Management:** mitigation, preparedness, response and recovery.
- **Majors Disasters in Odisha:** Flood, cyclone, drought, tsunami, etc
- **Disaster Management Programs and System in India:** Nation Disaster Management Act (2005), National Policy on Disaster Management (2009), Disaster Management in the Xth Five Year Plan onwards, different bodies National Disaster Management Agency (NDMA), State Disaster management Agency (SDMA), National Disaster Response Force (NDRF), National Institute of Disaster Management (NIDM), India Disaster Resource Network (IDRN). Community based disaster management and community based disaster management practices (case studies), The role of INGOs and NGOs.
- **Disaster Warning and Evacuation:** Factors influencing evacuation and some policy considerations, media and other sources of information, Phases of evacuation: Preparation, Decision

Unit IV:

- **Environmental Legislation and Regulations associated with Disaster Management:** Environment Policy of the Government of India: Five Year Plans, Environment Protection Act (1986), The Environment (Sitting for Industrial Projects) Rules (1999), The Indian Forest Act (1927 and Amendment 1984), The Indian Forest (Conservation) Act (1981), Coastal Regulation Zone Notification (1991).
- **Rehabilitation:** Need for rehabilitation, Government and Non-government programs for rehabilitation, role of NGOs for rehabilitation programmes, Critical review of programmes, Role of Social Work in minimizing the effects of disaster.

Reading List:

Anandha Kumar K.J and Ajinder Walia (2013) India Disaster Report, NIDM: New

Delhi.

Gupta. Anil K et, al (Ed) (2014). Training Module Mainstreaming Climate Change Adaptation and Disaster Risk Reduction into District Level Development Plans, NIDM : New Delhi.

Satendra and Kaushik. D (2013) Forest Fire Disaster Management NIDM: New Delhi.

Vogelbacher (2013) Flood Disaster Risk Management NIDM: New Delhi.

Kaushik. A.D. (2012) Flood Risk Mitigation and Management: A Training of Trainers Module, NIDM: New Delhi.

Course Title: People-Centered Advocacy

Course Code: SWEP – 11

Level: MSW (IV)

Objectives:

1. To acquire conceptual clarity and theoretical knowledge about linkages between state, civil society and market, governance and social policy processes
2. To acquire conceptual clarity about Social Advocacy as a method for bringing about social change to achieve equality and social justice goals enshrined in the Constitution using non-violent methods
3. To become aware of the democratic institutions, actors and the processes of democratic decision making
4. To acquire necessary skills for strategy planning to engage in Social Advocacy
5. To internalize values and attitudes necessary for working at micro, meso and macro levels and with diverse individuals and groups by following the Constitutional and democratic processes

Unit 1: Understanding People Centred Advocacy

- Politics in Social Advocacy and its role in democratic decision making
- Advocacy vis-à-vis Social Revolution and Social Action
- Relevance and importance of people centered advocacy and rights based approaches in India
- Power, politics and public arguments
- Personal and institutional benefits of Social Advocacy

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Unit 2: Role of Information, Networking and the Media in Advocacy

- Power of Information in People Centered Advocacy

- Identifying incidents, collecting information and framing issues
- Mobilizing support and importance of coalitions
- Role of organization and campaign strategies
- Building favorable public opinion and putting pressure on decision makers
- Understanding the politics of media and its role in consensus and conflict creation
- Developing material for the media and its diverse audience
- Exploring alternate media for pro-people advocacy

Unit 3: Advocacy with the Legislature and Executive

- Understanding channels between legislators and advocacy groups
- Knowing the actors within and outside legislative bodies
- Role of bureaucracy in policy making, operationalization and implementation.
- Finding policy hooks and political angles. Understanding phases of policy making
- Implications of transparency and accountability vis-à-vis elected representatives and the bureaucracy
- Practical tips and strategies for advocating with legislatures and the bureaucracy

Unit 4: Advocating with the Judiciary and with the reference to the International framework.

- Understanding central and state laws and function of various courts in India
- Role of Information and PILs in Judicial Advocacy
- Post 2015 agenda, post MDG frameworks
- Making post 2015 matter for socially excluded groups in India

Reading List

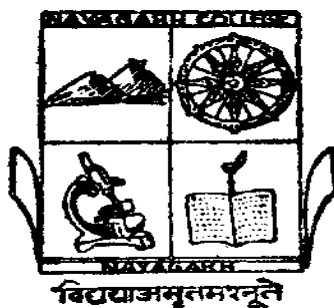
NCAS.resource material and documented case stories on People Centred Advocacy

MASTER OF COMMERCE

M. COM.






((Master Degree Course under CBCS))

For the Admission Batch : 2018-19



NAYAGARH AUTONOMOUS COLLEGE,

NAYAGARH-752 069

	Skill Development
	Employability
	Entrepreneurship
	All the three
	Skill Development and Employability
	Skill Development and Entrepreneurship
	Employability and Entrepreneurship

MASTER OF COMMERCE (Choice Based Credit System)DEPARTMENT OF COMMERCE, NAYAGARH AUTONOMOUS COLLEGE, NAYAGARH,
AFFILIATED TO UTKAL UNIVERSITY**Semester-I**

Code	Course Name	Marks	Credit	Category
MCC-101	Management Concepts and Practices	100	4	A
MCC-102	Statistics for Management	100	4	A
MCC-103	Corporate Financial Accounting	100	4	A
MCC-104	Financial Management	100	4	A
MCC-105	Accounting for Managerial Decision Making	100	4	A
MCC-106	Risk and Insurance Management	100	4	A
Total		600	24	

Semester-II

Code	Course Name	Marks	Credit	Category
MCC-201	Business Environment	100	4	A
MCC-202	Organization Behavior	100	4	A
MCC-203	Marketing Management	100	4	A
MCC-204	Managerial Economics	100	4	A
MCC-205	Small Business Management	100	4	A
MCC-206	Social Survey and Research Methodology	100	4	A/C/D
Total		600	24	

Category: A- Core, C- Open to Allied subjects, D- Open to All

Semester-III

Code	Course Name	Marks	Credit	Category
MCC-301	Project Report (Report -100, Presentation and Vive voce -100)	200	8	A
MCC-302	Strategic Management	100	4	A
MCC-303	Financial Institutions and Markets	100	4	A
MCC-304	Economic Analysis for Decision Making	100	4	A
	Any ONE group from the following			
	(A)Accounting			
MCEA-309	Advanced Accounting	100	4	B/C
MCEA-310	Corporate Tax	100	4	B/C
MCEA-311	planning	100	4	B/C
	Advanced Auditing			
	(B)Finance			
MCEB-312	Merchant Banking & Financial Services	100	4	B/C
MCEB-313	International Finance	100	4	B/C
MCEB-314	Security Analysis	100	4	B/C
	(C)Marketing			
MCEC-315	Services marketing	100	4	B/C
MCEC-316	Retail Management	100	4	B/C
MCEC-317	Customer Relationship Management	100	4	B/C
	(D)International Business			
MCED-318	International Business	100	4	B/C
MCED-319	International Finance	100	4	B/C
MCED-320	Global Risk Management	100	4	B/C
	(E) Entrepreneurship			
MCEE-321	Entrepreneurship in MSMEs	100	4	B/C
MCEE-322	Project Appraisal & Implementation	100	4	B/C
MCEE-323	Accounting & Finance for small Entrepreneurs	100	4	B/C

Category: A- Core, B- Elective, C-Open to Allied Subjects, D-Open to All

Semester-IV

Code	Course Name	Marks	Credit	Category
MCC-401	Corporate Governance & Business Ethics	100	4	A
MCC-402	Management of Financial Institutions	100	4	A
	Any ONE group from the following			
	(A)Accounting			
MCEA-409	International Accounting	100	4	B/
MCEA-410	Accounting Standards & Corporate Reporting	100	4	C
MCEA-411	Accounting for NPOs	100	4	B/
				C
	(B)Finance			
MCEB-412	Portfolio Management	100	4	B/C
MCEB-413	Risk Management & Derivatives	100	4	B/C
MCEB-414	Financial Regulations	100	4	B/C
	(C)Marketing			
MCEC-415	Product Planning & Sales Force Mgt.	100	4	B/C
MCEC-416	International Marketing	100	4	B/C
MCEC-417	Product & Brand Management	100	4	B/C
	(D)International Business			
MCED-418	International Accounting	100	4	B/
MCED-419	International Marketing	100	4	C
MCED-420	International Financial Services	100	4	B/
				C
	(E) Entrepreneurship			
MCEE-421	Entrepreneurship : Innovation & Strategy	100	4	B/
MCEE-422	Statistics for Business Decision Making	100	4	C
MCEE-423	Entrepreneurship & Information Technology	100	4	B/
				C

Category: A- Core, B- Elective, C-Open to Allied Subjects, D-Open to All

Audit Courses

- i) Management of Personal Finances
- ii) Capital Market Instruments
- iii) Financial Inclusion
- iv) Accounting for small Business organizations
- v) Personal Taxation & Planning

(Credit will be assigned if the student opts to go through the examination process. But it will not be considered for CGPA) (Cumulative Grade Points Average)

Evaluation: End Term: 70 Marks

Unit Test and Quiz: 20 Marks, Assignment and Presentation: 10 Marks

Project Report: Thesis: 100 marks, Presentation & Viva-Voce: 100 marks

Minimum Total Marks= 2500

Minimum Credit Points: Core 76 + Elective 24 = 100

FIRST SEMESTER

MCC - 101. MANAGEMENT CONCEPTS AND PRACTICES (Credit – 4)

Objective

To familiarize the students with the developments of management principles and practices.

Course Inputs

UNIT-I Basic Concepts of Management: Management in Antiquity, Historical development of management thought- Classical, Neo-Classical and Modern Schools, Tasks of a professional manager, Managerial roles.

UNIT-II Planning: Nature and significance, developing planning premises, planning exercises and limitations,

Decision Making: Types of decision, decision making process, models, techniques and conditions, creativity exercises.

UNIT-III Organizational Design: Organization structure-mechanistic and organic, Products Functional, and Project and Matrix structure, Centralization versus Decentralization of Authority, Informal Organization, and Organization Effectiveness.

UNIT-IV Management of Human Resources: Manpower planning, Job Analysis, Recruitment & Selection, Training and Development, Performance Appraisal

UNIT-V Management Control: Process, Tools and Techniques, Behavioral Implication of Control, Management in a Global Environment Case Study.

References:

1. Robbins, "Management", Pearsons Education, New Delhi.
2. Koontz & Weihrich, "Essentials of Management "-McGraw Hill
3. Gibson JL etal: Organisations, Behaviour, Structure and Process- McGraw Hill
4. Rao & Narayana ; Principle & Practice of Management – Konark Publishing
5. Stoner & Freeman : Management-PHI
6. Prasad L.M. : Principles & Practice of Management – Sultan Chand.
7. Prasad Manmohan," Management : Concepts and Practices, Himalayan.
8. Terry, George R," Principles of Management", Richard D Irwin.

Objective

The objective of this course is to make the students learn the application of statistical tools and techniques for decision making.

Course Inputs

UNIT-I Partial Correlation, Multiple Correlation, Multiple Regression, Interpolation & Extrapolation.

UNIT-II Probability Theory: Probability- classical, relative and subjective probability; Addition and multiplication probability models; Conditional probability and Baye's theorem.

Probability Distributions: Binomial, Poisson and normal distributions: Heir characteristics and applications.

UNIT-III Statistical Decision Theory: Decision Environment; Expected profit under uncertainty and assigning probabilities; Utility Theory; Decision Tree analysis.

Sampling: Sampling and Sampling (probability and non-probability) methods; Sampling and non-sampling errors; Law of large numbers and central limit Theorem; Sampling distributions and their characteristics.

UNIT-IV Statistical Estimation and Testing: Point and interval estimation of population mean, proportion and variance; Statistical testing- hypotheses and errors; sample size; Large and small sampling tests- Z tests, T tests and F tests.

UNIT-V Non Parametric Tests: Chi-square tests; Sign tests; Wilcoxon Signed – Rank tests;

Statistical Quality Control: Causes of variations in quality characteristics; Quality control chart- purpose and logic; Constructing a control chart- computing the control limits (X and R charts); Process under control and out of control; Control charts for attributes- fraction defectives and number of defects; Acceptance sampling.

References:

1. Levin, Richards I, and David S Rubin: Statistics of Management, Pearson Education, Delhi.
2. Lawrence B. Morse: Statistics for Business & Economics. Harper Collins, NY.
3. Watsnam Terry J. and Keith Parramor: Quantitative Methods in Finance, International Thompson Business Press.
4. Hien, L.W: Quantitative Approach to Managerial Decisions, Pearson Education, Delhi.
5. Gupta, S.P.; Statistical Methods, Sultian Chand, Delhi.
6. Sharma, Anand; Quantitative Techniques for Decision Making, Himalaya Publishing House.
7. Arora P.H., Sumeet etc.; Comprehensive Statistical Methods, S. Chand.
8. Anderson, Sweeney, Williams, Statistics for Business and Economics, Thompson.
9. Agarwal, D.R.; Quantitative Methods, Urinda Publication.

10. Heinz Kohler: Statistics for Business & Economics, Harper Collins, New Delhi.
11. Hooda, R.P: Statistics for Business and Economics, Macmillan, New Delhi.

Objective

The objective of this course is to expose students to advanced accounting issues and practices such as maintenance of company accounts, valuation of goodwill and shares, and handling accounting adjustments.

Course Inputs**UNIT-I Final Accounts and Financial Statements of Companies:**

Corporate problems with special reference to published Accounts.

UNIT-II Valuation of Goodwill and Shares: Funds Flow and cash flow statements.**UNIT-III Accounting Issues: Relating to Amalgamation, absorption, and reconstruction of companies both external and internal.****UNIT-IV Accounts: Relating to liquidation of companies. Investment Accounts. Lease Accounting.****UNIT-V Human Resource Accounting: Meaning, Approaches & Assumptions, Methods of human Resource Accounting.****References:**

1. Beams, F.A.: Advanced Accounting, Pearson Education, New Delhi.
2. Dearden, J. and S. K Bhattacharya: Accounting for Management, Vikas, New Delhi.
3. Engler, C., L.A. Bemstein. And K.R L Lambet: Advanced Accounting, Irwin, Chicago.
4. Fischer, P.M., W.J Taylor and J.A Leer: Advanced Accounting, South-Western, Ohio.
5. Gupta, R.L: Advanced Financial Accounting, S. Chand & Co., New Delhi.
6. Horngreen," Introduction to Financial Accounting:, Pearson Education, New Delhi.
7. Keiso D.E. and J.J Weygandt: Intermediate Accounting, John Wiley and Sons, NY.
8. Maheshwaari, S.N: Advanced Accountancy- Vol. II, Vikas Publishing House, New Delhi.
9. Monga, J.R: Advanced Financial Accounting, Mayoor Paperbacks, Noida.
10. Tulsian, P.C.: Financial Accounting, Pearson Education, New Delhi.
11. Neigs, R.F: Financial Accounting, Tata McGraw Hill, New Delhi.
12. Shukla, M.C. and T.S. Grewal: Advanced Accountancy, Sultan Chand & Co., New Delhi.
13. Warren, C.S. and P.E Fess: Principles of Financial and Managerial Accounting, South-Western, Ohio.

Objective

The objective of this course is to enable the students to understand the fundamentals of financial management in the context of a corporate entity. It attempts to acquaint them with different dimensions of financial management with a focus on the application of the relevant tools and techniques of financial decision-making aimed at shareholder's wealth maximization.

Course Inputs

UNIT-I Introduction: Nature and Scope of Financial Management; Financial Goals-Conflict of interest between the stakeholders; Functions of Financial Manager, Changing Financial Environment, Emerging Challenges faced by the Finance Manager.

UNIT-II Financing Decisions: Sources of Long term Capital-Equity, Debt, Term Loan, Preference share, Hybrid Securities, Internal Funds-Innovative sources of Domestic and Foreign Capital-Issues relating Financing Decisions.

UNIT-III Leverage and Capital Structure Analysis: Analysis of Operating Leverage and Financial Leverage- Combined Financial and Operating Leverage Concept of Capital Structure- Determinants – Theories of Capital Structure- Relevance and Irrelevance- Capital Structure Decision and Shareholder's Value Maximization.

UNIT-IV Long Term Investment Analysis: Investment Idea Generation-Tools and Techniques of investment analysis-Risk Analysis in Capital Investment Decisions
Dividend Decisions: Issues in Dividend Decisions-Models and Theories of Dividend- Forms of Dividend-Corporate Dividend Behavior.

UNIT-V Short Term Asset Management: Strategic Planning and Estimation of Short Term Funding Needs-Financing Sources-Computation of Cost of Short Term Fund.
Management of Cash, Inventory and Receivables.

References:

1. Bhattacharya, H., "Working Capital Management: Strategies and Techniques". Pearson Education, Delhi.
2. Brealey, Richard A and Steward C. Myers: Corporate Finance, McGraw Hill, Int. ED, New York.
3. Chanda, Prasanna: Financial Management, Tata Mc Graw Hill, Delhi,
4. Pandey, I.M: Financial Management, Vikas Publishing House, Delhi.
5. Van Home, J.C. and J.M. Wachowicz Jr.: Fundamentals of Financial Management, Pearson Education, New Delhi.
6. Van Home, James C, "Financial Management and Policy" Pearson Education, New Delhi.
7. Pinches, George E: Essentials of Financial Management; Harper and Row, New York.
8. Khan MY, Jain PK: Financial Management; Tata Mc Graw Hill, New Delhi.
9. Archer, Stephen H., Choate G Marc, R. George; Financial Management; John Wiley, NY.
10. Block, Stanley B. Geoffrey A Hilt; Foundations of Financial Management; Richard D. Irwin, Homewood, Illinois.

MCC - 105 ACCOUNTING FOR MANAGERIAL DECISION MAKING
(Credit – 4)

Objective

The objective of this course is to acquaint students with the accounting concepts, tools and techniques for managerial decisions.

Course Inputs

UNIT I Accounting Information and Managerial Decision Making: Financial accounting; Accountant's Position, role, and responsibilities.

Analysis Financial Statements: Horizontal and Vertical Analysis, Ratio analysis.

UNIT II Marginal Costing and Break-even Analysis: Concept of marginal cost; Marginal costing and absorption costing; cost- volume-profit analysis; Break-even analysis; Decisions regarding sales-mix, make or buy decisions and discontinuation of a product line etc.

UNIT III Budgeting : Features of a budget; Essentials of budgeting; Types of Budgets- functional, master budgets, etc; Fixed and flexible budget; Budgetary control; Zero-base budgeting; Performance budgeting.

UNIT IV Standard Costing and Variance Analysis: Standard costing as a control technique; setting of standards and their revision; Variance analysis- meaning and importance, kinds of variance and their uses- materials, labour, overhead and sales variance; Disposal of variances.

Accounting Plan and Responsibility Centres: Meaning and significance of responsibility accounting; Responsibility centers – cost centre, profit centre and investment centre; Objective and determinants of responsibility centers.

UNIT V Activity-based costing; Reporting to Management; Balanced Score Card

References:

1. Homgren Charles T. George Foster and Srikanta M. Dattar: Cost Accounting: A Managerial Emphasis, Pearson.
2. Banerjee, B. Cost Accounting. PHI
3. Jawahar Lal, Cost Accounting, Tata McGraw
4. Homgren, C.T. Gary L. Sundem and William O. Stratton: Introduction to Management Accounting, Pearson
5. Khan, M.Y., and Jain, P.K., Cost Accounting, Tata McGraw
6. Maheswari, S.N., Principles of Cost Accounting, Sultan Chand
7. Lall, B.M., and I.C. Jain; Cost Accounting Principles and Practice, PHI
8. Pandey, I.M, Management Accounting, Vani
9. Kaplan, Management Accounting , PHI.
10. Kishore, R.M., Cost and Management Accounting, Taxman
11. Druty, C., Management and Cost Accounting. Thomsom.
12. Shukla, Grewal & Gupta, Cost Accounting, S. Chand.

Objective

The course aims at developing necessary skills for applying the principles of financial analysis to management of funds by commercial banks and the insurance sector.

Course Inputs

UNIT I Basic Concepts of Risk Management and Insurance: Meaning of risk, Basic categories of risk, methods of dealing with risk; Meaning and objective of risk management; Concepts and features of Insurance; Types of insurance contract and fundamental principles of Insurance; Cost benefit of Insurance to the society.

UNIT II Insurance regulatory Act, 1999 and Insurance Market; IRDA Act, 1999, Meaning, Objectives, Duties, Powers and Functions of Authority, Globalization of Indian Insurance, Privatization and Challenges before the Insurance Industry, Need for Reforms and Reforms Strategy.

UNIT III Life Insurance: Definition, Features and Principles of Life Insurance, Procedure for taking a policy, policy conditions, Premium Plans, Calculation of Premium. Settlement of Claims.

UNIT IV Fire and Marine Insurance: Principles, Policy conditions, Types of policies, of fire & Marine Insurance, Clauses and factors of Marine Insurance, Settlement of claims (Both Fire and Marine Insurance).

UNIT V Re-Insurance and Investment: General Features, Common terms, Features and Objects, Rights and Liabilities of Re-Insurance, Principles of Re-Insurance, Methods.
Investment: Investment Principles, Types, Legal and Social aspect of Investment, Policies of Insurance Companies.

References:

1. Arif, "Theory and Practice of Insurance" Educational Book House.
2. Sharma R.S., "Insurance Principles and Practice" Vora, Delhi.
3. Greene and Trieschemann, "Risk Insurance", south Western Publishing Co.
4. Grieder and Beadies, "Principles of Insurance"
5. Mishra M.N. "Insurance principles & Practice", S.Chand.
6. Palande, Shah & etc "Insurance in India" changing policies & Emerging Opportunities, Response Books.
7. Study Material of Insurance Institute of India, Bombay.
8. Ganguly Anand "Insurance Act", New Age International Publication.
9. Insurance Law Manual, Taxman, Delhi.
10. Holyake, "Insurance Management", AITBS Publication.
11. Darfman, Introduction to Risk Management and Insurance.

SECOND SEMESTER

MCC - 201 BUSINESS ENVIRONMENT (Credit – 4)

Objective

The Course develops ability to understand and scan business environment analysis opportunity and take decisions under uncertainty.

Course Inputs

UNIT I Theoretical Framework of Business Environment: Concept, Significance and Nature of business environment; Elements of environment; Techniques of environmental scanning and monitoring. Global environment and its rationale merits and demerits.

UNIT II Economic Environment of Business : Significance and elements of economic environment; Economic systems and business environment; Economic Planning in India; Government Policies- Industrial Policy, Fiscal Policy, Monetary Policy, Public Sector and Economic Development.

UNIT III Political and Legal Environment of Business: Critical elements of political environment; Government and Business; Changing dimensions of legal environment in India.

Socio-Cultural Environment: Critical elements of socio-cultural environment; Social Institution and systems; Social values and attitudes; Indian business system; Social responsibility of business; Consumerism in India.

UNIT IV International and Technological Environment: Multinational Corporations; Foreign Collaborations and India business; International economic Institutions – WTO, World Bank, IMF and their importance to India; Foreign Trade Policies; TRIPS, TRIMS, Anti-dumping. Dispute Settlement.

UNIT V Economic Reforms: - Need for economic reforms, Main features of reforms, structural changes, Deregulation, privatization and globalization impact of reforms, Human faces of reforms, Future trends of reforms, **MNCs**- Definition, advantages, disadvantages, Control over **MNCs**.

OPTIONAL: Trade Block & Business Centres

EEC, NAFTA, ASEAN, SFTA, SAARC

References:

1. Adhikary, M; Economic Environment of Business, Sultan Chand & Sons, New Delhi
2. Ahluwalia, I.J: Industrial Growth in India, Oxford University Press, Delhi.
3. Alagh, Yoginder K: Indian Development Planning and Policy, Vikas Pub. New Delhi
4. Aswathappa, K: Legal Environment of Business, Himalaya Publication, Delhi
5. Chakravarty, S: Development Planning, Oxford University Press, Delhi.
6. Ghosh, Blswanath: Economic Environment of Business, Vikas Pub. New Delhi.
7. Govt. of India: Economis Survey, Various Issues.
8. Raj Agrawal and Parag Diwan, Business Environment; Excel Books, New Delhi.
9. Ramaswamy, V.S. and Nama Kumari; Strategic Planning for Corporate Success, Macmillan New Delhi
10. Sengupta. N.K: Government and Business in India, Vikas Publication, New Delhi.
11. Daniels "International Business, Environment and Operations", Pearson Education, Delhi.

Objective

The objective of this course is to help students understand the conceptual framework of Interpersonal and organizational Behaviour.

Course Inputs

UNIT I Organisational Behaviour: Organisational behavior-concept and significance; Relationship between management and organizational behavior; Attitudes; Perception; Learning; Personality.

UNIT II Group Dynamics and Team Development: Interpersonal and Group Behaviour, Group dynamics-definition and importance, types of groups, group formation, group development, group composition, group performance factors; Group decision making merits and demerits.

Motivation: Process of motivation; Theories of motivation – Need hierarchy theory, theory X and theory Y, two factor theory, Alderfer's ERG theory, McClelland's learned need theory, Victor Vroom's expectancy theory, Stacy Adams equity theory.

UNIT III Leadership: Concept; Leadership styles; Theories- Trait theory, Behavioural theory, Fiedler's contingency theory; Hersey and Blanchard's situational theory; Managerial grid; Likert's four systems of leadership.

UNIT IV Interpersonal and Organisational Communication: Concept of two-way communication; Communication process; Barriers to effective communication; Types of organizational communication; Improving communication; Transactional analysis in communication. Stress Management.

UNIT V Organisational Conflict: Dynamics and management; Sources, patterns, levels, and types of conflict; Traditional and modern approaches to conflict; Functional and dysfunctional organizational conflicts; Resolution of conflict.

References:

1. Robbins, Stephen P. and Mary Coulter; Management, Pearson Education, Delhi.
2. Griffin, Ricky W; Organisational Behaviour, Houghton Mifflin Co. Boston.
3. Robbins, Stephen P: Organisational Behaviour, Pearson Education, Delhi.
4. Hellreigel, Don, John W. Slocum, JR., and Richard W. Woodman: Organisational Behaviour; South Western College Publishing, Ohio. Utilising Human Resources, Prentice Hall, New Delhi.
5. Hersey, Paul, Kenneth H. Blanchard and Dewey E. Johnson; Management of Organisational Behaviour; Utilising Human Resources, Prentice Hall, New Delhi.
6. Ivancevich; John and Michael T. Matheson: Organisational Behaviour and Management, Business Publication Inc. Texas.
7. Koontz, Harold, Cyril O'Donnell and Heinz Wehrich; Essentials of Management. Tata McGraw-Hill, New Delhi.
8. Luthans, Fred; Organizational Behaviour, McGraw-Hill, New York.
9. Newstrom, John W, and Keith Davis; Organizational Behaviour; Human Behaviour at work, Tata McGraw-Hill, New Delhi.

Objective

The objective of this course is to facilitate understanding of the conceptual framework of marketing and its applications in decision making under various environmental constraints.

UNIT I Basics of Marketing: Meaning, Importance, Scope of Marketing; Marketing elements and Strategies, Marketing Environment; Marketing and Economic Development Process; Marketing Organisation.

UNIT II Marketing Management and Studying Consumers Behaviour; Marketing Management Process:- Planning & Market Segmentation, Marketing Research & Marketing Information System; Consumers Behaviour and Marketing Strategies. Buyer's Decision process and consumer Behaviours

UNIT III Production Management & Pricing Strategies: Meaning and importance of product decision, Product Classification, Product Life Cycle (PLC) and marketing Strategies; Branding & Packaging; Pricing objectives, factors of pricing methods, and pricing policies and Strategies

UNIT IV Promotion & Placement Strategies: Meaning and importance of Communication and Promotion, elements of communication, tools of promotion, Objectives and Strategies of Promotion; Meaning and importance of Distribution. Physical Distribution System, Wholesaling and Retailing practices in India.

UNIT V Marketing in Indian Practice: Rural & Agricultural Marketing; International Marketing; Cyber Marketing; Co-operative Marketing; Green Marketing, Services Marketing

Reference:

1. Etzel, M.J, Marketing-Concepts and Cases, Tata McGraw Hill, New Delhi.
2. Keegan: Global Marketing Management, Pearsons, New Delhi.
3. Kotler Philip and Armstrong Gary; Principles of Marketing, Pearsons, New Delhi, 2006
4. Kotler, P.: Marketing Management, Pearsons, New Delhi.
5. Kumar: Marketing & Branding, Pearsons, New Delhi.
6. Majumdar, Ramanuj : Product Management in India, Prentice : fall, New Delhi
7. Mathur; Strategic Marketing Management, McMillan.
8. Motr : Marketing of Higher Technology Products and Innovations, Pearsons, New Delhi
9. Perreault, W.D. and Mc Carthy, E.J: Basic Marketing, Tata McGraw Hill, 2007. New Delhi
10. Ramaswamy, Namkumari : Marketing Management, McMillan, New Delhi.
11. Ramaswamy, Namkumari : Marketing Management, McMillan, Calcutta.
12. Saxena, R: Case Studies in Marketing, The Indian Context. PH, New Delhi.
13. Srinivasan: Case Studies in Marketing, Prentice Hall of India, New Delhi.
14. Stanton, William: Fundamental of Marketing; Tata Mc Graw Hill Publication, New Delhi.
15. Mc Carthy; Marketing Management, Tata-Mc Graw Hill, New Delhi
16. Karunakaran K – Marketing Management, Himalaya Publishing House, New Delhi.

Objective

This course develops managerial perspective to economic fundamentals as aids to decision making under given environment.

Course Inputs

UNIT I Fundamental Concepts & Principles: Introduction to Managerial Economics; Scope and Subject matter. Basic Concepts and Techniques, Nature of Managerial and Economic Problems, Nature of Economic Analysis, Role and responsibility of managerial economic; Implicit and explicit costs.

UNIT II The Theory of Firm: The circular flow of Economic Activity. The nature of the firm. Objectives of the firm, Maximising versus satisfying, the concept of economic profit, theories of profit-Accounting and economic interpretation of profit. Policies on profit maximization, Profits for control.

UNIT III Demand Analysis: The demand schedule and demand curve. The demand function. Price elasticity of demand. Interpretation of elasticity of demand. Income and cross elasticities of demand, business and economic forecasting. Method of forecasting: Expert opinion. Market experiments, Surveys.

UNIT IV Theory of Production. The production function. One variable input production function – Empirical estimation and managerial uses. Two- variable input production function , Isoquants – Characteristics. Features and managerial use. Formulation of a Cobb- Douglas production function.

UNIT V The Theory of Cost: Cost Concepts- meaning and managerial use. Cost function – cost curves – Empirical estimation of a short – run cost function. Cost Reduction and Control.

References:

1. Craig Peterson. H.Cris Lewis, W.:Managerial Economics, Pearson Education, Delhi.
2. Mehta P.L.Managerial Economics Analysis, Problems and cases, Sultan Chand and Sons.
3. Mukherjee Sampat: Business and Managerial Economics. New Central Book Agency, Calcutta.
4. Baumol W. J., : Economic Theory and Operations Analysis, Prentice Hall of India LTD.
5. Johnson J; Economic Methods, New York, McGraw Hill.
6. Reddy, P.N. & Appannaiah, H.R., Essential Managerial Economics. Himalaya Publishing House.
7. Joal Dean: managerial Economics, PHI, New Delhi.
8. Case , “Principles of Economics”, Pearson Education, Delhi.

MCC - 205 SMALL BUSINESS MANGEMENT & PROJECT APPRAISAL

(Credit – 4)

Objective

The objective of the present course is to sensitize the student about the role of SME sector in the economic development of the country. The present course also includes discussion on various functions of a small scale units including tools and techniques of project preparation and appraisal.

Course Inputs

UNIT I SME ; Enterprise Evolution & Function; Definition of SSI Unit and SSI units Entrepreneur, Scope and Objective of SSI Units, Advantages & shortcomings of Small Industries, Small Industry and economic development, Developing Entrepreneurial Skill.

UNIT II Project Management: Project and Project Management, Project Identification, Project Formulation, Project Selection, Project implementation, Techno-Economic feasibility analysis, Social-cost-benefit analysis, Project Report.

UNIT III Small Industry Support system: Needs and importance of support system, NSIC, SIDO, SSIB, SISI, DIC, SIDBI, Commercial Banks, Venture Capital, Lease Financing.

UNIT IV Management Process in Small Business and Legal Framework: Planning Process, Organising, Leading and Motivating, Management of Time. The Factories Act, The Employees Provident Fund Act, Industrial Dispute Act, Payment of Wages Act, Workmen's compensating Act.

UNIT V Global Competition: Global Competitiveness, Strategies for SSIs; Sickness in Small Scale Industries- Symptoms, Reasons and Remedies; Future Growth Potential for SSIs.

References:

1. Dollinger, "Entrepreneurship-strategies and Resources", Pearson Education, Delhi.
2. Khamka, S.S "Entrepreneurship Development" S.Chand & Co
3. Cantillon, Richard "Entrepreneurship and Economic development" The Free Press, New York.
4. Gupta , C.B. and Khamka S.S. "Entrepreneurship and Small Business Management", S chand & Sons, Delhi.
5. Gupta C.B, & Srinivasan N.P."Entrepreneurship Development", S. Chand & Sons, Delhi.
6. Desai Vasant; "Dynamic of Entrepreneurial Development and Management, Himalaya Publishing House
7. Deshpande, M.U,; "Entrepreneurship of small Scale Industries", Deep & Deep Publication New Delhi.
8. Shrama, R.A. : "Entrepreneurial Change in Indian History", Sterling Publisher, New Delhi.

Objective

The Objective of this course is to acquaint students the concepts Social Survey and Research. They will also be provided inputs research methods, research methodology, process of research the process of research the process of report writing.

Course Inputs

UNIT I Research: Meaning and Objectives, Type of Research, Role of research in functional areas; Accounting, Finance, Marketing, HR etc. Research Methods, Research Methodology Research Process.

UNIT II Defining Research Problems: Setting Objectives, Formulating Hypothesis, Research Design, Sample Design.

UNIT III Social Survey: Collection of Primary and secondary data, Design of questionnaire.

UNIT IV Data Processing: Classification, Tabulation, Editing, Analysis and interpretation of data, Uni-variate, Bi-variate and Multi-variate Analysis.

UNIT V Report Writing: Categories of report, parts of a report, presentation of a report.

References:

1. Young. P.V. Sehid, C.F. Scientific Social Survey and Research
2. Seltiz Claire, et: Research Methods in Social Relation, Hold, Tinchart & Willton, New York.
3. Good and Halt, Methods in Social Research, McGraw Hill.
4. Kothari, C.R. Research Methodology Techniques, Wishwa Prakashan, New Delhi.
5. Cooper and Schindler, Business Research Methods, MsGraw Hill.
6. Wilkinsor & Bhandarkar, Methodology of Research in Social Sciences, Himalaya.
7. Paneerselvan R. Research Methodology, PHI.
8. Bajpal SR, research Methodology in Social Science.

THIRD SEMESTER

MCC - 301 PROJECT REPORT (Credit -8)

Objective : The objective of this is to make a survey and prepare a report on current issues.

MCC - 302 STRATEGIC MANAGEMENT (Credit - 4)

Objective

The objective of this course is to enhance decision making abilities of students in situation of uncertainty in a dynamic business environment.

UNIT I Concept of Strategy: Defining strategy, levels at which strategy operates; Approaches to strategic decision making; Mission and purpose, objectives and goals; strategic business unit (SBU); Functional level strategies.

Environmental Analysis and Diagnosis: Concept of environment and its components; Environment scanning and appraisal; organizational appraisal; Strategic advantage analysis and diagnosis: SWOT analysis.

UNIT II Strategy Formulation and Choice of Alternatives: Strategies- stability, growth, modernization, diversification, integration; Merger, take-over and joint strategic, Turnaround, divestment and liquidation strategies; Factors affecting strategic choice; Generic competitive strategies-cost leadership, differentiation focus, value chain analysis, bench marking service blue printing.

UNIT III Functional Strategic : Marketing, Production/Operations and R & D plans policies.
Personnel and Financial plans policies.

UNIT IV Strategy Implementation: Inter-relationship between formulation and implementation; Issues in strategy implementation, Resource allocation.

Strategy and Structure: Structural considerations, structures for strategies Organisational design and change.

UNIT V Strategy Evaluation: Overview of strategic evaluation; Strategic control; Techniques of strategic evaluation and control, Problem in management and evaluation, Global issues in Strategic Management.

References:

1. David, "Strategic Management", Pearson Education, New Delhi.
2. Bhattachary, S.K. and N.Venkataramin; managing Business Enterprises; Strategies structures and systems, Vikas Publishing House, New Delhi.
3. Budhiraja. S.B. and M.B. Athreya: Cases in strategic Management, Tata McGraw Hill, New Delhi.
4. Christensen, C.Roland, Kenneth R. Andrews, Joseph L. Bower, Rochard G. Hamermesh, Michael E. Porter; Business Policy; Text and cases, Richard D. Irwin, Inc, Homewood.
5. Coulter, Mary K: Strategic Management in Action, Prentice Hall New Jersey.
6. David, Fred R: Strategic Management, Prentice Hall, New Jersey.
7. Glueck, William F. and Lawrence R. Jauch: Business Policy and Strategic Management, McGraw Hill, International Edition.
8. H.Igor, Ansoff: Implanting Strategic Management, Prentice Hall, New Jersey.

9. Kazmi, Azhar: Business Policy and Strategic Management, Tata McGraw Hill, Delhi.
10. Srinivasan : Strategic Management – The India Context-PHI.

Objective

This course aims at providing students with an understanding of the structure, organization and working of financial markets and Institutions in India.

Course Inputs

UNIT I Nature of Financial System: Its function Components of Financial System, Evolution of India financial system-Measuring the efficiency of India financial system-Innovations in India Financial System.

Types of Financial Markets: Money Market and Capital Market. Role, Players, Instruments, Constituents and recent development Review of the Securities Market in India; Role of SEBI.

UNIT II Commercial Banking in India: Structure, and Functions., Balance-sheet Analysis,, Risk exposures, Basel Norms, Diversifications in Commercial Banking functions, Role of Commercial Banks in the Money Market, Bank Marketing. A SWOT Analysis of Indian Commercial Banks.

Rural Banking and Micro Finance: Problem and Prospects.

UNIT III Development Financial Institutions: Structure- Role and Objective- Promotional Functions – Emerging Problems & Development Banks- Strategic Options – Concept of Universal Banking.

Insurance Sector: Nature of Insurance Organization, Types of Insurance Products – Basics of Insurance Contracts – Insurance Sector Reforms- Problems of Market Structure – Risk Management and Insurance- Role of IRDA- Emerging Scenario.

UNIT IV Non-Banking Financial Companies: Concept and role in Financial Market- Regulation and Roles of leasing. Hire Purchase and Housing Finance Companies- Venture Capital Companies.

Mutual Funds: Concept, Features and different types of Mutual Funds. Regulation of Mutual Funds- Marketing of Mutual Funds- Problems and Prospects. Latest Scenario of Mutual Funds Industries.

UNIT V Merchant Banking: Concept, function- SEBI guidelines.

Depository System: Objectives, participants and operating mechanism.

Derivative Markets: Basic features of SWAPs, options, Forwards and Future Market.

Foreign investments: Role in economy, Trends, Implications and problems.

Reference:

1. Avdhant: Investment and Securities Markets in India, Himalaya Publication, Delhi.
2. Bhole, L.M. : Financial Markets and institutions, Tata McGraw Hill, Delhi.
3. Ghosh, D.Banking Policy in India, Allied Publication, Delhi.
4. Khan, M.Y: India Financial System, Tata McGraw Hill, Delhi.
5. Varshney, P.n:India Financial System, Sultan Chand & Sons, New Delhi.
6. Srivastava R.M:Management of Indian Financial institution, Himalaya Publishing House, Mumbai.

7. Verma JC: Guide to Mutual Funds and Investment Portfolio, Bharat Publishing House, New Delhi.
8. Gordon and Natarajan, "Financial Markets and Services". Himalayan Publishing House, N.Delhi.
9. Benton, E Gup, 'Financial Intermediations; An introduction', Response books.

MCC - 304 ECONOMIC ANALYSIS FOR DECISION MAKING (Credit - 4)

Objective

This course develops managerial perspective to economic fundamentals as aids to decision making under given environment.

Course Inputs

UNIT I Pricing Theory: Market structure and competitive Behaviour, Perfect Competition – Imperfect completion; monopoly, monopolistic competition and Oligopoly Pricing decisions under various market structure.

UNIT II Pricing Policies and Practices: Cost plus pricing. Skimming price and penetration price. Pricing products of lasting distinctiveness pricing products of perishable distinctiveness pricing standard products when competitor's and few, Pricing and practice.

UNIT III Product Diversification: Meaning and Scope. Product Life Cycle. Opportunity for multiple products. Specification product addition criteria. Policy on dropping old products.

UNIT IV Economic Environment: The Macro-Economic Scenario in India, Problems of Growth, Business Cycles: Cause and consequences – Measures to curb them. Balance of Payment problems. New Trade policy, WTO-critical evaluation and short coming.

UNIT V Economic Reforms: Need for economic reforms, Main features of reforms. Structural changes. Deregulation, Privatization and globalization, Impact of reforms-Human face of reforms. Future of economic reforms.

References:

1. Craig Peterson, H.Cris Lewis, W.:Managerial Economics, Pearson Education, Delhi.
2. Joel Dean: Managerial Economics. PHI.
3. Agarwal A.N.:Indian Economy problems of Development and Planning, New AGE International Pvt. Ltd., New Delhi.
4. Gupta G.S.:Macro Economic Theory and Application, Tata McGraw Hill publishing Company Ltd. New Delhi.
5. McGulgn J.R.and Charies Moyer, Managerial Economics. The Drycon Press, Hinadale
6. Michael Edgament:Macro Economics Theory and Policy, PHI Ltd.
7. Ghosh Alok:Indian Economy, S.Chand & Co.
8. Greene,"Econometric Analysis", Pearson Education, Delhi.
9. Sydsaeter "Mathematics for Economis Analys". Pearson Education, Delhi.

Objectives

The objectives of the paper is to enable students to:

- Appreciate the importance and need of soft skills in personal and personal life
- build a repertoire of functional vocabulary and to move from the lexical level to the syntactic level
- summon words, phrases relevant to the immediate communication tasks in class as well as office
- comprehend the concept of communication
- learn the four basic communication skills – Listening, Speaking, Reading and Writing

Course Inputs:

UNIT – I Recap of language skills – vocabulary, phrase, clause, sentence.

UNIT - II Fluency Building – word match, reading aloud, recognition of attributes, parts of speech in Listening and reading, listening – reading comprehension.

UNIT –III Principles of Communication – Communication as coding and decoding – signs and symbols – verbal and non –verbal symbols – Language AND communication; language VS communication – media/channels for communication

Individual Communication – Self advertising – Over stating and under stating – Overcoming shyness – Writing curriculum vitae, Statement of Purpose – Talking about oneself; interview.

UNIT- IV Types of Communication- functional, situational, verbal and non-verbal, interpersonal, group, interactive, public, mass line, dyadic – with illustrations

Intermediary Communication – Overcoming mental blocks, prejudices and hotspots of the addressee – telephone, teleconferencing, and web chat – greeting, introducing – memos, reports, minutes, business correspondence.

UNIT - V LSRW in Communication – Listening – Active vs Passive (Talk less, listen more); Speaking - Speech vs Enunciation (mind your tone); Reading –Focus on the structure not on the theme alone; Writing – Precise, not only précis writing
Social Communication – Etiquette in LSRW – polite yet assertive, tackling questions, seeking permission, expressing gratitude – gender fair language – discourse and transactional analysis – empathy.

References :

1. Dignen, Flinders and Sweeney. English 365. Cambridge University Press
 2. Goleman, Daniel. 1998. Working with Emotional Intelligence. Bantam Books. New York
 3. Hall and Shephard. The Anti-Grammar Grammar Book: Discovery Activities for Grammar Teaching. Longman
 4. Hewings, Martin. 1999. Advanced English Grammar: A Self-Study Reference and Practice Book for South Asian Students. Reprint 2003. Cambridge University Press. New Delhi
 5. Jayakaran. 2000. Everyone's Guide to Effective Writing. 2 M Publishing International, Chennai.
 6. Jones, Leo and Richard Alexander. 2003. New International Business English. Cambridge University Press
 7. Lewis, Norman. 1991. Word Power Made Easy. Pocket Books
- Nayagarh Autonomous College, Nayagarh (Odisha) affiliated to Utkal University, Vani Vihar,

8. Monippally, Matthukutty. M. 2001. Business Communication Strategies. 11th Reprint. Tata McGraw- Hill. New Delhi
9. Sasikumar.V and P.V. Dhamija. 1993. Spoken English: A Self-Learning Guide to Conversation Practice. 34th Reprint. Tata McGraw-Hill. New Delhi
10. Swets, Paul. W. 1983. The Art of Talking So That People Will Listen: Getting Through to Family, Friends and Business Associates. Prentice Hall Press. New York
11. Windshuttle, Keith and Elizabeth Elliot.1999. Writing, Researching and Communicating: Communication Skills for the Information Age. 3rd Reprint. Tata McGraw-Hill. Australia

MCE - 306 **ENTREPRENEURSHIP DEVELOPMENT**(Credit - 4)

Course Inputs

UNIT –I **Problems in Entrepreneurship Development:** Dot com entrepreneurship, role of Govt. in entrepreneurship Development - R & D, Science technology & Entrepreneurship development.

UNIT –II **Specialized institutions involved in entrepreneurship Development** Business incubation & venture capitalists, Entrepreneurship development efforts in India-Issues & cases

UNIT –III **Change in concept of entrepreneurship:** Entrepreneurship within organization, corporate strategy, Entrepreneurship.

UNIT –IV **Business idea search:** Project identification, project design, Network analysis, Business model PERT, Critical path method, Creativity & Innovation, Meaning & importance & role in developing a new business

UNIT – V **Issues in project management:** Project direction, co-ordination & control, project cost, Evaluations & cost control, Interface with industrial sickness, Project monitoring & MIS.

References:

1. S.S. Nadkarni-Developing new Entrepreneurs, EDII, Ahmadabad.
2. N.P.Singh- Entrepreneurs v/s Entrepreneurship Asian society for ED.
3. Desai Vasant –Dynamics of Entrepreneurial development & management, HPH.
4. Khairka S.S. Entrepreneurial Development , S.Chand & Co, New Delhi.
5. Moharana Drant Desai- Entrepreneurship Development, RBSA Publishers, Jaipur.
6. Paul Jose,Kumar N.Paul T.M. Entrepreneurship Development, HPH, New Delhi.
7. Saini J.S. Rathore B.S. Entrepreneurship Theory & Practice.

MCF - 307 MANAGEMENT OF PERSONAL FINANCES (Credit - 3)

Objectives

The objective of this paper is to make the students familiar with the basics of personal financial management, Personal Savings and Investment Plans, retirement savings plan a computation of risk & return of personal Investments.

Course Inputs:

UNIT-I Basics of Personal Financial Management : Personal Financial Planning Process, Preparation of Personal Budget, Personal Financial Statements, Personal Income Tax Planning, Case Studies on Personal Financial Planning of Individuals.

UNIT -II Personal Savings and Investments in Investment Criteria-Liquidity, Safety Financial Assets and profitability. Saving Instruments of Post Office and Banks, Investment in Shares Debentures, Corporate and Government Bonds, Mutual Funds, Chit Funds.

UNIT-III Personal Investments in Non-Financial Assets : Investment in Physical Assets – Real Estate. Gold and Silver, Risk and Return associated with Investment in Financial and Non-Financial Assets.

UNIT- IV Computation of Return and Risk of Personal Investment : Present Value and Future Value, Computation of Interest, Dividend and Capital gains on Personal Investments.

UNIT - V Retirement Savings Plan : Pension Plans : Defined Contribution plan and defined benefit plan, Provident Fund, Gratuity. Life Insurance Plans, General Insurance Plans, Reverse Mortgage Plans.

References :-

1. Personal Finance by Jack R. Kapoor, Les R. Dlabay and Robert J. Hugus, Tata McGraw –Hill Publishing Company Ltd. New delhi.
2. Financial Education By Reserve Bank of India - rbi.org
3. Personal Finance Columns in the Economic Times, The Business Lones and Financial Express Daily News Papers.
4. Information Bulletin of Post Offices, Banks , Mutual Funds, Insurance Companies.
5. Internal Sources : BSE, NSE, SEBI, RBI, IRDA, MFI etc

MCF - 308 CAPITAL MARKET INSTRUMENTS (Credit - 3)

Objective

To equip the students with an opportunity to understand the role of Capital Market Instruments like Stock, Bond etc.

Course Inputs

UNIT -I Origin, Nature and Role of Capital Markets-Globalization of Capital Markets, Capital Markets in India- Stock Exchange.

UNIT –I I Financial Instruments : Definition & Meaning, Classification of Financial Assets & Liabilities , Share Warrants or Options, Hedging Instruments.

UNIT- III Stocks, Bonds, Debentures – Convertible Debentures, ADR, GDR, ETFs, Units of Mutual Funds.

Unit-IV Derivatives – Basic Features : Role of Derivative Markets, Forward and Futures, Commodity Futures, Stock Futures and Index Futures

Unit-V Options, Stock Options and Index Options, Swaps, Currency Swaps and Interest rate Swaps.\

References :

1. Financial Institutions and Markets – Bhole L. M.- TMH
2. Financial Markets – M. Y. Khan
3. Financial Derivatives – Dr. G. Kotreshwar

Objective

The objective of the course is to expose the students to advanced company account as well as specialized accounts for different types of organization.

Course Inputs

UNIT I Holding Company Accounting: Meaning, Definitions and requirement, Philosophy of consolidation; Minority Interest, Cost Control, Revaluation of Assets and Liabilities, Bonus shares & Dividends, Consolidation of P/L Account and Balance Sheet.

UNIT II Double Account System: Meaning, definition and distinction between single and double account system, Final accounts under double account system, Revenue account, net revenue account, capital account & General Balance Sheet, Electricity Supply Act.

UNIT III Banking Company Accounts: Different systems of Posting, Different statutory books to be maintained. P & L account and p & L appropriation account & balance sheet as per Banking Regulation Act 1949.

UNIT IV Insurance Company Accounts: Life Insurance Companies & the statutory books to be maintained. Statutory provisions in preparing the revenue account, valuation balance sheet and balance sheet. Marine & Fire Insurance Accounts.

UNIT V Government Accounts: Commercial Accounts and Government Accounts, Accounting methods & financial statements, Basic principles of government accounts in India, classification of government accounts in India, Accounting for fire & marine insurance claims & losses construction contracts.

References:

1. Advanced Accounting – Vol. II,III & IV R.L.Gupta & M.Radhsamy (S.Chand)
2. Advanced Accounting – Arunanandan & Raman (Himalaya)
3. Advanced Accounting – Maheswari & Maheswari (Vikash)
4. Practice in Accountancy – Basu and Das (Rabindra Library)
5. Fundamentals of Advanced Accounts-Vol. II- Francis Xavier (TMH)
6. Advanced Accounting – Vol II, Hanif & Mukherjee (Tata McGraw Hill)

Objective

To provide a conceptual idea about the various provisions of the Income Tax Act. Related to the corporate sector and study the implications of these provisions on the tax planning of the companies.

Course Inputs

UNIT I Corporate Tax in India, Assessment of Corporate Assesse- Head wise

UNIT II MAT, TDS, Advance Payment Tax, Self assessment, Tax Planning as Residential Status, Basis of Tax Planning, Tax avoidance, Tax Management and Tax evasion

UNIT III Tax Planning with reference to: Depreciation, Capital gain, House Property, Amalgamation

UNIT IV Tax planning for setting up new undertaking: Basis of Location, Basis of nature of Business

UNIT V Tax Provisions of Merger and Demerger, Transfer Pricing, Double Taxation, Provision for GST in India (if any).

References:

1. R.N.Lakhotia and Subash Lakhotia, "Tax planning for non-resident Indians", Vision books (P) Ltd.
2. R.N.Lakhotia, "Corporate Tax Planning", "Vision books (P) Ltd.
3. Singhanian, V.K. Direct Taxes: Law and Practic, Taxman's Publication, Delhi.
4. Bhagabati Prasad, "Direct Tax Laws & Practices".

MCEB - 311 **Advanced Auditing** (Credit - 4)

Objectives

To gain expert knowledge of current audit practices and procedure and apply them in auditing engagements.

Course Inputs

UNIT-I Audit Strategy, Planning and programming : Planning the flow of audit work, drafting of reports, audit strategy planning, programme and importance of supervision, review of audit reports and working papers, control of quality of audit work.

UNIT-II Documentation and Internal Control, Audit Working Papers , Audit Files, Permanent and Current Audit Files, Ownership and Custody of Working Papers, Elements of Internal Control, Evaluation of Internal Control System, Internal Control Questionnaires, Internal Check List, Test of Control, Concept of Internal Audit.

UNIT- III Audit of Impersonal Hedger: Capital Expenditures, Deferred Revenue Expenditure, Revenue Expenditure, Outstanding Expenses and Incomes, Repairs and Renewals, Distinction Between Reserves and Provisions, Implications of Change on the Basis of Accounting.

UNIT - IV Audit Reports ; Qualification , Notes on Accounts, Distinction Between Notes and Qualifications, Detailed Observations by the Statutory Auditor to the Management vis-avis Obligations of reporting to members, Special Reports on offer Documents.

UNIT-V Government Audit : Constitutional Framework in India, Comptroller and Auditor General of India (Duties, Power and Conditions of Service) Act1971, Audit Procedures adopted by CAG; Audit of public Sector Undertakings- Audit of Commercial Accounts, Auditor of Government Companies, Audit report of CAG on Accounts of Union or State or Central Govt.

References –

- 1) Saxena R. G.- Principles and Practice of Auditing, Himalaya Publishing House
- 2) Gupta Kamal – Contemporary Auditing – Tata McGraw Books
- 3) Emite Woset et al – Advanced Auditing and Investigation-McDonald & Evans, UK
- 4) Emile Woolf – Auditing Today- Prentice Hall

MCEB - 312 **Merchant Banking and Financial Services**(Credit - 4)

Objective

To know conceptual, functional, and regulatory aspects of India Capital Market and Merchant Banking activities.

Course Inputs

UNIT I Indian Financial System & Financial Services: Introduction to Indian Financial system and Securities Market, Market Structure; Market Participants; Financial Instruments; Regulations.

UNIT II Capital Market Operations: New Issues Market and Development, Growth of Stock Market operations in India; Organization and Functioning of Regional Stock Exchange, National Stock Exchange and OTCEI; Trading and Settlement mechanism.

UNIT III Growth of Merchant Banking in India & Issue Management; Meaning, nature, role and functions, regulations; Project Appraisal and Management; Pre-issue and Post-issue management.

UNIT IV Marketing of Financial Services: Depository Services, Credit Rating, Housing Finance, Credit Cards, Mutual Fund.

UNIT V Assets Financial Services: Leasing and Hire Purchase; Factoring, Forfeiting and Bills Discounting.

References:

1. Fabozzi. F.J., "Capital Market", prentice Hall of India, New Delhi.
2. Fernando, A.C., "Indian Financial System", Pearson education, New Delhi.
3. Mishkin, Eakins., "Financial Markets & Institutions", Pearson", Pearson education, New Delhi.
4. Fabozzi. F.J., "Foundations of Financial Markets and Institutions". Pearson education, New Delhi.
5. Khan, M.Y., "Indian Financial System", TataMc-Graw Hills, New Delhi.
6. Srivastava, R.M., and Nigam, D. "management of Indian Financial institutions", Himalayan Publishing House, New Delhi.
7. Pathak, "Indian Financial System", Pearson education, New Delhi.
8. Desai, "Merchant Banking", Himalayan Publishing House, New Delhi
9. Abdhani, V., "Marketing of Financial Service", Himalayan Publishing House, New Delhi.
10. Machraju, "Merchant Banking and Financial Services," Willey Eastern Publication, New Delhi.
11. Indian Institute of Bankers, "Merchant Banking", Mac millan, New Delhi,
12. Ravichandran K. – Merchant Banking- Financial Services – Himalaya Publishing House, New Delhi.

Objective

To provide a theoretical and practical understanding of the issues involved in international finance from the perspective of a company engaged in international trading.

Course Inputs

UNIT I Forex Market: Structure, Exchange Rates, Player, Types of transactions – Risks in Forex Market – problem of market Imperfection and MNC's – International Monetary System – The concept of Balance of Payment – Challenges in International Finance.

UNIT II Types of Forex Market: Spot and Forward. Currency options and currency futures – Hedging with currency options and futures, International parity relationship.

UNIT III Management of Forex Exposure: Transaction Exposure, Operating/Economic Exposure, Accounting/Transaction exposure.

UNIT IV International Financial Market: Equity Market, Bond Market, International Financing Decisions – Cost of capital, Debt vs. Equity Decisions.

UNIT V Financing International Trade: Letter of Credit, Bill of Lading, Govt. Programmes to Finance International trade – Counter trade – Forms of counter trade.

References:

1. IAN.H.Giddy "Global Financial Markets" (AITBS Publishers and Distributors (1997) New Delhi).
2. P.G. Apte "International Financial Management" (Tata McGraw Hill, New Delhi, 1995).
3. Solink B.H."International Investment" (Addisonwesley publishing Co. Rending Mass).
4. Rajaram S."Forex Guide to Traders and Bankers" (R.Rajaram Madras).
5. Alan, C.Shapiro,"Multinational Financial Management" IAllyn and Bacon Inc,Boston).
6. Jain, Peyrand & Yadav" International Financial Management" (McMillan India Ltd.)

Course Inputs

Unit-I **Meaning and Definition of Investments, Security Portfolios, Returns and Risks** – Risk Elements, Measurement of Risk, Capital Assets Pricing Model, Arbitrage Pricing Theory.

Unit-II **Security Pricing** – Factors Influencing Valuation, Constant Growth Model, Capitalisation of Dividends, Security Pricing Models, Dividend Discounting Methods, P/E Ratio Model and Graham's Approach, Valuation of Securities in India.

Unit-III **Trading in Securities** : -Meaning and Characteristics of Options, Types of Options and Advantage of Derivative Markets – Speculation & hedging.

Futures Trading – Futures and Options, Index Futures, Valuation of Index Futures, Arbitrage Trading & Hedging- derivative trading in Securities.

Unit-IV **Analysis of Securities** : - Fundamentals Analysis, Technical Analysis and Efficient Market Theory.

Unit-V **Portfolio Management:-** What is a Portfolio, Risk and Return in Portfolio Theory, Risk Return analysis- Return on Portfolio, Risk on a Portfolio, Expected Returns, Concept of Alpha, Beta, Correlation Coefficient, Regression Equation- Basics of Portfolio Analysis in India- Markowitz Model, Modern Portfolio Theory- Portfolio Management in Mutual Funds.

References-

1. Avadhani V.A. "Securities Analysis & Portfolio Management", Himalaya Publishing House, Mumbai.
2. Singhi Preeti, "Investment Management", Himalaya Publishing House, Mumbai.
3. Sudhindra Bhat, "Securities Analysis & Portfolio Management", Excel Books, Mumbai.
4. Prasanna Chandra, "Investment Analysis and Portfolio Management", Tata McGraw Hill, India.
5. Fischer Jordan, "Securities Analysis & Portfolio Management", Pearson
6. Avadhani V.A. "Investment Management", Himalaya Publishing House, .

Objective

The objective of this paper is to get the students conceptually clarified and getting them being acquainted with applications of the marketing concepts and strategies to services.

Course Inputs

UNIT I Introduction to Services: Meaning, definition, features and classification of services, Products Vs. Services; Service Sectors and Economic development, Evolution & Growth of Service sector in India; Services Marketing Elements; Services Marketing Triangle;

UNIT II Services Marketing Planning: GAP Model; Services Marketing Management Process, Service Marketing Research; Service Marketing Planning, Market Segmentation (STP) and positioning; Consumer Behavior, Customer Expectations, and Perception; Managing Demand of Services; Service Encounter Management; Strategic Services Marketing and development Service Competitive Advantage (SCA).

UNIT III Services Marketing Strategies: Gap Model and Service Quality Management; Service Expectations and Service Product Planning, Blue Printing and Interactive Marketing; Pricing of Services; Customer Education and Promotion of Services; Service Location and Placement of Services; Internal and External Marketing.

UNIT IV Customer Relationship Management: Managing People, Process and Physical Evidence; Basics of Customer Relationship Management- Understanding Customers expectations, Perceptions and Building Customers Relationship. Services Recovery and Managing Customer Waiting lines and Reservations..

UNIT V Marketing of Services in India: Financial services, Tourism Services, Education and Professional Services, Health services and I.T. & Communication services.

References:

1. Lovelock, C., "Services Marketing, Pearson Education Inc, New Delhi,
2. Zethimal, V.A., and Bitner, M.J., "Services Marketing ". Tata MacGraw Hill, New Delhi.
3. Shajahan, S., "Services Marketing", Himalayan Publishing House, New Delhi.
4. Rao, R., "Services Marketing", Pearson Education Inc, New Delhi.
5. Jha, S.M., "Services Marketing", Himalayan Publishing House, New Delhi.
6. Shanker, Ravi. "Services Marketing ", Excell Book, New Delhi.
7. Apte,G., "Services Marketing", Oxfoed Publication, New Delhi.
8. Dyche, Jill., "The CRM Hand Book", Pearson Education Inc, New Delhi.
9. Mukharjee, Kaushik., "Customer Relationship Management", PHI Publication, New Delhi.
10. Balaji, B., "Services Marketing and Management", S.Chand & Company Ltd, New Delhi.
11. Mohamed, H.P., "CUSTOMER RELATIONSHIP MANAGEMENT", Vikas Publishing House, New Delhi.
12. Jha, S.M., "SOCIAL MARKETING", Himalayan Publishing House, New Delhi.

Objective

The objective of this course is to facilitate understanding of the conceptual framework of retail management and its applications in decision making under various environmental constraints.

Course Inputs:

UNIT I Introduction: Basic on Retailing; Meaning, Importance, Recent Trends Types, Opportunities, Ret. MgF. Decision Process; Retail Organizations; Retail Customers; Retailing in India; Retail Philosophies & Theories, Retailing; Marketing (Gilbert Book); Retail Marketing – Mi (II)

UNIT II Retailing Management Decisions: Retail Market Segmentation and Location Study, Understanding, Retail Customers Buying Behaviors; Retail Marketing; Strategy, Retail Locations and Site Selection; Financial Strategy; Management of Services and Quality in retailing.

UNIT III Product and Pricing Strategies Management IN Retailing: Product and Merchandise Management, Buying Systems, Buying Merchandise Pricing Strategies.

UNIT IV Retail Promotion: Store Management, Relationship Marketing: Atmosphere and Retail Stores Management; Organization- Miq; Store Layout and Management International Retailing; Customer Servicing Retail Customers; Retail Operations; Consumerism and Ethics in Retailing.

UNIT V Supply Chin Management: Introduction, Demand Management, Operation Management, Procure Management, Logistic Management. Information Technology, Performance measurement & Control; Information System and Supply Chain Management; Retail Management Information Systems; Application of IT in Retail Marketing; Challenges, Solutions, Operations, Planning, Designing; Understanding and Improving S.Chains and Supply Chain Processes; Internal Integration Managing Information Flows within the Organizations; Financial Impact of SCM; Customers/Supplier Integration and New Product Day;
Introduction and Basics of Supply Chain: Meaning Supply Chain Performance and Scope, Designing the Supply Chain Network Sourcing, Transporting and Technology in Supply Chain.

References:

1. Chitan Bajaj, Rajnish Tal, Nidhi Srivastava: Retail Management.
2. Michael Levy, Barton A Weitz, Tata Mc Graw Hill.
3. Swapna Pradhan, Tata Mc Graw Hill; Retail Management.
4. Barry Burman, J.E.Evans, Pearson: Retail Management.
5. David Gilbert, Pearson; Retail Management.
6. David A. Taylor, Pearson: Supply Chain.
7. Rahul V.Altekar, PHI: Supply Chain Management Sunil Chopra, Peter Meinal:
8. R.B.Handfield, E.L.Nichols: Supply Chain Redesign
9. Sunil Chopra, Peter Meinal: Supply Chain Management
10. J.R.Ogdon, D.T.Ogden, Biztantra Pub: Integrted Retail Management.

Course Inputs

UNIT -I Introduction to marketing, Customer Services and Customer Relationship Management :- Basics of CRM; Customer Values & Customer Satisfaction; CRM & Sales Cycle : Cost of Acquiring Customer; CRM in Marketing; CRM & Customer Services; The of CRM; Building CRM; Types of CRM

UNIT-II Management of CRM :-CRM Objectives, Planning Strategy & Building Blocks; Tools of CRM; CRM Success; CRM Business Plan; CRM Functionality;; Technological Requirements; CRM Process; CRM Complementation.

UNIT-III CRM Implementation:- Safeguarding CRM Failure, Pre-Implementation & Implementation ; CRM Development Team ; CRM Saboteurs ; CRM Roadblocks ; CRM Challenges.

UNIT-IV E-CRM : Basic , Benefits, Praceolure, CRM in Internet, Factors in e-CRM; Analytical CRM; CRM in e-Business ; Integration of CRM with ERP System, with Data Warehouse, With call Centres; Sales Force Automation.

UNIT-V CRM in Practice – Manufacturing Banking Insurance, Airlines, Hotels, Telecom, SMB Segment, HRM in CRM.

References:-

1. Anton Dr. Jone, Kalia Dr. Shalini Petouh off- Natalie I. "CRM: The Bottamline to Optimizing your ROI", Pearson Publication, New Delhi.
1. Mukherjee Kaushik, CRM- A Strategic Approach, PHI, New Delhi, 2007.
2. Dyche, Jill The CRM Handbook – "A Business Guide to CRM". Pearson Publication, New Delhi.
3. Mohamed, H. P. and Sagadevon, A., "CRM – A step by step Approach". Vikash Publication, New Delhi.
4. Bhat, Govind K. "CRM", Himalayan Publishing House, New Delhi.

Objective

The objective of the course is to help students understand the conceptual framework of international business and thereof make financial decisions.

Course Inputs

UNIT I Nature of International Business: Relevance of International Business, Process of Internationalization, Collaborative Strategies, Strategies For International Business. Barriers to trade- Tariff and Non-Tariff, Triad and International Business.

UNIT II International Environment: Economic Environment: Economic System, Structure, FDI, Free Trade, Competition, Privatization, Deregulation, Cultural Environment, Political & Legal Environment.

UNIT III Export Import Strategies: Export Challenges, Choice of Entry Mode, Factors Favoring Export, Stages of Export, Pitfalls, Selection of market, Export intermediaries, Key Export Documents, Import Strategies, Import documentation, Third Party intermediaries- Direct selling. Direct Exporting, Indirect selling, Export management and Trading companies.

UNIT VI International Trade Theories: comparative Cost Theory, Theories of Specialisation. Theory of Country size, Factor Proportion Theory, Product Life Cycle Theory, Country similarities Theory.

UNIT V Financing of Foreign Trade and Institutional infrastructure: Financing of Operation, Management of Foreign Exchange Risk, Settlement of International Transaction, Uses of Bills of Exchange, Forfaiting, Letter of Credit & Settlement, Factoring, IMF, World Bank, UNCTAD.

References:

1. International Business- Daniels, Radebaugh & Sullivan, Pearson Education
2. International Business- Rugman & Hodgetts, Pearson Education
3. International Business- Bennett, Pearson
4. International Business Environment- Cherunijam, Himalaya
5. International business- Sharan
6. Justin, P., International Business, PHI
7. Cherunillam, International Business, PHI.

Objective

To provide a theoretical and practical understanding of the issues involved in international from the prospective of a company engaged in international trading.

Course Inputs

UNIT I Forex Market: structure, Exchange Rates, Player, Types of Transactions –Risks in Forex Market –Problem Of Market imperfection and MNC's –International Monetary System; The concept of Balance of Payment –Challenges in International Finance.

UNIT II Types of Forex Market: Spot and Forward. Currency options and Currency Futures –Hedging With currency options and futures, International parity relationship.

UNIT III Management Of Forex Exposure: Transaction Exposure, Operating /Economic Exposure ,Accounting/Transaction Exposure.

UNIT IV International Financial Market: Equity Market, Bond Market, International Financing Decisions-Cost of Capital, Debt vs Equity Decisions.

UNIT V Financing International Trade: Letter of Credit, Bill of Lading, Govt. Programmes to Finance International trade-Counter trade-Forms of counter trade.

References:

1. Apte ,p g: International Financial Management, Tata McGraw Hill, New Delhi.
2. Buckley, Adrian: Multinational Finance , Prentice Hall, New Delhi.
3. Eitman D.K and A.I Stonehill, Eitman, Multinational Business Cash Finance, Addition Wesley New York.
4. Sharan V., International Financial Management PHI, New Delhi.
5. Clark, E., International Finance, Thomson.
6. Henning C.N.,W Piggot and W.H. scolt; International financial Management , McGraw Hill, International Edition.
7. Levi, Maurice D; International Finance, McGraw Hill, International Edition.
8. Rodriquefe R.M. and E.E. Carter: International Financial management, Prentice Hall, International Edition.
9. Shaprio Alan C: Multinational Financial Management, Prentice Hall, New Delhi.
10. Yadav S., P.K.Jain and Max P., foreign Exchange Markets, Macmillan, New Delhi.
11. Zeneff D. and J Zwick: International Financial Management, Prentice Hall, International Edition.
12. O, Connor DJ, Bueso At: International Dimensions of Financial Management; Macmillan, New Delhi.
13. Plibeam Keith: International Finance: MacMillan Press, Hong Kong.
14. Melvin "International Money and Finance "Pearson, New Delhi.

Course Inputs

UNIT-I Introduction :- Corporate Growth Strategies and Types of Projects, Major features of the manufacturing and source projects, Importance of project risk management, Project risk management process, Planning project risk management , Importance.

UNIT – II Identifying Project Scope Risk :- Sources of Scope Risk, Risk levels, Assessment tools, Documenting the risk.

Identifying Project Schedule Risk :- Sources of schedule risk, Estimating activity duration, Activity sequencing, Documenting the schedule risk.

UNIT-III Identifying Project Resource Risk :- Source of resource risk, Resource planning outsourcing, Cost estimation and budgeting, Documenting the project resource risk.

Managing the Project Constraints & Documenting Risk :- Analysing constraints, Managing opportunities, Scope medication, Resource modification, Assessing options & updating plans, Seeking missing risks.

UNIT-IV Quantifying and Analysing Activity Risk:- Quantitative and qualitative risk analysis, Risk probability, Risk impact, Qualitative & quantitative risk assessment.

Managing Activity Risk :- Cause analysis, Categories of risk, Risk avoidance, Risk mitigation and risk transfer , Implementing Preventive ideas, Contingency planning and risk acceptance.

UNIT – V Quantifying and Analysing Project Risk :- Project level risk, Aggregating risk response, Questionnaire & surveys, Analysis of scale, Project appraisal.

Managing Project Risk :- Project documentation, Project start up & project implementation, Specification of change management.

Monitoring & Controlling Risky Project-

Reference:

1. Patel M. Bhavesh “ Project Management” Vikash Publishing
2. Kendrick Tom “Identifying & Managing Project Risk”, PHI
3. Koster Kathrin “ Interantional Project Management” Sage Publication.
4. Bary Bentor “Project Management and Leadership Skill”, The Fair mound Press.
5. Daniel Brandon “ Project Performance Measurement” John Wiley & Sons
6. Capels Thomas M. “Financially Focussed Project Management”, J. Ross.
7. Kevin R. Callahan “ Essentials of Strategic Project Management” John Wiley & Sons
8. Chapman Chris et. El. “ managing Project Risk & Uncertainly” John Wiley & Sons.
9. Cleland David “ Project Management: Strategic Design & Implementation”. TMH
10. Cooper Dale F et. el. “ Project risk Management Guidelines : Managing risk in large Projects & Complex Procurements” John Wiley & Sons.

Objective : The purpose of this paper is to prepare a ground where the students view Entrepreneurship as a desirable and feasible career option. In particular the paper seeks to build the necessary competencies and motivation for a career in Entrepreneurship.

Course Inputs :

UNIT- I Entrepreneurship-Enterprise: Conceptual Issues, Entrepreneurship vs. Management, Roles and functions of in relation to the enterprise and in relation to the economy, Entrepreneurship is an interactive process between the individual and the environment, Small business as seedbed of Entrepreneurship. The teachers should emphasize to students the desirability as well as feasibility of a career in Entrepreneurship in the Indian scenario, Entrepreneurs competencies, Entrepreneur motivation, performance and rewards, The teachers may make use of Entrepreneurship Development Institute of India's Inventory of Entrepreneur Competencies and National Institute of Entrepreneurship and Small Business Developments training kit for arousing Entrepreneur motivation and capacity and capability building.

UNIT- II Opportunity scouting and idea generation : Role of creativity and innovation and business research. Sources of business ideas, Entrepreneur opportunities in contemporary business environment, for example opportunities in net-work marketing, franchising, business process outsourcing in the early 21 century, The students be advised to visit various product/service franchises, BPO concerns and meet up/down links in the net-work marketing.

UNIT- III The process of setting up a small business ; Preliminary screening and aspects of the detailed study of the feasibility of the business idea and financing/ non-financing support agencies to familiarize themselves with the policies/programs and procedures and the available schemes, Preparation of project report and Report on Experiential Learning of successful and unsuccessful entrepreneurs, The students may be advised to develop a structured instrument for conducting surveys of the various aspects of entrepreneur/enterprise, They may also be advised to prepare a comprehensive business plan. The desirability and feasibility of liaison with relevant funding and non-funding agencies may also be explored.

UNIT – IV Management roles and functions in a small Business: Designing and re-designing business process, location, layout, operations planning and control. Basic awareness on the issues impinging on quality, productivity and environment, Managing business growth, The pros and cons of alternative growth options: internal expansion, acquisitions and mergers, integration and diversification, Crisis in Business growth.

UNIT – V Issues in small business marketing : The concept and application of product life cycle, advertising and publicity, sales and distribution management, The idea of consortium marketing, competitive

bidding/tender marketing, negotiating with principal customers, The contemporary perspectives on Infrastructure Development, Product and Procurement Reservation, Marketing Assistance, Subsidies and other Fiscal and Monetary Incentives. National state level and grass- root level financial and non-financial institutions in support of small business development.

References

1. Brandt, Steven C., The 10 Commandments for Building a Growth Company, Third Edition, Macmillan Business Books, Delhi, 1977
2. Bhide, Amar V., The Origin and Evolution of New Business, Oxford University Press, New York, 2000.
3. Dollinger M.J., 'Entrepreneurship strategies and Resources', 3rd edition, Pearson Education, New Delhi 2006.
4. Desai, Vasant Dr. (2004) Management of small scale enterprises New Delhi: Himalaya Publishing House,
5. Taneja, Gupta, Entrepreneur Development New Venture Creation,,: 2nd ed.

MCED – 322 **PROJECT APPRAISAL & IMPLEMENTATION** (Credit - 4)

Objective

The objective of the course is to acquaint the students with the concepts, tools and techniques as well as the methods of project planning and use as the strategy in the financial management.

Course Inputs

UNIT I Project: Meaning, Lifecycle, Types of project, Scope of project, Pre- investment studies. Feasibility studies and reports, project report and its contents.

UNIT II Project Appraisal and Evaluation: Material appraisal, technical appraisal, Manpower appraisal, Marketing appraisal, Financial appraisal, Preparation of appraisal reports, techniques of methodology of appraisal.

UNIT III Estimation of Cost of Project: Financing and financial closure, Estimation of profitability and techniques of evaluation.

UNIT IV Administrative Approval: Project organization, Administration, engagement of consultants, preparation of technical specifications and contract finalization.

UNIT V Project Implementation: Scheduling and monitoring and Contract, Post completion Audit and evaluation, Capitalisation of Amount of price.

References:

1. Narendra Singh: Project Management & Contract
2. Vasant Desai: Project Management
3. Bhavesh Patel : Project Management
4. Feasibility Studies, IDBI Manuals for the Preparation of Industrial Project.

MCED – 323 ACCOUNTING & FINANCE FOR SMALL ENTREPRENEURS
(Credit - 4)

UNIT – I Principles of double-entry book-keeping: journal entries, cash- book, pass book, and Bank Reconciliation Statement, ledger accounts, trail balance, Preparation of final accounts: Trading and Profit and Loss Account; Balance-sheet. Brief introduction to Single-Entry system of record keeping.

UNIT- II Financial statement analysis techniques – Ratio analysis and Inventory Valuation and estimation.

UNIT - III Funds flow statement & Cash flow statement analysis, Sources of long term finance.

UNIT- IV Meaning, scope, aims and objectives of financial management; finance function; Sources of risk/venture such as leasing and factoring. capital, fixed capital, working capital and a basic awareness of financial services

UNIT- V Capital budgeting- concepts, risk analysis of capital investments, cost of capital. Capital Structure: Planning & Theories; Marginal Costing & Profit Planning; Cost volume profit Analysis,

References:

1. Maheshwari, S.N. (2001). Management Accounting and Financial Control. *Sultan Chand and Sons*, New Delhi.
2. Bhattacharya, S.K. and Dearden, J. (1996). Accounting for Management: Texts and Cases. *Vikas Publishing*, New Delhi.
3. **Bhattacharya** (2003). **Financial Accounting for Business Managers**. *Prentice Hall of India*, New Delhi.
4. **Pandey, I.M.** (2003). **Finance: A Management Guide for Managing Company Funds and Profits**. *Prentice Hall of India*, New Delhi.

FOURTH SEMESTER

MCC - 401 CORPORATE GOVERNANCE & BUSINESS ETHICS (Credit- 4)

Objective

The objective of the paper is to provide a theoretical understanding of the issues involved in corporate governance and business ethics from the perspective of a company manager engaged in welfare of the stakeholders.

Course Inputs

UNIT I Corporate Governance (CG): Meaning, Historical Perspective, Issues In CG, Theoretical basis of CG, CG Mechanism, CG Systems, Good CG.

UNIT II Landmarks in the emergence of CG: CG Committees, World Bank on CG, OECD Principles, Sarbanes- Oxley Act, 2002, Indian Committees and Guidelines, CII Initiatives.

UNIT III Agents & Institutions in CG: Rights & Privileges of Shareholders, Investors Problems & Protection, CG & other Stakeholders, Role of Regulators & Government.

UNIT IV Business Ethics: Importance & Need for Business Ethics, Unethical Behavior & Issues, Corporate Governance Ethics, Ethics in Global Business.

UNIT V Ethics and CSR: Importance & Scope of CSR, Social Responsibility & Indian Corporations, Environmental Concerns, Ethics in the Business Decisions.

Reference:

1. A.C.Femado – Corporate Governance, Pearson Education
2. L. P.Hartman – Business Ethics, Tata McGraw-Hill
3. B.H Agalgatti & S. Krishna – Business Ethics, Niraj

MCC - 402 **MANAGEMENT OF FINANCIAL INSTITUTIONS (Credit - 4)**

Objective

The objective of the present course is to provide a comprehensive knowledge to the students about the role of financial institutions in the economy and the way these institutions, specially the commercial banks manage the asset and liabilities side of the balance sheet.

Course Inputs

UNIT- I Introduction: Financial Intermediaries and their Economic functions, Efficiency and stability of the financial institutions – Role of financial regulation Measuring the efficiency of Financial intermediaries Challenges before the financial institutions

UNIT-II Management of Capital and Liabilities: Risk based Capital Standards _ Composition of bank capital – Basel norms. Bank Liabilities – Composition – Funding costs and Banking risk.

UNIT -III Management of Loans and Investments: Loan Management – Principles of sound bank lending – Credit analysis and pricing of Commercial loan, Management of Non-performing Assets.

UNIT I-V Management of Income and Liquidity: Income determination – Structure of Income and Expenditure – Allocation of Income – Determining factors of Income allocation.

UNIT- V Liquidity; Sources of liquidity – Asset vs. liability liquidity – Estimation liquidity needs and liquidity management theories – Management of Primary reserve Secondary reserve – Problems of liquidity management.

References:

1. Srivastava R.M and Nigam Divya “Management of India Financial Institution” Himalaya Publishing House>
2. Altman, Edward “Handbook of Financial Markets and Institutions “ Wiley New York
3. Fabozzi, Frank J & Franco M.G” Financial Markets and Institutions” Prentice Hall
4. Read, Edward W”Commercial Bank Management” Harper and Row New York
5. Robichek A.A Coleman A.B and Hempal G.H “Management of Financial Institutions – Notes and Cases” Dryden Press
6. Grosse H.D “Management policies of Commercial Banks” Prentice Hall Inc
7. Roland, Robinson “Financial Institutions” Richard D Irwin Inc Homewood Illinois
8. Bradley, S.P and Dnignt B.C “Management of Bank Portfolio” John Wiley and Sons Inc
9. Cooper S.K & fraser D.R “The Financial Market Place” Adison – Wisley Publishing Company
10. Levison Marc “Guide to Financial Markets” The Economists
11. Rose and fraser “ financial Institutions “ Business Publication Inc
12. Jadhav Narendra “Challenges to Indian Banking : Competition. Globalisation and Financial Markets “ Mc Millan India

Objective

The objective of this course is to provide an understanding of computers, computer operating system, and application of relevant software in managerial decision making.

Course Inputs

UNIT I Computer Hardware & Software: Computer system as Information processing system, Computer System, different types of computer systems, hardware options – CPU, input devices, output devices, storage devices, communication devices, configuration of hardware devices and their applications. Memory, Software, Different types software, Programming Languages.

UNIT II Modern Information Technology: Basic idea of Local Area Networks (LAN) and Wide Area Networks (WAN), E-mail, Internet technologies, access devices, concept of a World Wide Web and internet browsing. Multimedia.

UNIT III Introduction to Operating System: What is Operating System? Functions of Operating system, Types of Operating System. Windows, Word Processing : Introduction and working with Ms-WORD in Ms- Office, Word basic commands, Formatting-text and documents, Sorting and Tables, Working with graphics, Introduction to mail-merge.

UNIT IV Spread Sheets: Working with EXCEL- formatting, function, chart features, working with graphics in Excel, Using worksheets as database in accounting, marketing, finance and personal areas.

Presentation with Power Point: Power-Point basics, creating presentations the easy way, working with graphics in Power Point, Show time, sound effects and animation effects.

UNIT V Introduction to Accounting Packages: Company Creation, Group and Ledger Creation, Voucher Entry, Maintenance of accounting books and final accounts, financial reports generation, Practical Knowledge on Tally.

References:

1. Diennes, shells S: Microsoft Office, Professional for windows 95, Instance reference, BPB Publication, Delhi
2. Mansfield, Ron: The Compact guide to Microsoft office, BPB Publication , Delhi.

MCE - 404

CORPORATE LEGAL FRAMEWORK

(Credit - 4)

Objective

The objective of this course is to familiarize students with the relevant provisions of various laws influencing business.

Course Inputs

UNIT -I Indian Contract Act, Negotiable Instruments Act, Indian Stamp

Act

UNIT -II Workmen Compensation Act ,Consumer Protection Act, Patent

Act.

UNIT- III Indian Competition Act 2002,, Sick Industries Companies Act.

UNIT -IV FEMA – 2000, Exim-Policies. Information Technology Act,

UNIT -V Indian Companies (Amendment) Act, Trademark Act. , Copy Right Act.

References:

1. Avadhani V. A: SEBI Guidelines and Listing of Companies, Himalaya Publishing House, Delhi
2. Indian Contract Act, 1872.
3. SEBI Act 1992, Nabhi Publication, Delhi.
4. Securities (Contract and Regulation) Act, 1956.
5. Taxman's Company Act, (Latest), V.S.Datey.
6. Taxman's Masters Guide to Companies Act, 1998
7. Taxman's Mercantile Law, (Latest).
8. The Companies Act, 1956.
9. The Negotiable Instruments Act, 1881.
10. Singh, Avtar, Law Relating to Monopolies, Restrictive and Unfair Trade Practices, Eastern Book' Co.
11. Bhandari ML: Guide to Company Law Procedure- Vols I, II and III; Jain Book Agency, New Delhi.
12. Ramalya A; Guide to Companies Act; Wadhwa Publishing, Nagpur.

UNIT - I Concept, Types and motives behind corporate restructuring, Economic Rationale behind Major types of Mergers, Merger Theories. Evaluating the Success of Mergers and Acquisitions. Recent Trends and Challenges In corporate restructuring.

UNIT - II Strategic Approach to Value Creation-Competitive Strategy Vrs Diversification Strategy-Value Creation in Horizontal mergers, vertical Mergers, and Conglomerate Acquisitions-Value creation in Consolidating Fragmented Industries.

UNIT- III Deal Structuring, Valuation Financing M & A-Due Diligence, Selection of Target Company- Methods of Valuation-Paying for Acquisition-Accounting and Taxation Issues in M & A.

Unit: - IV Forms of Restructuring and Divestiture-Spin-offs, Split-ups, Target Stocks, Equity Carve-outs, Going Private and Leverage Buy Outs, Joint Ventures and Alliances, Share Repurchase, Cross Border Acquisitions.

UNIT- V Regulating Takeover Bids, -Bid Strategies and Tactics, Defenses against Takeovers, Post Acquisition Integration, Risks Associated with Mergers and Acquisitions.

REFERENCES-

1. **Jha Nisikanta** "Mergers, Acquisitions and Corporate Restructuring" Himalayan Publishing House.
2. **Weston. J.Fred & Weaver Samuel** "Mergers and Acquisitions" Tata McGraw Hill.
3. **Boeh Kevin & Beamish Paul** "Mergers and Acquisitions- Text and Cases" Sage South Asia Edition.
4. **Sudarsanam Sudi** "Creating Value from Mergers and Acquisitions- The Challengers" Pearson Education.
5. **Weston J Fred, Siu Juan & Johnson Brian** "Takeovers, Restructuring and Corporate Governance" Pearson Education.
6. **Chandrasekhar Krishnamurthy & Viswanath S.R** "Mergers, Acquisitions and Corporate Restructuring "Response Business Books.
7. **Weston J Fred, Chung S Kwang & Hoag. E Susan** "Mergers, Restructuring and Corporate Control" Prentice Hall of India.
8. **Das Bhagaban, & Rakshit** "Corporate Restructuring" Himalayan Publishing House.
9. **Sundarsanam. P. S.** "The essence of Mergers and Acquisitions" Prentice Hall of India.
10. **Shiva Ramu. S** "Corporate Growth Through Mergers and Acquisitions" Response Books.

Objectives

The objective of this paper is to make the students familiar with the basics of personal financial management, Personal Savings and Investment Plans, retirement savings plan a computation of risk & return of personal Investments.

Course Inputs:

UNIT-I Basics of Personal Financial Management : Personal Financial Planning Process, Preparation of Personal Budget, Personal Financial Statements, Personal Income Tax Planning, Case Studies on Personal Financial Planning of Individuals.

UNIT-II Personal Savings and Investments in Investment Criteria-Liquidity, Safety Financial Assets and profitability. Saving Instruments of Post Office and Banks, Investment in Shares Debentures, Corporate and Government Bonds, Mutual Funds, Chit Funds.

UNIT- III Personal Investments in Non-Financial Assets : Investment in Physical Assets – Real Estate. Gold and Silver, Risk and Return associated with Investment in Financial and Non-Financial Assets.

UNIT- IV Computation of Return and Risk of Personal Investment : Present Value and Future Value, Computation of Interest, Dividend and Capital gains on Personal Investments.

UNIT -V Retirement Savings Plan : Pension Plans : Defined Contribution plan and defined benefit plan, Provident Fund, Gratuity. Life Insurance Plans, General Insurance Plans, Reverse Mortgage Plans.

References :-

1. Personal Finance by Jack R. Kapoor, Les R. Dlabay and Robert J. Hugus, Tata McGraw –Hill Publishing Company Ltd. New delhi.
2. Financial Education By Reserve Bank of India - rbi.org
3. Personal Finance Columns in the Economic Times, The Business Lones and Financial Express Daily News Papers.
4. Information Bulletin of Post Offices, Banks , Mutual Funds, Insurance Companies.
5. Internal Sources : BSE, NSE, SEBI, RBI, IRDA, MFI etc

UNIT- I Agricultural Business Practices:- Characteristics of Agriculture

Business- Nature of Indian, Agriculture – Government policies related to agricultural Business- Problems and prospects of Agricultural Business –Agricultural Taxation policy.

UNIT- II Agricultural products and Farms Services:-Nature and

disposal of Agricultural by-products-Farm waste cost of recycling of farm waste.

UNIT- III Allied agricultural business :- Dairy Poultry – Bio –

Manures, etc WTO and its impact on agri-business Practices.

UNIT- IV HRM in Agri Business Management :-

- a) Development of Human Resource through Agricultural Training
- b) Importance of Human Resource in Agricultural
- c) H. R. M. development program for Agribusiness

UNIT-V Emerging Trends In ABM :-

- a) Agro Tourism
- b) Organic Farming
- c) Contract Farming
- d) Herbal Farming

REFERENCES-

1. Principles of Business Organisation Acharya Govekar A.R. Sheth and Co
2. Principles of Practice of Marketing Mamoria, Joshi Kitab Mahal
3. Regulated Markets W. R. Natu
4. Marketing Co-Operative Way G.S. Kamat Maharastra state Co-op Union
5. Future Trading and Control Ram Desai
6. Bombay Money Market H.T.Y.B.A Parekh
7. Commodity Marketing and P.L. Gadgil Shubhada Sarswat, Distributive Trade Pune

UNIT – I Financial Inclusion and Economic Development,
Savings, Investment and Capital Formation

UNIT – II Dimensions of Financial Inclusions: Micro-credit,
Micro- saving and Micro-insurance

UNIT – III Financial Inclusion and Financial Literacy: Awareness
Campaign by Government

UNIT – IV Financial Regulatory and Financial Inclusion:
Government Directives, RBI Directives

UNIT – V Commercial Banks and Financial Inclusions:
Branch Expansions, Technology and Schemes

References

- 1 Financial Education By Reserve Bank of India - rbi.org
- 2 Personal Finance Columns in the Economic Times, the Business Lines and Financial Express Daily News Papers.
3. Information Bulletin of Post Offices, Banks, Mutual Funds, Insurance Companies.
4. Internal Sources: BSE, NSE, SEBI, RBI, IRDA, MFI etc.

Objective

To acquaint the students regarding the international dimensions of accounting, foreign currency translation, transactional reporting and efforts at harmonization.

Course Inputs

UNIT I International Dimensions of Accounting: Meaning, Importance & Scope of International Accounting, Internationalization of the Accounting in Select Countries.

UNIT II Foreign Currency Translation: The Need for translation, Transaction of Foreign Currency, Financial Statement- Forward Exchange Contracts.

UNIT III International Dimensions of Financial Reporting: Transactional Reporting, Reporting Practices, Consolidation of Financial statements.

UNIT IV Harmonization of Accounting Practices: The Need for Harmonisation, Methods of achieving Harmonisation, Impediments to Harmonisation, The Harmonisation Process at work; Regional and Global Harmonisation, International accounting standards, Indian accounting standards.

UNIT V Analysis of Foreign Financial Statement: Techniques of Financial Statement Analysis, Analysing global financial statements. Evaluation of Performance.

References:

1. Shirin Rathore; "International Accounting " PHI
2. A.K. Basu; "International Accounting Harmonisation" University of Calcutta.
3. B.Banerjee; "Contemporary Issues in Accounting Research " IAA Research Foundation.
4. Meigs & Meigs ; "Accounting : The Basis for Business Decisions" McGraw Hills.
5. Belverd e, Needles Jr. " Financial Accounting". Pub. Houghton & Middlin.

MCEA – 410 ACCOUNTING STANDARDS AND CORPORATE REPORTING
(Credit - 4)

Objective

To provide an understanding of the accounting standards of ASB and IASB, and to study the corporate reporting practices in India.

Course Inputs

UNIT I Accounting Standards: Meaning and Importance, Historical development, Need for harmonization and standardization.
Accounting Standards in India: Objectives, Process of Standard Setting.

IASB & IFRS: International Accounting Standards.

UNIT II Brief idea: About first fifteen accounting standards developed by ASB. (Special emphasis on AS- 1, 2, 3, 6, 10 and 14)

UNIT III Brief idea: About other Accounting Standards, Developed by ASB. (Special emphasis on AS- 17, 18, 20, 25 and 28)

UNIT IV Corporate Disclosure: Statutory and Non-Statutory, Modern Trends in Corporate disclosure.

UNIT V Project Work in Accountancy/ Case Studies

References:

1. N. Das gupta: Accounting Standards: Indian International, Sultan Chand
2. L.S.Porwal: Accounting Theory, Tata McGraw
3. S. Rathore: International Accounting, Tata McGraw
4. E.R.Brown Lee II, K.R.Ferris & M.E.Haskins: Corporate Financial Reporting, Irwin
5. D.S.Rowat: Students' Guide to Accounting Standards, Taxman
6. A.K.Basu (University of Calcutta): International Accounting Harmonisation.
7. Jawahar Lal: Corporate Financial Reporting, Taxman.

MCEA – 411 ACCOUNTING FOR NPOs (Credit - 4)

Course Inputs

UNIT- I Accounting Language & Information System: Generally Accepted Accounting Principles (GAAP), Methods of Accounting; Cash & Accrual.

UNIT- II Books of Accounts: Cash Book & Bank Account, Bank Reconciliation Statement.

UNIT – III Types of Assets: Depreciation, Grants & Donations, Expenditures.

UNIT - IV Final Accounts: Receipt & Payments A/C, Income & Expenditure A/c, Balance Sheet

UNIT - V Financial Statement Analysis & Reporting, Audit Reports

References:

1. Finance & Legal Handbook for NPOs – CA Manoj Fogla, FMSF, 2012.
2. Financial Accounting – Prof. Jawaharlal –Himalaya Publishing House P Ltd
3. 2-Shankarnarayana-Financial Accounting.(Cengage Learning)
4. 3-Bruns-Financial Reporting and Management Accounting(Cengage Learning)
5. 4-Stice-Financial Accounting reporting and analysis.(Cengage Learning)

Objective

The objective of this course is to help students understand various in security analysis & portfolio management.

Course Inputs

UNIT I Investments: Nature and scope of investment analysis, element of investment, avenues of investment.

Security Markets: Primary and secondary market; Primary market- role functions and methods of selling securities in primary market.

Secondary Market: Role, importance, type of brokers, trading mechanism, listing of securities in stock exchange, Depository- role and need.

UNIT II Fundamental Analysis: Trends, indicators, indices and moving averages applied in technical analysis.

Technical Analysis: Trends, indicators, indices and moving averages applied in technical analysis.

UNIT III Efficient Market Hypothesis: Weak, semi-strong and strong market and its testing techniques.

UNIT IV Portfolio Analysis: Estimating rate of return and standard deviation of portfolio. Effect of combining the securities; Markowitz Risk-return optimization; single Index Model or Market Model; Portfolio total risk, portfolio market risk simple Sharpe's optimization solution.

UNIT V Capital Market Theory: Capital market line, Security market line, risk free lending and borrowings; factor Models; Arbitrage pricing theory, two factor and multi factor models.

Portfolio Performance Evaluation: Measure of return, risk adjusted measures of return, market timing, evaluation criteria and procedures.

References:

1. Amling; fundamentals of Investment Analysis, Pearson Education, Delhi
2. Bhalls: Investment Analysis, S.Chand & Co. Delhi.
3. Chandratre K.R.: Capital Issue, SEBI & Listing, Bharat Publishing House, New Delhi.
4. Clark James Fransis, Investment – analysis and management, McGraw Hill, International Edition.
5. Donal e. fisher and Ronal J. Jordan: Security Analyisi and Portfolio management. PH. New Delhi.
6. Fabozzi Frank J: investment Management, Pearson Education, Delhi
7. Gupta L.C: Stock Exchange Trading in India; Society for Capital Market Research and Development, Delhi .
8. Machi Raju, H.R: Merchant banking; Wiely eastern Ltd., New Delhi
9. Machi Raju, H.R.; Working of Stock Exchanges in India; Wiley eastern Ltd., New Delhi.
10. Sharpe Willam F., Gordon J Alexander and J.V.Bailly: Investments, Pearson Education, Delhi
11. Sharpe William F: Portfolio Theory and Capital Markets; McGraw Hill, NY.

Objective

This course will familiarize the students in the application of various tools and techniques of financial risk management.

Course Inputs

UNIT I Risk: Definition, types of Risk, Process of Risk Management, The tools of risk Management.

Derivatives: Definition and Evolution of derivatives, Derivatives Markets, Types of Derivatives, Derivatives in India.

UNIT II Futures Market: Functions of futures market, Speculation and hedging, Price spread and hedging, futures and price stabilization, tests of efficiency, Financial futures as a mechanism of risk transference, spot and futures prices.

UNIT III Financial Futures: Interest Rate futures, Currency Futures, (Foreign Exchange) Stock index futures and Financial Futures in India. Risk Management with Futures, Cost of Carry Model, Index Arbitrage, Purchasing Power Parity Theorem.

UNIT IV Options: Terminology and methodology of trading, Types of Options, Option pricing, Swaps, types of Swaps, Swap Valuation, and other derivatives, Speculation with options, Risk management with options & futures.

UNIT V Regulatory Framework of Futures & Derivatives: Regulatory bodies in Major international Markets, Regulatory framework in India, regulatory instruments and needs, Accounting for derivative transactions.

References:

1. John C.Hill : Options, Futures & other derivatives, Pearsons.
2. T.V. Somanathan, Derivatives, Tata McGraw Hill.
3. Redhead, Financial Derivatives, Prentice Hall.
4. Lasys Walter, Lexinton, Speculation, Hedge and Commodity Price Forecasting.
5. Miller, H., Financial Innovation and Markets.
6. Hill J. and T. Schneelesis, Risk reduction and Potential of Financial Futures.

Course Inputs

UNIT –I Banking Regulation Act, 1949:- Provisions relating to: Definition (Sec -5) Functions of banking companies (Sec -6), Restrictions on business of banking companies (Sec -8, 19 and 20) ,Powers of the RBI (Sec -21, 35 and 36 to 36 AD), Winding up of a banking company (Part III and III-A of the Act), Applicability of the act to cooperative banks (Sec- 56).

UNIT-II The Reserve Bank of India Act, 1934 :-Provisions relating Incorporation, Capital management and Business (Sec 3 to 19),Central Banking functions ((Sec -20 to 45):Regulatory and Supervisory, Collection and furnishing of credit information (45 A to 45 G) Penalties, (Sec 58 B to 58 -G), Changing role of the RBI.

UNIT- III Securities & Exchange Board of India (SEBI):- SEBI Act 1992 – Powers & Functions – Collectives, Investment scheme – Registration of intermediaries-Finance, Accounts & Audit of SEBI- Penalties for failure default, Inside trading & Non-disclosure of Acquisition of shares & Takeovers- securities Appellate Tribunals

UNIT – IV Insurance Regulatory and Development Authority (IRDA), IRDA Act, 1999, Establishment and incorporation of authority and duties, powers and functions of authority

**UNIT- V Pension Fund Regulatory and Development Authority Act, 2003(PFRDA)
Forward Market Commission in India (FMC)**

References

1. Tannan's 'Banking', Law and Practice in India Banking
2. P.N. Varshney, Banking: Law and Practice
3. Justin Paul and Padmalatha Suresh: Management of Banking and Financial Services
4. All relevant and recent Bare Acts
5. Indian Institute of Bankers: Laws and Practices relating to banking
6. All journals published by Indian Institute of Banking and Finance
7. Reserve Bank of India functions and working (latest edn.) R.B.I.
8. Monetary Economics for India, Dr. Narendra Jadhav
9. Central Banking for emerging market economies, A. Vasudevan
10. Monetary and financial sector reforms in India : A central banker's perspective, Dr. Y.V. Reddy
11. Indian economy : Essays on money and finance, Dr. C. Rangarajan.
12. Annual Report on Trend and Progress of Banking in India. Reserve Bank of India Bulletin

MCEC - 415 PRODUCT PLANNING AND SALES FORCE MANAGEMNT
(Credit - 4)

Objective

The objective of the course is to acquaint the students with the concepts, tools and techniques as well as the methods of project planning and use as the strategy in the financial management.

Course Inputs

UNIT I Project: Meaning, Lifecycle, Types of project, Scope of project, Pre- investment studies. Feasibility studies and reports, project report and its contents.

UNIT II Project Appraisal and Evaluation: Material appraisal, technical appraisal, Manpower appraisal, Marketing appraisal, Financial appraisal, Preparation of appraisal reports, techniques of methodology of appraisal.

UNIT III Estimation of Cost of Project: Financing and financial closure, Estimation of profitability and techniques of evaluation.

UNIT IV Administrative Approval: Project organization, Administration, engagement of consultants, preparation of technical specifications and contract finalization.

UNIT V Project Implementation: Scheduling and monitoring and Contract, Post emplitia Audit and evaluation, Capitalisation of Amount of price.

References:

1. Narendra Singh: Project Management & Contract
2. Vasant Desai: Project Management
3. Bhavesh Patel : Project Management
4. Feasibility Studies, IDBI Manuals for the Preparation of Industrial Project.

Objective

The objective of this course is to expose students to the conceptual framework of international marketing management.

Course Inputs

UNIT I Introduction to International Marketing: Nature significance; Scope of international marketing; International market orientation framework and EPRG Model. International market entry strategies: Export entry and Non-export entry modes, Bases of International Marketing **International Marketing Environment:** International Marketing Environment; External environment-geographical, demographic, economic, socio-cultural, political and legal environment; Impact of environment on international marketing decisions.

UNIT II Foreign Marketing Selection: Global market segmentation; Selection of Export markets; International positioning **International Marketing Planning, Organising and Control:** Issues in international marketing planning; International marketing information system; Organising and controlling; International marketing operations.

Product Decisions: Product planning for global markets; New product development; Management of international brands; Packing and labeling; Provision of sales related services.

UNIT III Pricing Decisions: Objectives, Factors, Methods and Strategies of Pricing; Financing and Methods of Payment.
Promotion Decisions: Promotional practices in international Marketing, personal selling, sales promotion and public relations, Promotion and Marketing Communication

UNIT IV Distribution Channels and Logistics: Functions and types of channels; Channel selection decisions; Selection of foreign distributors/agents and managing relations with them; International logistics decisions, Organization of International Marketing Activities, Supply Chain Management (SCM)

UNIT V Emerging Issues and Developments in International Marketing: Ethical and social issues; international marketing of services; Information technology and international marketing; Impact of globalization; WTO and Development of International Marketing.

References:

1. Czinkota, M.R: International Marketing, Dryden Press, Boston.
2. Fayerweather, John: John: International Marketing, Prentice Hall, New Delhi.
3. Jain, S.C: International Marketing, CBS Publications, New Delhi.
4. Keegan, Warren J.; Global Marketing Management, Prentice Hall, New Delhi.
5. Onkvisit, Sak and John J. Shaw: International Marketing: Analysis and Strategy, Prentice Hall, New Delhi.
6. Paliwoda, S.J (ed): International Marketing Reader, Routledge, London.
7. Pallwoda, Stanley J.: The Essence of International Marketing, Prentice Hall, New Delhi
8. Sarathy, R and V Terpatra: International Marketing, Dryden Press. Boston.
9. Vasudeva P.K., International Marketing: Excel Books, New Delhi.
10. Gerald Albaum and Edwin Duerr- International Marketing and Export Management, Pearsons

Publication
New delhi

UNIT- I Basics of Product : Meaning, Importance, product Classification, Product –mix, Product Strategy, Product Planning, Product Life Cycle and Marketing, marketing Environment, product and Brand Management, Product Market Strategies for Leaders/Challenges,

UNIT – II New Product Development, Product Positioning Strategies, Packaging Management, Creative Spark, Concept Testing and Test Marketing.

UNIT- III Issues & Concept of Branding :- Meaning, Significance, Function, Creating a Brand, Brand Building, Branding Decision, Anatomy of Brands, Types of Brands, Re-branding, Logo-Changes, Brand Re-launch, Repositioning, Brand Culture, Brand Rituals, Brand and Consumer Psychology,

UNIT- IV Brand Building, Brand Equity, Brand Extension, Global Brands, Brand Placement , Product and Brand Failures, Consumer Protection, Marketing Organisations, Leveraging Plants, Brand Personality, Brand Extensions, Service brands;

UNIT – V Positioning :- Perceptual space and Positioning, Positioning relating to Product Class, Consumer Segmentation, Perceptual Mapping, Brand Benefits and Attributes, Positioning S, Advertising and Positioning Brand, Celebrity Endorsement

References :-

- 1) Chunawalla, S. A., “ Product Management”, Himalaya Publishing House, New Delhi.
- 2) Rao, K. Venugopal, “ Product and Brand Management- Text and Cases”, Himalaya Publishing House, New Delhi
- 3) Sengupta, Subrato : “Brand Positioning”, Tata Mc Graw Hill Publishing House, New Delhi.
- 4) Gupta S. L. , “Brand Management- Text & Cases”, Himalaya Publishing, New Delhi.
- 5) Chunawalla, S. A., “Compendium of Brand Management”, Himalaya Publishing House, New Delhi

Objective

To acquaint the students regarding the international dimensions of accounting, foreign currency translation, transactional reporting and efforts at harmonization.

Course Inputs

UNIT I International Dimensions of Accounting: Meaning, Importance & Scope of International Accounting, Internationalization of the Accounting Profession, Accounting Profession in Select Countries.

UNIT II Foreign Currency Translation: The Need for translation, Transaction of Foreign Currency, Financial Statements- Forward Exchange Contracts.

UNIT III International Dimensions of Financial Reporting: Transactional Reporting, Reporting Practices, Consolidation of Financial statements.

UNIT IV Harmonization of Accounting Practices: The Need for Harmonisation, Methods of achieving Harmonisation, Impediments to Harmonisation, The Harmonisation Process at work: Regional and Global Harmonisation, International accounting standards, Indian accounting standards.

UNIT V Analysis of Foreign Financial Statements: Techniques of Financial Statement Analysis, Analysing global financial statements. Evaluation of Performance.

Reference:

1. Shirin Rathore; "International Accounting" PHI
2. A.K.Basu; "International Accounting Harmonisation" University of Calcutta.
3. B.Banerjee; "Contemporary Issues in Accounting Research" IAA Research Foundation.
4. Meigs & maigs; "Accounting: The Basis for Business Decisions" McGraw Hills.
5. Belverd Needles Jr, "Financial Accounting". Pub. Houghton & Mifflin.

Objective

The objective of this course is to expose students to the conceptual framework of international marketing management.

Course Inputs

UNIT I Introduction to International Marketing: Nature significance; Scope of international marketing; International marketing orientation framework; International market entry strategies.

International Marketing Environment: International Marketing Environment; External environment-geographical, demographic, economic, socio-cultural, political and legal environment; Impact of environment on international marketing decisions.

UNIT II Foreign Market Selection: Global market segmentation; Selection of foreign markets; International positioning.

Product Decisions: Product planning for global markets; New product development; Management of international brands; Packing and labeling; Provision of sales related services.

UNIT III Pricing Decisions: environment Influences on pricing decisions; International pricing policies and strategies.

Promotion Decisions: Promotional practices in international Marketing, personal selling, sales promotion and public relations.

UNIT IV Distribution Channels and Logistics: Functions and types of channels; Channel selection decisions; Selection of foreign distributors/agents and managing relations with them; International logistics decisions.

International Marketing Planning, Organising and Control: Issues in international marketing planning; International marketing information system; Organising and controlling; International marketing operations.

UNIT V Emerging Issues and developments in international marketing: Ethical and social issues; international marketing of services; Information technology and International marketing; Impact of globalization; WTO;

References:

1. Czinkota, M.R; International Marketing, Dryden Press, Boston.
2. Fayerweather, John: International Marketing, Prentice Hall, New Delhi.
3. Jain, S.C: International Marketing, CBS Publications, New Delhi.
4. Keegan, Warren J: Global Management, Prentice Hall, New Delhi.
5. Onkvisit, Sak and John J.Shaw: International Marketing: Analysis and Strategy, Prentice Hall, New Delhi.
6. Paliwoda, S.J (ED) : International Marketing, Reader, Routledge, London.
7. Paliwoda, Stanley J.: The Essence of International Marketing, Prentice Hall, New Delhi.
8. Sarathy, R and V terpstra: International Marketing, Dryden Press, Boston.
9. Vsudeva P.K., International Marketing: Excel Books, New Delhi

MCED - 420 INTERNATIONAL FINANCIAL SERVICES (Credit - 4)

Objectives

- To introduce the field of international financial services to the students and provide an in depth knowledge on various financial services
- To provide an understanding of global financial environment operations of business.

UNIT - 1 Evolution of International Financial Services – its impact on Indian Financial System – Formal Financial System and Informal Financial System – International Financial Institutions – Banking Companies and Non Banking Companies – Classification of Non Banking Companies

– Classification of Activities of Non Banking Finance Companies- Fund Based Activities – Fee Based Activities – concepts, growth, current issues and trends of fee Based and Fund Based activities.

UNIT - II Introduction, Definition, Concept, Players involved in International Securitisation and its Processes, structure, Difference between Pass Through Certificate and Pass Through Securities, International Instruments of Securitisation, Developments and hurdles in Securitisation with recent trends

UNIT - III International Credit Rating and Agencies: Introduction – Concept of Credit Rating – Meaning of Credit rating – Definition, Scope – need and Importance of credit rating in developing countries – Types of credit rating – Kinds of instruments, Credit rating symbols – Credit Rating advantages and disadvantages and the reliability on its rating.

Credit rating agencies in India (CRISIL, CARE, ICRA and Fitch India) vis-a-vis Global rating agencies– Process of Credit Rating and Methodology credit rating agencies – services rendered by credit rating agencies – Solicited rating and unsolicited rating – Equity assessments us Equity grading – rating, Methodology for Financial services, Manufacturing companies, Banks and financial companies, Mutual funds, Insurance companies and IPO grading – Registration and Regulation of Credit rating agencies

UNIT - IV Overview of Global Depository Systems vs. Key features of Depository system in India – depository – legal framework – Eligibility criteria to become a global depository- Agreement between Depository and Issuers – Rights and Obligation of Depositories- Records maintained by Depository – Services of and functions of Global Depositories.

UNIT - V Core International Financial Services- Account opening- Types of Accounts – Types of Application Forms- Dematerialisation Process – Rematerialisation Process. Trading and Settlement –Off-Market Trade,

– Market Settlement-Dematerialisation of Shares

Special Services -Pledge and Hypothecation-Procedure for pledge/Hypothecation-procedure of confirmation of creation of Pledge/Hypothecations by Pledge-Closure of a Pledge/Hypothecation by Pledgor-Invocation of Pledge by Pledge Stock lending and Borrowing – Corporate actions

References:

1. Agarwala&Agarwala, Bulls Bears 7 the Mouse, Macmillan
2. Apte, P.G., International Financial Management, Tata McGraw Hill, 2006.
3. B. L. Mathur, Changing Profile of Financial Services, Bookman Associates
4. Dr. J. C. Verma, Credit Rating, Bharat Publication
5. Eitman, David K., Stonehill, Arthur, Moffet, Michael H., Multinational Business Finance, Pearson Education, 2007
6. I. M. Pandey, Venture Capital – The Indian Experience, Prentice Hall India
7. J. C. Verma, Venture Capital Financing in India, Response Books
8. J. K. Dietrich, Financial Services and Financial Institutions, Prentice Hall India
9. Journal of Financial Services

10. Journal of Investing
11. Journal of Structure Finance
12. Khan M.Y. Financial Services, Tata Mc Graw Hill

MCED - 421 ENTREPRENEURSHIP : INNOVATION AND STRATEGY
(Credit - 4)

UNIT - I Entrepreneurial Growth: Economic & Non-economic Factors, Government Policy and Actions, Entrepreneurial Development Programmes, Youth Entrepreneurship and Women Entrepreneurship.

UNIT- II Innovation: Innovative Project Identification and Selection, Project Formulation, Entrepreneur and Innovation.

UNIT- III Support : Innovative Financing, New sources of finance, Lease Financing and Hire Purchase , Institutional Support and Taxation Benefits , Outsourcing.

UNIT- IV Management : Production and Operations Management, Working Capital Management, Total Quality Management, Creative Destruction for Value Addition.

UNIT- V Strategy : Growth Strategies in Small Business, Marketing Strategies, Sickness in Small Business, Small Enterprises in International Business, E-Commerce.

References :-

1. Nanda, S. K., Lenka T. K., (Ed) Entrepreneurship : Innovations and Strategy, Himalaya Publishers.
2. Khanka, S. S., Entrepreneurial Development, S. Chand

MCED - 422 STATISTICS FOR BUSINESS DECISION MAKING (Credit - 4)

Objective :

This course shall acquaint the students with the concepts and techniques used in Statistics and enable them to apply this knowledge in business decision- making.

UNIT -I Statistics; Characteristics, functions, limitations and scope; statistics in business management; Data collection and presentation, frequency distribution and analysis

UNIT- II Measure of central tendency and dispersion, correlation and regression.

UNIT- III Basic concepts of Probability and probability distribution binomial poisson and normal

UNIT – IV Probability and non-probability sampling, sampling distribution of means and proportions, estimation.

UNIT – V Hypothesis testing of means and proportions for large and small Samples.

References:

1. **Pillai R S N and Bagavathi**, Statistics, S Chand and Co., New Delhi
2. **Sharma J K**, Business Statistics, Pearson Education
3. **Gupta S P**, Statistics, S Chand & Company, New Delhi
4. **Hooda R P**, Statistics for Business and Economic, Macmillan.

MCED - 423 ENTREPRENEURSHIP & INFORMATION TECHNOLOGY

(Credit - 4)

Objective

The objective of this course is to provide an understanding of computers, computer operating system, and application of relevant software in managerial decision making.

Course Inputs

UNIT I Computer Hardware & Software: Computer system as Information processing system, Computer System, different types of computer systems, hardware options – CPU, input devices, output devices, storage devices, communication devices, configuration of hardware devices and their applications. Memory, Software, Different types software, Programming Languages.

UNIT II Modern Information Technology: Basic idea of Local Area Networks (LAN) and Wide Area Networks (WAN), E-mail, Internet technologies, access devices, concept of a World Wide Web and internet browsing. Multimedia.

UNIT III Introduction to Operating System: What is Operating System? Functions of Operating system, Types of Operating System. Windows, Word Processing : Introduction and working with Ms-WORD in Ms- Office, Word basic commands, Formatting-text and documents, Sorting and Tables, Working with graphics, Introduction to mail-merge.

UNIT IV Spread Sheets: Working with EXCEL- formatting, function, chart features, working with graphics in Excel, Using worksheets as database in accounting, marketing, finance and personal areas.
Presentation with Power Point: Power-Point basics, creating presentations the easy way, working with graphics in Power Point, Show time, sound effects and animation effects.

UNIT V Introduction to Accounting Packages: Company Creation, Group and Ledger Creation, Voucher Entry, Maintenance of accounting books and final accounts, financial reports generation, Practical Knowledge on Tally.

References:

1. Diennes, shells S: Microsoft Office, Professional for windows 95, Instance reference, BPB Publication, Delhi
2. Mansfield, Ron: The Compact guide to Microsoft office, BPB Publication ,Delhi.

**Audit
Courses**

Management of Personal Finances

Objectives

The objective of this paper is to make the students familiar with the basics of personal financial management, Personal Savings and Investment Mans, retirement savings plan a computation of risk & return of personal Investments.

Course Inputs:

UNIT-I Basics of Personal Financial Management : Personal Financial Planning Process, Preparation of Personal Budget, Personal Financial Statements, Personal Income Tax Planning, Case Studies on Personal Financial Planning of Individuals.

UNIT-II Personal Savings and Investments in Investment Criteria-Liquidity, Safety Financial Assets and profitability.
Saving Instruments of Post Office and Banks, Investment in Shares Debentures, Corporate and Government Bonds, Mutual Funds, Chit Funds.

UNITt-III Personal Investments in Non-Financial Assets : Investment in Physical Assets – Real Estate. Gold and Silver, Risk and Return associated with Investment in Financial and Non-Financial Assets.

UNIT-IV Computation of Return and Risk of Personal Investment : Present Value and Future Value, Computation of Interest, Dividend and Capital gains on Personal Investments.

UNIT-V Retirement Savings Plan : Pension Plans : Defined Contribution plan and defined benefit plan, Provident Fund, Gratuity. Life Insurance Plans, General Insurance Plans, Reverse Mortgage Plans.

References :-

5. Personal Finance by Jack R. Kapoor, Les R. Dlabay and Robert J. Hugus, Tata McGraw –Hill Publishing Company Ltd. New delhi.
6. Financial Education By Reserve Bank of India - rbi.org
7. Personal Finance Columns in the Economic Times, The Business Lones and Financial Express Daily News Papers.
8. Information Bulletin of Post Offices, Banks , Mutual Funds, Insurance Companies.
9. Internal Sources : BSE, NSE, SEBI, RBI, IRDA, MFI etc

CAPITAL MARKET INSTRUMENTS

Objective

To equip the students with an opportunity to understand the role of Capital Market Instruments like Stock, Bond etc.

Course Inputs

UNIT-I Origin, Nature and Role of Capital Markets-Globalization of Capital Markets, Capital Markets in India- Stock Exchange.

UNIT-II Financial Instruments : Definition & Meaning, Classification of Financial Assets & Liabilities , Share Warrants or Options, Hedging Instruments.

UNIT-III Stocks, Bonds, Debentures – Convertible Debentures, ADR, GDR, ETFs, Units of Mutual Funds.

UNIT-IV Derivatives – Basic Features : Role of Derivative Markets, Forward and Futures, Commodity Futures, Stock Futures and Index Futures

UNIT-V Options, Stock Options and Index Options, Swaps, Currency Swaps and Interest rate Swaps.

References :

1. Financial Institutions and Markets – Bhole L. M.- TMH
2. Financial Markets – M. Y. Khan
3. Financial Derivatives – Dr. G. Kotreshwar

FINANCIAL INCLUSION

UNIT – I Financial Inclusion and Economic Development, Savings, Investment and Capital Formation

UNIT – II Dimensions of Financial Inclusions: Micro-credit, Micro-saving and Micro-insurance

UNIT – III Financial Inclusion and Financial Literacy: Awareness Campaign by Government

UNIT – IV Financial Regulatory and Financial Inclusion: Government Directives, RBI Directives

UNIT – V Commercial Banks and Financial Inclusions: Branch Expansions, Technology and Schemes

References

1. Financial Education By Reserve Bank of India - rbi.org
2. Personal Finance Columns in the Economic Times, the Business Lines and Financial Express Daily News Papers.
3. Information Bulletin of Post Offices, Banks, Mutual Funds, Insurance Companies.
4. Internal Sources: BSE, NSE, SEBI, RBI, IRDA, MFI etc

Accounting for small Business organizations

Course Inputs

UNIT- I Accounting Language & Information System Generally Accepted Accounting Principles (GAAP), Methods of Accounting; Cash & Accrual.

UNIT- II Books of Accounts : Cash Book & Bank Account, Bank Reconciliation Statement.

UNIT – III Types of Assets, Depreciation, Grants & Donations, Expenditures.

UNIT - IV Final Accounts : Receipt & Payments A/C, Income & Expenditure A/c, Balance Sheet

UNIT - V Financial Statement Analysis & Reporting, Audit Reports

References :

1. Finance & Legal Handbook for NPOs – CA Manoj Fogla, FMSF, 2012.
2. Financial Accounting – Prof. Jawaharlal –Himalaya Publishing House P Ltd
3. 2-Shankarnarayana-Financial Accounting.(Cengage Learning)
4. 3-Bruns-Financial Reporting and Management Accounting(Cengage Learning)
5. 4-Stice-Financial Accounting reporting and analysis.(Cengage Learning)

PERSONAL TAXATION & PLANNING

UNIT – I Basic Concept : Assessee, Person, Income, Connotation of income, Taxable income, tax free income, Gross total income, Assessment year, Previous year, Residential status of assessee, Basis of Charge of Income Tax.

UNIT- II Income from Salary: Income from salary- basis of charge, place of charge, component of salary, partially taxable salary, pension, gratuity, retrenchment, voluntary retirement compensation, PF, profit lieu of salary, fully exempted, salary payment,

UNIT- III Income from house property and Business or Profession: Chargeable income, deemed owner, co-owner, fair rent, annual rent. Standard rent, calculation of annual value, and net annual value for rented and self-coupled houses, deductions. Computation of Business Profits, Concept of Deemed Profits, Deductions, Valuation of Stock, Treatment of Depreciation

UNIT-IV Income from Capital Gain and Other Sources: Transfer of Capital Assets, Cost of Acquisition, STCG, LTCG, Deemed Capital Gain, Exempted Capital Gains,

UNIT – V Computation of Tax Liability and Planning: Aggregation of Income, Deduction to be made in Computing Total Income, Set-off and Carry Forward of Losses, surcharge, Difference between exemption, deduction and rebate, Tax Evasion and Tax Avoidance, Methods of Tax Planning.

Reference Book:

1. Gaur and Narang- *Income Tax Laws and Practice*- Kalyani Publishers.
2. Singhania- *Direct Laws and Practice*- Taxman's Publication, New Delhi.
3. BhagabatiPrasad,"Direct Tax Laws & Practices".

(Credit will be assigned if the student opts to go through the examination process. But it will not be considered for CGPA (Choice Based Credit System))

Evaluation: End Term: 70 Marks

Unit Test and Quiz: 20 Marks, Assignment and Presentation: 10 Marks

Project Report: Thesis: 100 marks, Presentation & Viva-Voce: 100 marks

Minimum Total Marks= 2500

Minimum Credit Points: Core 68 + Elective 28 = 96

Mutual Fund And Portfolio Management

Objective

The objective of the course is to impart conceptual knowledge and skills relating to mutual fund and portfolio Management.

Course Input

Unit-I Portfolio : Risk & Return, Measurement & Analysis , Non –satiation and risk aversion, diversification, borrowing and lending, utility theory and indifference curves, choice of portfolio and efficient set theorem.

Unit-II Portfolio Analysis : Market Optimization, Sharpe's Optimization, Significance of Beta in the Portfolio, Investment Objectives, Process and Policies.

Unit-III CAPM : Factor Models, APT, Construction of Portfolio, Investment Strategy, Execution, Assets Pricing, Revision and Measures of Return and Performance

Unit-IV Managed Portfolio ; Investment timing, Performance Measurement and Evaluation (different techniques), Foreign Portfolio Investment in India : Issues, Trends, Policies and Techniques.

Unit-V Mutual Funds : Concepts, Origin, Types, Regulation and Operations, Risk Factors, Performance Evaluation.

References :

1. SK., Barua, V. Raghunathan and J. R. Varma : Portfolio Management, TMC
2. Elton, Edwin J. and M. J. Gruber : Modern Portfolio Theory and Investment Analysis, John Wiley & Sons.
3. Graham, Benjamin & David L. Dodd : Security Analysis, M. Graw Hill
4. V. K. Bhalla : Investment Management, S. Chand, New Delhi
5. Fischer, Donald E. Jordan : Security Analysis Portfolio Management.
6. S. Francis, Jack Clarice ; Portfolio Analysis
7. Sharpe, Alexander, Betty : Investment , Prentice Hall of India.
8. Russell J. Fuller, Farrel, Jr. Modern Investment and Security Analysis. Tata McGraw Hill
9. Lee Chang. F. Joseph : Security Analysis & Portfolio Management
10. M. Y. Khan : Indian Financial System, McGraw Hill.
11. Resort A. Strang : Portfolio Construction and Protection.

Financial Derivatives and risk Management

Objective

The Course will familiarize the students in the application of various tools and techniques of Financial Risk Management.

Course Input

Unit-I Risk : Definition, Types of risk, Process of risk Management, The Tools of Risk Management.

Derivatives : Definition and Evolution of Derivatives, Derivatives Markets, Types of Derivatives, Derivatives Market in India

Unit-II Futures Market : functions of Futures Market ,Speculation and hedging, Price, Spread and hedging, futures and price stabilization, Tests of Efficiency, Financial futures as a mechanism of risk transference, Spot and future Prices.

Unit- III Financial Futures : Interest Rate Futures , Currency Futures(Foreign Exchange) Stock Index Futures and Financial Futures in India, Risk Management with Futures, Cost of Carry Model, Index Arbitrage, Purchasing Power Parity Theorem.

Unit-IV Options : Terminology and Methodology of Trading, Types of Options, Option Pricing, Swaps, Types of Swaps, Swap Valuation, and other Derivatives, Speculation with Options, Risk Management with options & Futures.

Unit- V Regulatory Framework of Futures & Derivatives ; Regulatory bodies in Major International Markets, Regulatory framework in India, Regulatory Instruments and needs, Accounting for Derivative Transactions.

References :

1. John C. Hull : Options, Futures & Other Derivatives, Pearsons
2. T. V. Somanathan : Derivatives, Tata mc Graw Hill
3. Redhead : Financial Derivatives, Prentice Hall
4. Lasys Walter, Lexinton : Speculation, Hedg & Commodity Price Forecasting.
5. Hill J. and t. Schneelesis ; Risk Reduction, Potential of Fina ncial Futures.
6. Jarrow and Rudd. Lrwin ; Optional Pricing, Homewood, Irwin.
7. Dubofsky and Miller, derivatives : Valuation and Risk Management, Oxford University Press, New York.
8. Watsham. T., Futures and Options in Risk Management, Thompson, Asia
9. Wilmott. P., The Theory and Practice of Financial Engineering, John Wily and Sons, England.
10. Gupta. S. L., Financial Derivatives, PHI
11. Kumar, Financial Derivatives, PHI
12. Cox, J. and Rubinstein M. " Options Market" PHI
13. Tucker, A. L.: "Financial Futures, Options and Swaps", West Publishing Co, St paul Minn.

Advanced Auditing

1. Auditing concepts Basic Principles governing an audit- Relationship of auditing with other disciplines -Audit Programme-Vouching, - Verification and Valuation.

2 Auditing and Assurance Standards

Overview-Standard setting process-Role of International Auditing and Assurance Standard Board and Auditing and Assurance Standard Board in India.

3 Risk Assessments and Internal Control

Evaluation of internal control procedures; techniques including Questionnaire; flowchart; internal audit and external audit, coordination between two.

4 Audits of Limited Companies

Preliminaries to the audit of limited company-Audit of share capital Transactions, Debentures and other transactions-Audit report with special Reference to CARO 2003 *Profit and divisible profit-Dividends- Investigation under Companies Act, 1956.

5 Audit Committee and Corporate Governance

Corporate Governance: Introduction-Verification of Compliance of Corporate Governance.

Audit Committee: Constitution-Powers of Audit Committee-CEO/CFO Certification to Board-Report on Corporate Governance.

Recommended Books:

- 1) Spicer and Peglar : Practical Auditing
- 2) Kamal Gupta: Contemporary Auditing
- 3) R.C. Saxena : Auditing (Himalaya)
- 4) Basu : Auditing
- 5) Jagdish Prasad: Auditing: Principles
- 6) M.D.Paula : The Principles of Auditing
- 7) B.N. Tondon: A Handbook of Practical Auditing
- 8) The Institute of Accountants of India : Auditing assurance Standards

Sales & Sales Force Management

Unit-I Introduction to Sales Management: Meaning, Nature, Importance and Scope of Sales Management, Role of Sales in, Sales Process and Personal Selling; Selling & Sales Management; Sales Strategic Ethics in Sales Management.

Unit-II Sales Techniques and Selling Skills : Direct Marketing and Relationship Selling; Sales Channels and Industrial, Commercial, Public Authority Selling; Selling for resale and selling Services ; Sales Promotion, Public Relations, Sales Strategic ; Personal Selling Theories.

Unit-III Sales Force Management: Job analysis, Recruitment Selection; Training; Compensation and Motivation; Monitoring and Performance Evaluation; Salesmanship and sales Promotions.

Unit-IV Sales Planning: Job of Sales Manager; Sales Planning, Sales Organizations and Compensation, Sales Quota and Sales Forecasting; Territory Management.

Unit-V Sales Control – Monitoring & Performance Evaluation; Sales Control & Cost Analysis; Controlling the Sales Efforts through Sales Budgeting, Sales Quota, Sales Territories; Institutional Sales Management.

References:-

1. Spiro, R. L. Stunton, W.J. , Rich, G. A., " Management of Sales Force", Tat McGraw Hill, new Delhi.
2. David Jobbes, and Geoff Lancaster, "Selling and Sales Management, Pearson Publications, New Delhi.
3. Chunawalla, S. A. "Sales Management", Himalaya Publishing House, Mumbai.
4. Keskar, Anil and Abhayankar, Suresh, "Sales Management and Personal Selling". Himalaya Publishing House.
5. A. Keskar, and S. Abhankar, "Sales Management and personal Selling", Himalaya Publishing House, New Delhi.
6. Khan Martin, "Sales & Distribution Management", Excel Books.
7. Gupta S. L. "Sales & Distribution Management", Excel Books.
8. Tanner Jeff, Honeycutt, Earl De, Erffmeyer, Robert C., "Sales Management", Pearson Publications, New Delhi.
9. Still, Richard R., Edward Cunoliff W., Norman Govani A. P., "Sales Management: Decision Strategy and Cases", Pearson Publication: New Delhi.

BUSINESS LANGUAGE AND COMMUNICATION SKILLS

Websites

www.tatamcgrawhill.com/digital_solutions/monippally

www.dictionary.cambridge.org

Nayagarh Autonomous College, Nayagarh (Odisha) affiliated to Utkal University, Vani Vihar,

www.wordsmith.org

Academic Year
2019-20

STATE MODEL SYLLABUS FOR UNDERGRADUATE COURSES IN ARTS (2019-2020)

UNDER CHOICE BASED CREDIT SYSTEM

	Skill Development
	Employability
	Entrepreneurship
	All the three
	Skill Development and Employability
	Skill Development and Entrepreneurship
	Employability and Entrepreneurship

Course structure of UG Economics Honours

Semester	Course	Course Name	Credits	Total marks
I	AECC-I	AECC-I	04	100
	C-I	Introductory Microeconomics	06	100
	C-II	Mathematical Methods for Economics I	06	100
	GE-I	Indian Economy	06	100
			22	
II	AECC-II	AECC-II	04	100
	C-III	Introductory Macroeconomics	06	100
	C-IV	Mathematical Methods for Economics II	06	100

	GE-II	Indian Economy II	06	100
			22	
III	C-V	Microeconomics I	06	100
	C-VI	Macroeconomics I	06	100
	C-VII	Statistical Methods for Economics	06	100
	GE-III	Introductory Microeconomics	06	100
	SEC-I	SEC-I	04	100
			28	
IV	C-VIII	Microeconomics II	06	100
	C-IX	Macroeconomics II	06	100
	C-X	Research Methodology	06	100
	GE-IV	Introductory Macroeconomics	06	100
	SECC-II	SECC-II	04	100
			28	
Semester	Course	Course Name	Credits	Total marks
V	C-XI	Indian Economy I	06	100
	C-XII	Development Economics I	06	100

	DSE-I	1. Economic History of India (1857-1947) or 2. Public Economics	06	100
	DSE-II	1. Introductory Econometrics or 2. Odisha Economy or 3. Money and Banking	06	100
			24	
VI	C-XIII	Indian Economy II	06	100
	C-XIV	Development Economics II	06	100
	DSE-III	1. Environmental Economics or 2. History of Economic Thought	06	100
	DSE-IV	1. International Economics or 2. Agricultural Economics or 3. Project/Dissertation	06	100
			24	

ECONOMICS

HONOURS PAPERS:

Core course – 14 papers

Discipline Specific Elective – 4 papers (out of the 9 papers suggested)

Generic Elective for non Public Administration students – 4 papers. In case University offers 2 subjects as GE, then papers 1 and 2 will be the GE paper.

Marks per paper - Midterm : 20 marks, End term : 80 marks, Total – 100 marks

Credit per paper – 6

Teaching hours per paper – 50 hours + 10 hours tutorial

Dissertation : (content : 50; Seminar : 30; Viva Voce : 20)

Core Paper I INTRODUCTORY MICROECONOMICS

Introduction:

This course is designed to expose the students to the basic principles of microeconomic theory. The

emphasis will be on thinking like an economist and the course will illustrate how microeconomic concepts can be applied to analyze real-life situations.

Unit I: Exploring the Subject Matter of Economics, Markets and Welfare

The Ten Principles of Economics: How people make decisions; Working of the economy as a whole; Thinking Like an Economist: The economist as Scientist – The scientific method: Observation, Theory and more observation; Role of Assumptions; Economic Models; Why economists disagree; Graphs in Economics

The Market Forces; Markets and Competition; The Demand and Supply curves – Market vs Individual curves, Shifts in Demand and Supply Curves; Market Equilibrium and changes there in; Price Elasticity of Demand – determinants and computation; Income and Cross Elasticity of Demand; The Price Elasticity of Supply – determinants and computation; Consumer and Producer Surplus.

Unit II: Theory of Consumer Choice

The Budget Constraint; Preferences – representing preferences with indifference curves; Properties of Indifference Curves; Two extreme examples of indifference curves; Optimization – Equilibrium; Change in equilibrium due to changes in income, changes in price; Income and Substitution Effect; Derivation of Demand Curve; Three applications – Demand for Giffen goods, Wages and Labour Supply, Interest rate and Household saving.

Unit III: The Firm and Market Structures

Cost concepts; Production and Costs; The various measures of cost – Fixed and Variable cost, Average and Marginal cost; Cost curves and their shapes; Costs in the short run and in the long run; Economies and diseconomies of scale. Firms in Competitive Markets – What is a competitive market; Profit maximization and the competitive firm's supply curve; The marginal cost curve and the firm's supply decision; Firm's short-run decision to shut down; Firm's long-run decision to exit or enter a market; The supply curve in a competitive market – short run and long run.

Unit IV: The Input Markets

The Demand for Labour – The production function and the marginal product of labour; Value of the marginal product of labour and demand for labour; Shifts in labour demand curve; The supply of labour – the trade-off between work and leisure; Shifts in the labour supply curve; Equilibrium in the Labour Market; Other factors of production: Land and Capital; Linkages among factors of production.

Text Book:

-] Principles of Economics, Gregory N Mankiw, 6e Cengage Learning India Private Limited, New Delhi

Reference Book:

-] Karl E. Case and Ray C. Fair (2007): *Principles of Economics*, 8th Edition, Pearson Education Inc.

Core Paper II

MATHEMATICAL METHODS FOR ECONOMICS I

Introduction:

This is the first of a compulsory two-course sequence. The objective of this sequence is to transmit the body of basic mathematics that enables the study of economic theory at the undergraduate level, specifically the courses on microeconomic theory, macroeconomic theory, statistics and econometrics set out in this syllabus. In this course, particular economic models are not the ends, but the means for illustrating the method of applying mathematical techniques to economic theory in general. The level of sophistication at which the material is to be taught is indicated by the contents of the prescribed textbook.

Unit I: Preliminaries and Functions of one Real Variable

Sets and set operations; Cartesian product; relations; functions and their properties; Number systems

Types of Functions- constant, polynomial, rational, exponential, logarithmic; Graphs and graphs of functions; Limit and Continuity of functions; Limit theorems.

Unit II: Derivative of a Function

Rate of change and derivative; Derivative and slope of a curve; Continuity and differentiability of a function; Rules of differentiation for a function of one variable; Application- Relationship between total, average and marginal functions.

Unit III: Functions of two or more Independent Variables

Partial differentiation techniques; Geometric interpretation of partial derivatives; Partial derivatives in Economics; Elasticity of a function – demand and cost elasticity, cross and partial elasticity.

Unit IV: Matrices and Determinants

Matrices: concept, types, matrix algebra, transpose, inverse, rank; Determinants: concept, properties, solving problems using properties of determinants, solution to a system of equations - Cramer's rule and matrix inversion method.

Text Book:

- A. C. Chiang and K. Wainwright (2005): *Fundamental Methods of Mathematical Economics*, McGraw Hill International Edition.

Reference Book:

-] K. Sydsaeter and P. J. Hammond (2002): *Mathematics for Economic Analysis*. Pearson Educational Asia

Core Paper III INTRODUCTORY MACROECONOMICS

Introduction:

This course aims to introduce the students to the basic concepts of Macroeconomics. Macroeconomics deals with the aggregate economy. This course discusses the preliminary concepts associated with the determination and measurement of aggregate macroeconomic variable like savings, investment, GDP, money, inflation, and the balance of payments.

Unit I: Basic Concepts in Macroeconomics

Macro vs. Micro Economics; Limitations of Macroeconomics; Stock and Flow variables, Equilibrium and Disequilibrium, Partial and General Equilibrium Statics – Comparative Statics and Dynamics; National Income Concepts – GDP, GNP, NDP and NNP at market price, factor cost, real and nominal; Disposable personal Income.

Unit II: Measurement of Macroeconomic Variables

Output, Income and Expenditure Approaches; Difficulties of Estimating National Income; National Income Identities in a simple 2-sector economy and with government and foreign trade sectors; Circular Flows of Income in 2, 3 and 4-sector economies; National Income and Economic Welfare; Green Accounting.

Unit III: Money and Changes in its Value

Evolution and Functions of Money, Quantity Theory of Money – Cash Transactions, Cash Balances and Keynesian Approaches, Value of Money and Index Number of Prices
Inflation – Meaning, Causes, and Anti-Inflationary Measures; Classical, Keynesian, Monetarist and Modern Theories of Inflation, Inflationary Gap, Deflation- Meaning, Causes, and Anti-Deflationary Measures, Depression and Stagflation; Inflation vs. Deflation.

Unit IV: Determination of National Income

The Classical Approach - Say's Law, Theory of Determination of Income and Employment with and without saving and Investment; Basics of Aggregate Demand and Aggregate Supply and Consumption-Saving– Investment Functions, The Keynesian Approach– Basics of Aggregate Demand and Aggregate Supply and Consumption, Saving, Investment Functions; The Principle of Effective Demand; Income Determination in a Simple 2-Sector Model; Changes in Aggregate Demand and Income- The Simple Investment Multiplier

Text Book:

-] N. Gregory Mankiw (2010): *Macroeconomics*, 7th edition, Cengage Learning India Private Limited, New Delhi

Reference Book:

-] Richard T. Froyen (2005): *Macroeconomics*, 2nd Edition, Pearson Education Asia, New Delhi.

Core Paper IV MATHEMATICAL METHODS FOR

ECONOMICS II

Introduction:

This course is the second part of a compulsory two-course sequence. This part is to be taught in Semester II following the first part in Semester I. The objective of this sequence is to transmit the body of basic mathematics that enables the study of economic theory at the undergraduate level, specifically the courses on microeconomic theory, macroeconomic theory, statistics and econometrics set out in this Syllabus. In this course, particular economic models are not the ends, but the means for illustrating the method of applying mathematical techniques to economic theory in general. The level of sophistication at which the material is to be taught is indicated by the contents of the prescribed textbook.

Unit I: Linear models:

Input- Output Model: Basic concepts and structure of Leontief's open and static Input-Output model; Solution for equilibrium output in a three industry model; The closed model.

Unit II: Second and Higher Order Derivatives and Integration:

Technique of higher order differentiation; Interpretation of second derivative; Second order derivative and curvature of a function; Concavity and convexity of functions; Points of inflection, Derivative of Implicit Function; Higher Order Partial Derivative.

Indefinite Integrals; Rules of Integration; Techniques of Integration: Substitution Rule, Integration by parts, and Partial Fractions; Definite Integral – Area Interpretation.

Unit III: Single and Multivariable Optimization:

Optimum values and extreme values; Relative maximum and minimum; Necessary versus sufficient conditions - First and Second derivative tests (using Hessian Determinants); Economic applications thereof, First and second order condition for extrema of multivariable functions; Convex functions and convex sets.

Unit IV: Optimization with Equality Constraints:

Effects of a constraint; Finding stationary value – Lagrange-Multiplier method (Two variable single constraint case only): First and second order condition; The Bordered Hessian determinant.

Text Book:

- A. C. Chiang and K. Wainwright (2005): *Fundamental Methods of Mathematical Economics*, McGraw Hill International Edition.

Reference Book:

-] K. Sydsaeter and P. J. Hammond (2002): *Mathematics for Economic Analysis*. Pearson Educational Asia

Core Paper V MICROECONOMICS I

Introduction:

The course is designed to provide a sound training in microeconomic theory to formally analyze the behavior of individual agents. Since students are already familiar with the quantitative techniques in the previous semesters, mathematical tools are used to facilitate understanding of the basic concepts; this course looks at the behavior of the consumer and the producer and also covers the behavior of a competitive firm.

Unit I: Consumer Theory I

Preferences and Utility, Axioms of Rational Choice, Utility, Trades and Substitutions, Indifference curves; Mathematics of Indifference curves, Utility functions for specific preferences, the many good case; Utility Maximization and choice: the 2-good case (graphical analysis), the n-good case, Indirect utility function, the Lump sum principle, Expenditure minimization, properties of expenditure function.

Unit II: Consumer Theory II

The Income and Substitution Effects: Demand function, changes in income, changes in a goods price- Direct and Indirect Approaches (Slutsky), the Individual's Demand Curve, Compensated (Hicksian) demand curves and functions, demand elasticity, Consumer Surplus, Demand relationships among goods, the 2-good case, substitutes and complements, Net (Hicksian) substitutes, and Complements, Substitutability with many goods.

Unit III: Production Theory and Costs

Production Functions: Marginal productivity, Production with One Variable Input (labour) and with Two-Variable Inputs, Isoquant Maps and the Rate of Technical Substitution, Returns to Scale, Elasticity of Substitution, Some Simple Production Functions: Linear, Fixed Proportions, Cobb-Douglas; Technical Progress.

Definition of Cost and its properties, Cost minimizing input choices (Optimization principles, Expansion Path), Cost Functions and Shift in Cost Curves, Long-Run versus Short-Run Cost Curves.

Unit IV: Profit Maximization

The Nature and Behavior of Firms, Marginal Revenue – Relationship between Average and marginal revenue, Short-Run Supply by a Price-Taking Firm, Profit Functions and its Properties, Profit maximization – General conditions, Input demands.

Text Book:

-] C. Snyder and W. Nicholson (2012): Microeconomic Theory: Basic Principles and Extensions, 11th Edition, Cengage Learning, Delhi, India.

Reference Books:

-] H. R. Varian (2010): Intermediate Microeconomics: A Modern Approach, 8th Edition, W.W. Norton and Company/Affiliated East-West Press (India). The workbook by Varian and Bergstrom may be used for problems.

Core Paper VI MACROECONOMICS I

Introduction:

This course introduces the students to formal modeling of a macro-economy in terms of analytical tools. It discusses various alternative theories of output and employment determination in a closed economy in the short run as well as medium run, and the role of policy in this context. It also introduces the students to various theoretical issues related to an open economy.

Unit I: Consumption and Investment

Consumption – Income Relationship, Propensities to Consume and the Fundamental Psychological Law of Consumption; Implications of Keynesian Consumption Function; Factors Influencing Consumption Function; Measures to Raise Consumption Function; Absolute, Relative, Permanent and Life – Cycle Hypotheses
Autonomous and Induced Investment, Residential and Inventory Investment, Determinants of Business Fixed Investment, Decision to Invest and MEC, Accelerator and MEI, Theories of Investment.

Unit II: Demand for and Supply of Money

Demand for Money – Classical, Neoclassical and Keynesian Approaches, The Keynesian Liquidity Trap and its Implications, Supply of Money, The Theory of Money Supply Determination and Money Multiplier, Measures of Money Supply in India.

Unit III: Aggregate Demand and Aggregate Supply

Derivation of Aggregate Demand and Aggregate Supply Curves in the IS-LM Framework; Nature and Shape of IS and LM curves; Interaction of IS and LM curves and Determination of Employment, Output, Prices and Investment; Changes in IS and LM curves and their Implications for Equilibrium.

Unit IV: Inflation, Unemployment and Expectations, and Trade Cycles

Inflation – Unemployment Trade off and the Phillips Curve – Short run and Long run Analysis; Adaptive and Rational Expectations; The Policy Ineffectiveness Debate; Meaning and Characteristics of Trade Cycles; Hawtrey's Monetary Theory, Hayek's Over-investment Theory and Keynes' views on Trade Cycles.

Text Book:

-] N. Gregory Mankiw (2010): *Macroeconomics*, 7th edition, Cengage Learning India Private Limited, New Delhi.

Reference Book:

-] Richard T. Froyen (2005): *Macroeconomics*, 2nd Edition, Pearson Education Asia, New Delhi.

Core Paper VII

STATISTICAL METHODS FOR ECONOMICS

Introduction:

This is a course on statistical methods for economics. It begins with some basic concepts and terminology that are fundamental to statistical analysis and inference. It is followed by a study and measure of relationship between variables, which are the core of economic analysis. This is followed by a basic discussion on index numbers and time series. The paper finally develops the notion of probability, followed by probability distributions of discrete and continuous random variables and introduces the most frequently used theoretical distribution, the Normal distribution.

Unit I: Data Collection and Measures of Central Tendency and Dispersion

Basic concepts: population and sample, parameter and statistics; Data Collection: primary and secondary data, methods of collection of primary data; Presentation of Data: frequency distribution; cumulative frequency; graphic and diagrammatic representation of data; Measures of Central Tendency: mean, median, mode, geometric mean, harmonic mean, their relative merits and demerits; Measures of Dispersion: absolute and relative - range, mean deviation, standard deviation, coefficient of variation, quartile deviation, their merits and demerits; Measures of skewness and kurtosis.

Unit II: Correlation and Regression Analysis

Correlation: scatter diagram, sample correlation coefficient - Karl Pearson's correlation coefficient and its properties, probable error of correlation coefficient, Spearman's rank correlation coefficient. Two variable linear regression analysis - estimation of regression lines (Least square method) and regression coefficients - their interpretation and properties, standard error of estimate.

Unit III: Time Series and Index Number

Time Series: definition and components, measurement of trend- free hand method, methods of semi-average, moving average and method of least squares (equations of first and second degree only), measurement of seasonal component; Index Numbers: Concept, price relative, quantity relative and value relative; Laspeyer's and Fisher's index, family budget method, problems in construction and limitations of index numbers, test for ideal index number.

Unit IV: Probability Theory and Sampling

Probability: Basic concepts, addition and multiplication rules, conditional probability; Meaning of Sampling, Types of Sampling: Probability Sampling versus Non-Probability Sampling; Simple Random Sampling and its selection, Systematic Sampling, Multi-stage Sampling, Quota Sampling; Error: Sampling and Non-sampling.

Text books:

- S. C. Gupta (2017): *Fundamentals of Statistics*, Himalaya Publishing House, Delhi

Reference Book:

- Murray R. Spiegel (2017): *Theory & Problems of Statistics*, Schaum's publishing Series.

Core Paper VIII MICROECONOMICS II

Introduction:

This course is a sequel to Microeconomics I. The emphasis will be on giving conceptual clarity to the student coupled with the use of mathematical tools and reasoning. It covers Market, general equilibrium and welfare, imperfect markets and topics under information economics.

Unit I: Firm Supply and Equilibrium

Market Environments; Pure competition; Supply decision of a competitive firm and Exceptions; Inverse Supply Function; Profits and Producer's Surplus; Long Run Supply Curve of a Firm; Long Run Average Costs; Short Run and Long Run Industry Supply; Industry Equilibrium in Short and Long Run; Meaning of Zero Profits; Economic Rent.

Unit II: General Equilibrium, Efficiency and Welfare

The Edge worth Box; Trade; Pareto Efficient Allocations; Existence of equilibrium and efficiency; The Welfare Theorems and their implications; The Firm; Production and the Welfare Theorems ; Production possibilities, comparative advantage and Pareto efficiency.

Unit III: Market Imperfections: Monopoly and Oligopoly

Barriers to Entry, Profit Maximization and Output Choice, Monopoly and resource Allocation, Monopoly, Product Quality and Durability, Price Discrimination, Second Degree Price Discrimination through Price Schedules, Regulation of Monopoly, Dynamic Views of Monopoly. Monopolistic competition; Price output determination; excess capacity under monopolistic competition .

Unit IV: Game Theory

The Payoff Matrix of a Game; Nash Equilibrium; Mixed Strategies ;The Prisoner's Dilemma; Repeated Games; Enforcing a cartel; Sequential Games; A Game of entry deterrence. Oligopoly – Choosing a strategy; Quantity and price leadership; Simultaneous Quantity Setting; Example of Cournot Equilibrium; Simultaneous Price Setting; Collusion.

Text Book:

-] H. R. Varian (2010): Intermediate Microeconomics: A Modern Approach, 8th Edition, W.W. Norton and Company/Affiliated East-West Press (India). The workbook by Varian and Bergstrom may be used for problems.

Reference Book:

-] C. Snyder and W. Nicholson (2012): Microeconomic Theory: Basic Principles and Extensions, 11th Edition, Cengage Learning, Delhi, India.
-] Pindyck, Robert and Daniel Rubinfeld (2018): Microeconomics, 9th Edition, Pearson Education Inc.

Core Paper IX MACROECONOMICS II

Introduction:

This course is a sequel to Macroeconomics I. In this course, the students are introduced to the long run dynamic issues like growth and technical progress. It also provides the micro-foundations to the various aggregative concepts used in the previous course.

Unit I: Modeling Economic Growth

Accumulation of Capital in the basic Solow Model; supply and demand for goods, growth in the capital stock and the steady state, Golden rule level of capital: Comparing steady states, transition to the golden rule steady state with too much and too little capital, Population Growth, Technological Progress- Solow version, Beyond Solow Model and Endogenous Growth.

Unit II: Open Economy and Macroeconomic Policy

Balance of payments- concept; meaning of equilibrium and disequilibrium in balance of payments; Determination of foreign exchange rate- the balance of payments theory; Fixed versus flexible exchange rates; Short-run open economy model- the basic Mundell-Fleming model; Macroeconomic Policies – Fiscal policy, Crowding –out and Crowding – in; Monetary policy and instruments, the Transmission Mechanism; Effectiveness of macroeconomic policies in open and closed economies.

Unit III: Classical and Keynesian Macroeconomics Thoughts

Keynes versus classics: Classical macroeconomics, Employment and output determination, Say's law, the quantity theory of money, Keynes's General theory: Keynes's main propositions; analysis of the labour market, Keynes's critique of Say's law and Quantity theory of money, the orthodox Keynesian school, underemployment equilibrium in the Keynesian model, the Phillips curve and orthodox Keynesian school.

Unit IV: Monetarist and New Classical Macroeconomic Thoughts

The orthodox monetarist school, the Quantity Theory of Money approach, the expectations augmented Phillips curve analysis, the orthodox monetarist school and stabilization policy. New Classical Economics: The influence of Robert e Lucas Jr, the structure of new classical models: the Rational Expectations hypothesis; and policy implications.

Text Book:

-] N. Gregory Mankiw (2010): *Macroeconomics*, 7th edition, Cengage Learning India Private Limited, New Delhi

Reference Book:

-] Brian Snowdon and Howard R Vane (2005): *Modern Macroeconomics: Its Origins, Development and Current State*, Edward Elgar

Core Paper X Research Methodology

Introduction:

The course is to develop a research orientation among the students and to acquaint them with fundamentals of research methods. Specifically, the course aims at introducing them to the basic concepts used in research and to scientific social research methods and their approach. It includes discussions on sampling techniques, research designs and techniques of analysis.

Unit I: Basics of Research

Introduction to Research: Meaning, Objectives, Motivation, Types, Approaches, Significance, Research Process, Criteria of Good Research; Qualities of a Good Researcher, Research as a Career.

Unit II: Research Problem

Defining the Research Problem: What is a Research Problem? Selecting the Problem, Necessity of Defining the Problem, Technique Involved in Defining a Problem; Research Design: Meaning, Need, Features of a Good Design, Important Concepts Relating to Research Design, Different Research Designs, Basic Principles of Experimental Designs.

Unit III: Issues in Research

Measurement in Research, Measurement Scales, Sources of Error in Measurement, Tests of Sound Measurement, Techniques of Measurement Tools, Scaling and Important Scaling Technique
Research Ethics: codes and ethics, permissions to research, responsibilities, confidentiality, feedback, participatory research; Research Proposal and literature review: research proposal, review of literature, levels of analysis, using the library and internet, abstracting, word processing, plagiarism, Concept of IPR.

Unit IV: Actions in Research

English in report writing: words, sentences, paragraph, writing style; The Report: improving quality, sections, drawing conclusions, evaluation checklists, persistence; Common Citation Styles

Text Book:

-] Kothari, C. R. (2004): Research Methodology: Methods and Techniques, New Age International Private Limited Publishers, New Delhi.

Reference Books:

-] Guthrie, G. (2010): Basic Research Methods, Sage Publications India Private Limited, New Delhi.

Core Paper XI INDIAN ECONOMY I**Introduction:**

Using appropriate analytical frameworks, this course reviews major trends in economic indicators and policy debates in India in the post-Independence period, with particular emphasis on paradigm shifts and turning points. Given the rapid changes taking place in India, the reading list will have to be updated annually.

Unit I: Basic Characteristics of Indian Economy as a Developing Economy

Indian Economy in the Pre-British Period; The Structure and Organization of Villages and Towns; Industries and Handicrafts in Pre-British India; Colonialism; Economic Consequences of British Rule; Decline of Handicrafts and Progressive Ruralization; The Land System and Commercialization of Agriculture; Industrial Transition; Colonial Exploitation and Impacts – Underdevelopment; Colonization and Modernization; State Policies and Economic Underdevelopment; The Current State of Indian Economy

Unit II: Population and Human Development

Population Growth and Economic Development – size, growth and future of population; Causes of rapid population growth; Population and economic development; Population policy; Demographic issues– Sex and Age Composition of population; Demographic Dividend; Urbanization and Migration; Human Resource Development – Indicators and importance of Human Resource Development; Education policy; Health and nutrition.

Unit III: National Income in India – The Growth Story and Current Challenges

Trends in national and per capita income; Changes in sectoral composition of national income; Regional disparities in Growth and Income; Savings and Investment and Economic Growth – The Linkage; Poverty – Estimation and Trends, Poverty Alleviation Programs– MGNREGA, NRLM, SJSRY; Inequality –Measures and trends in India; Unemployment– Nature, Estimates, Trends, Causes and Employment Policy.

Unit IV: Economic Planning in India

Rationale, Features, Objectives, Strategies, Achievements and Assessment of Planning in India; Eleventh Five Year Plan– Objectives, Targets and Achievements; Twelfth Five Year Plan – Vision and Strategy; From Planning to NITI– Transforming India’s Development Agenda.

Text Book:

-] Misra, S. K. and Puri V. K. Indian Economy — Its Development Experience. Himalaya Publishing House, Mumbai

Reference Books:

-] Dutt R. and Sundharam K. P. M. *Indian Economy*. S. Chand & Company Ltd., New Delhi.
-] Indian Economy Datt and Sundharam, Gaurav Datt and Ashwani Mahajan, S Chand Publications, 7th Revised Edition
-] Indian Economy Since Independence, ed by Uma Kapila, Academic Foundation, Revised Nineteenth Edition 2008-09
-] Government of India (Current Year): Economic Survey, Ministry of Finance, New Delhi

Core Paper XII

DEVELOPMENT ECONOMICS I

Introduction:

This is the first part of a two-part course on economic development. The course begins with a discussion of alternative conceptions of development and their justification. It then proceeds to aggregate models of growth and cross-national comparisons of the growth experience that can help evaluate these models. The axiomatic basis for inequality measurement is used to develop measures of inequality and connections between growth and inequality are explored. The course ends by linking political institutions to growth and inequality by discussing the role of the state in economic development and the informational and incentive problems that affect state governance.

Unit I: Study of Economic Development

Development Economics as subject; economic growth and economic development; Characteristics of underdeveloped countries – vicious cycle of poverty and cumulative causation; obstacles to economic development; measures of economic development – national and per capita income, basic needs approach, capabilities approach, three core values of development, PQLI, HDI, HPI, MDPI, GDI; capital formation and economic development.

Unit II: Theories of Economic Growth and Development

Classical theory, Marxian theory; Schumpeterian theory; Rostow's stages of economic growth; Solow model and convergence with population growth and technical progress.

Unit III: Poverty, Inequality, Agriculture, Industry and Development

Measuring poverty: Head Count Ratio, Poverty Gap Ratio, Squared Poverty Ratio, FGT Ratio; Measuring Inequality – Lorenz curve and Kuznets' inverted U hypothesis; Growth, poverty and inequality; Policy options – some basic considerations.

Agriculture, Industry and Economic Development: Role of agriculture; Transforming traditional agriculture; Barriers to agricultural development; Role of industrialization; Interdependence between agriculture and industries – A model of complementarities between agriculture and industry; terms of trade between agriculture and industry; functioning of markets in agrarian societies; interlinked agrarian markets.

Unit IV: Institutions and Economic Development:

Role of institutions in economic development; Characteristics of good institutions and quality of institutions; The pre-requisites of a sound institutional structure; Different measures of institutions – aggregate governance index, property rights and risk of expropriation; The role of democracy in economic development; Role of markets and market failure; Institutional and cultural requirements for operation of effective private markets; Market facilitating conditions; Limitations of markets in LDCs; Corruption and economic development – tackling the problem of corruption.

Text book:

- Todaro, Michael P and Stephen C Smith (2006): *Economic Development*, 8th Edition, Pearson

Reference Books:

-] Debraj Ray (2009): *Development Economics*, Oxford University Press.
-] Thirlwall, A P (2011): *Economics of Development*, 9th Edition, Palgrave Macmillan

Core Paper XIII INDIAN ECONOMY II

Introduction:

This course examines sector-specific policies and their impact in shaping trends in key economic indicators in India. It highlights major policy debates and evaluates the Indian empirical evidence. Given the rapid changes taking place in the country, the reading list will have to be updated annually.

Unit I: Agricultural Development in India

Indian Agriculture: nature, importance, trends in agricultural production and productivity, factors determining production, land reforms, new agricultural strategies and green revolution, rural credit; Agricultural marketing and warehousing.

Unit II: Industrial Development in India

Trends in industrial output and productivities; Industrial Policies of 1948, 1956, 1977 and 1991; Industrial Licensing Policies – MRTP Act, FERA and FEMA; Growth and problems of SSIs, Industrial sickness; Industrial finance; Industrial labour.

Unit III: Tertiary Sector, HRD and the External Sector

Tertiary Sector: growth and contribution of service sector to GDP of India, share of services in employment; Human development – concept, evolution, measurement; HRD: indication, importance, education in India, Indian educational policy; Health and Nutrition.

Foreign Trade: role, composition and direction of India's foreign trade, trends of export and import in India, export promotion versus import substitution; Balance of Payments of India; India's Trade Policies; Foreign Capital – FDI, Aid and MNCs.

Unit IV: Indian Economy and Environment

Environmental Policies in India: The Environment (Protection) Act 1986, The Environment (Protection) Rules 1986, The National Forest Policy 1988, Policy statement for Abatement of Pollution 1992, National Conservation Strategy and Policy Statement on Environment and Development 1992, The National Environment Appellate Authority Act 1997, National Environmental Policy 2006; Global deal with Climate Change: Introduction, Intergovernmental Panel for Climate Change (IPCC), Impact of Climate Change on India, Global Response on Climate Change, Possible Role of India.

Text Book:

-] Misra, S. K. and Puri V. K. *Indian Economy — Its Development Experience*. Himalaya Publishing House, Mumbai

Reference Books:

-] Dutt R. and Sundharam K. P. M. *Indian Economy*. S. Chand & Company Ltd., New Delhi.
-] *Indian Economy* Datt and Sundharam, Gaurav Datt and Ashwani Mahajan, S Chand Publications, 7th Revised Edition
-] *Indian Economy Since Independence*, ed by Uma Kapila, Academic Foundation, Revised Nineteenth Edition 2008-09
-] Government of India (Current Year): *Economic Survey*, Ministry of Finance, New Delhi

Core Paper XIV DEVELOPMENT ECONOMICS II

Introduction:

This is the second unit of the economic development sequence. It begins with basic demographic concepts and their evolution during the process of development. The structure of markets and contracts is linked to the particular problems of enforcement experienced in poor countries. The governance of communities and organizations is studied and this is then linked to questions of sustainable growth. The course ends with reflections on the role of globalization and increased international dependence on the process of development.

Unit I: Population and Development

Demographic concepts : birth and death rates, age structure, fertility and its determinants, the Malthusian population trap and the microeconomic household theory of fertility; costs and benefits of population growth and the model of low level equilibrium trap; rural-urban migration – the Harris Todaro migration model and policy implications.

Unit II: Dualism and Economic Development

Dualism – geographic, social and technological; the theory of cumulative causation (Myrdal); the regional inequalities in the context of economic development; the inverted U relationship; international inequality and the centre periphery thesis; dependency, exploitation and unequal exchange; the dualistic development thesis and its implications.

Unit III: Environment and Development

Basic issues of environment and development – Development and environment inter-linkage; Poverty, environmental degradation and externalities; common property resources, renewable and non-renewable resources; concept of sustainable development; basics of climate change.

Unit IV: International Trade and Economic Development and Financing Economic Development

Trade and economic development; export led growth; terms of trade and economic growth – the Prebisch Singer Hypothesis; trade strategies for development – import substitution vs. export promotion; international commodity agreements; trade vs aid.

Saving, capital formation and economic development; financial sector and economic development; taxation, public borrowing and economic development; inflation, foreign finance, investment and foreign aid – controversies and opportunities.

Text Book:

-] Todaro, Michael P and Stephen C Smith (2006): *Economic Development*, 8th Edition, Pearson

Reference Book:

-] Thirlwall, A P (2011): *Economics of Development*, 9th Edition, Palgrave Macmillan.

DSE Group I

Discipline Specific Elective Paper-1

ECONOMIC HISTORY OF INDIA 1857-1947

Introduction:

This course analyses key aspects of Indian economic development during the second half of British colonial rule. In doing so, it investigates the place of the Indian economy in the wider colonial context, and the mechanisms that linked economic development in India to the compulsions of colonial rule. This course links directly to the course on India's economic development after independence in 1947.

Unit I: Introduction: Colonial India: Background and Introduction and Macro trends:

Overview of colonial economy, National Income; population; occupational structure.

Unit II: Agriculture

Agrarian structure and land relations; agricultural markets and institutions – credit, commerce and technology; trends in performance and productivity; famines.

Unit III: Railways and Industry

Railways; the de-industrialization debate; evolution of entrepreneurial and industrial structure; nature of industrialization in the interwar period; constraints to industrial breakthrough; labor relations.

Unit IV: Economy and State in the Imperial Context

The imperial priorities and the Indian economy; drain of wealth; international trade, capital flows and the colonial economy – changes and continuities; government and fiscal policy.

Text Book:

- Tirthankar Roy, *The Economic History of India 1857-1947*, Oxford University Press, 3rd edition, 2011.

Discipline Specific Elective Paper-2

INTRODUCTORY ECONOMETRICS

Introduction:

This course provides a comprehensive introduction to basic econometric concepts and techniques. It covers statistical concepts of hypothesis testing, estimation and diagnostic testing of simple and multiple regression models. The course also covers the consequences of and tests for misspecification of regression models.

Unit I: Introduction

Definition, Nature and scope of econometrics; Theoretical Probability Distributions: Binomial, Poisson and Normal distributions: their properties
Theory of Estimation: Estimation of parameters; properties of estimators – small sample and asymptotic properties; point and interval estimation.

Unit II: Hypothesis Testing

Testing of hypotheses: defining statistical hypotheses; Simple and composite hypotheses; Null and alternative hypothesis; Type I and Type II errors, Critical region; Neyman-Pearson lemma; Power of a test; Test statistics: z, chi square, t and F.

Unit III: Linear Regression Analysis

Two variable linear regression model – Assumptions; Least square estimates, Variance and covariance between Least square estimates; BLUE properties; Standard errors of estimates; Coefficient of determination; Inference in a two variable linear regression model; ANOVA; Forecasting. Introduction to multiple regression models.

Unit IV: Violation of Classical Assumptions

Heteroscedasticity, Multicollinearity and Auto-correlation: Meaning, consequences, tests and remedies.

Text Book:

- Gujarati, D & Sangeetha (2007); “Basic Econometrics”, McGraw Hill Book Co.

Discipline Specific Elective Paper-3 ODISHA ECONOMY

Introduction:

Using appropriate analytical frameworks, this course reviews major trends in economic indicators and policy debates in Odisha in pre- and post-Independence period, with particular emphasis on

paradigm shifts and turning points. Given the rapid changes taking place in Odisha, the reading list will have to be updated annually.

Unit I: Odisha Economy before 1947

Orissa's Economy in the Nineteenth Century: Benevolence or Exploitation, Forces of Nature, Animal Power, The Company Steps in, Public Works and Public Health, Education, Disintegration of Village Economy, New Social Environment, Changing Position of Social Classes, The Moneylenders, The Borrowers, Money-flows from Village to Metropolis, Pauperization of Peasantry, The Wage Earners, Demographic Changes, Profiting from Rural Adversity; Diarchy in 1919 and Separation of Provincial Finances from Central Government in 1937; Emergence of Federal Finance (Ref.: Das 1976a and 1976b, GoO 2016).

Unit II: Macro Economy of Odisha

A macro glance of Odisha economy: aggregate income, broad sectoral decomposition, performance of districts, employment, child labour and bonded labour, employment programmes, consumption expenditure, cost of living; Odisha State public finances (Chapter 14 and 15 of Ref 1; & Chapter 2 and 9 of Ref 2).

Unit III: Agriculture, Industry, Infrastructure and Environment in Odisha

Agriculture: land ownership and land tenure, agricultural wages and rural unemployment, production and productivity of major crops, agricultural inputs, agricultural policy; Animal Husbandry; Fisheries (Chapter 1 to 3 of Ref 1; & Chapter 3 of Ref 2)

Industry: Investment, industrial policy, and the growth of large industries, mining and quarrying; Construction; tertiary sector: tourism, transport and power; Water Resources, Forest Resources (Chapter 4 to 8 of Ref 1; & Chapter 4 & 5 of Ref 2).

Unit IV: Social Sector in Odisha

Poverty: income poverty and inequality; health sector: outcomes, infrastructure, finance, public health, NRHM; education: Literacy, Primary education, secondary education, higher education, SSA; human development (Chapter 9 to 13 of Ref 1; & Chapter 7 & 8 of Ref 2).

Text Book:

-] Nayak, P., Panda, S. C., Pattanaik, P. K. (2016): The Economy of Odisha: A Profile, Oxford University Press, New Delhi.

Reference Book:

-] GoO (Latest): Odisha Economic Survey, Planning and Convergence Department, Directorate of Economics and Statistics, Government of Odisha, Bhubaneswar.
-] GoO (2004): *Human Development Report 2004 Orissa*, Planning and Coordination

Department, Government of Odisha, Bhubaneswar.

-] GoO (2018): 80 Years Odisha Budget: Commemorative Volume, Department of Finance, Bhubaneswar.

Discipline Specific Elective Paper-4

MONEY, BANKING AND FINANCIAL MARKET

Introduction:

This course exposes students to the theory and functioning of the monetary and financial sectors of the economy. It highlights the organization, structure and role of financial markets and institutions. It also discusses interest rates, monetary management and instruments of monetary control.

Financial and banking sector reforms and monetary policy with special reference to India are also covered.

Unit I: Money

Definition and functions of money; Types of money: legal tender money and bank money, near money; Value of money and index number; construction of index number; WPI, CPI, PPI, GDP deflator, Cost of living index

Demand for money- Classical and Keynesian approaches, Patinkin and the Real Balance Effect; Friedman's Quantity theory of money. Supply of Money- Measures of money supply: M_1, M_2, M_3 and M_4 ; High powered money and money multiplier.

Unit II: Commercial Banking

Meaning and types; Functions of commercial banks; the process of credit creation and its limitations; Balance sheet and portfolio management, Banking sector reforms in India; Lessons from Global Financial Crisis and Policy Response in India.

Unit III: Central Banking

Functions of a central bank; Quantitative and qualitative methods of credit control; Central Bank's Supervision and prudential measures for Financial stability; current monetary policy of India, liquidity adjustment facility (LAF) through Repo and reverse repo operation, MSF.

Unit IV: Financial Markets

Financial Market, Meaning, Types, Money market and Capital Market, Primary and Secondary Market, Stock Exchanges, SEBI; Role of Financial Markets for Economic Development.

Text Book

- L. M. Bhole and J. Mahukud, *Financial Institutions and Markets*, Tata McGraw Hill, 5th edition, 2011.

Discipline Specific Elective Paper-5 PUBLIC ECONOMICS

Introduction:

Public economics is the study of government policy from the points of view of economic efficiency and equity. The paper deals with the nature of government intervention and its implications for allocation, distribution and stabilization. Inherently, this study involves a formal analysis of government taxation and expenditures. The subject encompasses a host of topics including public goods, market failures and externalities.

Unit I: Introduction to Public Finance and Public Budgets

Public Finance: meaning and scope, distinction between public and private finance; public good versus private good; Principle of maximum social advantage; Market failure and role of government; Public Budget: kinds of budget, economic and functional classification of the budget; Balanced and unbalanced budget; Balanced budget multiplier; Budget as an instrument of economic policy.

Unit II: Public Expenditure

Meaning, classification, principles, cannons and effects, causes of growth of public expenditure, Wagner's law of increasing state activities, Peacock-Wiseman hypotheses.

Unit III: Public Revenue

Sources of Public Revenue; Taxation - meaning, cannons and classification of taxes, impact and incidence of taxes, division of tax burden, the benefit and ability to pay approaches, taxable capacity, effects of taxation, characteristics of a good tax system, major trends in tax revenue of central and state governments in India.

Unit IV: Public Debt

Sources, effects, debt burden – Classical/ Ricardian views, Keynesian and post-Keynesian views; shifting - intergenerational equity, methods of debt redemption, debt management, tax versus debt.

Text Books:

-] J. Hindriks and G. Myles (2006): *Intermediate Public Economics*, MIT Press.

Reference Book:

-] R. A. Musgrave and P. B. Musgrave(1989): *Public Finance in Theory and Practices*.
McGraw Hill
-] Bhatia H L (2018): *Public Finance*. Vikas Publishing House.

DSE Group II

Discipline Specific Elective

Paper- 1 Environmental

Economics

Introduction:

This course introduces the students to the basics of environmental economics to understand the fundamentals of environmental concerns and develop insights into valuation of environment.

Unit I: Economy and Environment

Nature and Scope of Environmental Economics- Environment and Economy interaction; Environment as a public good- Serious environmental problems of Developing Countries – Air pollution, water pollution and deforestation.

Global environmental problems, trade and environment, International Cooperation for Environmental Protections, Montreal and other protocols.

Unit II: The Economics of Pollution and Climate change

Pollution as externality, The market Approach to optimal pollution, Property rights and market bargain theorems, Coase theorem; Pigouvian Taxation, Subsidies and optimal pollution; Climate change – concept, causes, effects and management.

Unit III: Valuation of Environmental Damage

Methods and difficulties of environmental valuation, Economic value, Use value, Option value, Existence value; Direct and Indirect Valuation of Environmental Goods: The hedonic price approach, Contingent valuation, Travel cost approach.

Unit IV: Natural Resources and Sustainable Development

Natural resources- Renewable and exhaustible; Tragedy of commons, People's Participation in the management of common property resources; Sustainable Development Concepts, Sustainability rules, Indicators of sustainability, Solow/Hartwick, Natural capital stock, Safe Minimum Standard.

Text Book:

-] Bhattacharya, R. N. (2002): Environmental Economics: An Indian Perspectives, OUP, New Delhi

Reference Book:

-] Kolstad, C.D (1999); Environmental Economics Oxford University Press, New Delhi

Discipline Specific Elective Paper-2

INTERNATIONAL ECONOMICS

Introduction:

This course introduces the students to international trade and finance to understand the theories of international trade and develop insights into trade policy and balance of payments. The course

also develops insight into international financial system and the trade policy of India.

UNIT I: Importance of Trade and Trade Theories

Importance of the study of International Economics; Inter-regional and international trade; Theories of Trade-absolute advantage (Adam Smith), comparative advantage (David Ricardo) and opportunity cost (Haberler); Heckscher-Ohlin theory of trade — its main features, assumptions and limitations (Leontief Paradox) Factor Price Equalization theorem.

UNIT II: Trade Policy and International Economic Institutions

Concepts of terms of trade and their importance; Doctrine of reciprocal demand – Offer curve technique; Gains from trade ;Trade as an Engine of Growth and Concept of immiserizing growth, Tariffs and quotas – their impact in partial equilibrium analysis; General Equilibrium analysis of tariff and the concept of optimum tariff, Functions of IMF (Conditional Clause), Role of IMF in international liquidity, Reforms for the emergence of international monetary system; World Bank and WTO; Their achievements and failures; Their Role from the point of view of India.

UNIT III: Exchange Rate

Concept and Types of Exchange Rate (bilateral vs. trade-weighted exchange rate, cross exchange rate, spot, forward, futures), Demand for and Supply of foreign exchange, Exchange Rate Determination: Mint Parity Theory, Purchasing-Power Parity Theory, Fixed versus Flexible exchange rate.

UNIT IV: Balance of Trade and Payments

Concepts and components of balance of trade and balance of payments; Disequilibrium in balance of payments; Various measures to correct deficit in BOPs (Expenditure switching and expenditure reducing policies, Direct control), Depreciation Vs. Devaluation; Elasticity approach to devaluation, Foreign trade multiplier- Concept and implications.

Text Book:

-] Mannur H. G (Recent Edition) *International Economics*, Vikash Publishing

Reference Books:

-] SalvatoreDominick, *InternationalEconomics*,WileIndia.
-] SoderstenBo andReedJ, *InternationalEconomics*, McMillanPublisher

Discipline Specific Elective Paper-3 AGRICULTURAL

ECONOMICS

Course description

This course introduces students to the significance of agriculture in the Indian economy and helps

to understand the role agriculture in economic development. It is designed to develop insights into changing agricultural practices in India and assess the significance of agriculture in the era of liberalization.

UNIT I: Agriculture and Economic Growth

Role of Agriculture in Economic Development, sectoral changes and agriculture, agriculture in rural development, farm and non-farm employment issues, inter-linkages between agriculture and industry; empirical evidence of inter-dependence between agriculture and industry; Schultz's hypothesis on traditional agriculture – its criticisms; Mechanization of Indian Agriculture; Case for and against farm mechanization; Green revolution and trends of mechanization in India.

UNIT II: Agricultural Price and Marketing

Agricultural price policy for a developing economy – objectives and effectiveness of agricultural price policy, elements of agricultural price policy, features of an ideal agricultural price policy, agricultural price policy in India and public distribution system
Agricultural marketing – need and criteria for assessing efficiency, agricultural marketing system in India, development of a national agricultural marketing platform.

UNIT III: Risk and Uncertainty in Agriculture

Difference between risk and uncertainty, types of uncertainty in agriculture, measures for mitigating risk and uncertainty in agriculture, new agricultural insurance scheme of India
Rural credit in India, importance and estimates, agencies for rural credit, review of progress of institutional finance in rural India since independence.

UNIT IV: Agriculture in India

Agriculture in Indian Planning, Globalization and Indian agriculture, Case for and against privatization of agriculture, WTO and India's trade in agricultural commodities.

Text Book

-] Sony, R. N. (2006), Leading Issues in Agricultural Economics, Vishal Publishing, Jalandhar.

Reference Book:

-] Sadhu, A N and A Singh (2008), Fundamentals of Agricultural Economics, Himalaya Publishing House, Mumbai.

Discipline Specific Elective Paper-4

HISTORY OF ECONOMIC THOUGHT

Introduction:

This course provides a perspective to our intellectual history, development of economic thought and helps relate this thought to the current thinking. It introduces the students to the philosophers and economists who developed economic reasoning and modeling of economic activities. It also

helps create critical abilities and attitudes.

UNIT I: Introduction and Early Economic Thought

Mercantilism-main characteristics, Thomas Mur's views ; Physiocracy- main features, Tableau Economique, taxation; Early Classicism: Adam Smith- Theory of Value, Division of labour, capital accumulation, distribution, views on trade and economic progress; David Ricardo-theory of value, theory of rent, distribution, ideas on international trade and development.

UNIT II: Classicism Vs Marxism

Thomas Malthus- population theory, glut theory; Karl Marx-dynamic of social change, theory of value, surplus value, theory of profit, crisis of capitalism, Johns Stuart Mill- ideas on value, distribution, views as a synthesizer.

UNIT III: The Marginalists' Revolution

Economic ideas of Jevons, Walras and Menger, Bohm-Bowerk, Wicksell ; Marshall – Role of time element in price determination, ideas on consumer surplus, Marshal as a synthesizer.

UNIT IV: Indian Economic Thought

Main themes of Kautilya's Arthasashtra; Modern Economic Ideas: Dada Bhai Naoroji, M.K. Gandhi, village swaraj, non-violence, machines and labour, cottage industries; Comparison of Indian Economic thought with western Economic thought.

Text Book

-] Gide, Charles and Rist, Charles (1973): A History of Economic Doctrines, Oxford University Press.
- Dasgupta, A K (1986): Epochs of Economic Theory, Oxford University Press, New Delhi.

Reference Book:

-] O'Brien, D P (1975): Classical Economists, Oxford, Clarendon Press.
-] Ekelund, Robert B. and Robert F. Hebert (1990): A History of Economic Theory and Method, third edition, New York: McGraw Hill.
-] Henry W. Spiegel (1991): The Growth of Economic Thought, 3rd ed. Durham: Duke University Press.
-] Tom Bottomore (1980): Dictionary of Marxist Thought, Basic Blackwell Publishers.
-] Roll, Eric, History of Economic Thought, Faber and Faber Ltd.
- L N Rangarajan (1992): Kautilya: The Arthasashtra, edited, rearranged, translated and introduced; Penguin books, New Delhi.

DSE Paper –4

DISSERTATION / RESEARCH PROJECT

(College can give this choice only for students with above 60% aggregate marks)

Introduction : The project is intended to establish the connection between Economics as confined to the text books and class rooms and Economics at play in the ground. It is expected to give an empirical content to the subject. Economics is defined as the study of mankind in the ordinary business of life. It studies individual as well as group behavior.

Project work at the undergraduate level is an in-depth study on a topic chosen by the student. The objective of the project work for the students at undergraduate level is to expose students to the social and real world contexts in which the subjects taught in the classroom have applications. Therefore, the topic must be related to the field of study the student is enrolled. It is undertaken with the guidance of a faculty supervisor, and involves a prolonged period of investigation and writing. The supervisor is supposed to help the student and mentor him/her throughout, from selection of the topic to submission of the project report.

The project output will be a project report written on the topic, chosen by the student and approved by the guide, in about 10000 words.

The process of project preparation typically comprises of an investigation of a particular topic, based on the application of philosophical and theoretical knowledge available in the already existing scientific literature and other published sources of information. The student may use already available data (texts, documents, artworks or existing data sets) or she may go for collection of data from the field. The final report should ideally have the following sections.

- (1) Abstract (in about 500 words) containing a summary of the entire report.
- (2) Introduction of the topic, arguments for choosing such a topic and the key investigation propositions.
- (3) A review of the existing knowledge on the topic
- (4) Information on the data and data treatment tools used in the study
- (5) An analysis of data and findings
- (6) Conclusions
- (7) References

A good research project requires sincere efforts and honest dedication from students. Moreover, it requires an engagement of the student with an issue under probe for a fairly long period of time compared to their preparations of subjects for the examination.

A successful completion of the project report has several positive learning outcomes for the student. It empowers the student with the life skill of patience and persistence. It also helps the student to locate her theoretical understandings in the context of socio-economic and political realities.

Generic Elective Paper I INDIAN ECONOMY

Introduction: This paper introduces the students to the essentials of Indian economy with an intention of understanding the basic feature of the Indian economy and its planning process. It also aids in developing an insight into the agricultural and industrial development of India. The students will understand the problems and policies relating to the agricultural and industrial sectors of India and current challenges of Indian economy.

Unit I: Introduction to Indian Economy and Current Challenges

Colonialism & British Rule: Exploitation and under-development in India; Basic features of India Economy; Indian Economy as a developing economy; Demographic trends in India - Size and growth of population, Occupational structure, Sex composition, Age structure and demographic dividend; Causes of population growth and population policy; The problem of unemployment and recent policies for employment generation; The problem of inequality in income distribution and its causes, Policies to address inequality.

Unit II: Indian Agriculture

Role of Agriculture in Indian Economy; Cause of low productivity, Green Revolution and Land Reforms, Agricultural Finance-Sources and Problems; Agricultural Marketing in India.

Unit III: Industrial Development in India

Role of Industrialization in Indian Economy; Small Scale & Cottage Industries: Meaning, Role, Problems and Remedies; Industrial Policies of 1948, 1956, 1977 and 1991; Problems of Industrial Development in India; Industrial Sickness.

Unit IV: Service Sector in India

Growth & Contribution to GDP; Composition and relative importance of service sector; Factors determining growth of the sector; ICT and IT – Spread and Policy; Sustainability of services led growth.

Text Book:

-] Misra, S. K. and Puri V. K. Indian Economy — Its Development Experience. Himalaya Publishing House, Mumbai

Reference Book

-] Dutt R. and Sundharam K. P. M. *Indian Economy*. S. Chand & Company Ltd., New Delhi.

Generic Elective Paper II INDIAN ECONOMY II

Introduction : This paper is the part II of Indian economy deals with the external sector, financial markets in India, Indian Public Finances and Economic Reforms. This paper also throws some light on current challenges of Indian Economy.

Unit I: External Sector in India

Trends, Composition & Direction in exports from and imports of India; Problems of Balance of Payment: Causes of deficit in BOP & measures to correct it; Trade Policy- Export Promotion Vs Import Substitution; Foreign Trade Policy of India; WTO and India.

Unit II: Financial Markets in India

Commercial Banking in India- Nationalization of Banks; Lead bank scheme and branch expansion; RBI - Functions, Monetary Policy; Development Banking- IFCI, IDBI, SIDBI and NABARD

Unit III: Indian Public Finance

Public Expenditure-Growth and Composition, Causes of Growth of Public Expenditure in India: Tax Revenue of Central and State Governments; Concept of VAT; Deficit Financing in India- Revenue, Budget, Fiscal and Primary Deficits; Purpose and Effects of Deficit Financing; India's Fiscal Policy-Objectives.

Unit IV: Current Challenges Facing Indian Economy

Inflation – Causes, Consequences and Anti-inflationary Policy; Poverty – Poverty line and Estimates, Major Poverty Alleviation Programmes; Environmental Degradation – Growth and Environment; Population Growth and Environment; Environment Policy; Economic Reforms- Globalization, Macroeconomic Stabilization, Structural Reforms, and their impact on the Indian Economy; Foreign capital and MNCs-Role and consequences.

Text Book:

-] Misra, S. K. and Puri V. K. Indian Economy — Its Development Experience. Himalaya Publishing House, Mumbai.

Reference Book

-] Dutt R. and Sundharam K. P. M. *Indian Economy*. S. Chand & Company Ltd., New Delhi.
-] Basu, Kaushik (2016): *An Economist in the Real World: The Art of Policy Making in India*,
enguin.

Generic Elective Paper III INTRODUCTORY

MICROECONOMICS

Introduction:

This course is designed to expose the students to the basic principles of microeconomic theory. The emphasis will be on thinking like an economist and the course will illustrate how microeconomic concepts can be applied to analyze real-life situation.

Unit I: Exploring the Subject Matter of Economics, Markets

and Welfare

The Ten Principles of Economics: How people make decisions; Working of the economy as a whole; Thinking Like an Economist: The economist as Scientist – The scientific method: Observation, Theory and more observation; Role of assumptions; Economic Models; Why economists disagree; Graphs in Economics.

The market forces; Markets and competition; The demand and supply curves – Market vs. individual curves, Shifts in demand and supply curves; Market equilibrium and changes there in; Price elasticity of demand – determinants and computation; Income and cross elasticity of demand; The price elasticity of supply – determinants and Computation; Consumer and Producer Surplus.

Unit II: Theory of Consumer Choice

The Budget Constraint; Preferences – representing preferences with indifference curves; Properties of indifference curves; Two extreme examples of indifference curves; Optimization – Equilibrium; Change in equilibrium due to changes in income, changes in price; Income and substitution effect; Derivation of demand curve; Three applications – Demand for Giffen goods, Wages and Labour Supply, Interest rate and Household saving.

Unit III: The Firm and Market Structures

Cost concepts; Production and costs; The various measures of cost – Fixed and variable cost, average and marginal cost; Cost curves and their shapes; Costs in the short run and in the long run; Economies and diseconomies of scale. Firms in competitive markets – What is a competitive market; Profit maximization and the competitive firm's supply curve; The marginal cost curve and the firm's supply decision; Firm's short-run decision to shut down; Firm's long-run decision to exit or enter a market; The supply curve in a competitive market – short run and long run.

Unit IV: The Input Markets

The demand for labour – The production function and the marginal product of labour; Value of the marginal product of labour and demand for labour; Shifts in labour demand curve; The supply of labour – the trade-off between work and leisure; Shifts in the labour supply curve; Equilibrium in the labour market; Other factors of production: Land and capital; Linkages among factors of production.

Text Book:

- Principles of Economics, Gregory N Mankiw, 6e Cengage Learning India Private Limited, New Delhi.

Reference Book:

- Karl E. Case and Ray C. Fair (2007): *Principles of Economics*, 8th Edition, Pearson Education Inc.
- Pindyck, Robert and Daniel Rubinfeld (2018): *Microeconomics*, 9th Edition, Pearson Education Inc.

Generic Elective Paper IV INTRODUCTORY

MACROECONOMICS

Introduction:

This course aims to introduce the students to the basic concepts of Macroeconomics. Macroeconomics deals with the aggregate economy. This course discusses the preliminary concepts

associated with the determination and measurement of aggregate macroeconomic variable like savings, investment, GDP, money, inflation, and the balance of payments.

Unit I: Basic Concepts in Macroeconomics

Macro vs. Micro Economics; Limitations of Macroeconomics ; Stock and Flow variables, Equilibrium and Disequilibrium, Partial and General Equilibrium Statics – Comparative Statics and Dynamics ; National Income Concepts – GDP, GNP, NDP and NNP at market price, factor cost, real and nominal; Disposable personal Income.

Unit II: Measurement of Macroeconomic Variables

Output, Income and Expenditure Approaches ; Difficulties of Estimating National Income; National Income Identities in a simple 2- sector economy and with government and foreign trade sectors; Circular Flows of Income in 2, 3 and 4-sector; economies; National Income and Economic Welfare; Green Accounting.

Unit III: Money and Changes in its Value

Evolution and Functions of Money, Quantity Theory of Money – Cash Transactions, Cash Balances and Keynesian Approaches, Value of Money and Index Number of Prices. Inflation – Meaning, Causes, and Anti-Inflationary Measures; Classical, Keynesian, Monetarist and Modern Theories of Inflation, Inflationary Gap, Deflation- Meaning, Causes, and Anti-Deflationary Measures, Depression and Stagflation; Inflation vs. Deflation.

Unit IV: Determination of National Income

The Classical Approach - Say's Law, Theory of Determination of Income and Employment with and without saving and Investment; Basics of Aggregate Demand and Aggregate Supply and Consumption- Saving – Investment Functions, The Keynesian Approach – Basics of Aggregate Demand and Aggregate Supply and Consumption, Saving, Investment Functions; The Principle of Effective Demand; Income Determination in a Simple 2-Sector Model; Changes in Aggregate Demand and Income- The Simple Investment Multiplier.

Text Book:

-] N. Gregory Mankiw (2010):*Macroeconomics*, 7th edition, Cengage Learning India Private Limited, New Delhi

Reference Book:

- Richard T. Froyen (2005): *Macroeconomics*, 2nd Edition, Pearson Education Asia, New Delhi.

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Course structure of UG Education Honours

Semester	Course	Course Name	Credits	Total marks
I	AECC-I	AECC-I	04	100
	C-I	Educational Philosophy	04	75
	C-I Practical		02	25
	C-II	Educational Psychology	04	75
	C-II Practical		02	25
	GE-I	GE-I	04	75
	GE-I Practical		02	25
			22	
II	AEC-II	AEC-II	04	100
	C-III	Educational Sociology	04	75
	C-III Practical		02	25
	C-IV	Changing Pedagogical Perspective	04	75
	C-IV Practical		02	25
	GE-II	GE-II	04	75
	GE-II Practical		02	25
			22	
III	C-V	Educational Assessment and Evaluation	04	75
	C-V Practical		02	25
	C-VI	Educational Research	04	75
	C-VI Practical		02	25
	C-VII	Statistics in Education	04	75
	C-VII Practical		02	25
	GE-III	GE-III	04	75
	GE-III Practical		02	25
SEC-I	SEC-I	04	100	
			28	
IV	C-VIII	History of Education in India	04	75
	C-VIII Practical		02	25
	C-IX	Curriculum Development	04	75
	C-IX Practical		02	25

	C-X	Guidance and Counseling	04	75
	C-X Practical		02	25
	GE-IV	GE-IV	04	75
	GE-IV Practical		02	25
	SEC-II	SEC-II	04	100
			28	
Semester	Course	Course Name	Credits	Total marks
V	C-XI	Development of Education in Odisha	04	75
	C-XI Practical		02	25
	C-XII	Information and Communication Technology in Education	04	75
	C-XII Practical		02	25
	DSE-I	A. Pedagogy of language (English) B. Pedagogy of language (Odia)	04	75
	DSE-I Practical		02	25
	DSE-II	A. Pedagogy of Social Sciences B. Pedagogy of Mathematics	04	75
	DSE-II Practical		02	25
			24	
VI	C-XIII	Contemporary Trends and Issues in Indian Education	04	75
	C-XIII Practical		02	25
	C-XIV	Educational Management and Leadership	04	75
	C-XIV Practical		02	25
	DSE-III	A. Policy and Practices in School Education in India B. Policy and Practices in Higher Education in India	04	75
	DSE-III Practical		02	25
	DSE-IV	Inclusive Education (Theory)	04	75
	DSE-IV Practical		02	25
	OR			
	DSE-IV	Dissertation	06	100*
			24	

EDUCATION

HONOURS PAPERS:

Core course – 14 papers

Discipline Specific Elective – 4 papers

Generic Elective for non Education students – 4 papers. Universities where 2 subjects of two paper each are offered can offer GE1 and GE2

Marks per paper – Mid term : 15 marks, End term : 60 marks, Practical : 25 marks

Total – 100 marks

Credit per paper – 6

Core Paper I EDUCATIONAL PHILOSOPHY

Learning Objectives:

On completion of this course, the learners shall be able to:

- State and analyze the meaning of education and form own concept on education
- Explain philosophy as the foundation of education
- Analyze aims of education
- Describe the essence of different formal philosophies and draw educational implications
-] Compare and contrast Indian and western philosophies of education

UNIT 1: Education in Philosophical Perspective

- (i) Etymological meaning of education
- (ii) Narrower and broader meaning of education, Lifelong education
- (iii) Aims of Education- Individual and Social aims of education
- (iv) Meaning and nature of philosophy
- (v) Branches of Philosophy- Metaphysics, Epistemology and Axiology, and its educational implications
- (vi) Functions of Philosophy in relation to education

UNIT 2: Formal Schools of Philosophy and Educational Implications

- (i) Idealism, Naturalism, Pragmatism with reference to: Aims of education, curriculum, methods of teaching, role of teacher, discipline

UNIT 3: Indian Schools of Philosophy and their Educational Implications

- (i) Common characteristics of Indian philosophy
- (ii) Sankhya, Vedanta, , Buddhism, Jainism with reference to:
Philosophical tenets, aims of education, curriculum, methods of teaching, role of

teacher

UNIT 4: Educational Thought of Western and Indian Thinkers

- i. Plato
- ii. Dewey
- iii. Gopabandhu Das
- iv. Gandhi
- v. Tagore
- vi. Aurobindo

PRACTICAL

▮ Field visit to a seat of learning in the locality and prepare report.

NB: It will be evaluated by both the internal core -1 internal and External examiners.

Text Books

- Safaya, R.N. & Shaida, B.D. (2010). *Modern Theory and Principles of Education*. New Delhi: Dhanpatrai Publishing Company Pvt. Ltd. (Nayak, B.K. (2018).
- Ravi, Samuel.S. (2015). *A Comprehensive Study of Education*. Delhi: PHI Learning Pvt. Ltd.
- Taneja, V.R. (2000). *Educational thought and practice*. New Delhi: Sterling Publishers Pvt. Limited.

Reference Books

- Aggrawal, J.C. (2013). *Theory and principle of education*. New Delhi: Vikash Publishing House Pvt Ltd.
- Anand, C.L. *et.al.* (1983). *Teacher and education in emerging in Indian society*, New Delhi: NCERT.
- Brubacher, John.S.(1969). *Modern philosophies of education*. New York: McGraw Hill Co.
- Clarke, P. (2001). *Teaching and learning: The Culture of pedagogy*. New Delhi: Sage Publication.
- Dash, B.N. (2011) *Foundation of education*, New Delhi; Kalyani Publishers.
- Dewey, John (1916/1977). *Democracy and education*. New York: MacMillan.
- Dewey, John (1956). *The Child and the curriculum, school and society*. Chicago, Illinois: University of Chicago Press.
- Dewey, John (1997). *Experience and education*. New York: Touchstone.
- Ganesh, Kamala & Thakkar, Usha (Ed.) (2005). *Culture and making of identity in India*. New Delhi: Sage Publications.
- Govt. of India (1986/'92). *National policy on education*. New Delhi: MHRD.
- Krishnamurthy, J. (1953). *Education and significance of life*. New Delhi: B.I. Publications
- Kumar Krishna (1996). *Learning from conflict*. New Delhi: Orient Longman.
- Ministry of Education (1966). *Education and national development*. New Delhi: Ministry of Education, Government of India.
- Ornstein, Allan C. & Levine, Daniel U. (1989). *Foundations of education* (4th Edn.). Boston: Houghton Mifflin Co.
- Pathak, R. P. (2012). *Philosophical and sociological principles of education*. Delhi: Pearson. Pathak, Avijit (2002). *Social implications of schooling*. New Delhi: Rainbow Publishers.
- Peters, R.S. (1967). *The Concept of education*. London: Routledge Kegan & Paul.
- Radhakrishnan, S. *Indian philosophy Vol. I and Vol. II*

- Ross, James S.(1981). Ground work of educational theory.Delhi: Oxford University Press
- Rusk, Robert R., Philosophical bases of education, London: Oxford University Press.
- Salamatullah, (1979). Education in social context. New Delhi: NCERT.
- Srinivas, M.N., (1986). Social changes in modern India. Bombay: Allied Publishers.
- Wingo, G. Max (1975). Philosophies of education. New Delhi: Sterling Publisher Pvt. Limited.

Core Paper II EDUCATIONAL PSYCHOLOGY

Learning Objectives:

On completion of this course, the learners shall be able to:

- Explain the concept of educational psychology and its relationship with psychology.
- Understand different methods of educational psychology.
- Describe the theoretical perspectives of educational psychology.
- Explain the concepts of growth and development of child and adolescence, and underlined general principles of growth and development.
- Describe briefly the periods and the typical characteristics of growth and development during childhood and adolescence.
- Specify the contexts and factors influencing development.
- Explain the theory of cognitive development and its educational implications.
- State the different forms and characteristics of individual differences and the ways of meeting the classroom issues arising out of the differences.
- Identify the learning needs during the different stages of development and adopt appropriate strategies in and out of school to meet the learning needs.

UNIT 1: Educational Psychology in Developmental Perspective

- (i) Meaning, nature, scope and relevance of educational psychology
- (ii) Methods of educational psychology- observation, experimentation, and case study
- (iii) Application of educational psychology in understanding learner
- (iv) Growth and Development-Concept, difference between growth and development, and principles of growth and development
- (v) Characteristics of development during adolescence in different areas: Physical, social, emotional and intellectual (with reference to Piaget)

UNIT 2: Intelligence, Creativity and Individual difference

- (i) Individual difference-concept, nature, factors and role of education
- (ii) Intelligence- meaning and nature of intelligence, concept of I.Q, theories of intelligence- Two factor theories, Guildford's structure of intelligence (SI) model, Gardner's multiple theory of intelligence.
- (iii) Measurement of intelligence- individual and group test, verbal, non-verbal test
- (iv) Creativity- meaning, nature and stages of creative thinking, strategies for fostering creativity

UNIT 3: Learning and Motivation

- (i) Learning- meaning, nature and factors of learning
- (ii) Theories of learning with experiment and educational implications-
- (iii) Classical conditioning, operant conditioning, insightful learning and constructivist approach to learning
- (iv) Motivation – concepts, types, and techniques of motivation

UNIT 4: Personality and Mental health

- (i) Personality- meaning and nature of personality
- (ii) Theories- type theory and trait theory
- (iii) Assessment of personality- subjective, objective and projective techniques
- (iv) Mental health-concept, factors affecting mental health and role of teacher, mental health of teacher.
- (v) Adjustment mechanism: Concept and Types

PRACTICAL

- Administration and interpretation of any psychological test relating to intelligence or personality

: It will be evaluated by both the Internal and External examiners.

Text Books

- Woolfolk, A. (2015). *Educational psychology (9th Ed.)*. New Delhi: Pearson Publication
- Chauhan, S.S. (2010). *Advanced educational psychology*. New Delhi: Vikas Publishing House Pvt. Ltd.
- Mangal, S.K. (2002). *Advanced educational psychology*. New Delhi: Prentice Hall of India.

Reference Books

- Arnett, J. (2007). *Adolescence and emerging adulthood: A cultural approach*. (3rd Edn.). Upper Saddle River, N.J.: Pearson.
- Berk, Laura E. (2011). *Child development (9th Edn.)*. New Delhi: Prentice Hall of India.
- Flavell, J.H. (1963). *The developmental psychology of Jean Piaget*. New York: Van Nostrand
- Hurlock, E. B. (1980). *Developmental psychology: All span approach*. New York: McGraw Hill Book.
- Hurlock, E.B. (1980). *Child development (6th Edn.)*. Tokyo: McGraw-Hill, Kogakusha Ltd.
- Hurlock, E.B. (2007). *Child growth and development*. New York: McGraw Hill.
- Kail, Robert V (2011). *Children and their development (6th Edition)*. Englewood Cliffs, N.J: Prentice Hall.
- Stephens, J. M.; Evans, E. D.(1973). *Development and classroom learning: An introduction to educational psychology*. New York: Holt, Rinehart and Winston

**CORE PAPER III
EDUCATIONAL SOCIOLOGY**

Learning Objectives:

On completion of this course, the students shall :

-] State the relationship between education and society.
-] Understand the meaning of Educational Sociology and function of education as a social system.
-] State different agencies of education and their functions.
-] Justify the importance of education for social change.
-] Describe the role of education in modernization and globalization.
-] Describe the function of education to ensure equality and equity.

UNIT 1: Education and Society

- (i) Relationship between education and society, school as a miniature society
- (ii) Educational Sociology- Concept, nature, scope and importance;
- (iii) Relationship between education and sociology.
- (iv) Education as a process of socialization.
- (v) Education and politics, education and economic development

UNIT 2: Agencies of Education

- (i) Family- Importance, functions and role for education and socialization of the children
- (ii) School - Importance, functions and role for education and socialization of the children
- (iii) Society- Importance, functions and role for education and socialization of the children
- (iv) Mass Media- Importance, functions and role for education and socialization of the children

UNIT 3: Education, Social change and Modernization

- (i) Concept of social change and factors affecting Social Change
- (ii) Education as an instrument of social change and social control
- (iii) Concept and attributes of modernization
- (iv) Education for accelerating the process of modernization
- (v) Impact of globalization on education

UNIT 4: Equalization of Educational opportunities for ensuring equity and Inclusion

- (i) Concept of equality, equity and inclusion: its educational implication
- (ii) Ensuring equality in the education of SC and ST
- (iii) Education for women empowerment
- (iv) Inclusive education with reference to children with special needs (CWSN)

PRACTICAL

Field Visit: Study of a social unit (Home/School/Village/slum) and reporting.

NB: It will be evaluated by both the internal and external examiners

Text Books

- Mathur, S. S. (2000). *A sociological approach to Indian education*. Agra : Vinod Pustak Mandir.
- Pathak, R. P. (2012). *Philosophical and sociological principles of education*. Delhi: Pearson.
- Bahttacharya, S. (2006). *Sociological Foundation of Education*. New Delhi: Atlantic

Reference Books

- Ravi, Samuel.S.(2015). *A Comprehensive Study of Education*. Delhi: PHI Learning Pvt. Ltd.
- Safaya, R.N. & Shaida, B.D. (2010), *Modern theory and principles of education*. New Delhi: Dhanpati Publisng Company Pvt. Ltd.
- Aggrawal, J.C.(2013). *Theory and principle of education*. New Delhi: Vikash Publishing House Pvt Ltd.
- Anand, C.L. et.al. (1983). *Teacher and education in emerging in Indian society*, New Delhi: NCERT. Brubacher, John.S.(1969). *Modern philosophies of education*. New York: McGraw Hill Co.
- Clarke, P. (2001). *Teaching and learning: The Culture of pedagogy*. New Delhi: Sage Publication.
- Dewey, John (1916/1977). *Democracy and education*. New York: MacMillan.
- Dewey, John (1956). *The Child and the curriculum, school and society*. Chicago, Illinois: University of Chicago Press.
- Dewey, John (1997). *Experience and education*. New York: Touchstone.
- Ganesh, Kamala & Thakkar, Usha (Ed.) (2005). *Culture and making of identity in India*. New Delhi: Sage Publications.
- Govt. of India (1986/'92). *National policy on education*. New Delhi: MHRD. Ministry of Education (1966). *Education and national development*. New Delhi: Ministry of Education, Government of India.
- Ornstein, Allan C. & Levine, Daniel U. (1989). *Foundations of education* (4th Edn.). Boston: Houghton Mifflin Co.
- Pathak, Avijit (2002). *Social implications of schooling*. New Delhi: Rainbow Publishers.
- Salamatullah, (1979). *Education in social context*. New Delhi: NCERT.
- Saraswati, T.S. (Ed.) (1999). *Culture, socialization and human development. Theory, research and applications in India*. New Delhi: Sage Publication.
- Taneja, V.R. (2000). *Educational thought and practice*, New Delhi: Sterling Publishers Pvt. Limited.

Core Paper IV

CHANGING PEDAGOGICAL PERSPECTIVE

Learning Objectives:

On completion of this course, the students shall:

] Explain the concept of pedagogy

- Differentiate pedagogy from other allied concepts
- Explain different teaching task with example
- Establish relationship between teaching and learning
- List out different approaches and methods of teaching
- ▢ Prepare a lesson plan following different designs

UNIT 1: Concept of Teaching and Learning

- (i) Meaning and definition of teaching and learning
- (ii) Relationship between teaching and learning
- (iii) Variables involved in teaching task: independent, dependent and intervening
- (iv) Phases of teaching: Pre- active, inter- active and post- active
- (v) Levels of teaching: memory, understanding and reflective
- (vi) Lesson plan design- The Herbartian steps, 5 E and ICON design model

UNIT 2: Theories of Teaching

- (i) Meaning and nature of teaching theory
- (ii) Types of teaching theories:
- (iii) Formal theories of teaching- communication theory of teaching
- (iv) Descriptive theories of teaching– Gagne’s hierarchical theory of instruction and Bruner’s cognitive theory of instruction
- (v) Normative theories of teaching - Mitra’s psychological theory of teaching and Clarke’s general theory of teaching

UNIT 3: Principles and maxims of teaching

- (i) General principles of teaching
- (ii) Psychological principles of teaching
- (iii) Maxims of teaching
- (iv) Core teaching skills: Introducing the lesson, explaining, illustrating with examples, stimulus variation, and reinforcement, questioning, probing questions, closure.

UNIT 4: Approaches and methods of Teaching

- (i) Concept of approach, method, strategy and techniques
- (ii) Methods of teaching: inductive-deductive, analytic- synthetic, problem solving and project
- (iii) Shift in focus from teaching to learning- constructivist approach to learning

PRACTICAL

- ▢ Preparation of rating scale/ checklist /observation schedule to evaluate classroom teaching and reporting.

NB: It will be evaluated by both the internal and external examiners

Text Books

- Kochar, S.K.(2011). *Methods and Techniques of teaching*. Sterling Publisher Pvt. Ltd., New Delhi
- Chauhan, S.S.(1995). *Innovations of teaching learning process*. Vikash Publishing House, New Delhi
- Sharma, R.A.(1986). *Technology of Teaching*. International Publishing House, Meerut.

Reference Books

- Aggarwal, J.C.(1995). *Essentials of Educational Technology*. Vikash Publishing House, New Delhi
- Walia, J.S. (2013). *Educational Technology*. Jalandhar, Punjab: Ahim Publications.
- Mangal, S.K. and Mangal, U.(2010) *Essentials of Educational Technology*, New Delhi, PHI Learning Pvt. Limited
- Mangal, S.K.(1988) *Foundations of Educational Technology*, Ludhiana, Tandan Publications
- Nageswar Rao, S., Sreedhar, P. & Rao, B.(2007). *Methods and techniques of teaching*, Sonali Publications, New Delhi
- Oliver,R.A. (1963) *Effective teaching*, JM Dent & Sons
- Pathak, R.P. & Chaudhary, J. (2012) *Educational Technology*, Pearson, New Delhi
- Ryburn, W.M.(1955) *Principles of Teaching*, Geoffrey Cembridge, OUP
- Sampath,K, Pannir Salvam,A.,& Santhanam, S.(1981) *Introduction to Educational Technology*, Sterling Publisher, New Delhi

Core Paper V

EDUCATIONAL ASSESSMENT AND EVALUATION

Learning Objectives:

On completion of this course, the students will.

- State the nature, purpose and types of educational assessment and evaluation.
- Develop and use different types of tools and techniques for continuous and comprehensive assessment of learning in the school situation.
- Explain the importance of assessment for learning and its processes for enhancing the quality of learning and teaching.
- Describe the characteristic of a good test.
- Analyze the trends and issues in learning and learner assessment.
- Analyze and interpret results of the assessment using standard score.
- Illustrate the principles of test construction in education.

UNIT 1: Assessment and Evaluation in Education

- (i) Understanding the meaning and purpose of test, measurement, assessment and evaluation
- (ii) Scales of measurement- nominal, ordinal, interval and ratio
- (iii) Types of test- teacher made and standardized
- (iv) Approaches to evaluation- placement, formative, diagnostic and summative

- (v) Types of evaluation- norm referenced and criterion referenced
- (vi) Concept and nature of continuous and compressive evaluation

UNIT 2: Instructional Learning Objectives

- (i) Taxonomy of instructional learning objectives with special reference to cognitive domain
- (ii) Criteria of selecting appropriate learning objectives, and stating of general and specific instructional learning objectives
- (iii) Relationship of evaluation procedure with learning objectives
- (iv) Difference between objective based objective type test and objective based essay type test

UNIT 3: Tools and Techniques of Assessment and construction of Test

- (i) Steps of test construction: planning, preparing, trying out and evaluation
- (ii) Principles of construction of objective type test items- matching, multiple choice, completion and true – false
- (iii) Principles of construction of essay type test
- (iv) Non- standardized tools: Observation schedule, interview schedule, rating scale, check list, portfolio and rubrics .

UNIT 4: Characteristics of a good Test

- (i) Validity-concept, types and methods of validation
- (ii) Reliability- concept and methods of estimating reliability
- (iii) Objectivity- concept and methods of estimating objectivity
- (iv) Usability- concept and factors ensuring usability

PRACTICAL

- Construction of Unit test on a school subject based on blueprint and reporting.
NB: It will be evaluated by both Internal and External examiners.

Text Books

- Aggrawal, J.C. (1997). *Essentials of examination system, evaluation, tests and measurement*. New Delhi: Vikas Publishing House Pvt Ltd.
- Goswami, M. (2011). *Measurement and evaluation in psychology and education*. Hyderabad: Neelkamal Publishers
- Gronlund, N.E. (2003). *Assessment of student Achievement*. Boston: Allyn & Bacon
- Singh, A.K. (2016). *Tests, measurements and research methods in behavioural sciences*. New Delhi: Bharati Bhawan Publishers.

Reference Books

- Anastasi, A.(1976). *Psychological testing*. New York: Macmillan Publishing Co.
- Anderson, L.W. (2003). *Classroom assessment: Enhancing the quality of teacher decision making*.
- Banks, S.R. (2005). *Classroom assessment: issues and PRACTICES*. Boston: Allyn & Bacon.

- Blooms, B.S.(1956). *Taxonomy of educational Learning Objectives*. New York: Longman Green and Company
- Cohen, R.J., Swerdlik, M.E., & Phillips, S.M. (1996). *Psychological testing and assessment. an introduction to the tests and measurement*. California: Mayfield Publishing Co.
- Earl, L.M. (2006). *Assessment as learning: using classroom assessment to maximize student learning*. Thousand Oaks, California: Corwin Press
- Hopkins, KD. (1998). *Educational and psychological measurement and evaluation*. Boston: Allyn and Bacon.
- Linn, R.L. & Gronlund, N.E. (2000). *Measurement and assessment in teaching*. London: Merrill Prentice Hall.
- Macmillan, J.H. (1997). *Classroom assessment, principles and practice for effective instruction*. Boston: Allyn and Bacon
- Mohan, R. (2016). *Measurement evaluation and assessment in education*. Delhi: PHI Learning Pvt. Ltd.
- National Council of Educational Research and Training (2006). *Position paper: Examination Reforms*. New Delhi: NCERT
- Noll, N.H. S cannell, D.P. & Craig, RC. (1979). *Introduction to educational measurement*. Boston: Houghton Mifflin.

Core Paper VI **Educational Research**

Learning Objectives: On completion of this course, the student will:

- Describe nature, scope and limitation of educational research.
- Understand different types and methods of educational research.
- Explain sources from where knowledge could be obtained.
- Describe the process of research in education.
- Analyze research design in education.
- Illustrate procedure of collecting and analyzing data.
- Prepare the research report.

UNIT 1: Concept and Types of Educational Research

- (i) Concept and nature of research
- (ii) Meaning, nature and scope of educational research
- (iii) Types of research by purpose- fundamental, applied and action
- (iv)Types of research by approach- quantitative and qualitative

UNIT 2: Design of Research and preparation of research proposal

- (i) Steps of Research
- (ii) Review of Related Literature; and identification of problem
- (iii) Hypothesis: meaning, types, sources and characteristics of hypothesis
- (iv)Concept of population and sample
- (v) Sampling procedures- probability and non-probability
- (vi)Tools and techniques for data collection(i.e. questionnaire, interview, observation and procedure of data collection , preparation of research proposal

UNIT 3: Methods of Research

Meaning nature and steps of:

- (i) Survey method
- (ii) Case-study method
- (iii) Historical research
- (iv) Experimental research

UNIT 4: Writing Research Report

- (i) Data analysis and interpretation in research.
- (ii) Steps for reporting research
- (iii) Reporting style (APA Style)
- (iv) Plagiarism checking
- (v) Referencing Style (APA Style): Bibliography, Webliography

PRACTICAL

- Preparation of a Research Proposal on any Educational Topic (Issues/ Trends/ Problems/ Psychological Topics)

NB: It will be evaluated by both Internal and External examiners.

Text Books

- Best J.W. and Kahn, J. V. (2006). *Research in education* (9th Ed.) New Delhi: Pearson Education Inc.
- Kaul, L. (1984). *Methodology of educational research*. New Delhi: Vikas Publication
- Singh, A.K. (2016). *Tests, measurements and research methods in behavioural sciences*. New Delhi: Bharati Bhawan Publishers.

Reference Books

- Nanda, G.C. & Khato, P.K. (2012). *Fundamentals of Educational Research and Statistics*. New Delhi: Ludhiana.
- Gay, L.R. (1990). *Educational research-competencies for analysis and application* (3rd Ed.), Macmillan Publishing Company, New York
- Ary, D., Jacobs, L. C., & Razavieh, A. (2002). *Introduction to research in education* (6th Ed.). Belmont, CA: Wadsworth/Thomson Learning.
- Bhandarkar, P.L. and Wilkinson, T.S. (2010). *Methodology and techniques of social research*. Himalaya Publishing House, New Delhi.
- Creswell, J.W. (2014). *Educational research-planning, conducting and evaluating quantitative and qualitative research* (4th Ed.). New Jersey, USA: Pearson Education Inc. (Indian Reprint available at PHI Learning Pvt.Ptd.)
- Kerlinger, F.N. (1973). *Foundation of behavioral research*. New York: Holt Rinehart & Winston.
- Rao, U. (2007). *Action research*. Himalaya Publishing House, New Delhi.
- Borg, W.R. & Gall, M.D. (1989). *Educational research: An introduction*. New York: Longman.
- Corey, S. M. (1953), *Action research to improve school practice*, New York: Teachers College Press
- Johnson, B. & Christensen, L. (2008). *Educational research: quantitative, qualitative, and mixed approaches*. London: Sage Publication
- McMillan, J.H. & Schumacher, S. (1989). *Research in Education- a Conceptual Introduction*. New York: Harper Collins.
- Mertler, C.A. (2006). *Action research: teachers as researchers in the classroom*.

Core Paper VII STATISTICS IN EDUCATION

Learning Objectives:

On completion of this course, the students will:

- Describe the importance of statistics in education.
- Organise and represent educational data in tabular and graphical form.
- Compute and use various statistical measures of average, variation and bi-variate distribution to in analysis and interpretation of educational data.
- Describe the concept and importance of normal probability curve and interpret test scores in using normal probability curve.
- Understand the divergence of data from normality.

UNIT 1: Educational Statistics

- (i) Educational Statistics-meaning, nature, scope and uses
- (ii) Organization of Data: frequency distribution, cumulative frequency distribution
- (iii) Graphical representation of data (histogram, frequency polygon , ogive and pie-diagram)

UNIT 2: Measures of Central Tendency and Variability

Mean, Median and Mode- concept, computational process, uses and limitations

- (i) Range, Average Deviation, Quartile Deviation and Standard Deviation- Concept, computational process, uses and limitations

UNIT 3: Co-relational Statistics

- (i) Meaning and types of correlation
- (ii) Computation of coefficient of correlation by rank difference method; product moment method

UNIT 4: Normal Probability Curve and Divergence from Normality

- (i) Normal Probability Curve- concept, properties and applications
- (ii) Skewness and Kurtosis
- (iii) Interpretation of derived scores: Z- score and T- score

PRACTICAL

- Analysis of Achievement Data of a particular class and Reporting
NB: It will be evaluated by both Internal and External examiners.

Text Books

- Aggarwal, Y.P.(2009). *Statistical methods: concepts, application and computation*. New Delhi: Sterling Publishers Pvt. Ltd.
- Garrett, H.E. (1971). *Statistics in psychology and education*. New Delhi: Paragon International Publisher
- Mangal, S.K. (2008). *Statistics in education and psychology*. New Delhi: Prentice-

Reference Books

- Ferguson, G.A.(1971). *Statistical analysis in psychology and education*. Kogakusha, Tokyo: McGraw-Hill
- Guilford, J.P. &Fruchter, B. (1981). *Fundamental statistics in psychology and education*. New York: McGraw Hill
- McCall, R. (1993). *Fundamental statistics for the behavioral Science*. New York: Harcourt Brace
- Ravid, Ruth. (2000). *Practical statistics for education*. New York: University Press of America.
- Seigel. S. & Castel Ian N.J. (1988). *Non-parametric statistics for the Behavioral Science*. Singapore: Graw- Hill Book Co.

Core Paper VIII

HISTORY OF EDUCATION IN INDIA

Learning Objectives:

On completion of this course, the student will

- Understand the development of education in India during ancient period, medieval period and pre-independence period.
- Describe the development of education in India during post-independence period.
- Describe major recommendations of different policies and committee reports on education in India.

UNIT 1: Education during Ancient Period

- (i) Features of Vedic period with special reference to aims, curriculum and methods of teaching
- (ii) Features of Buddhist period with special reference to aims, curriculum and methods of teaching
- (iii) Relevance of Gurukul system and Buddhist centers of learning
- (iv) Ancient seats of learning

UNIT 2: Education during Medieval Period

- (i) Features of education during medieval period with special reference to aims, curriculum and methods of teaching
- (ii) Educational institutions during Muslim period, important centers of education.
- (iii) Relevance of Islamic period

UNIT 3: Education during pre-independence period

- (i) Charter's Act(1813)
- (ii) Maculay's Minute(1835)
- (iii) Wood's Despatch (1854)
- (iv) Indian Education Commission(1882)

(v) Calcutta University Commission(1917)

(vi) Hartog committee (1929)

UNIT 4: Education during post-independence period

Major recommendations of the following commissions and committees relating to the aims of education and curriculum:

- (i) University Education Commission (1948-49)
- (ii) Major recommendations of Secondary Education Commission (1952-53)
- (iii) Major recommendations of Education Commission (1964-66)
- (iv) National Policy on Education (1986), revised in 1992 and beyond

PRACTICAL

- Study on implementation of NPE (1986) in respect of recommendations for elementary level

NB: It will be evaluated by both Internal and External examiners.

Text Books

- Aggrawal, J.C. (2010). *Landmarks in the history of modern Indian education*. New Delhi: Vikash Publishing Pvt Ltd.
- Dash, B.N. (1911). *Development of education in India*. New Delhi: Ajanta Prakashan
- Das, K.K. (1993). *Development of education in India*. New Delhi: Kalyani Publishers.

Reference Books

- Naik, J.P. & Narullah, S. (1996). *A student's history of education in India*. New Delhi: Mc Millan India Ltd
- Rawat, P.L. (1989). *History of Indian education* New Delhi: Ram Prasad & Sons.
- Govt. of India. (1992, 1998). National policy on education, 1986 (As modified in 1992). Retrieved from http://mhrd.gov.in/sites/upload_files/mhrd/files/NPE86-mod92.pdf
- Keay, F.E. & Mitra, Sukumar (1978). *A history of education in India*. New Delhi: Oxford University Press.
- Ministry of Education (1966). *Education and national development*. New Delhi: Ministry of Education, Government of India.
- Ministry of Human Resource Development (2004). *Learning without Burden: Report of the National Advisory Committee*. New Delhi: Min. of HRD.
- Mookharjee, R.K. (1989). *The Gupta Empire*. Delhi: Motilal Banarsi Dass Publishers Pvt Ltd.
- Mukherji, S.M., (1966). *History of education in India*. Vadodara: Acharya Book Depot.
- Naik, J.P. and Syed, N., (1974). *A student's history of education in India*. New Delhi: MacMillan.
- Rawat, P.L. (1989). *History of Indian education*. New Delhi: Ram Prasad & Sons. Website, www.mhrd.gov.in

Core Paper IX CURRICULUM DEVELOPMENT

Learning Objectives:

On completion of this course, the students will

- Differentiate curriculum from courses of study, text book.
- Analyse bases and sources of curriculum.
- Describe different types of curriculum.

- Critically examine National curriculum framework- 2000 and 2005.
- Describe process of curriculum development and differentiate different models of curriculum development.
- Evaluate curriculum using different evaluation models.

UNIT 1: Curriculum

- (i) Concept of syllabus, courses of study, text book and curriculum
- (ii) Bases of curriculum- philosophical, sociological and psychological
- (iii) Components of curriculum: learning objectives, contents, methods and evaluation
- (iv) Concept of curriculum design

UNIT 2: Types of Curriculum

- (i) Subject centered curriculum
- (ii) Learner centered curriculum
- (iii) Experience centered curriculum
- (iv) Core curriculum

UNIT 3: Curriculum Organization

- (i) Principles of curriculum construction
- (ii) Selection and organization of content
- (iii) Selection and organization of learning experiences
- (iv) National curriculum framework- 2005 and its guiding principles

UNIT 4: Curriculum Development and Evaluation

- (i) Curriculum development- its process, role of local authority, state level agencies like SCERT, BSE and National Agencies like CBSE, NCERT
- (ii) Tyler and Taba Model of curriculum development
- (iii) Meaning and nature of curriculum evaluation

PRACTICAL

- Content Analysis of any text book of elementary level

NB: It will be evaluated by both Internal and External examiners.

Text Books

- Ornstein, A.C. & Hunkins, E (1998). *Curriculum. Foundations, Principles and Issues*. Boston: Allyn & Bacon, Boston.
- Oliva, P.F. (2001). *Developing the curriculum* (Fifth Ed.). New York, NY: Longman.
- Talla, M. (2012). *Curriculum Development: Perspectives, Principles and Issues*. New Delhi: Pearson Publications.

Reference Books

- Beane, J.A. ,Conrad, E.P. Jr. and Samuel JA, Jr. (1986). *Curriculum planning and development*, Boston: Allyn & Bacon.

- Brady, L. (1995). Curriculum development, New Delhi: Prentice Hall.
- Doll, R.C. (1996).Curriculum development: decesion-making and process, Boston: Allyn & Bacon.
- Krug, E.A.(1956). Curriculum planning. New York: Harper and Row Publishers.
- Oliva, P.F. (2001). *Developing the curriculum* (Fifth Ed.). New York, NY: Longman.
- Pratt, D.(1980). Curriculum design and development. New York: Macmillan Publishing Co. Inc.
- Popham, W.J. (1993). Modern educational measurement. Englewood Cliffs, N.J.: Prentice Hall.
- Saylor, J.G., Alexander, W.M. and Lewis, A.J.(1981). Curriculum planning for better teaching and learning. New York: Holt Rienehart & Winston.
- Taba, H. (1962). Curriculum development-theory and practice. New York: Harcourt Brace, Jovanoich.
- Tanner, D. and Tanner, L.(1975) Curriculum development- theory and practice. New York: Macmillan Publishing Co. Inc.
- Tyler, R.W.(1941). Basic principles of curriculum and instruction .Chicago: University of Chicogo Press.

Core Paper X GUIDANCE AND COUNSELLING

Learning Objectives:

On completion of this course, the students will

- State the concept, need, principles and bases of guidance.
- Use various tools and techniques of guidance in appropriate contexts.
- Explain the role of school in organizing different guidance programmes.
- State the concept, scope and type of counseling.
- Narrate the process, tools and techniques of counseling.
- Explain the qualities and role of a counselor.
- Describe different programmes for with differently abled children.
- Explain the role of teacher and head master in organizing different guidance programmes.

UNIT 1: CONCEPT OF GUIDANCE

- (i) Meaning, nature and scope of guidance
- (ii) Philosophical, psychological and sociological bases of guidance
- (iii) Need, importance, purpose and scope of educational guidance in schools
- (iv)Need, importance, purpose and scope of vocational guidance

UNIT 2: EDUCATIONAL GUIDANCE

- (i) Basic data necessary for educational guidance
- (ii) Basic principles and main types of pupil personnel records
- (iii) Cumulative records in a guidance programme
- (iv)Case study procedure in guidance

UNIT 3: CONCEPT OF COUNSELLING

- (i) Meaning, nature and scope of counseling

- (ii) Relationship between guidance and counselling
- (iii) Different types of counseling
- (iv) Steps and techniques of counseling
- (v) Necessary qualities of a good counselor
- (vi) Role of a counselor in secondary schools

UNIT 4: ORGANISATION OF GUIDANCE SERVICE

- (i) Placement service
- (ii) Follow-up service
- (iii) Individual inventory service
- (iv) Occupational information service
- (v) Launching school guidance programme

PRACTICAL

- Case Study of a Child with Special Needs or a child coming from socially disadvantaged background

NB: It will be evaluated by both Internal and External examiners.

Text Books

- Goswami, Marami (2016). *Essentials of Guidance and Counselling*. New Delhi: Lakshi Publishers And Distributors.
- Kochhar. S.K. (2017). *Educational and Vocational Guidance in Secondary Schools*. New Delhi: Sterling Publishers
- Siddiqui, M.H. (2009). *Guidance And Counselling*. New Delhi: APH Publishing Corporation

Reference Books

- Sharma, R. N., & Sharma, R. (2013). *Guidance and counselling in India*. New Delhi: Atlantic Publishers and Distributors (P) Ltd.
- Bhatnagar, Asha Gupta, Nirmala (Eds) (1999). *Guidance and counseling: A theoretical perspective (Vol.I)*. New Delhi: Vikas
- Bhatnagar, Asha and Gupta, Nirmala (Eds) (1999). *Guidance and counseling: A practical approach (Vol.II)*. New Delhi: Vikas.
- Dave, Indu (1984). *The basic essentials of counseling*. New Delhi: Sterling Pvt. Ltd.
- Gazda George R.M.(1989). *Group counseling: A development approach*. London: Allyn and Bacon.
- Gibson, R.L. & Mitchell, M.H. (1986). *Introduction to guidance*. New York: McMillan.
- Nugent, Frank A. (1990). *An Introduction to the profession of counseling*. Columbus: Merrill publishing Co.
- Pietrofesa, J.J., Bernstein, B., and Stanford, S.(1980). *Guidance: An introduction*. Chicago: Rand McNally.
- Rao, S.N. (1981). *Counseling psychology*. New Delhi: Tata McGraw Hill.
- Saraswat, R.K. & Gaur, J.S.(1994). *Manual for guidance counselors*. New Delhi: NCERT.

Core Paper XI DEVELOPMENT OF EDUCATION IN ODISHA

Learning Objectives

On completion of the course the students will:

- Grasp the structure of educational system of Odisha
- State the function of institutions/units at the state and district levels
- Appreciate the contribution of Utkalmani Gopabandhu Das to the thoughts and
- Practices of Indian education narrate the learning objectives and implementation process of the major education
- Schemes of central as well as state government being implemented in the state of Odisha
- Explain the role of various state and district level institutions in education
- Analyze the scenario of higher and technical education of Odisha
- Establish linkage between higher education and development of the state

UNIT 1: Status of Elementary Education

- (i) History of primary education in Odisha
- (ii) Efforts to Universalize Elementary Education: DPEP, SSA and Right to Education Act, 2009
- (iii) Indicator wise position in terms of provision, enrolment, retention and achievement for elementary level programmes: NPEGEL and KGBV
- (iv) Problem and issues in elementary education

UNIT 2: Status of Secondary and Higher Secondary Education

- (i) History of secondary education in Odisha
- (ii) Rashtriya Madhyamik Shiksha Abhiyan (RMSA) and its implementation in Odisha.
- (iii) Role of BSE, Odisha- Problems and issues
- (iv) Status of Higher Secondary Education and Role of CHSE; Problems and Issues
- (v) Status of Higher Secondary Vocational Education-Problems and Issues

UNIT 3: Status of Higher Education

- (i) History of collegiate education
- (ii) Organization of higher education at the under graduation level and university level-present status
- (iii) RUSA and its implementation
- (iv) Autonomous colleges and their functioning
- (v) Problems and issues relating to higher education

UNIT 4: Status of Teacher Education

- (i) History of teacher education in Odisha
- (ii) Pre-service and In-service teacher education for elementary schools teachers
- (iii) Pre-service and In-service teacher education for secondary school teachers
- (iv) Role of DIET, CTE, IASE and SCERT
- (v) Problems and issues in teacher education

Practical: 25 Marks

- Seminar Presentation (Each student has to present minimum two papers during this semester related to themes based on Core-11)

NB: It will be evaluated by both the Internal and External Examiners.

Text & Reference Books

- Govt. of Odisha, Department of S & ME (2011). *School Education at a Glance-2011-12*, Bhubaneswar
- Samal, J.K.(1984). *History of Education in Odisha: 1905-1936*, Sankar Bhattacharya, Punthi Pustak, 136/4B, Bidhan Sarani, Calcutta -700004 ;p-171
- Samal, J.K.(1989). *History of Modern Orissa*, Firma KLM private limited, 257B,B.B.Ganguly Street, Calcutta;p-188

Websites to be visited:

- www.shodhganga.inflibnet.ac.in/bitstream/10603/.../08_chapter%202.pdf: Education in Odisha- 1850-1900: Retrieved on dt.25.07.2012
- www.en.wikipedia.org/wiki/Odisha: Odisha - Wikipedia, the free encyclopedia/Retrieved on dt.25.07.2012
- www.newkerala.com/states-of-india/Odisha.php: Odisha: Info on geography, history, government, districts, business ...: Retrieved on dt.25.07.2012
- www.Odisha.gov.in/e-magazine/OdishaReview/2011/Jan/engpdf/57-61.pdf:
- Gopabandhu Das:The National Education Planner of Odisha: Retrieved on dt.25.07.2012
- www.dheOdisha.in/ Higher Education Department - Online Admission - e-Admission for ...: Retrieved on dt.25.07.2012
- www.Odisha.gov.in/highereducation/index.htm: Higher Education Department.... - Government of Odisha: Retrieved on dt.25.07.2012
- www.Odisha2020.org/home/Odisha-higher-education-task-force:Odisha Higher Education Vision 2020: Retrieved on dt.25.07.2012
- <http://www.scertodisha.nic.in/>
- <http://www.chseodisha.nic.in/>
- <http://bseodisha.nic.in/>
- <http://mhrd.gov.in/rusa>
- <http://mhrd.gov.in/rmsa>

Core Paper XII

INFORMATION AND COMMUNICATION TECHNOLOGY IN EDUCATION

Learning Objectives

On completion of this course, the student will:

- Explain the concept, nature and scope of ICT in education
- Explore ICT resources for Teaching and learning.
- Differentiate between Web1.0 and Web2.0
- Describe the importance of free and open source software in education
- Demonstrate the use of various application software in education.
- Develop the ability to use various tools connect the world
- Explain the content by using various subject tools.
- Explore tools and techniques of ICT for evaluation.

UNIT 1: Educational technology

(i) Meaning , nature and scope

- (ii) Approaches to educational Technology: hardware, software and system approach
- (iii) Innovations in Educational Technology: Open Educational Resources (OER), Massive Open Online Course (MOOC) Learning Management System (LMS)
- (iv) Importance of Educational Technology for the teacher and the student.

UNIT 2: ICT in Education

- (i) Conceptual understanding: Information Technology; Communication Technology; and Information and Communication Technology (ICT)
- (ii) Relevance of ICT in Education
- (iii) Nature and scope of ICT in Education.
- (iv) Content, pedagogy and technology integration
- (v) Challenges in Integrating ICT in Education
- (vi) Use of computers in education- Computer Aided Learning

UNIT 3: Application of software and ICT assessment Tools in Education

- (i) Word Processing Application
- (ii) Spread sheet Application
- (iii) Presentation Application
- (iv) Free and Open Source Software (FOSS)
- (v) Subject Tools: Digital Storytelling, Concept Map Software (C-Map)
- (vi) Assessment Tools: Rubistar, Hot potatoes, E- portfolios

UNIT 4: Connecting with the World

- (i) Use of browsers and search engines; choosing appropriate sites; search and retrieval of information and resources; Downloading, uploading and sharing information and resources;
- (ii) Use and importance of Web 2.0 Tools: E-mail, Wikis, Social networking (WhatsApp, Twitter, Facebook and Blogging)
- (iii) Use and importance of e-library, e-books, e-journals, Inlibnet.

PRACTICAL

- Development of an objective test using any assessment tool or development of a Rubric using Rubistar.

NB: It will be evaluated by both Internal and External examiners.

Text Books

- UNESCO (2002). *Information and communication technology in education: A curriculum for schools and programme of teacher development*. Paris: UNESCO.
- Kanvaria, V.K. (2014). *A Comprehension on Educational Technology and ICT for Education*. New Delhi: GBO.
- Vanaja and Rajasekar, S. (2016). *Information & Communication Technology (ICT) In*

Reference books

- Senapaty, H.K. (2011). *Pedagogy-Technology Integration for the Professional Development of Teacher Educators*. Bhubaneswar: Regional Institute of Education, NCERT (Monograph).
- NCERT (2006). National Curriculum Framework 2005 Position Paper National Focus Group on Educational Technology. New Delhi: Author.
- Senapaty, H.K. (2009). *ICT Integrated Learning Materials on Basic School Subjects from Constructivist Perspectives*. Bhubaneswar: Regional Institute of Education, NCERT (Monograph).
- Singh, L. C. (Ed.) (2010). *Educational Technology for Teachers and Educators*. New Delhi: Vasunandi Publication.
- UNESCO (2008). *ICT Competency Standards for Teachers: Policy Framework*. Retrieved from <http://portal.unesco.org>.
- UNESCO (2002). *Information and Communication Technologies in Teacher Education A Planning Guide*. Paris: Author
- UNESCO (2005). *How ICT can create new, open learning environments: Information and communication technologies in schools: A handbook for teachers*. Paris: UNESCO.
- Mishra, S. (2008). Developing E-Learning Materials: Some Pedagogical Concerns. *Indian Journal of Open Learning*, 17 (2).

Core Paper XIII

CONTEMPORARY TRENDS AND ISSUES IN INDIAN EDUCATION

Learning Objectives

On completion of this course the students will:

- Understand the importance of pre-school and elementary school education. Analyze various problems and issues for ensuring quality education.
- State the importance of secondary education and analyze various problems and issues for ensuring quality in secondary education.
- Enumerate the importance of higher education and analyze various problems and issues for ensuring quality in higher education.
- Justify the importance of teacher education and analyze various problems and issues for ensuring quality in teacher education.
- Analyze emerging concerns in Indian education.

UNIT 1: Pre-school and Elementary School Education

- (i) Meaning, nature and importance of ECCE, problems and issues with regard to ECCE
- (ii) Universalisation of Elementary Education: efforts to achieve UEE, SSA
- (iii) Problems and issues in implementing Right to Education Act 2009.
- (iv) Problems and issues in bringing the community to school, role of SMC
- (v) Problems in ensuring equity and quality of elementary education

UNIT 2: Secondary and Higher Secondary Education

- (i) Rashtriya Madhyamik Shiksha Abhiyan (RMSA) and ensuring secondary education for all.
- (ii) Role of School Management and Development Committee (SMDC)
- (iii) Shifting the teaching learning process from teacher centered to learner centered and activity based classroom –problems and issues
- (iv) Problems and issues with regard to vocationalisation of secondary and higher secondary education
- (v) Examination reforms at the secondary level
- (vi) Widening the access to secondary education through National Open School

UNIT 3: Higher Education and Teacher Education

- (i) Challenges in Higher education- expansion, quality and inclusion
- (ii) Role of RUSA and NAAC for quality assurance in Higher education
- (iii) Higher education through open and distance learning mode
- (iv) Elementary level pre-service teacher education- problems, issues and reforms with reference to National Curriculum Framework for Teacher Education-2009
- (v) Secondary level pre-service teacher education- problems, issues and reforms with reference to National Curriculum Framework for Teacher Education-2009

UNIT 4: Emerging Concerns

- (i) Examination system: defects and reforms for making examination system flexible (internal assessment and semester system , grading, open book examination, online examination)
- (ii) Choice Based Credits System (CBCS): concept, learning objectives, importance, problems and issues.
- (iii) Human Rights Education: concept, learning objectives, importance, problems and issues.
- (iv) Life-Skill Education: concept, learning objectives, importance, problems and issues.
- (v) Peace Education: concept, learning objectives, importance, problems and issues.

PRACTICAL

- Study of perception of Stakeholder’s of Education on any of the current issues and concerns, and reporting.

NB: It will be evaluated both by the Internal and External Examiners.

Text Books

- Kumar, Chanchal & Sachedeva, M.S. (2017). *Vision of Secondary Education In India in the context of 21st century*. Twentyfirst Century Publications; First Edition edition (2015)
- Pathak, K. R. (2007). *Education in the Emerging India*. New Delhi: Atlantic Publishers.
- Saxena, V. (2011). *Contemporary trends in education: A handbook for educators*. New

- Delhi: Pearson.

Reference Books

- Broudy, H.S. (1977) *Types of knowledge and purposes of education*. In R.C. Anderson, R.J., Spiro and W.E. Montanague (Eds.) *Schooling and the acquisition of knowledge* (PP. Hillsdale, NJ: Erlbaum).
- Bruner, J.S. (1996). *The culture of education*. Cambridge, M.A.: Harvard University Press.
- Butchvarov, P. (1970). *The concept of knowledge*. Evanston, Illinois, North Western University Press.
- Dearden R. F. (1984). *Theory and practice in Education*. Routledge K Kegan & Paul.
- Delors, Jacques, et al; (1996). *Learning: the Treasure within report of the international commission on education for 21st century*, UNESCO.
- Illich, I. (1996). *Deschooling society*. Marion Boyers, London.
- Matheson, David (2004). *An Introduction to the study of education* (2 Ed.). David Fulton Publish.
- MHRD (2008). *Framework for implementation of Rashtriya Madhyamik Shiksha Abhiyan: A scheme for universalisation of access to and improvement of quality at the secondary stage*. New Delhi: Department of School Education and Literacy.
- MHRD (2011). *Sarva Shiksha Abhiyan: Framework for implementation based on the Right of Children to Free and Compulsory Education Act, 2009*. New Delhi: Department of School Education and Literacy.
- MHRD, (1992). *Programme of action*. Govt. of India, New Delhi.
- MHRD, Gov. of India (1992). *National policy on education* (revised) New Delhi: MHRD.
- Ministry of Law and Justice (2009). *Right to education Act 2009*. New Delhi: Govt of India.
- Naik, J.P. (1975). *Equality, quality and quantity: The elusive triangle of Indian education*. Allied Publications, Bombay.
- NCERT (2005). *National curriculum framework 2005*. New Delhi: NCERT.
- NCERT (2005). *National curriculum framework*, New Delhi: NCERT.
- Slattery, P. and Dana R. (2002). *Ethics and the foundations of education-Teaching Convictions in a postmodern world*. Allyn & Bacon.
- UN (2015). *The sustainable development goals (SDGs) – UNDP*. United Nations
- UNESCO (1998). *Educating for a sustainable future: A transdisciplinary vision for concerted action*. Paris: UNESCO.
- UNICEF (2000). *Defining quality in education*. New York: Programme Division (Education), Unicef.
- Wall, Edmund (2001). *Educational theory: philosophical and political Perspectives*. Prometheus Books.
- WHO (1991). *Comprehensive school health programme*. New Delhi: World Health Organization Regional Office.
- Winch, C. (1996). *Key concepts in the philosophy of education*. Routledge.
- Yadav, M. S. & Lakshmi, T. K. S. (1995). Education: Its disciplinary identity. *Journal of Indian Education*, XXI (1), 01-21.

Core Paper XIV

EDUCATIONAL MANAGEMENT AND LEADERSHIP

Learning Objectives

On completion of this course, the students will

- Describe the concept, types and importance of educational management.
- Spell out the structure of educational management at different levels - from national to institution level
- Describe different aspects and importance of educational management.
- Describe the concept, theories and style of leadership in educational management.
- Analyze the concept, principles and structures of total quality management approach in education.

UNIT 1: Educational Management

- (i) Concept of educational management- meaning, nature, scope and principles
- (ii) Process of educational management- planning, execution, staffing, control, supervision, monitoring, evaluation and feedback
- (iii) Types of Management:
- (iv) Centralized and decentralized
- (v) Authoritarian, democratic, dynamic/creative and laissez-faire
- (vi) Educational management in Odisha- structure and function with reference to school and mass education, and higher education

UNIT 2: Aspects of Institutional Management

- (i) Human, material and financial resource management
- (ii) Management of curricular and co curricular programmes
- (iii) Management of students' welfare, auxiliary services including students' health services
- (iv) School development plan
- (v) Working with SMC and SMDC

UNIT 3: Leadership in Education

- (i) Leadership- meaning, nature and importance in education
- (ii) Leadership : Functions and skills
- (iii) Theories of leadership- Redden's 3-D theory, and Hersey and Blanchard's situational theory
- (iv) Styles of leadership-participating style, delegating style, selling style and telling style, Hersey and Blanchard)

UNIT 4: Total Quality Management

- (i) Total Quality Management(TQM)- meaning, nature and importance
- (ii) Principles of TQM- Demming's and Jurana's
- (iii) Planning for TQM in school and higher education
- (iv) Quality Assurance in Higher Education

PRACTICAL

- Studying the role of SMC/SMDC in school management and reporting
- NB: It will be evaluated by both Internal and External examiners.

Text Books

- Kochar, S.K (2011). *School Administration and Management*. New Delhi: Sterling Publishers Private Limited.
- Bhatnagar, R. P. & Aggrawal V (2015). *Educational Administration, Supervision, Planning and financing*. Meerut: R Lal Book Depot.
- Mukhopadhyay, M. (2005). New Delhi: Sage

Reference Books

- Adolph and Turner Harold, E. *Supervision for change & Innovation*. Houghton Mifflin Company.
- Anderson, C.A & Bowman, M.J (1971). *Educational management*, London, U.K: Frankas
- Ashima V, Deshmukh & Naik A.P (2010). *Educational management*. Girgaon, Mumbai: Himalaya Publishing House.
- Bhatnagar, R.P & Verma, I.B (1978). *Educational administration*. Meerut, India: Loyal Book Depot.
- Chau, Ta-Ngoc (2003): *Demographic aspects of educational planning*. Paris: International Institute for Educational Planning.
- Hariss, B. M (1963). *Supervisory behaviour in education*. USA: Englewood Cliffs.
- Kimbrough, S.Ralph, Michall & Nunnery. *Educational administration*. New York: Mc Millan Company.
- Livack, et al (1998). *Rethinking Decentralization in developing countries*. Washington, D.C, USA: World Bank.
- Mukerji, S.N. *Administration of educational planning and finance*. Baroda, India: Acharya Book Depot.
- Naik, J.P. (1965): *Educational planning in India*. New Delhi, India: Allied.
- Naik, J.P. (1982): *The educational commission & after*. New Delhi, India: Allied.
- Newman and summer. *The process of management: concept, behaviour and practice*. New Delhi, India: Prentice Hall of India Pvt. Ltd.
- Oliva, O (19760. *Supervision for today's school*. New York, USA: Harper & Row.
- Ramani, K.V (2004). *A text book of educational management*. New Delhi, India: Dominant Publisher
- Safya, R & Saida, B.D (1964). *School administration and organisation*. Jalandhar, India: Dhanpat Rai & Sons
- Shukia, P.O (1983). *Administration in India*. New Delhi, India: Vikas Publication.
- Simon, Herbart A. *Administrative behaviour*. New York, USA :McMillan Company.
- Tilak, J.B.G. (1992). *Educational planning at grassroots*. New Delhi: India.
- Waber, Clarence A. *Fundamentals of educational leadership*. New York ,USA: Exposition Press.
- Buch, T. et al. (1980). *Approaches to school management*. London: Harper and Row.
- Chalam K.S. (2003): *Introduction to Educational Planning and Management*: New Delhi, Anmol Publications Pvt. Ltd.
- Chandrasekharan P. (1997): *Educational Planning and Management*. New Delhi: Sterling Publishers Pvt. Ltd.
- Deshmukh, A.V. & Naik, A.P.(2010). *School administration and management*. Mumbai.
- Glasser, William(1990). *The quality school*. New York, NY: Harper Collins Publishers, Inc.
- Government of India (1986/92). *National policy on education*. New Delhi: MHRD.
- Government of India (1992). *Programme of action*. New Delhi: MHRD.
- Gupta, S.K. & Gupta, S.91991). *Educational administration and management*. Indore: Manorama Prakashan.
- Hallak, J.(1990). *Investing in the future:Setting educational priorities in the developing world*. Paris: UNESCO.
- Kalra, Alka (1977). *Efficient school management and role of principals*. New Delhi: APH Publishing Corporation.
- Kochar, S.K. (2011). *School administration and management*. New Delhi: Sterling

Mukhopadhyay, M. (2001). Total quality management in education. New Delhi: NIEPA.

- Shaeffer, S. (1991). Collaborating for educational change: The role of parents and the community in school improvement. Paris: UNESCO.
- Tyagi R.S. and Mahapatra P.C. (2000), Educational Administration in Orissa : New Delhi, National Institute of Educational Planning and Administration (NIEPA)
- Vashist, Savita(ed.) (1998). Encyclopaedia of school education and management. New Delhi: Kamal Publishing House.

Discipline Specific Elective Paper-I

(A student has to choose any one from Pedagogy of English and Odia under DSE-1)

A.PEDAGOGY OF LANGUAGE (ENGLISH)

Learning Objectives

On completion of this course, the student will

- Analyze the issues relating to place of English in school curriculum, acquisition of skills in English, realization of aims and Learning Objectives of learning English and language policy as conceived in NPE, 1986 and NCF – 2005
- Use various methods, approaches and strategies for teaching-learning English and transact various types of lesson plans covering all aspects of English language following different approaches
- Develop test items to assess learning in English and provide feedback as well as prepare enrichment materials
- Use the understanding of phonetics for facilitating students' speaking in English
- Plan appropriate pedagogical treatment of the prescribed contents for effective classroom transaction

UNIT 1: English in School Curriculum

- (i) Language policy in India with reference to NPE 1986 and NCF 2005
- (ii) Place of English as a compulsory subject in school curriculum (both at elementary and secondary levels)
- (iii) Learning Objectives of learning English at elementary and secondary levels
- (iv) English language skills –components, their independence and interdependence

UNIT 2: Approaches, Methods and Strategies of Teaching English

- (i) Understanding of different methods and strategies: Bi-lingual Method, Translation Method, Direct Method, Structural Approach, Communicative Approach.
- (ii) Listening Skill: Tasks for developing Listening Comprehension
- (iii) Speaking Skill: Tasks for developing Speaking skills
- (iv) Reading skill: Types of Reading, Strategies to develop reading comprehension
- (v) Writing Skill: Strategies to improve writing skill, Qualities of good writing (simplicity, logicity and organization in writing)

UNIT 3: Transaction of Contents

- (i) Teaching of Prose (detailed and non-detailed), poetry, grammar and composition – Approaches, Methods and Strategies
- (ii) Pedagogic analysis :Content analysis- analysis of topics of English text book for identification of language items(new vocabulary, structural words, grammar components),learning learning objectives, methods and strategies, teaching learning materials including ICT materials
- (iii) Preparing lesson plan following 5E and Interpretation Construction Design Model(ICON)
- (iv) Preparation of lesson plans following Herbartian approach.

UNIT 4: Lesson Delivery Strategies and Assessment

- (i) Lesson delivery strategies: lecturing, role play and dramatization, collaborative approach, ability grouping, group work; learning through narratives and discourses; concept mapping and brain storming
- (i) Techniques of assessment in English : continuous assessment of learners performance in English, preparation of different types of objective-based test items (Extended Response Type, Restrictive

PRACTICAL

- School Internship (Delivery of 5 Lessons following Herbatian/5E/ICON model)

NB: It will be evaluated by both Internal and External examiners.

Text Books

- Kohli, A.L (2010) *Techniques of teaching english*. New Delhi: Dhanpat Rai publishing Company
- Jain, R.K (1994). *Essentials of English teaching*, Agra: Vinod Pustak Mandir
- Sharma, K.L(1970) *.Methods of teaching English in India*. Agra : Laxmi Narayan Agrawal

Reference Books

- Agnihotri R. K. and Khanna A. L. (1994). *Second language acquisition: socio-cultural and linguistic aspects of English in India*. New Delhi: Sage Publications.
- Allen, H.B. (1965). *Teaching English as a second language: A book of readings*. New York: McGraw-Hill.
- Baruah, T.C (1984). *The English teacher's handbook*. New Delhi: Sterling Publishers Pvt.Ltd,
- Billows, F. L. (1975). *The techniques of language teaching*. London: Longman
- Bista, A.R(1965). *Teaching of English (Sixth Edition)*. Agra: Vinod Pustak Mandir
- Bright, J.A(1976). *Teaching English as second language*. London: Long Man Group
- Catarby, E. V (1986) *Teaching English as a foreign language in school curriculum India*, New Delhi: NCERT
- Hudelson, Sarah. (1995). *English as a second language teacher resource handbook. A practical guide for K-12 ESL programs*. California.: Corwin Press, Inc.
- Joyce , Bruce and Weil, Marsha (2003). *Models of teaching*. New Delhi: Prentice Hall of India Pvt. Ltd.
- Krishna Swamy, N. and Sri Raman, T. (1994). *English teaching in India*. Madras : T.R. Publication.

- Mukalel, Joseph C. (2009). *Approaches to English language teaching*. New Delhi:

- Discovery Publishing House Pvt Ltd.
- Pal, H.R and Pal, R(2006). *Curriculum – yesterday, today and tomorrow*, New Delhi: Shipra Publications
 - Sachdeva, M.S. (1973). *A new approach to teaching of english in India*. Ludhiana : Prakash Brothers
 - Shrivastava, B.D(1968). *Structural approach to the teaching of English*. Agra: Ramprasad and Sons

Discipline Specific Elective Paper-I

(A student has to choose ANY ONE from Pedagogy of English and Odia under DSE-1)

B. PEDAGOGY OF LANGUAGE (ODIA)

Learning Objectives

On completion of this course, the student will:

- State the importance and place of Odia as mother tongue in school curriculum.
- Develop the strategies to address the problems of Odia language acquisition in multilingual context.
- Use various strategies for facilitating the acquisition of language skills in Odia.
- Decide appropriate pedagogic approaches to transact different types of lessons in Odia.
- Prepare appropriate tools for comprehensive assessment of learning in Odia.
- Explain the fundamentals of Odia linguistics and their relevance in teaching learning Odia.
- Plan appropriate pedagogic treatment of the prescribed textual contents (in Odia) of classes IX and X.

UNIT 1: Odia as Mother Tongue in School Curriculum

- (i) Importance of mother tongue in the life and education of an individual
- (ii) Place of Odia as mother tongue in school curriculum in Odisha (both at elementary and secondary levels) in the context of language policy recommended by NPE, 1986 (three language formula) and NCF-2005
- (iii) Learning objectives of teaching-learning Odia at elementary and secondary levels
- (iv) Inter-dependence of language skills in Odia and strategies for facilitating acquisition of four-fold language skills in Odia

UNIT 2: Pedagogic Approaches to Teaching-Learning Odia

- (i) Psychology of language learning and acquisition with reference to Odia as mother tongue.
- (ii) Problems and issues related to acquisition of Odia language in multi-lingual context
- (iii) Traditional versus modern methods of teaching-learning Odia.
- (iv) Different approaches and strategies to the teaching-learning of : – Odia prose (detailed and non- detailed) , Odia poetry , Odia composition , Odia grammar .

UNIT 3: Curricular Activities in Odia

- (i) Pedagogic analysis :
- (ii) Content analysis- analysis of topics of Odia text book for identification of language items(new vocabulary, structural words, grammar components), learning objectives.
- (iii) Methods and strategies, teaching learning materials Including ICT materials, assessment strategies
- (iv) Preparing Lesson Plans following Herbartian, 5E and Interpretation Construction Design Model(ICON)

UNIT 4: Assessment

- (i) Types of Assessment-self assessment, peer assessment, teacher assessment, internal assessment and external assessment
- (ii) Techniques of Assessment in Odia : Continuous assessment of learners performance in Odia, preparation of different types of objective-based test items (Extended Response Type, Restrictive Response Type and Objective Type), preparation of check list, rating scale and rubric, Portfolio assessment in Odia

PRACTICAL

- School internship (delivery of 5 Lessons following Herbartian/5E/ICON model)

NB: It will be evaluated by both Internal and External examiners.

Text Books

- Barik, N. (2014). Odia shikshyadana paddhati. Cuttack: A.K.Mishra Publishers Pvt. Ltd.
- Kocchar, S.K. (2012). Teaching of Mother Tongue. Sterling Publishers, New Delhi.
- Mohanty, J., Barik, N. & Khandai, U. (1983). Odia sikshadana paddhati. Cuttack : Nalanda.
- Nayak, B.; Mohanty, J.(1999): Odia bhasa O Sahityara Bhitibhumi O Shikshyadan Padhati. Cuttack: Jagannath Process, Toni Road, Cutack-2.

Reference Books

- Daswani, C. J. Language Education in Multilingual India. New/Delhi (UNESCO)
- Dhal, G.B. (1974). Dhvani bijanana. Bhubaneswar : Odisha Rajya Pathya Pustaka Pranayana Sanstha.
- Dhal, G.B. (1972). English uchharana siksha. Cuttack : Friends Publisher.
- Mathur, S.A. Sociological Approach to Indian Education. Vinod Pustak Bhandar, Agra.
- Mohanty, B. (1970). Odia bhasara utpati O 65arma bikasha. Cuttack : Friends Publishers.
- Mohapatra, D. (1976). Odia Dhvani tattwa O sabdha sambhar. Cuttack : Grantha Mandir.
- Mohapatra, N. & Das, S. (1943). Sarbasara vyakarana. Cuttack : New Student's Store
- Palmer, H.P. Principles of Language Teaching. George G. Harrep and Co. Ltd.
- Rybum, W.M.(1926). Suggestions for the Teaching of Mother Tongue. OUP.
- Saiyadain, K.G. Education and Social Order. Asia Publishing House, Bombay.

Discipline Specific Elective Paper-II

(A student has to choose ANY ONE from Pedagogy of Social Science and Mathematics under DSE-2)

A. PEDAGOGY OF SOCIAL SCIENCES

Learning Objectives

On completion of this course, the student will:

- State the meaning, scope and importance of Social science
- Specify the skills and competencies to formulate specific LEARNING OBJECTIVES for different History and Political Science lessons
- Identify the different methods and skills of teaching History and Political Science for transacting the contents effectively.
- Explain the importance of time sense and prepare / utilize timelines for effecting teaching of History
- Prepare Unit Plans and Lesson Plans in History and Political science
- Develop diagnostic achievement test, administer them and analyse the results for providing feedback

UNIT 1: Concept, Learning Objectives and Values Of Teaching Social Science

- (i) Meaning, nature and scope of Social Science as NCF-2005
- (ii) Learning objectives of teaching Social Science at elementary and secondary levels
- (iii) Importance of teaching Social Science in school education
- (iv) Identification of values/ competencies/ skills to be developed through Social Sciences

UNIT 2: Methods and Approaches to Teaching-Learning Social Science

- (i) Story-telling
- (ii) Narration-cum-discussion
- (iii) Dramatization
- (iv) Source method
- (v) Project method
- (vi) Field trips
- (vii) Observation

UNIT 3: Curricular Activities in Social Sciences Pedagogic

analysis:

- (i) Content analysis- analysis of topics of social science text book .
- (ii) Learning objectives,
- (iii) Methods and strategies,

- (iv) Teaching learning materials including ICT materials
- (v) Learning activities including student and teacher activities
- (vi) Assessment strategies
- (vii) Preparing lesson plan following Herbart, 5E and Interpretation Construction Design Model (ICON)

UNIT 4: Development of Resource Materials and Assessment in Social Science

- (i) Teaching-learning materials – Maps, Atlas, Globes, Charts, Graphs, Models, Filmstrips, T.V. Video, OHP, and Computer
- (ii) Timeline – concept, aspects, type and use
- (iii) Types of Assessment-self assessment, peer assessment, teacher assessment, internal assessment and external assessment
- (iv) Techniques of Assessment in history and political science: Continuous Assessment of learners performance in history and political science, preparation of different types of objective-based test-
- (v) Items (Extended Response Type, Restrictive Response Type and Objective Type)

PRACTICAL

- School internship (delivery of 5 Lessons following Herbatian /5E/ ICON model)

NB: It will be evaluated by both Internal and External examiners.

Text Books

- Kochhar, S.K. (1970). *Methods of Teaching Social Studies*. New Delhi, India: Sterling Publication.
- Mangal, S.K. & Mangal, U. (2008). *Teaching of Social Studies*. New Delhi: PHI Learning Pvt, Ltd.
- Sharma, R.A. (2014). *Teaching of Social Science*. Meerut: R Lal Book Depot.

Reference Books

- Kochhar, S.K. (1970). *Teaching of History*. New Delhi, India: Sterling Publishers Pvt. Ltd.
- Banks James, A. (1997). *Teaching Strategies for the Social Studies Enquiry, Valuing and Decision Making*. Massachusetts, USA: Addison- Westely Publishing Co. Reading.
- Bining & Binning.(1952). *Teaching of Social Studies in Secondary Schools*. New York, USA: Mc Graw Hills.
- Burston, W.H.(1963). *Principles of History Teaching*. New Fetter Lance : Methuen & Co. Ltd.II.
- Burton W.H. (1972). *Principles of history teaching*, London: Methuen.
- Carretero, Mario, & Voss, James F. (Eds.) (1994). *Cognitive and instructional processes in history and the social sciences*. Hillsdale: Lawrence Erlbaum Associate.
- Choudhury, K.P. (1975). *The effective Teaching of History*. New Delhi, India: NCERT.
- Dharmiaja Neelam.(1993). *Multimedia Approaches in Teaching Social Studies*. New Delhi, India: Harmer Publishing House.
- Drake, Frederick D. & Lynn, R. Nelson (2005). *Engagement in teaching history: Theory and practices for middle and secondary teachers*. Columbus, OH: Pearson.

- Ghate, V.D. (1956). Teaching of history. Bombay: Oxford University Press.
- Gunnin, Dennis (1978). The teaching of history. Goom Helm Ltd. London.
- James H. (1953). *The Teaching of Social Studies in Secondary Schools*. London,UK: Longman Green & Co.
- James, T. H., Arthur,J. and Hunt, M. (2001). Learning to teach history in the secondary school: A companion to school experience. London: Routledge Falme.
- Kochhar, S.K.(1970). *Teaching of political science*. New Delhi: Sterling Publishers
- NCERT. (1970). *Teaching of History of Secondary Schools*.New Delhi,India: Author.
- NCERT.(1966). *A Handbook for History Teachers*.Bombay:India: Allied Publishers.
- Taneja,V.R.(1970). *Fundamentals of Teaching Social Studies*. Mahendra Capital Publishers.
- Verma, O.P.(1984). New Delhi, India: Sterling Publishers Pvt. Ltd.
- Verma,O.P. & Vedanayagam E.G. *Geography Teaching*. New Delhi,India: Sterling Publishers Pvt. Ltd .
- Yagnik, K.S.(1966). *The Teaching of Social Studies in India*. Bombay,India: Orient Longman Ltd.

Discipline Specific Elective Paper-II

(A student has to choose ANY ONE from Pedagogy of Social Science and Mathematics under DSE II)

B. Pedagogy of Mathematics

Learning Objectives

On completion of this course, the students will

- Narrate the evolution and nature of Mathematics and its importance in the school curriculum in the context of the recent curricular reforms.
- Use various methods and approaches of teaching and learning mathematics especially suitable for the secondary school classes.
- Plan lessons in Mathematics using traditional and constructivist approaches for effective classroom transactions.
- Develop and collect activities and resource materials for their use in enhancing the quality of learning Mathematics at the secondary level.
- Conduct continuous and comprehensive assessment for enhancing the quality of Mathematics learning.
- Explain the concepts in Mathematics included in the secondary school curriculum and make pedagogical analysis of those concepts

UNIT 1: Foundations of Mathematics Education

- (i) Nature and Scope of Mathematics,
- (ii) Learning of Mathematics: Importance of Mathematics at elementary and secondary level, Learning Objectives of teaching-learning Mathematics at the two levels,
- (iii)Curriculum reforms in school mathematics: rationale, learning objectives, principles, designs and materials in Mathematics, recent curricular reforms at the National and State levels (NCF 2005).

UNIT 2: Methods of Teaching-learning Mathematics

- (i) Learning by Discovery: Nature and purpose of learning by discovery; guided discovery strategies in teaching Mathematical concepts.
- (ii) Teaching for understanding proof: Proof by induction and deduction; proof by analysis and synthesis.
- (iii) Problem Solving in Mathematics: Importance of problem solving in Mathematics, Steps of problem solving in Mathematics.
- (iv) Constructivist approaches: Self-learning and peer learning strategies, collaborative strategies; 5E and ICON Models.

UNIT 3: Curricular Activities in Mathematics

- (i) Pedagogic analysis :
- (ii) Content analysis- analysis of topics of mathematics text book .
- (iii) Learning objectives,
- (iv) Methods and strategies,
- (v) Teaching learning materials including ICT materials
- (vi) Learning activities including student and teacher activities
- (vii) Assessment strategies
- (viii) Process of preparing lesson plan following Herbatian, 5E and Interpretation Construction Design Model(ICON)

UNIT 4: Assessment In Mathematics

- (i) Assessment of Mathematics learning: Unit test – Designing blue print, item construction, marking schemes.
- (ii) Assessment for Mathematics learning: Assignments, Projects and portfolios in Mathematics, group and collaborative assessment in Mathematics,
- (iii) Non-testing methods of assessment of/for Mathematics Learning: Observation of learners in action, rating of participation in various Mathematics tasks and activities,
- (iv) Diagnosis of difficulties in learning Mathematics concepts, Remediation of the difficulties, enrichment programmes in Mathematics learning –National Mathematics Talent Search, Mathematics Olympiad.
- (v) Planning for continuous assessment of classroom learning in Mathematics.

PRACTICAL

- School internship (Delivery of 5 Lessons following Herbatian/5E/ICON model)

NB: It will be evaluated by both Internal and External examiners.

Text Books

- Sidhu, K.S (1985). *Teaching of mathematics*. New Delhi: Sterling publication.
- James, A. (2003). *Teaching of mathematics*. Neel Kamal Publication: Hyderabad.
- NCERT (2011). *Pedagogy of mathematics for two year B.Ed. course*. New Delhi:

Reference Books

- Cooney, Thomas J. et al. (1975). *Dynamics of Teaching Secondary School Mathematics*. Boston: Houghton Mifflin.
- Cooper, B. (1985). *Renegotiating secondary school mathematics*. The Hamer Press: East Sussex.

- Michel. (1982). *Teaching mathematics*. Nicholos Publication Co: New York.
- NCF (2005). *National curriculum framework*. NCERT: New Delhi
- NCERT (2006). *Position paper: National focus group (NFG) on teaching Mathematics*. NCERT: New Delhi.
- NCERT (2005). *Position paper: national focus group (NFG) on examination reform*. NCERT: New Delhi.
- Scopes, P.G. (1973). *Mathematics in secondary schools- a teaching approach*. Cambridge: Cambridge University Press
- Driscoll,M., Egan, M., Nikula, J., & DiMatteo, R. W. (2007). *Fostering geometric thinking: A guide for teachers, grades 6-10*. Portsmouth, NH: Heinemann.
- Driscoll,M.(1999). *Fostering algebraic thinking: A guide for teachers, grades 5-10*. Portsmouth, NH: Heinemann.
- Grouws, D.A. (ed) (1992). *Handbook of research on mathematics teaching and learning*. New York: Macmillan Publishing.
- Malone, J. and Taylor, P. (eds) (1993). *Constructivist interpretations of teaching and learning mathematics*. Perth: Curtin University of Technology.
- Marshall, S.P. (1995). *Schemes in problem-solving*. New York: Cambridge University Press.
- Moon, B. & Mayes, A.S. (eds.) (1995). *Teaching and learning in secondary school*. London: Routledge.
- NCERT (1998). *A textbook of content-cum-methodology of teaching mathematics*. New Delhi: NCERT.
- NCERT (2005). *National curriculum framework 2005*. New Delhi: NCERT.
- NCERT (2006). *Position paper: National focus group on teaching mathematics*. New Delhi:NCERT.
- TESS India (2015). *Key resources*. The Open University U.K.(<http://creativecommons.org/licences/> and <http://www.tess-india.edu.in/>)

Discipline Specific Elective Paper-III

(A student has to choose any one from A & B under DSE-III)

A. POLICY AND PRACTICES IN SCHOOL EDUCATION IN INDIA

Learning Objectives

On completion of this course, the student will:

- Analyse various policies on education for school education in India
- Evaluate progress of schools education
- Examine the problems in implementation of the policies on school education
- Explore status of women education and education for SC, ST and Minorities in Indian

UNIT 1: Policies in School Education

- (i) National Education Policy, 1986, revised in 1992 and its corresponding document Programme of Action with reference to Elementary Education and Secondary Education.
- (ii) Implementation of Elementary Education with reference to RTE Act-2009 and Policy issues.
- (iii) Implementation of Secondary Education with reference to Rashtriya Madhyamik

Siksha Abhiyan (RMSA) and policy issues

- (iv) Guiding principles of NCF-2005 and curriculum revision at the school level.

UNIT 2: Policies for Vocationalisation of Education

- (i) Vocationalisation of education- A policy analysis with reference to the report of Patel Committee (1977), Adishesia Committee (1978) and National Policy on Education (1986) revised NPE (1992)
- (ii) Vocational Education at Higher Secondary level: Policy challenges
- (iii) Work education in schools –concept to implementation

UNIT 3: Policies for Inclusive Education

- (i) Education of Children with Special Needs (CWSN): Policy perspectives with reference to NPE,1986, 1992, Mental Health Act, 1987, Persons with Disabilities Act, 1995, Rehabilitation Council of India Act, 1992, National Trust Act,1999
- (ii) Inclusive education- Policies, Progress and Problems.

UNIT 4: Policy on Access and equity in Education

- (i) Women's education and empowerment of women with reference to National Policy on Women Empowerment, , NPE-1986
- (ii) Progress of Women Education and Problems.
- (iii) Access and Equity in Education with focus to SC, ST and Minorities
- (iv) Policy for SC children- Implementation, Progress and Problems.
- (v) Policy for ST children- Implementation, Progress and Problems with reference to Mother Tongue based Multilingual Education
- (vi) Policy for Minority Children- Implementation, Progress and Problems.

PRACTICAL

- Analysis of any Policy documents being implemented at School Education level

NB: It will be evaluated by both Internal and External examiners

Text Books

- Aggarwal, J.C. (2010). Landmarks in the history of modern Indian education (7th Ed) New Delhi: Vikash Publishing Pvt. Ltd.
- Rawat, P.L. (1989). History of Indian education New Delhi: Ram Prasad & Sons.

Reference Books

- Das, K.K. (1993). *Development of education in India*. New Delhi: Kalyani Publishers
- Dash, B.N. (1991). *Development of education in India*. New Delhi: Ajanta Prakashan
- Keay, F. E. & Mitra, Sukumar (1978). *A history of education in India*. New Delhi: Oxford University Press
- Mukherjee, R.K. (1988). *Ancient Indian education*. New Delhi: Motilal Banarsidass
- Mukherjee, R.K. (1989). *The Gupta Empire*. New Delhi: Motilal Banarsidass
- Naik, J.P. & Narullah, S. (1996). *A student's history of education in India*. New Delhi: Mc Millan India Ltd
- Ghosh, S.C. (1989). *Education policy in India since warren Hastings*, Calcutta: N-Prakashan.
- Reference Books
- Altekar, A.S. (1934), *Education in ancient India*, Banaras: Indian book Shop.
- Das Gupta, S.N. (1988). *A history of Indian philosophy*. (5 Vols.) Delhi: Motilal Banarasi Dass.
- MHRD, GOI (1986). *National policy on education*. New Delhi: The Author

- MHRD, GOI (1993). Learning without burden. Yashpal Committee Report (1993). New Delhi: The Author
- Ministry of Education, GOI (1964-66). Education and national development. (Report of education commission (1964-66). New Delhi: The Author
- Sen, Bimal (1989). Development of technical education in India and state policy-a historical perspective. Indian Journal of History of Science, 24 (2): 224-248, Indian National Science Academy.
- Sen, S.N. (1988). Education in ancient and medieval India. Indian Journal of History of Science, 23 (1): 1-32.
- Shanker, Uday (1984). Education of Indian teachers. New Delhi: Sterling Publishers Pvt. Ltd.
- Singh. R.P. (1970). Education in ancient and medieval India. Delhi: Arya Book Depot.Rao, K.Sudha (Ed.) (2002). Educational policies in India: Analysis and review of promise and performance. New Delhi: NUEPA.
- NCERT (2005). *National curriculum framework*, New Delhi: NCERT.
- MHRD, Gov. of India (1986). *National policy on education*. New Delhi: GoI.
- MHRD, Gov. of India (1992), *National policy on education* (revised) New Delhi: GoI. MHRD, (1992), *Programme of action.*, New Delhi: Govt. of India.
- NCTE (1998b). *Curriculum Framework for Quality Teacher Education*. New Delhi:NCTE.
- NCTE (2009). *National Curriculum Framework for Teacher Education Towards Preparing Professional and Humane Teacher*. New Delhi:NCTE.
- Ministry of Law Justice (2009). The Right of Children to Free and Compulsory Education Act, 2009. *The Gazette of India*, Ministry of Law Justice, Govt. of India.
- Kurrien, J (1983). *Elementary Education in India*. New Delhi: Vikas. MHRD (). *Report to the People on Education 2011-12*. New Delhi: Author. MHRD (1986): *National Policy on Education*. New Delhi: MHRD.
- MHRD (2000). *Sarva Shiksha Abhiyan: A program for Universal Elementary Education A framework for implementation*. New Delhi: Author.
- Government of India, Ministry of Human Resource Development (2005), Report of the CABE Committee on Autonomy of Higher Education Institutions, Department of Secondary and Higher Education, New Delhi, June.

Websites to be referred:

- http://www.rehabcouncil.nic.in/writereaddata/RCI_Amendments_ACT.pdf
- <http://socialjustice.nic.in/pwdact1995.php>
- <http://mhrd.gov.in/rmsa>

Discipline Specific Elective Paper-III

(A student has to choose ANY ONE from A & B under DSE-III)

B. POLICY AND PRACTICES IN HIGHER EDUCATION IN INDIA

Learning Objectives

On completion of this course, the student shall:

- Analyse various policies on education for Higher education in India
- Evaluate progress of Higher education
- Examine the problems in implementation of the policies on higher education
- Explore status of higher education.
- Analyse role of various agencies of higher education in India.

UNIT 1: Policies in Higher Education

- (i) NPE-1986, revised in 1992 and its corresponding document Programme of Action (POA) with reference to Higher Education.
- (ii) Recommendations of National Knowledge Commission-2006.
- (iii) Implementation of Policies, progress and problems.

UNIT 2: Future of Higher Education

- (i) Rashtriya Uchattar Shiksha Abhiyan (RUSA)- goals, features, strategies and implementation- problems and issues.
- (ii) Progress Higher Education in Odisha.
- (iii) Autonomy and Accountability in Higher Education

UNIT 3: Curriculum and Assessment

- (i) Curriculum issues in higher education
- (ii) Choice Based Credits System, Semester system, Grading.
- (iii) Role of UGC, NAAC and Accreditation
- (iv) Quality Assurance in Higher Education
- (v) ICT in Higher Education

UNIT 4: Educational Management System

- (i) Funding and management of Higher Education
- (ii) Open and Distance Learning System: Policy and Development-Role of IGNOU.
- (iii) Research in higher education-problems and issues- Role of ICSSR, UGC, Association of Indian Universities
- (iv) Capacity Building of Teachers in Higher Education.

PRACTICAL

- Analysis of any Policy Document being implemented in the field of Higher Education in India

NB: It will be evaluated by both Internal and External examiners

Text Books

- Rao, K.Sudha (Ed.) (2002). Educational policies in India: Analysis and review of promise and performance. New Delhi: NUEPA.

Reference Books

- Government of India, Ministry of Human Resource Development. 2011a. 'Indian Institutes of Development'. Available at http://mhrd.gov.in/itt_higher_english.
- Government of India, Ministry of Statistics and Programme Implementation. No date. NSS Survey Reports. Available at http://mospi.nic.in/Mospi_New/site/inner.aspx?status=3&menu_id=31.
- Cheney, G. R., with B. B. Ruzzi and K. Muralidharan. 2005. India Education Report. NCEE (National Center on Education and the Economy). Available at <http://www.ncee.org/wp-content/uploads/2013/10/IndiaEducation-Report.pdf>.
- UGC (University Grants Commission). 2008. Higher Education in India: Issues Related to Expansion, Inclusiveness, Quality and Finance. New Delhi: University Grants Commission. Available at <http://www.ugc.ac.in/oldpdf/pub/report/12.pdf>.
- Agarwal, P. 2006. 'Higher Education in India: The Need for Change'. ICRIER Working Paper No. 180, June. Delhi: Indian Council for Research on International Economic Relations.

- Bhalla Veena & et al (1998), Accountability and Autonomy in Higher Education, AIU.
- Country paper (1998), Higher Education in India: Vision & Action, presented in UNESCO world conference of Higher Education in the Twenty-first century, Paris 5-9th Oct 1998, National Commission for Cooperation with UNESCO.
- UNESCO (1998), report on Higher Education in the Twentieth First Century Vision & Actions held at Paris 5-9th Oct 1998, UNESCO.
- Meek, V Lynn (2000), Diversity and marketisation of higher education: incompatible concepts? Higher Education Policy, 13 (2000), p-25 & 26.
- Government of India, Ministry of Human Resource Development (2005), Report of the CABE Committee on Autonomy of Higher Education Institutions, Department of Secondary and Higher Education, New Delhi, June.
- Tilak, J.B.G. (1996), "Higher Education under Structural Adjustment", Journal of Indian School of Political Economy 8 (2) (April-June): 266-93.
- UGC (2005), University Development in India: Basic Facts and Figures (1995-96 to 2001-02), University Grants Commission, Information & Statistics Bureau, New Delhi, November

Discipline Specific Elective Paper-IV INCLUSIVE EDUCATION

Learning Objectives

On completion of the course the students shall be able to:

- Define meaning and scope of inclusive education.
- identify the assumptions of disability underlying current general and special education practices
- understand the various suggestions given by different recent commissions on education of children with disabilities for realizing the concept of "Universalization of Education";
- explore and utilize pedagogical approaches that can support students with a variety of learning profiles in respectful ways
- explain the meaning and implications of universal design in learning (UDL) for classroom pedagogy
- examine the different support services and collaboration for inclusive education

UNIT 1: Meaning, Genesis and Scope Inclusive Education

- (i) Special education and inclusive education: concept and principles
- (ii) Historical developments of special and inclusive education in India.
- (iii) Medical and social models of disability
- (iv) Examining the practice of labeling
- (v) Social, psychological and educational contexts of inclusion

UNIT 2: Policies & Frameworks Facilitating Inclusive Education

- (i) International Declarations: Universal Declaration of Human Rights (1948), World Declaration for Education for All (1990)
- (ii) International Conventions: United Nations Convention of Rights of Persons with Disabilities (UNCRPD) (2006)
- (iii) International Frameworks: Salamanca Framework (1994), Biwako Millennium Framework of Action (2002)
- (iv) Constitutional Obligations; RCI Act 1992; PwD 1995 and NTA 1999; RTE-SSA and

UNIT 3: Understanding and Support Needs of Students with Disability

- (i) Understanding and support needs of students with different labels of disability including: autism, learning disabilities, speech & hearing disability, blindness, and intellectual disabilities in inclusive classroom.

UNIT 4: Frameworks, Support and Collaboration for Inclusive Education

- (i) Universal Design for Learning: Multiple Means of Access, Expression, Engagement & Assessment
(ii) Principles of Differentiated Instruction and Assessment
(iii) Capacity Building of Teachers for Inclusive Education
(iv) Assistive Technology & Devices for Inclusive Education

PRACTICAL

- Visit to a centre for students with special needs (special school/special institute). Observe the process of teaching learning and write a report.

NB: It will be evaluated by both Internal and External examiners

Text Books

- Panda, K.C. (nd). *Education of Exceptional Children*
- Daniels, H. (1999). *Inclusive education*. London: Kogan.
- Mangal, S.K. (2013). *Exceptional Childred*. New Delhi: PHI Learning Pvt. Ltd.

Reference Books

- Bartlett, L. D., & Weisentein, G. R. (2003). *Successful inclusion for educational leaders*. New Jersey: Prentice Hall.
- Deiner, P. L. (1993). *Resource for Teaching Children with Diverse Abilities*. Florida: Harcourt Brace and Company.
- Dessent, T. (1987). *Making Ordinary School Special*. Jessica Kingsley Pub.
- Gargiulo, R.M. *Special Education in Contemporary Society: An Introduction to Exceptionality*. Belmont: Wadsworth.
- Gartner, A., & Lipsky, D.D. (1997). *Inclusion and School Reform Transferring America's Classrooms*. Baltimore: P. H. Brookes Publishers.
- Giuliani, G.A. & Pierangelo, R. (2007). *Understanding, Developing and Writing IEPs*. Corwin press: Sage Publishers.
- Gore, M.C. (2004). *Successful Inclusion Strategies for Secondary and Middle School Teachers*, Crowin Press, Sage Publications.
- Hegarthy, S. & Alur, M. (2002). *Education of Children with Special Needs: from Segregation to Inclusion*. Corwin Press, Sage Publishers.
- Karant, P., & Rozario, J. ((2003). *Learning Disabilities in India*. Sage Publications.
- Karten, T. J. (2007). *More Inclusion Strategies that Work*. Corwin Press, Sage Publications.
- King-Sears, M. (1994). *Curriculum-Based Assessment in Special Edcuation*. California: Singular Publications.
- Kluth, P. (2009). *The autism checklist: A practical reference for parents and teachers*. San Francisco, CA: Jossey-Bass.
- Lewis, R. B., & Doorlag, D. (1995). *Teaching Special Students in the Mainstream*.

4th Ed. New Jersey: Pearson.

- Rayner, S. (2007). *Managing Special and Inclusive Education*, Sage Publications.
- Rose, D. A., Meyer, A. & Hitchcock, C. (2005). *The Universally Designed Classroom: Accessible Curriculum and Digital Technologies*. Cambridge, MA: Harvard Education Press.
- Ryandak, D. L. & Alper, S. (1996). *Curriculum Content for Students with Moderate and Severe Disabilities in Inclusive Setting*. Boston, Allyn and Bacon.
- Thousand, J., Villa, R., & Nevin, A. (2007). *Differentiating instruction: Collaborative planning and teaching for universally designed learning*. Thousand Oaks, CA: Corwin Press.
- Turnbull, A., Turnbull, R., Turnbull, M., & Shank, D.L. (1995). *Exceptional Lives: Special Education in Today's Schools*. 2nd Ed. New Jersey: Prentice-Hall, Inc
- Udvari-Solner, A. & Kluth, P. (2008). *Joyful Learning: Active and collaborative learning in inclusive classrooms*. Thousand Oaks, CA: Corwin Press.

DSE Paper – IV

DISSERTATION/ RESEARCH

PROJECT

(College can give this choice only for students with above 60% aggregate marks)

The students will select a research project on any Educational issue or problem or topic and prepare a report. The project will be prepared based on proposal already developed in Semester-III, Core-6.

Distribution of Marks will be as follows:

Item	Total
Report	75
Viva-voce	25
Total	100

The assessment of students' performance will be made jointly by the external and internal examiners.

Generic Elective Paper I

EDUCATIONAL PHILOSOPHY

Learning Objectives

On completion of this course, the learners shall be able to:

- State and analyse the meaning of education and form own concept on education
- Explain philosophy as the foundation of education
- Analyse aims of education
- Describe the essence of different formal philosophies and draw educational implications
- Compare and contrast Indian and western philosophies of education

UNIT 1: Education in Philosophical Perspective

- (i) Etymological meaning of education
- (ii) Narrower and broader meaning of education, lifelong education
- (iii) Aims of Education- Individual and Social aims of education
- (iv) Meaning and nature of philosophy
- (v) Branches of Philosophy- Metaphysics, epistemology and axiology, and its educational implications
- (vi) Functions of Philosophy in relation to education

UNIT 2: Formal Schools of Philosophy and their Educational Implications

- (i) Idealism, Naturalism, Pragmatism with reference to:
Aims of Education, curriculum, methods of teaching, role of teacher, discipline

UNIT 3: Indian Schools of Philosophy and their Educational Implications

- (i) Common characteristics of Indian philosophy
- (ii) Sankhya, Vedanta, , Buddhism, Jainism with reference to: Philosophical tenets, Aims of education, curriculum, methods of teaching, role of teacher.

UNIT 4: Educational Thought of Western and Indian Thinkers

- (i) Plato
- (ii) Dewey
- (iii) Gopabandhu Das

(iv) Gandhi

(v) Tagore

(vi) Aurobindo

PRACTICAL

1 Field visit to a seat of learning in the locality and prepare report.

NB: It will be evaluated by both the internal and External examiners.

Text Books

- Safaya, R.N. & Shaida, B.D. (2010). *Modern Theory and Principles of Education*. New Delhi: Dhanpatrai Publishing Company Pvt. Ltd.
- Ravi, Samuel.S. (2015). *A Comprehensive Study of Education*. Delhi: PHI Learning Pvt. Ltd.
- Nayak, B.K. . . *Text Book of Foundation of Education*. Cuttack, Odisha: Kitab Mhal.

Reference Books

- Aggrawal, J.C. (2013). *Theory and principle of education*. New Delhi: Vikash Publishing House Pvt Ltd.
- Anand, C.L. *et.al.* (1983). *Teacher and education in emerging in Indian society*, New Delhi: NCERT. Brubacher, John.S.(1969). *Modern philosophies of education*. New York: McGraw Hill Co.
- Clarke, P. (2001). *Teaching and learning: The Culture of pedagogy*. New Delhi: Sage Publication.
- Dash, B.N. (2011) *Foundation of education*, New Delhi; Kalyani Publishers.
- Dewey, John (1956). *The Child and the curriculum, school and society*. Chicago, Illinois: University of Chicago Press.
- Dewey, John (1997). *Experience and education*. New York: Touchstone.
- Ganesh, Kamala & Thakkar, Usha (Ed.) (2005). *Culture and making of identity in India*. New Delhi: Sage Publications.
- Krishnamurthy, J. (1953). *Education and significance of life*. New Delhi: B.I. Publications
- Kumar Krishna (1996). *Learning from conflict*. New Delhi: Orient Longman.
- Ministry of Education (1966). *Education and national development*. New Delhi: Ministry of Education, Government of India.
- Ornstein, Allan C. & Levine, Daniel U. (1989). *Foundations of education* (4th Edn.). Boston: Houghton Mifflin Co.
- Pathak, R. P. (2012). *Philosophical and sociological principles of education*. Delhi: Pearson. Pathak, Avijit (2002). *Social implications of schooling*. New Delhi: Rainbow Publishers.
- Peters, R.S. (1967). *The Concept of education*. London: Routledge Kegan & Paul.
- Radhakrishnan, S. *Indian philosophy* Vol. I and Vol. II
- Ross, James S.(1981). *Ground work of educational theory*. Delhi: Oxford University Press Rusk, Robert R., *Philosophical bases of education*, London: Oxford University Press.
- Salamattullah, (1979). *Education in social context*. New Delhi: NCERT.
- Srinivas, M.N., (1986). *Social changes in modern India*. Bombay: Allied Publishers.
- Taneja, V.R. (2000). *Educational thought and practice*, New Delhi: Sterling Publishers Pvt. Limited.
- Wingo, G. Max (1975). *Philosophies of education*. New Delhi: Sterling Publisher Pvt.

Limited.

Generic Elective Paper II

EDUCATIONAL PSYCHOLOGY

Learning Objectives

On completion of this course, the students will:

- Explain the concept of educational psychology and its relationship with psychology.
- Understand different methods of educational psychology.
- Explain the concepts of growth and development of child and adolescence, and underlined general principles of growth and development.
- Describe briefly the periods and the typical characteristics of growth and development during childhood and adolescence.
- Explain the theory of cognitive development and its educational implications.
- State the different forms and characteristics of individual differences and the ways of meeting the classroom issues arising out of the differences.
- Identify the learning needs during the different stages of development and adopt appropriate strategies in and out of school to meet the learning needs.

UNIT 1: Educational Psychology in Developmental Perspective

- (i) Meaning, nature, scope and relevance of educational psychology
- (ii) Methods of educational psychology- observation, experimentation, and case study
- (iii) Application of educational psychology in understanding learner
- (iv) Growth and Development-Concept, difference between growth and development, and principles of growth and development
- (v) Characteristics of development during adolescence in different areas:
- (vi) Physical, social, emotional and intellectual (with reference to Piaget)

UNIT 2: Intelligence, Creativity and Individual difference

- (i) Individual difference-concept, nature, factors and role of education
- (ii) Intelligence- meaning and nature of intelligence, concept of I.Q, theories of intelligence- Two factor theories, Guildford's structure of intelligence (SI) model, Gardner's multiple theory of intelligence.
- (iii) Measurement of intelligence- individual and group test, verbal, non-verbal test
- (iv) Creativity- meaning, nature and stages of creative thinking, strategies for fostering creativity

UNIT 3: Learning and Motivation

- (i) Learning- meaning, nature and factors of learning
- (ii) Theories of learning with experiment and educational implications-
- (iii) Classical conditioning, operant conditioning, insightful learning and constructivist approach to learning
- (iv) Motivation – concepts, types, and techniques of motivation

UNIT 4: Personality and Mental health

- (i) Personality- meaning and nature of personality
- (ii) Theories- type theory(Jung), trait theory(Allport)
- (iii) Assessment of personality- subjective, objective and projective techniques
- (iv) Mental health-concept, factors affecting mental health and role of teacher, mental health of teacher.
- (v) Adjustment mechanism: concept and types

PRACTICAL

- Case study of an exceptional child and reporting
- : It will be evaluated by both the Internal and External examiners.

Text Books

- Chauhan, S.S. (1978). *Advanced educational psychology*. New Delhi: Vikas Publishing House Pvt. Ltd.
- Mangal, S.K. (2002). *Advanced educational psychology*. New Delhi: Prentice Hall of India.
- Woolfolk, A. (2015). *Educational psychology (9th Ed.)*. New Delhi: Pearson Publication

Reference Books

- Aggarwal, J.C. (2014). *Essentials of Educational Psychology*. New Delhi: Vikas Publishing House Pvt. Ltd.
- Attri, A.K. (2015). *Psychology of development and learning*. New Delhi: APH Publishing Corporation.
- Bernard, P.H. (1970). *Mental Health in the class room*. New York: McGraw Hill.
- Biehler, R.F. & Snowman, J., (1997). *Psychology applied to teaching*. New York: Houghton Mifflin.
- Bigge, M.L., *Psychological foundations of education*, Harper and Row, New York, 1985.
- Chandraiah, K. (2011). *Emotional intelligence*. New Delhi: APH Publishing Corporation.
- Dececco, J.P. & Crawford, W.R. (1997). *Psychology of learning and institution*. New Delhi: Prentice Hall of India.
- Good T., (1990). *Educational psychology*. Longman, New York, 1990.
- Lindgren, H.C. (1980). *Educational psychology in the classroom*. New York: Oxford University Press.
- Mouly, G.J. (1982). *Psychology for teaching*. Allyn & Bacon, Boston.
- Rothstein, P.R. (1990). *Educational psychology*. New York: McGraw Hill..
- Salvin, R. (1990). *Educational psychology: theory into practice*, N.J.: Prentice hall, Englewood Cliffs,
- Snowman and Biehler (---). *Psychology applied to teaching.....*
- Sprint hall, RC. & Sprint hall, NA, (1990). *Educational psychology, development approach*, New York: McGraw Hill.

Generic Elective Paper III

CONTEMPORARY TRENDS AND ISSUES IN INDIAN EDUCATION

Learning Objectives

On completion of this course the students will

- Understand the importance of pre-school and elementary school education. Analyze various problems and issues for ensuring quality education.
- State the importance of secondary education and analyze various problems and issues for ensuring quality in secondary education.
- Enumerate the importance of higher education and analyze various problems and issues for ensuring quality in higher education.
- Justify the importance of teacher education and analyze various problems and issues for ensuring quality in teacher education.
- Analyze emerging concerns in Indian education.

UNIT 1: Pre-school and Elementary School Education

- (i) Meaning, nature and importance of ECCE, problems and issues with regard to ECCE
- (ii) Universalization of Elementary Education: efforts to achieve UEE, SSA
- (iii) Problems and issues in implementing Right to Education Act 2009.
- (iv) Problems and issues in bringing the community to school, role of SMC
- (v) Problems in ensuring equity and quality of elementary education

UNIT 2: Secondary and Higher Secondary Education

- (i) Rashtriya Madhyamik Shiksha Abhiyan (RMSA) and ensuring secondary education for all.
- (ii) Role of School Management and Development Committee (SMDC)
- (iii) Shifting the teaching learning process from teacher centered to learner centered and activity based classroom –problems and issues
- (iv) Problems and issues with regard to vocationalisation of secondary and higher secondary education
- (v) Examination reforms at the secondary level
- (vi) Widening the access to secondary education through National Open School

UNIT 3: Higher Education and Teacher Education

- (i) Challenges in Higher education- expansion, quality and inclusion
- (ii) Role of RUSA and NAAC for quality assurance in Higher education
- (iii) Higher education through open and distance learning mode
- (iv) Elementary level pre-service teacher education- problems, issues and reforms with reference to National Curriculum Framework for Teacher Education-2009
- (v) Secondary level pre-service teacher education- problems, issues and reforms with reference to National Curriculum Framework for Teacher Education-2009

UNIT 4: Emerging Concerns

- (i) Examination system: defects and reforms for making examination system flexible (internal assessment and semester system , grading, open book examination, online examination)

- (ii) Choice Based Credits System (CBCS): Concept, learning objectives, importance, problems and issues.
- (iii) Human Rights Education: Concept, learning objectives, importance, problems and issues.
- (iv) Life-Skill Education: Concept, learning objectives, importance, problems and issues.
- (v) Peace Education: Concept, learning objectives, importance, problems and issues.

PRACTICAL

- Study of Perception of Stakeholder's of Education on any of the current issues and concerns, and reporting.

NB: It will be evaluated both by the Internal and External Examiners.

Text Books

- Kumar, Chanchal & Sachedeva, M.S. (2017). *Vision of Secondary Education In India in the context of 21st century*. Twentyfirst Century Publications; First Edition edition (2015)
- Pathak, K. R. (2007). *Education in the Emerging India*. New Delhi: Atlantic Publishers.
- Saxena, V. (2011). *Contemporary trends in education: A handbook for educators*. New Delhi: Pearson.

Reference Books

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- Butchvarov, P. (1970). *The concept of knowledge*. Evanston, Illinois, North Western University Press.
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- MHRD, Gov. of India (1992). *National policy on education* (revised) New Delhi: MHRD.
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- Naik, J.P. (1975). *Equality, quality and quantity: The elusive triangle of Indian education*. Allied Publications, Bombay.
- NCERT (2005). *National curriculum framework 2005*. New Delhi: NCERT.
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- Slattery, P. and Dana R. (2002). *Ethics and the foundations of education-Teaching*

Convictions in a postmodern world. Allyn & Bacon.

- UN (2015). *The sustainable development goals (SDGs) – UNDP.* United Nations
- UNESCO (1998). *Educating for a sustainable future: A transdisciplinary vision for concerted action.* Paris: UNESCO.
- UNICEF (2000). *Defining quality in education.* New York: Programme Division (Education), Unicef.
- Wall, Edmund (2001). *Educational theory: philosophical and political Perspectives.* Prometheus Books.
- WHO (1991). *Comprehensive school health programme.* New Delhi: World Health Organization Regional Office.
- Winch, C. (1996). *Key concepts in the philosophy of education.* Routledge.
- Yadav, M. S. & Lakshmi, T. K. S. (1995). Education: Its disciplinary identity. *Journal of Indian Education, XXI (1), 01-21.*

Generic Elective Paper IV

EDUCATIONAL ASSESSMENT AND EVALUATION

Learning Objectives

On completion of this course, the students will.

- State the nature, purpose and types of educational assessment and evaluation.
- Develop and use different types of tools and techniques for continuous and comprehensive assessment of learning in the school situation.
- Explain the importance of assessment for learning and its processes for enhancing the quality of learning and teaching.
- Describe the characteristic of a good test.
- Analyze the trends and issues in learning and learner assessment.
- Analyze and interpret results of the assessment using standard score.
- Illustrate the principles of test construction in education.

UNIT 1: Assessment and Evaluation in Education

- (i) Understanding the meaning and purpose of test, measurement, assessment and evaluation
- (ii) Scales of measurement- nominal, ordinal, interval and ratio
- (iii) Types of test- teacher made and standardized
- (iv) Approaches to evaluation- placement, formative, diagnostic and summative
- (v) Types of evaluation- norm referenced and criterion referenced
- (vi) Concept and nature of continuous and compressive evaluation

UNIT 2: Instructional Learning Objectives

- (i) Taxonomy of instructional learning objectives with special reference to cognitive domain
- (ii) Criteria of selecting appropriate learning objectives, and stating of general and specific instructional learning objectives
- (iii) Relationship of evaluation procedure with learning objectives
- (iv) Difference between objective based objective type test and objective based essay type test

UNIT 3: Tools and Techniques of Assessment and construction

of Test

- (i) Steps of test construction: planning, preparing, trying out and evaluation
- (ii) Principles of construction of objective type test items- matching, multiple choice, completion and true – false
- (iii) Principles of construction of essay type test
- (iv) Non- standardized tools: Observation schedule, interview schedule, rating scale, check list, portfolio and rubrics.

UNIT 4: Characteristics of a good Test

- (i) Validity-concept, types and methods of validation
- (ii) Reliability- concept and methods of estimating reliability
- (iii) Objectivity- concept and methods of estimating objectivity
- (iv) Usability- concept and factors ensuring usability

PRACTICAL

- Construction of Unit test on a school subject based on Blueprint and Reporting.

NB: It will be evaluated by both Internal and External examiners.

Text Books

- Aggrawal, J.C. (1997). *Essentials of examination system, evaluation, tests and measurement*. New Delhi: Vikas Publishing House Pvt Ltd.
- Gronlund, N.E. (2003). *Assessment of student Achievement*. Boston: Allyn & Bacon
- Singh, A.K. (2016). *Tests, measurements and research methods in behavioural sciences*. New Delhi: Bharati Bhawan Publishers.

Reference Books

- Anastasi, A.(1976). *Psychological testing*. New York: Macmillan Publishing Co.
- Anderson, L.W. (2003). *Classroom assessment: Enhancing the quality of teacher decision making*.
- Banks, S.R. (2005). *Classroom assessment: issues and PRACTICES*. Boston: Allyn & Bacon.
- Blooms, B.S.(1956). *Taxonomy of educational Learning Objectives*. New York: Longman Green and Company
- Cohen, R.J., Swerdlik, M.E., & Phillips, S.M. (1996). *Psychological testing and assessment. an introduction to the tests and measurement*. California: Mayfield Publishing Co.
- Earl, L.M. (2006). *Assessment as learning: using classroom assessment to maximize student learning*. Thousand Oaks, California: Corwin Press
- Hopkins, KD. (1998). *Educational and psychological measurement and evaluation*. Boston: Allyn and Bacon.
- Linn, R.L. & Gronlund, N.E. (2000). *Measurement and assessment in teaching*. London: Merrill Prentice Hall.
- Macmillan, J.H. (1997). *Classroom assessment, principles and practice for effective instruction*. Boston: Allyn and Bacon
- Mohan, R. (2016). *Measurement evaluation and assessment in education*. Delhi: PHI Learning Pvt. Ltd.
- National Council of Educational Research and Training (2006). *Position paper: Examination Reforms*. New Delhi: NCERT
- Noll, N.H. S cannell, D.P. & Craig, RC. (1979). *Introduction to educational measurement*. Boston: Houghton Mifflin.

Course structure of UG English Honours

Semester	Course	Course Name	Credits	Total marks
I	AECC-I	AECC-I	04	100
	C-I	British Poetry and Drama: 14th to 17th Centuries	06	100
	C-II	British Poetry and Drama: 17th and 18th Century	06	100
	GE-I	Academic Writing and Composition	06	100
			22	
II	AECC-II	AECC-II	04	100
	C-III	British Prose: 18th Century	06	100
	C-IV	Indian Writing in English	06	100
	GE-II	Gender and Human Rights	06	100
			22	
III	C-V	British Romantic Literature	06	100
	C-VI	British Literature 19 th Century	06	100
	C-VII	British Literature: Early 20th Century	06	100
	GE-III	Nation, Culture, India	06	100
	SEC-I	SEC-I	04	100
			28	
IV	C-VIII	American Literature	06	100
	C-IX	European Classical Literature	06	100
	C-X	Women's Writing	06	100
	GE-IV	Language and Linguistics	06	100
	SEC-II	SEC-II	04	100
			28	
Semester	Course	Course Name	Credits	Total marks
V	C-XI	Modern European Drama	06	100
	C-XII	Indian Classical Literature	06	100
	DSE-I	Literary Theory	06	100

	DSE-II	World Literature	06	100
			24	
VI	C-XIII	Postcolonial Literatures	06	100
	C-XIV	Popular Literature	06	100
	DSE-III	Partition Literature	06	100
	DSE-IV	Writing for Mass Media	06	100
	OR			
	DSE-IV	Dissertation	06	100*
			24	

ENGLISH

HONOURS PAPERS:

Core Course -14 papers

Discipline Specific Elective - 4 papers (3+1 Paper or Project)

Generic Elective for Non English students- 4 Papers. In case the University offers 2 subjects with two papers each in GE, then papers 1 and 2 will be the GE paper

Marks per paper – Midterm : 20 marks, End term : 80 marks, Total – 100 marks

Credit per paper – 6

Project (Hard Copy-80, Presentation-20)

Core Paper I

BRITISH POETRY AND DRAMA: 14TH TO 17TH CENTURIES

Introduction:

The paper seeks to introduce the students to British poetry and drama from the 14th to the 17th century. It helps students sample and explore certain seminal texts from the early modern period, covering the genesis of modern English poetry and the Renaissance that set British poetry and drama on their glorious course to greatness.

UNIT 1: Historical overview

- (i) The period is remarkable in many ways: 14th century poetry evokes an unmistakable sense of “modern” and the spirit of Renaissance is marked in the Elizabethan Drama. The Reformation brings about sweeping changes in religion and politics. A period of expansion of horizons: intellectual and geographical.

UNIT 2: Geoffrey Chaucer

- (i) *The Pardoner's Tale*

UNIT 3: Spenser: "Sonnet 34 (Amoretti)"

- (i) Shakespeare: "That time of the year..." (Sonnet 73)
- (ii) Ben Jonson: "Song to Celia"
- (iii) John Donne: "Sunne Rising"

UNIT 4: Shakespeare

- (i) *Macbeth*

Text Books

-] Texts as prescribed in Units 2,3,4

Reference Books

-] *The Pelican Guide to English Literature*. Ed. Boris Ford. Vol 1
- [*The Age of Chaucer English Literature in Context*. Paul Poplawski. Cambridge UP, 2008
- *Routledge History of Literature in English*. Ronald Carter & John Mc Rae. London: Routledge, 1997
-] *Shakespeare for Beginners* by Brandon Toropov
-] *English Literature* by Jonathan Bate (Ch. 7 "Shakespeare and the Dramatic Literature")

Core Paper II

BRITISH POETRY AND DRAMA: 17TH AND 18TH CENTURY

Introduction:

The Introduction of this paper is to acquaint students with the Jacobean and the 18th century British poetry and drama, the first a period of the acid satire and the comedy of humours, and the second a period of supreme satiric poetry and the comedy of manners.

UNIT 1: Historical overview

- (i) 17th C: Period of the English Revolution (1640–60); the Jacobean period; metaphysical poetry; cavalier poetry; comedy of humors; masques and beast fables
- (ii) 18th C: Puritanism; Restoration; Neoclassicism; Heroic poetry; Restoration comedy; Comedy of manners

UNIT 2: Milton: "Lycidas"

- (i) Andrew Marvell: "To His Coy Mistress"
- (ii) Alexander Pope: "Ode On Solitude"
- (iii) Aphra Behn: "I Led my Silvia to a Grove"

(iv) Robert Herrick: "His Return to London"

UNIT 3: Ben Jonson

- (i) *Volpone*

UNIT 4: Dryden

- (i) *All For Love*

Text Books

-] Texts prescribed in units 2, 3, 4 (All the texts are freely available on the sites such as www.poetryfoundation.org, www.bartleby.com, <http://www.poemhunter.com> etc. In addition, the following anthologies may be consulted.)

Reference Books

-] *Routledge History of Literature in English*. Ronald Carter & John Mc Rae. London: Routledge, 1997
-] Black, Joseph (Ed). : *The Broadview Anthology of British Literature Concise Edition*, Vol. A. Broadview Press, London, 2007.
-] Corns, T N(ed.) *The Cambridge Companion to English Poetry*. Cambridge: University Press, 1973
- Ford, Boris ed. *The Pelican Guide to English Literature*. Vol 3. From *Donne to Marvell* in. Harmondsworth: Penguin Books, 1976.
- Parry, G.: *The Seventeenth Century: The Intellectual and Cultural Context of English Literature*. Harlow: Longman, 1989.
-] Sherwood, T. G: *Fulfilling the Circle: A Study of John Donne's Thought*, Toronto, Toronto Press, 1984.

Core Paper III

BRITISH PROSE: 18TH CENTURY

Introduction:

The Introduction of the paper is to acquaint the students with a remarkable, newly evolved form of literature: the essay. The period is also known for its shift of emphasis from reason to emotion

UNIT 1: Historical overview: Restoration, Glorious Revolution, Neo-classicism, And Enlightenment.

UNIT 2: Mary Wollstonecraft

- (i) "The Rights and Involved Duties of Mankind Considered" (Chapter 1, *A Vindication of the Rights of Women*)

UNIT 3: Joseph Addison: Essays

(i) “Friendship,” “Good Nature,” “Six Papers on Wit”

(From *Joseph Addison: Essays and Tales*, <<http://www.biblioteca.org.ar/libros/167707.pdf>>)

UNIT 4: Samuel Johnson

(i) "Narratives of Travellers Considered," and "Obstructions of Learning"
from *Samuel Johnson's Essays* < <http://www.johnsonessays.com/>>

Text Books

-] Texts prescribed in Units 2, 3, 4. Web sources are indicated against the texts in brackets.

Reference Books

-] *Routledge History of Literature in English*. Ronald Carter & John Mc Rae. London: Routledge, 1997
-] Norton Anthology of English Literature. Vol 2 (Head notes on the periods and authors featured in the paper)
-] *English Literature* by Jonathan Bate (Ch. 4 "The Study of English")
-] *Pelican Guide to English Literature*. Ed. Boris Ford. Vol 4. *From Dryden to Johnson*
O.M. Myres, "Introduction" to *The Coverley Papers*

Core Paper IV

INDIAN WRITING IN ENGLISH

Introduction:

Indian writing in English has been the fastest growing branch of Indian literature in the last one hundred years. It has produced a rich and vibrant body of writing spanning all genres. As a 'twice born' form of writing, it partakes of both the indigenous and the foreign perspectives and has an inherent tendency to be postcolonial. This paper seeks to introduce the students to the field through a selection of representative poems, novel and play.

UNIT 1: Historical overview

- (i) Indian writing in English, the key points of which are East India Company's arrival in India, Macaulay's 1835 Minutes of Education, India's first war of independence and the establishment of colleges to promote Western education and the evolution of Indian writing in English in 20th century.

UNIT 2:

- (i) Sarojini Naidu "The Bangle Sellers",
- (ii) A.K.Ramanujan "Obituary",
- (iii) Jayanta Mahapatra "Grandfather",
- (iv) Nissim Ezekiel "Night of the Scorpion"

UNIT 3: R.K Narayan

(i) *The Guide*

UNIT 4: Mahesh Dattani

- (i) *Final Solutions*

Text Books

-] Texts prescribed in Units 2, 3, 4.

Reference Books

-] Mehrotra, Arvind Krishna. *Concise History of Indian Literature in English*, Permanent Black, 2010.
-] K. Srinivas Ayenger. *A History of Indian Writing in English*
-] M.K. Naik. *History of Indian Writing in English*
- Vinay Dharwadker. “The Historical Formation of Indian English Literature” in Sheldon Pollock (ed) *Literary Cultures in History*
-] *Modern Indian Drama: Issues and Interventions* (ed) Lakshmi Subramanyam

Core Paper V

BRITISH ROMANTIC LITERATURE

Introduction:

The paper aims at acquainting the students with the Romantic period and some of its representative writers. The students will be able to sample some seminal works of the Romantic age which gave expression to the key ideas of the period such as return to nature, subjectivity, desire for personal freedom and the defiance of classicism-imposed restrictions on poetic form.

UNIT 1: Historical overview

- (i) The period otherwise known as The Romantic Revival; The Age of Revolution as it owes its origin to the epoch making French Revolution of 1789. The emphasis on the organic relationship between man and Nature, individual liberty and unbridled desire free from the shackles of classicism made this period unique—Romanticism vs Classicism

UNIT 2:

- (i) Thomas Gray: “Elegy Written in a Country Churchyard,”
(ii) William Blake: “A Poison Tree” and “Chimney Sweeper”

UNIT 3:

- (i) William Wordsworth’s “Tintern Abbey”
(ii) S. T. Coleridge: “Kubla Khan,”
(iii) John Keats: “Ode to a Nightingale,”

(iv)P. B. Shelley: “Ode to the West Wind,”

UNIT 4:

- (i) William Wordsworth's *Preface* to the 2nd edition of *Lyrical Ballads*

Text Books

-] Texts prescribed in Units 2, 3, 4

Reference Books

-] Paul Poplawski, *English Literature in Context*, "The Romantic Period"
]
] *Routledge History of Literature in English*. Ronald Carter & John Mc Rae. London: Routledge, 1997
]
] Norton Anthology of English Literature. Vol 2 (Head notes on the periods and authors featured in the paper)
] *Pelican Guide to English Literature. Vol 5. From Blake to Byron*. Ed. Boris Ford
] Maurice Bowra, *The Romantic Imagination*
]
] *English Literature*. Jonathan Bate (Ch. 5 "Periods and Movements")

Core Paper VI

BRITISH LITERATURE 19TH CENTURY

Introduction:

This paper seeks to introduce the students to the exploits of the 19th century British Literature in prose, especially fiction and cultural criticism. It also includes samples of Victorian poetry.

UNIT 1: Historical overview

- (i) The 19th century British literature though mainly famous for the Romantic Movement, was also a witness to major socio-political developments like industrialization, technological advancements and large scale mobilization of people from the rural to the urban centers.

UNIT 2: Poetry

- (i) Tennyson; "Break, Break, Break", Robert Browning, "My Last Duchess"
(ii) Criticism: Matthew Arnold: "The Study of Poetry"

UNIT 3: Jane Austen

- (i) *Pride and Prejudice*

UNIT 4: Charles Dickens

- (i) *Hard Times*

Text Books:

-] Texts prescribed in Units 2, 3, 4

Reference Books:

- [*English Literature in Context*. Paul Poplawski. Cambridge UP, 2008
-] *Routledge History of Literature in English*. Ronald Carter & John Mc Rae. London: Routledge, 1997
-] Norton Anthology of English Literature. Vol 2 (Head notes on the periods and authors featured in the paper)
-] *English Literature*. Jonathan Bate (Ch. 4 “The Study of English”, Ch. 5 “Periods and Movements”)
-] Terry Eagleton, *The English Novel*

Core Paper VII

BRITISH LITERATURE: EARLY 20TH CENTURY

Introduction:

The paper aims at acquainting the students with the literature of Britain in the early 20th century, focusing on the modernist canon in poetry, novel, and literary criticism.

UNIT 1: Historical overview

- (i) Developments in society and economy, leading to a crisis in western society known as the First World War and the resultant change in the ways of knowing and perceiving. Marx’s concept of class struggle, Freud’s theory of the unconscious are to be discussed.

UNIT 2: Poetry

- (i) T.S. Eliot “Love Song of J. Alfred Prufrock”,
- (ii) Yeats: “Second Coming”,
- (iii) Wilfred Owen: “Strange Meeting”,
- (iv) Siegfried Sassoon, “Suicide in the Trenches”
- (v) Criticism: T.S. Eliot: “Tradition and the Individual Talent”

UNIT 3:

- (i) Virginia Woolf: *Mrs. Dalloway*

UNIT 4:

- (i) J M Synge *Ryders to the Sea*

Text Books

- [Texts prescribed in Units 2, 3, 4

Reference Books:

] *Pelican Guide to English Literature: Vol. 7. The Modern Age* (ed.) Boris Ford
] *Routledge History of Literature in English*. Ronald Carter & John Mc Rae. London:

- Routledge, 1997
-] *English Literature*. Jonathan Bate (Ch. 5 “Periods and Movements”)
-] *Modernism*. Critical Idiom. By Peter Faulkner
-] *Modernism*. New Critical Idiom. By Peter Childs

Core Paper VIII

AMERICAN LITERATURE

Introduction:

This is a survey paper providing an overview of canonical authors from American Literature in the established genres.

UNIT 1: Historical overview

- (i) Genesis and evolution, and the defining myths of American Literature—city on a hill, the frontier spirit, the American Dream, manifest destiny, *e pluribus unum*

UNIT 2:

- (i) Walt Whitman: “Out of the Cradle Endlessly Rocking”,
- (ii) Robert Frost: “Stopping by the Woods in a Snowy Evening”,
- (iii) Emily Dickinson: “Because I could not stop for death”
- (iv) Maya Angelou: “I Know Why the Caged Birds Sing”

UNIT 3:

- (i) Arthur Miller: *The Death of a Salesman*

UNIT 4:

- (i) Ernest Hemingway: *A Farewell to Arms*

Text Books

-] Texts prescribed in Units 2, 3, 4 (All texts are available on the Internet.)

Reference Books:

-] *Pelican Guide to English Literature*. Vol. 9. *American Literature*. Ed. Boris Ford
-] *Highlights of American Literature*. Dr. Carl Bode (USIS)
-] *A Short History of American Literature*, Krishna Sen and Ashok Sengupta. Orient BlackSwan, 2017
-] *The Story of American Literature*. By Ludwig Lewisohn

Norton Anthology of American Literature. (Head notes on authors and periods to be read)

Core Paper IX

EUROPEAN CLASSICAL LITERATURE

Introduction:

This paper seeks to introduce the students to European Classical literature, commonly considered to have begun in the 8th century BC in ancient Greece and continued until the decline of the Roman Empire in the 5th century AD. The paper seeks to acquaint the students with the founding texts of the European canon.

UNIT 1: Historical Review

- (i) Classical Antiquity: ancient Greece, the rise and decline of the Roman Empire;
Geographical space: cultural history of the Greco-Roman world centered on the Mediterranean Sea

UNIT 2: Epic poetry

- (i) Homer: *Odyssey* (Book I)

UNIT 3: Tragedy:

- (i) Sophocles: *Oedipus the King*

UNIT 4: Criticism:

- (i) Aristotle: *Poetics* (Chapters: 6,7,8)

Text Books

-] Texts prescribed in Units 2, 3, 4 (All texts are available for free access on Project Gutenberg <https://www.gutenberg.org/>)

Reference Books:

-] H.D.F. Kitto, *Form and Meaning in Greek Drama*
-] H.D.F. Kitto, *The Greeks*
- Eric Auerbach, *Mimesis: The Representation of Reality in Western Literature*
-] Gilbert Murray, *A History of Ancient Greek Literature*, Andesite Press, 2017.
-] *Classicism: A Very Short Introduction* OUP

Core Paper X

WOMEN'S WRITING

Introduction:

The paper seeks to acquaint the students with the works of women writers from different cultures and nations in various genres. Further, it seeks to make them critically aware of the

issues relating to the workings of patriarchy, issues of gender, and relations of desire and power.

UNIT 1: Virginia Woolf

- (i) "Chapter 1" from *A Room of One's Own*

UNIT 2: Charlotte Bronte

- (i) *Jane Eyre*

UNIT 3:

- (i) Kamala Das, 'An Introduction', 'The Sunshine Cat'
- (ii) Sylvia Plath, 'Mirror', 'Barren Woman'
- (iii) Eunice de Souza, 'Women in Dutch Painting', 'Remember Medusa'
- (iv) Shanta Acharya, 'Homecoming', 'Shringara'

UNIT 4:

- (i) Ashapura Devi, *The Distant Window*

Text Books

-] Texts prescribed in Units 1, 2, 3, 4

Reference Books:

-] Toril Moi, *Sexual/Textual Politics*
-] Elaine Showalter, *A Literature of Their Own*
-] Sandra Gilbert and Susan Gubar, *The Mad Woman in the Attic*
-] *The Distant Window*, Prachi Prakashan, Tr. Anima Bose, 1997
-] Helen Carr, 'A History of Women's Writing' in *A History of Feminist Literary Criticism* by Gill Plain and Susan Sellers
-] Mary Eagleton, 'Literary Representations of Women' in *A History of Feminist Literary Criticism* by Gill Plain and Susan Sellers

Core Paper XI

MODERN EUROPEAN DRAMA

Introduction:

The aim of this paper is to introduce the students to the best of experimental and innovative dramatic literature of modern Europe.

UNIT 1: Historical Review

- (i) Politics, social change and the stage; text and performance; European Drama: Realism and Beyond; Tragedy and Heroism in Modern European Drama; The Theatre of the Absurd

UNIT 2: Henrik Ibsen

- (i) *Ghosts*

UNIT 3: Eugene Ionesco

- (i) *Chairs*

UNIT 4: Bertolt Brecht

- (i) *Life of Galileo*

Text Books

-] Texts prescribed in Units 1, 2, 3, 4

Web Resources

-] Ionesco: <http://www.kkoworld.com/kitablar/ejen-ionesko-kergedan-eng.pdf>
] Ibsen: <http://www.gutenberg.org/files/8121/8121-h/8121-h.htm>

Reference Books:

-] Constantin Stanislavski, *An Actor Prepares*, Chap. 8,
] 'Faith and the Sense of Truth', tr. Elizabeth Reynolds Hapgood (Harmondsworth: Penguin, 1967) sections 1,2, 7,8,9, pp. 121-5, 137-46.
] Bertolt Brecht, 'The Street Scene', 'Theatre for Pleasure or Theatre for Instruction', and 'Dramatic Theatre vs Epic Theatre', in *Brecht on Theatre: The Development of an Aesthetic*, ed. And tr. John Willet (London: Methuen, 1992) pp.68-76, 121-8.
] George Steiner, 'On Modern Tragedy', in *The Death of Tragedy* (London: Faber, 1995) pp. 303-24.
] Raymond Williams, *Drama from Ibsen to Brecht*
] Jean Genet, *Reflections on Theatre* (London: Faber & Faber) Chapter 2: "The Strange World Urb..." pp. 63-74.
] *Theatre of Absurd*. Martin Esslin

Core Paper XII

INDIAN CLASSICAL LITERATURE (Training of teachers essential for teaching this course)

Introduction:

This paper seeks to create awareness among the students of the rich and diverse literary and aesthetic culture of ancient India.

UNIT 1: Introduction to the history and genesis of Indian

Classical Literature UNIT 2: Sanskrit Drama –1

- (i) Kalidasa, *Abhijnanasakuntalam*, Act IV, tr. M.R Kale, Motilal Banarasi Dass, New Delhi

UNIT 3: Sanskrit Drama-2

- (i) *Mrcchakatika* by Sudraka, Act I, tr. M.M. Ramachandra Kale (New Delhi: Motilal Banarasidass, 1962)

UNIT 4: Aesthetics and Maxims

- (i) Bharata's *Natyasastra*, Chapter VI on Rasa theory

Text Books

-] Texts prescribed in units II,III, IV

Reference Books:

- [Kalidasa. Critical Edition. Sahitya Akademi
[Bharata's *Natyashastra*. English Translation by M.M. Ghosh. Vol 1. 2nd edition. Asiatic Society, Kolkata, 1950. Ch. 6 "Sentiments". Pp. 158-95
] J.A.B. Van Buitenen, "Dharma and Moksa" in Roy W. Perrett. Ed. *Indian Philosophy*. Vol 5, *Theory of Value: A Collection of Readings*. New York: Garland, 2000. Pp. 33-40
] Vinay Dharwadkar, "Orientalism and the Study of Indian Literature", *Orientalism and the Postcolonial Predicament: Perspectives on South Asia*. Ed. Carol A. Breckenridge and Peter Van der Veer. New Delhi: OUP, 1994. Pp. 158-95
] Haldhar Panda, *Universals of Poetics*

Core Paper XIII

POSTCOLONIAL LITERATURES

Introduction:

This paper seeks to introduce the students to postcolonial literature —a body of literature that responds to European colonialism and empire in Asia, Africa, Middle East, the Pacific and elsewhere. The paper aims to provide the students with the opportunity to think through the layered response – compliance, resistance, mimicry, subversion – that is involved in the production of post-independence literature

UNIT 1:

- (i) Postcolonialism: Elleke Boehmer (From *Literary Theory and Criticism* Ed. Patricia Waugh)
(a) The post in Postcolonial,
(b) Movements and theories against Empire
(c) Leading Postcolonial Thinkers (Frantz Fanon, Edward Said, Gayatri Spivak, Homi Bhabha)

UNIT 2: Raja Rao

- (i) *Kanthapura*

UNIT 3: Jean Rhys

- (i) *Wide Sargasso Sea*

UNIT 4: Athol Fugard

- (i) *Blood Knot*

Text Books

-] Texts prescribed in Units 1, 2, 3, 4

Reference Books:

-] Chinua Achebe: "English and the African Writer" (Available online)
• Ngugi wa Thiong'o: "The Quest for Relevance" from *Decolonizing the Mind: The Politics of Language in African Literature*
] Leela Gandhi, *Postcolonial Theory: An Introduction*. OUP, 1998.
] Bill Ashcroft, Gareth Griffin, Helen Tiffin, *The Empire Writes Back: Theory and Practice of Post-Colonial Literature*.
] Edward Said. *Orientalism*.

Core Paper XIV

POPULAR LITERATURE

Introduction:

This paper seeks to introduce the students to genres such as children's literature, detective fiction and campus fiction, which have a "mass" appeal, and can help us gain a better understanding of the popular and folk roots of literature.

UNIT 1: Introduction to the concept

- (i) What is popular literature?
(ii) Debate between popular and high cultures ('high brow' v/s 'low brow')
(iii) What is Genre fiction?
(iv) Debate between genre fiction and literary fiction

Essays for discussion:

-] Lev Grossman: "Literary Revolution in the Supermarket Aisle: Genre Fiction is Disruptive Technology"
<http://entertainment.time.com/2012/05/23/genre-fiction-is-disruptive-technology/>
] Arthur Krystal: "Easy Writers: Guilty pleasures without guilt" _

<http://www.newyorker.com/magazine/2012/05/28/easy-writers>
] Joshua Rothman: “A Better Way to Think About the Genre Debate”_

- <http://www.newyorker.com/books/joshua-rothman/better-way-think-genre-debate>
] Stephen Marche: "How Genre Fiction Became More Important than Literary Fiction"
<http://www.esquire.com/entertainment/books/a33599/genre-fiction-vs-literary-fiction/>

UNIT 2: Children's Literature

- (i) Lewis Carroll: *Alice in Wonderland*

UNIT 3: Detective Fiction

- (i) Arthur Conan Doyle: *The Hound of the Baskervilles*

UNIT 4: Campus Fiction

- (i) Chetan Bhagat: *Five Point Someone*

Text Books

-] Essays given for discussion under unit I and Texts prescribed in Units 2, 3, 4

Reference Books

- Leslie Fiedler, "Towards a Definition of Popular Literature" in *Super Culture: American Popular Culture and Europe*. Ed. C.W.E. Bigsby. pp. 29-38
- Leo Lowenthal, *Literature, Popular Culture and Society*
- Felicity Hughes, "Children's Literature: Theory and Practice" in *English Literary History*. Vol. 45, 1978. pp. 542-61.
- Raymond Chandler, "The Simple Art of Murder", *Atlantic Monthly*. Dec. 1944 (available at <<http://www.en.utexas.edu/amlitprivate/scans/chandlerart.html>>)
- *Popular Fiction: Essays in Literature and History* by Peter Humm, Paul Stigant, Peter Widdowson
- Sumathi Ramaswamy, "Introduction", in *Beyond Appearances?: Visual Practices and Ideologies in Modern India*. Pp.xiii-xxix

Discipline Specific Elective

Paper-I LITERARY THEORY

Introduction:

This paper seeks to expose the students to the basic premises and issues of major theoretical approaches to literary texts.

UNIT 1:

- (i) New Criticism ("Language of Paradox" by Cleanth Brooks)

UNIT 2:

- (i) Marxist Criticism (Terry Eagleton: “Literature and Ideology” from *Marxism and Literary Criticism*)

UNIT 3:

- (i) Feminist Criticism (*Second Sex*, Vol 1 Introduction “Facts and Myths”)

UNIT 4:

- (i) Structuralism (“The Nature of Linguistic Sign” by Saussure)

Text Books

-] Texts prescribed in Units 1, 2, 3, 4

Reference Books

-] Peter Barry, *Beginning Theory*
-] Terry Eagleton, *Literary Theory*
-] David Lodge, ed. *Twentieth Century Criticism*
-] David Lodge, ed. *Modern Criticism and Theory: A Reader*
-] Jonathan Culler, “In Pursuit of Signs”
-] Tony Bennett, *Formalism and Marxism* (New Accents)

Discipline Specific Elective

Paper- II WORLD LITERATURE

Introduction:

This paper proposes to introduce the students to the study of world literature through a representative selection of texts from around the world. The idea is to read beyond the classic European canon by including defining literary texts from other major regions/countries—except the United States of America—written in languages other than English, but made available to the readers in English translation.

UNIT 1: European

- (i) Albert Camus: *The Outsider*

UNIT 2: Caribbean

- (i) V S Naipaul: *A Bend in the River*

UNIT 3: Canadian Short Fiction

- (i) Alice Munroe: “The Bear Came Over the Mountain”, “Face”

UNIT 4: Latin American Poetry

- (i) Pablo Neruda :“Tonight I can Write” and “Every day you play”
- (ii) Octavio Paz: “Between going and staying the day wavers” and “Motion”

Text Books

-] Texts prescribed in Units 1, 2, 3, 4

Web Resources:

-] Alice Munro’s short Stories <http://www.newyorker.com/magazine/2013/10/21/the-bear-came-over-the-mountain-2>, <http://www.newyorker.com/magazine/2008/09/08/face>
-] Poems of Octavio Paz http://www.poetrysoup.com/famous/poems/best/octavio_paz

Reference Books:

- *Weltliteratur*: John Wolfgang von Goethe in *Essays on Art and Literature* Goethe : The Collected Works Vol.3
-] Rabindranath Tagore “World Literature”: *Selected Writings On Literature and Language: Rabindranath Tagore* Ed. Sisir Kumar Das and Sukanta Chaudhuri
-] Goethe’s “World Literature Paradigm and Contemporary Cultural Globalization” by John Pizer
- “Something Will Happen to You Who Read”: Adrienne Rich, Eavan Boland’ by Victor Luftig .JSTOR iv. *Comparative Literature* University of Oregon.
-] “WLT and the Essay” *World Literature Today* Vol. 74, No. 3, 2000. JSTOR Irish University Review, Vol.23 Spring 1, Spring-Summer.
-] What is world Literature? (Introduction) David Damrosch <http://press.princeton.edu/chapters/i7545.html>
-] Tagore’s comparative world literature <https://www.academia.edu/4630860/>
- Rabindranath Tagores Comparative World Literature

Discipline Specific Elective Paper- III

PARTITION LITERATURE

Introduction:

This paper seeks to expose the students to some significant writings on Indian partition, which brought untold miseries to those who lost lives and homes. The issues of loss, trauma, communalism etc. are explored by the texts.

UNIT 1: Defining partition literature

- (i) Ritu Menon and Kamla Bhasin, ‘Introduction’ from *Borders and Boundaries* (New Delhi: Kali for Women, 1998)

UNIT 2:

- (i) W.H. Auden "Partition", Agha Shahid Ali, "Learning Urdu", "The Dawn of Freedom" Faiz Ahmad Faiz

UNIT 3: Bapsi Sidhwa

- (i) *Ice-candy-man*

UNIT 4:

- (i) Sadat Hassan Manto, 'Toba Tek Singh' (from *Mottled Dawn*, Penguin India)
- (ii) Rajinder Singh Bedi, "Lajwanti"(Trans. Khushwant Singh)
- (iii) Lalithambika Antharajanam, "A Leaf in the Storm"

Text Books

-] Texts prescribed in Units 1, 2, 3, 4
-] (*Mottled Dawn* for Manto and Bedi in Unit 4, Penguin India)
-] *Borders and Boundaries*. New Delhi: Kali for Women, 1998

Reference Books:

-] Sukrita P. Kumar, "Narrating Partition" (Delhi: Indialog, 2004)
-] Urvashi Butalia, "The Other Side of Silence: Voices from the Partition of India" (Delhi: Kali for Women, 2000)
-] Sigmund Freud, "Mourning and Melancholia" in *The Complete Psychological Works of Sigmund Freud*, tr. James Strachey (London: Hogarth Press, 1953) pp. 3041-53.

Discipline Specific Elective

Paper- IV WRITING FOR MASS MEDIA

UNIT 1:

- (i) History of English in India, Brief history of Journalism in English in India , Status of English in India, Indian writers of English and their treatment of the English language a non-native variety

UNIT 2:

(i) Writing for the Print Media: News Stories, Features, Editorials
(The teacher is required to cite examples and use material from mass media)

UNIT 3:

- (i) Writing for the Electronic Media
- (ii) Advertisement caption writing and tag lines (print and electronic)

UNIT 4:

- (i) Email, Blogs, Social networking
- (ii) Internet Journalism

Reference Books

- Rangaswamy Parthasarathy, *Journalism in India: From the earliest times to the present day*, Sterling.
-] S V Parasher, *Indian English: Functions and Form*, Bahri Publications.
- Stephen McLaren, *Easy Writer*
-] A R Parhi, *Indian English through Newspapers*, Concept Publications.
-] G L Labru, *Indian Newspaper English*, B R Publishing House.
-] Vinod Dubey, *Newspaper English in India*, Bahri Publications.
- Kachru, Braj: *from Indianization of English*
- Dutta and Parhi, 'Prospect of Electronic Media as Curriculum in Non-Native Contexts', *I-Manager's Journal on English Language Teaching*. (2014)
-] Aijaz Ahmed: 'Disciplinary English: Third-Worldism and Literature'.
-] Narasimhaih; C.D. (ed.): *Awakened Consciousness: Studies in Commonwealth Literature*, New Delhi: Sterling.
-] Omkar N. Koul: *English in India: Theoretical and Applied Issues*. New Delhi: Creative Publishers.

DSE Paper – IV: Dissertation/ Research Project (College can give this choice only for students with above 60% aggregate marks)

DISSERTATION/ RESEARCH PROJECT

Introduction and Outcome

A project is an individual or collaborative activity that is carefully planned to achieve a particular aim.

An undergraduate project is individual research by students to i. understand in-depth a particular topic or fact in their field of study, and ii. Strengthen their understanding of research processes

and methods.

Undergraduate research is inquiry-based learning that involves practical work, and not just

listening to classroom teaching and personal reading. Students learn to apply what they study in their courses to appreciate different aspects of their field better by working independently on the projects. At the same time, they contribute something original to the courses they study.

An undergraduate research project is expected to explore specific topics within the field of study of the students. The project should make an original contribution to the discipline in some manner. The results of quality undergraduate research can be presented in seminars and conferences, and published in research journals dedicated specifically to such work or in traditional academic journals with the student as a co-author.

There are many benefits of undergraduate research including, but not limited to, real world applications, research and professional experience, and better relationships between faculty and students. Relating coursework to out-of-class experiences, students train to work and think independently, take responsibility for their own learning, and take initiative to solve problems on their own rather than relying on experts for answers. They also learn to work in collaboration in interdisciplinary research. Most of all, projects help students learn a variety of skill sets to make them confident and competent in their future career.

The research process

Typically, all research answer three questions: *what*, *why* and *how*.

The *what* states the research question to be investigated in a project.

The *why* explains the purpose of the research and also every step undertaken to conduct the research.

The *how* describes the stages of the research procedure.

To understand the process of research and to practically conduct any requires a good background in research methodology. Students may study research methodology before undertaking their projects.

Pattern of examination

MID-SEMESTER ASSESSMENT

Presentation of the project synopsis

Synopsis to include:

- i. Research statement/question and its rationale
- ii. Review of literature stating the validity of the project
- iii. Discussion of the research steps
- iv. Possible conclusion/s
- v. Contribution of the project to the existing body of research
- vi. References

Semester final examination

A project of at least 3000 words to be submitted in the following structure:

- Research question - a short statement
- Rationale of the research
- Introductions of the research
- Review of literature relating the reviews to the research question and the research Introductions
- Data collection and interpretation
- Discussion of the findings; conclusions drawn
- Contribution of the project to the existing body of research
- Directions for future research
- Works cited section

Reference Books

-] John Creswell, *Research Design: Qualitative, Quantitative, and Mixed Methods Approaches*. Sage Publications. 2009
-] K Samantray, *Academic and Research Writing*. Orient Blackswan. 2015
-] Sword, H. *Stylish Academic Writing*. Harvard University Press. 2012
-] Norman Denzin, *Sage Handbook of Qualitative Research*. Sage Publications. 2005
-] Kothari & Garg, *Research Methodology*. New Age Publishers
-] Deepak Chawla & Neena Sondhi. *Research methodology: Concepts & Cases*. Vikas Publishing

Generic Elective Paper I

ACADEMIC WRITING AND COMPOSITION

Introduction:

This paper seeks to train the students in the basic writing skills required for writing competently in the academic context.

UNIT 1:

- (i) Introduction to the Writing Process: with a focus on Academic Writing

UNIT 2:

- (i) Writing in one's own words: Summarizing and Paraphrasing

UNIT 3:

- (i) Critical Thinking: Synthesis, Analysis, And Evaluation

UNIT 4:

- (i) Citing Resources: Editing, Book and Media Review

Reference Books:

-] Liz Hamp-Lyons and Ben Heasley, *Study Writing: A Course in Writing Skills for Academic Purposes* (Cambridge UP, 2006)
-] Ilona Leki, *Academic Writing: Exploring Processes and Strategies*. New York: CUP, 2nd edn, 1998
-] Stanley Fish, *How to Write a Sentence and How to Read One*. Harpar Perennial. 2011.
-] *Literature and the art of Communication*, Cambridge University Press
- Gerald Graff and Cathy Birkenstein, *They Say/I Say: The Moves That Matter in Academic Writing*. New York: Norton, 2009

Generic Elective Paper II GENDER AND HUMAN RIGHTS

(Faculty training needed)

Introduction:

This paper seeks to familiarize the students with issues of inequality, and oppression of caste, race and gender.

UNIT 1:

- (i) Unit I and II of *Gender Sensitivity* (UNESCO Module 5)

UNIT 2:

- (i) “ Castes in India”: Dr Babasaheb Ambedkar

UNIT 3:

- (i) *We Should All Be Feminists* by Chimamanda Ngozi Adichie,

UNIT 4:

- (i) *Sultana’s Dream* (a novella): Rokeya Sakhawat Hossain

Text Books

- Texts prescribed in Unit I,II,III, IV

Reference Books:

-] Babasaheb Ambedkar, *Writings and Speeches*, Vol 1, Compiled by Vasant Moon. Ambedkar Foundation, 2014.
-] Chimamanda Ngozi Adichi- *We Should All Be Feminists*. London: Fourth Estate, 2014.]
- Rokeya Sakhawat Hossain - *Sultana’s Dream*. Penguin Modern Classics, 2005.

UNESCO- Gender Sensitivity, Zambia, 2000.

http://www.unesco.org/education/mebam/module_5.pdf

Generic Elective Paper III NATION, CULTURE, INDIA

Introduction:

This paper seeks to introduce students across disciplines to basic ideas about Indian cultural ethos mediated through literature.

UNIT 1:

- (i) *An Autobiography (My Experiments With Truth)* - M.K. Gandhi. Part V, 'The First Experience' (Chapters I) to 'Face to Face with Ahimsa' (Chap XIV)

UNIT 2:

- (i) "Secularism and Its Discontents"- Amartya Sen (from *The Argumentative Indian*)

UNIT 3:

- (i) "Nationalism in India"- Rabindranath Tagore (from *Nationalism*)

UNIT 4:

- (i) " The Renaissance in India"- Sri Aurobindo (from *The Renaissance in India and Other Essays*)

Text Books

- Texts prescribed in Units 1, 2, 3, 4

Reference Books:

-] A.L. Basham, *Wonder that was India*
-] D.D. Kosambi, *Culture and Civilization of Ancient India in Historical Outline*
-] Romila Thapar, *Time as a Metaphor in Human History*
- Pawan K. Verma, *The Great Indian Middleclass*

Generic Elective Paper IV LANGUAGE AND LINGUISTICS

Introduction:

This paper aims to offer the students some fundamental knowledge in Linguistics and English Language Teaching (ELT). It also seeks to acquaint the students with the variety of English that people come in contact with in contemporary times with a special emphasis on Asia and in particular, India.

UNIT 1:

- (i) Language : What is Language, Linguistics, Branches and Scope, Applied Linguistics

Global Englishes: Who Speaks English today? Standard Language and Language Standards, Language Variation, Postcolonial English, Pidgin and Creole, English in Asia and Europe

UNIT 2:

- (i) Phonology and Morphology

UNIT 3:

- (i) Syntax

UNIT 4:

- (i) Semantics

Reference Books

-] *Introductory book on Linguistics and Phonetics* by R L Varshney
-] *Global Englishes: A Resource Book for Students*, Jennifer Jenkins, 3rd Edn, Special Indian Edition, Routledge, 2016
- *An Introduction to Language and Communication*,
-] A R Parhi, 'Localising the Alien: Newspaper English and the Indian Classroom', *English Studies in India*, Springer, 2018.
-] Adrian Akmajian, R. A. Demers, Ann K Farmer and R, M. Harnish, Prentice Hall of India, 2012
-] David Crystal, *Linguistics*
-] Braj B Kachru, *The Indianization of English* (OUP)
- David Crystal, *English as a World Language*

GE Tutorial - 4 (20 marks: 1 credit)

Introduction: This paper seeks to reinforce learning of the theory paper by way of engaging the students in remedial teaching and doubt clearing classes.

Scheme of Examination- Internal Assessment will be done by tutors through 10 multiple choice questions (10 x 1 = 10) and very short answer-type questions (5 x 2 = 10)

UG Course Structure for History

Semester	Course	Course Name	Credit	Total marks
Semester-I	AECC-I	AECC-I	4	100
	C 1	History of India-I	6	100
	C 2	Social Formations and Cultural Patterns of the Ancient World	6	100
	GE-I	History of India-I (Early Times to 1750)	6	100
Semester-II	AECC-II	AECC-II	4	100
	C 3	History of India-II	6	100
	C 4	Social Formations and Cultural Patterns of the Medieval World	6	100
	GE-II	History of India – II (1750-1950)	6	100
Semester-III	C 5	History of India-III (c.750-1206)	6	100
	C 6	Rise of Modern West-I	6	100
	C 7	History of India-IV (c.1206-1526)	6	100
	GE-III	Rise of the Modern West – I	6	100
	SEC-I	SEC-I	4	100
Semester-IV	C 8	Rise of Modern West-II	6	100
	C 9	History of India-V (c.1526-1750)	6	100
	C 10	Historical Theories and Methods	6	100
	SEC-II	SEC-II	4	100
	GE-IV	Rise of the Modern West – II	6	100
Semester-V	C 11	History of Modern Europe-I(c.1780-1880)	6	100
	C 12	History of India-VII (1750-1857)	6	100
	DSE-I	History and Culture of Odisha - I	6	100
	DSE-II	History and Culture of Odisha - II	6	100

Semester-VI	C 13	History of India-VIII (C.1857-1950)	6	100
	C 14	History of Modern Europe-II(1880-1939)	6	100
	DSE-III	History and Culture of Odisha- III	6	100
	DSE-IV	Project Report	6	100
Total			148	2600

HISTORY

HONOURS PAPERS:

Core course – 14 papers

Discipline Specific Elective – 4 papers

Generic Elective for non History students – 4 papers. In case University offers 2 subjects as GE, then paper 1 and 2 will be the GE papers.

Marks per paper – Mid term: 20 Marks, End term: 80 Marks Total – 100 marks

Credit per paper – 6

Teaching hours per paper – 50 hours (Theory) + 10 hours (Tutorial)

Core Paper I

HISTORY OF

INDIA- I

Unit-I: Reconstructing Ancient Indian History

1. Early Indian notions of History
2. Sources of Historical Writings
3. Historical Geography (Major Harappan Sites and Sixteen Mahajanapadas).

Unit-II: Pre-historic Hunter-Gatherers and Food Production

1. Paleolithic Culture: Upper, Middle and Lower; Tool making habit
2. Mesolithic Culture: New developments in Technology and Economy
3. Neolithic and Chalcolithic Settlements
4. Food Production : Beginning of Agriculture

Unit-III: The Harappan Civilization

1. Origins; Settlement Patterns and Town Planning
2. Economic Life: Agriculture, Craft Productions and Trade
3. Social and Political Organization; Religious Beliefs and Practices; Art

Unit-IV: Cultures in Transition

1. Early Vedic Age: Society, Polity, Religion and Literature

2. Later Vedic Age: Social Stratification (Varna and Gender), Polity, Religion, and Culture

Suggested Text Books:

1. R. S. Sharma, Material Culture and Social Formations in Ancient India, 1983.
2. Upinder Singh, A History of Ancient and Early Medieval India.

Reference Reading:

1. Romila Thapar, Early India: From Beginning to 1300 CE, Penguin.
2. A.L. Basham, The Wonder that was India, Vol.1
3. B. Fagan, Digging from the Earth
4. H.D. Sankhalia, Prehistory of India.
5. B.R. Alchin, The Birth of Indian Civilization.

Core Paper II

SOCIAL FORMATIONS AND CULTURAL PATTERNS OF THE ANCIENT WORLD

Unit I

1. Evolution of Man
2. Paleolithic Cultures
3. Mesolithic Cultures

Unit-II: Neolithic Culture:

1. Food Production
2. Development of Agriculture
3. Animal Husbandry

Unit-III: Bronze Age Civilizations

1. Egypt
2. Mesopotamia (Sumeria & Babylonia)
3. China (Shang)

Unit-IV: Ancient Greece:

1. Athens and Sparta
2. Politics, Economic
3. Culture

Suggested Text Books:

1. Burns and Ralph. World Civilizations, Vol. A.
2. V. Gordon Childe, What Happened in History?

Reference Reading:

1. G. Clark, World Prehistory: A New Perspective.
2. Bisman Basu, The Story of Man
3. H.Neil & M.C.Willam, A World of History, Oxford, New York, 1907.
4. H.R. Hall, Ancient History of the Near East, 1932.

5. H.S. Baghela, World of Civilization

Core Paper III

HISTORY OF INDIA-II (300BCE-750CE)

Unit-I: Economy and Society (circa 300 BCE to circa CE 300):

1. Expansion of Agrarian Economy: Production relations.
2. Urban growth: Trade & Commerce
3. Social stratification: Class, Varna, Jati, Gender

Unit-II: Changing Political Formations (circa 300 BCE to circa CE 300):

1. The Mauryan Empire: Chandragupta Maurya and Asoka-Conquest and Administration
2. Post-Mauryan Polities: Kushanas, and Satavahanas
3. The Cholas

Unit-III: Towards Early Medieval India [circa CE fourth century to CE 750]:

1. Gupta Age: Agrarian Expansion, Land Grants, Graded Land Rights and Peasantry.
2. Varna, Proliferation of Jatis: changing norms of marriage and property.
3. The Nature of Polities: The Gupta Empire
4. Post- Gupta Polities - Pallavas, Chalukyas, and Vardhanas

Unit-IV: Religion, Culture, Philosophy and Society

1. Consolidation of the Brahmanical Tradition: Dharma, Varnashram, Purusharthas,
2. Buddhism: Hinayan and Mahayana
3. Jainism: It's major Principles
4. Development of Art and Architecture: Mauryan, and Gupta

Suggested Text Books:

1. D. D. Kosambi, An Introduction to the Study of Indian History, 1975.
2. A. L. Basham, Wonder That Was India, Rupa.

Reference Reading:

1. Romila Thapar, Early India: From the Origins to 1300, 2002.
2. Dharma Kumar and Irfan Habib, Cambridge Economic History of India, vol-I.
3. Romila Thapar, Ancient India.
4. K.M. Ashraf, Life and Condition of the People of Hindustan.
5. D.N. Jha (ed.), Feudal Social Formation in Early India.

Core Paper IV

SOCIAL FORMATIONS AND CULTURAL PATTERNS OF THE MEDIEVAL WORLD

Unit-I: Polity and Economy in Ancient Rome

1. Polity and Empire in Ancient Rome
2. Crises of the Roman Empire-Rise and fall of Julius Caesar
3. Agrarian Economy
4. Urbanization and Trade

Unit-II: Economic Developments in Europe from 7th to 14th Centuries:

1. Agricultural Production
2. Towns and Trade,
3. Feudalism- Origin, Growth and Decline

Unit-III: Religion and Culture in Medieval Europe:

1. Medieval Church,
2. Monastic Communities
3. Papacy

Unit-IV: Societies in Central Islamic Lands:

1. The Tribal background, Rise of Islam; Rise of Sultanates
2. Religious Developments: the Origins of Shariah,

Suggested Text Books:

1. Perry Anderson, Passages from Antiquity to Feudalism.
2. Marc Bloch, Feudal Society, 2 Vols.

Reference Reading:

1. J. Barrowclough, The Medieval Papacy.
2. Cambridge History of Islam, 2 Vol.
3. Will Durant, The Story of Civilization (vols. I & II).
4. T.W. Wallbank & N.M. Bailey, Civilization –Past and Present.
5. R. Coulborne, Feudalism in History.

Core Paper V

HISTORY OF INDIA-III (c. 750 -1206)

Unit –I: Studying Early Medieval India: Political Structures

1. Sources: Literary and Archaeology
2. Evolution of Political structures: Rajputs and Cholas
3. Legitimization of Kingship; Brahmanas and Temples
4. Arab conquest of Sindh: Causes and Impact

Unit-II: Agrarian Structure and Social Change:

1. Agricultural Expansion; Crops
2. Landlords and Peasants
3. Proliferation of Castes
4. Peasantization of Tribes

Unit-III: Trade and Commerce:

1. Inter-regional Trade

2. Maritime Trade and Forms of Exchange
3. Process of Urbanization
4. Merchant Guilds of South India

Unit-IV: Religious and Cultural Developments:

1. Puranic Traditions; Buddhism and Jainism
2. Islamic Intellectual Traditions: Al-Biruni
3. Regional Languages and Literature
4. Art and Architecture: Evolution of Regional styles: Kalingan and Dravidian style of Temple Architecture

Suggested Text Books:

1. B.D. Chattopadhyaya, The Making of Early Medieval India.
2. R.S. Sharma and K.M. Shrimali, (eds), Comprehensive History of India, Vol. IV (A & B).

Reference Reading:

1. Satish Chandra, Medieval India, Vol. I, Har Anand.
2. D. D. Koasambi, The Culture and Civilization of Ancient India: In Historical outline New Delhi; Vikas 1971.5th Print.
3. K. A. Nilakantha Sastri, The Colas, South Indian History.
4. Mittal, Socio-Cultural History of India.
5. R.C.Majumdar (ed) History and Culture of Indian people. Bombay; Bharatiya Vidya Bhavan 1960.Relevant Vol.

Core Paper VI

RISE OF THE MODERN WEST - I

Unit-I: Transition from Feudalism to Capitalism:

1. The problems of Transition: Economic Expansion, Industrial production
2. Trade and Commerce
3. Urban Development, Town Life

Unit-II: Early Colonial Expansion:

1. Motives, Voyages and Explorations.
2. The Conquests of America
3. Mining and Plantation, The African Slaves.

Unit-III: Renaissance and Reformation:

1. Its Social Roots Spread of Humanism in Europe.
2. The Renaissance: Art, Architecture, Sculpture, Painting and Literature
3. Origins and Spread of Reformation Movements.
4. Emergence of European State system: Spain, France, England, Russia

Unit-IV: Economic Developments of the Sixteenth Century:

1. Shift of economic balance from the Mediterranean to the Atlantic.
2. Commercial Revolution- Causes and Nature
3. Growth of Industries and its Impact

Suggested Text Books:

1. Charles A. Nauert, Humanism and the Culture of the Renaissance (1996).
2. Harry Miskimin, The Economy of Later Renaissance Europe: 1460 û1600.

Reference Reading:

1. Meenaxi Phukan, Rise of the Modern West: Social and Economic History of Early Modern Europe.
2. F. Rice, The Foundation of Early Modern Europe.
3. Toynbee, A.J, A Study of History (12 volumes).
4. Maurice Dobb, Transition from Feudalism to Capitalism.
5. Wallbank, T.W. & Bailey, N.M. Civilization: Past and Present.

Core Paper VII

HISTORY OF INDIA IV

(c.1206 - 1526)

Unit-I: Sultanate: Political Structures

1. Survey of Sources: (a) Persian Tarikh Tradition, (b) Vernacular Histories; (c) Epigraphy.
2. Consolidation of the Sultanate of Delhi: Balban, Alauddin Khaljis and Mahammad-bin Tughluqs.
3. Theories of kingship: The Ruling Elites: Ulema, Sufis and the Imperial Monuments

Unit-II: Emergence of Regional Identities

1. Bahamanis, Vijayanagar and Odisha.
2. Regional Art, Architecture and Literature in Vijayanagar and Odisha

Unit-III: Society and Economy:

1. Iqta and the Revenue-free Grants.
2. Agricultural production, Technology.
3. Market Regulations, Growth of Urban Centers.
4. Trade and Commerce, Indian Overseas Trade.

Unit-IV: Religion, Society and Culture:

1. Sufi Silsilas: Chishtis and Suhrawardis; doctrines and practices, Social roles
2. Bhakti Movements and Monotheistic Traditions: Kabir, Nanak, Ravidas and Sri Chaitanya.
3. Social Impact of the Bhakti Tradition: Rise of Liberal Thought, Ideology of Equality and Gender Relations

Suggested Text Books:

1. Satish Chandra, Medieval India, Vol. I, Har Anand Publications, New Delhi.
2. J.L. Mehta, An Advanced Study of the History of Medieval India, Vol.I.

Reference Reading:

1. Irfan Habib, Medieval India: The Study of a Civilization, NBT, New Delhi.
2. ABM Habibullah, The Foundation of Muslim Rule in India.
3. SBP Nigam, Nobility under the Sultans of Delhi.
4. R.P. Tripathy, Some Aspects of Muslim Administration in India.
5. R.S.Sharma, Early Medieval Indian Society: Orient Blackswan 2001.

Core Paper VIII **RISE OF THE MODERN WEST - II**

Unit-I: The English Revolution and European Politics in the 18th century:

1. Background: Socio-Economic and Political Crisis in 17th Century Europe.
2. Major Issues-Political and Intellectual Currents;
3. Parliamentary Monarchy;
4. Patterns of Absolutism in Europe

Unit-II: Rise of Modern Science

1. Development of Science from Renaissance to the 17th century
2. Impact of Modern Science on European society

Unit-III: Mercantilism and European Economy

1. Origin and spread of Mercantilism
2. Impact of Mercantilism on European economy
3. Agricultural and Scientific Background to the Industrial Revolution

Unit-IV: The American Revolution

1. Political currents
2. Socio-Economic Issues
3. Significance of the American Revolution

Suggested Text Books:

1. H. Butterfield, The Origins of Modern Science.
2. Meenaxi Phukan, Rise of the Modern West: Social and Economic History of Early Modern Europe.

Reference Reading:

1. Harry Miskimin, The Economy of Later Renaissance Europe: 1460 - 1600.
2. C.A Fisher, History of Modern Europe.
3. F. Rice, The Foundation of Early Modern Europe
4. David Thomson, Europe since Napoleon, Pelican Books, 1985
5. Swain, J.E., A History of World Civilization, Eurasia Publishing House Pvt. Ltd., New Delhi, 1994

Core Paper IX **HISTORY OF INDIA V (c.** **1526 - 1750)**

Unit-I: Establishment of Mughal Rule:

1. India on the eve of advent of the Mughals

2. Military Technology: Fire Arms,
3. Sher Shah: Administrative and Revenue Reforms

Unit-II: Consolidation of Mughal Rule:

1. Incorporation of Rajputs and other Indigenous Groups in Mughal Nobility
2. Evolution of Administrative Institutions: zabti, mansab, jagir, madad-i-maash
3. Emergence of the Marathas; Shivaji; Expansion under the Peshwas

Unit-III: Society and Economy:

1. Land rights and Revenue system: Zamindars and Peasants
2. Trade Routes and patterns of Internal Commerce; overseas trade
3. Urban Centres, Craft and Technology

Unit-IV: Cultural Ideals:

1. Religious tolerance and sulh-i-kul; Sufi mystical and Intellectual Interventions
2. Art and Architecture
3. Mughal and Rajput Paintings: Themes and Perspectives

Suggested Text Books:

1. J.L. Mehta, An Advanced Study of the History of Medieval India, Vol.II.
2. Satish Chandra, Medieval India, vol.2, Har Anand Publications, New Delhi.

Reference Reading:

1. Irfan Habib, Agrarian System of Mughal India, 1526-1707.
2. A.B.Pandey, Later Medieval Period.
3. R.P.Tripathi, Rise and Fall of the Mughal Empire
4. S.Nurul Hassan, Thoughts on Agrarian Relations in Mughal India.
5. Ishwari Prasad, Life and Times of Humayun.

Core Paper X **HISTORICAL THEORIES &** **METHODS**

Unit-I: Meaning and Scope of History

1. Definition, Nature and Scope of History.
2. Object and Value of History.
3. History, Science and Morality.

Unit-II: Traditions of Historical Writing

1. Ancient Greek Traditions – Herodotus, Thucydides
2. Ancient Roman Traditions - Polybius, Livy and Tacitus
3. Medieval Understanding: Western – St. Augustine, Arabic – Ibn Khaldun.

Unit-III: History as Interdisciplinary Practice

1. History and Archaeology, History and Anthropology.

2. History and Psychology, History and Literature.
3. History and Political Science

Unit-IV: Historical Methods

1. Sources of History: Written, Oral. Visual & Archaeological.
2. Historical facts.
3. Historical Causation.
4. Historical Objectivity

Suggested Text Books:

1. B. Sheik Ali, History: Its Theory and Method, Macmillan, Reprinted, 1996.
2. E. H. Carr, What is History? , Penguin Books, Reprinted, 1983.

Reference Reading:

1. E. Sreedharan, A Text Book of Historiography, Orient Longman, Reprinted, 2004.
2. Marc Bloch, The Historians Craft.
3. R.G. Collingwood, The Idea of History
4. G.T.Reiner, History: Its Purpose and Method.
5. K.Rajayyan, History: it's Theory & Method

Core Paper XI

History of Modern Europe- I (c. 1780-1880)

Unit-I: The French Revolution (1789):

1. Socio, Religious, Economic and Political Conditions
2. Intellectual Currents.
3. Role of the Middle Classes

Unit-II: Revolution and its European Repercussions:

1. National Constituent Assembly
2. National Legislative Assembly
3. Napoleonic Consolidation- Reform and Empire

Unit-III: Restoration and Revolution: c. 1815 - 1848

1. Congress of Vienna Restoration of old Hierarchies
2. Revolutionary and Radical Movements-
 - A) July Revolution (1830) and
 - B) February Revolution (1848)

Unit-IV: Socio-Economic Transformation and Remaking of States (Late 18th Century to Late 19th Century)

1. Process of Capitalist Development: Agrarian and Industrial Revolutions in England and German States.
2. Evolution of Social Classes: Land Owners, Peasantry: Bourgeoisie and Proletariat
3. Popular Movements and the Formation of National Identities in Germany and Italy,

Ireland

Suggested Text Books:

1. T.S. Hamerow, Restoration, Revolution and Reaction: Economics and Politics in Germany [1815 - 1871].
2. Anthony Wood, History of Europe, 1815 to 1960 (1983).

Reference Reading:

1. E.J. Hobsbawm, Nations and Nationalism.
2. A .Wesley Rohem, The Record of Mankind, Health and Company, Boston, 1952.
3. CMD Ketelbey, History of Modern Times since 1789, OUP, 2009.
4. David Thomson, Europe since Napoleon, Pelican Books, 1985.
5. Edward Mac Nall Burns et al, World Civilizations, vols. A,B,C,Goyal Saab, New Delhi.

Core Paper XII HISTORY OF INDIA VII (c. 1750 - 1857)

Unit-I: Expansion and Consolidation of Colonial Power:

1. Foreign Trade and Early forms of Economic Exploitations in Bengal
2. Dynamics of Expansion, with special reference to Bengal, Mysore and Odisha

Unit-II: Colonial State and Ideology:

1. Arms of the Colonial state: army, Police, Law.
2. Imperial Ideology: Orientalism and Utilitarianism
3. Education: Indigenous and Modern.

Unit-III: Economy and Society:

1. Land revenue systems- Permanet, Ryotwari and Mahalwari.
2. Commercialization of Agriculture- Consequences
3. Drain of Wealth- Causes and Consequences
4. Growth of Modern Industry

Unit-IV: Popular Resistance:

1. Santhal Uprising (1856-57)
2. Indigo Rebellion (1860)
3. Movement of 1857- Causes and Consequences

Suggested Text Books:

1. Dharma Kumar and Tapan Raychaudhuri, (ed.), The Cambridge Economic History of India, Vol. II.
2. Bipan Chandra, K.N. Panikkar, Mridula Mukherjee, Sucheta Mahajan and Aditya Mukherjee, India's Struggle for Independence.

Reference Reading:

1. Sumit Sarkar, Modern India (1885-1947), Mac Milan.
2. A.R.Desai, Social Background of Indian Nationalism
3. R. Vlyanovsky, Agrarian India between the World Wars.
4. Sekhar Bondhapadhaya, From Plessey to Partition.
5. G.Kaushal, Economic History of India, 1757-1956

Core Paper XIII

C.C. XIII: HISTORY OF INDIA VIII (c. 1857 - 1950)

Unit-I: Cultural Changes, Socio and Religious Reform Movements:

1. The advent of Printing and its Implications
2. Reform and Revival: Brahma Samaj, Arya Samaj, Aligarh Movement.
3. Emancipation of Women, Sanskritization and Anti-Caste Movements

Unit-II: Nationalism: Trends up to 1919:

1. Political Ideology and Organizations, Formation of INC
2. Moderates and Extremists.
3. Swedish Movement
4. Revolutionaries

Unit-III: Gandhian Nationalism after 1919: Ideas and Movements:

1. Mahatma Gandhi: His Perspectives and Methods
2. Non- Cooperation, Civil Disobedience, Quit India,
3. Subhas Chandra Bose and INA
4. Nationalism and Social Groups: Peasants, Tribes, Dalits and Women

Unit-IV: Communalism and Partition:

1. Ideologies and Practices, Muslim League
2. Hindu Maha Sabha
3. Partition and Independence
4. Making of the Constitution

Suggested Text Books:

1. Sumit Sarkar, Modern India, 1885-1947.
2. Bipan Chandra, K.N. Panikkar, Mridula Mukherjee, Sucheta Mahajan and Aditya Mukherjee, India's, Struggle for Independence, Penguin

Reference Reading:

1. Sekhar Bandopadhyaya, From Plessey to Partition
2. N.S. Bose, Indian Awakening and Bengal
- 3.A. R. Desai, Social Background of Indian Nationalism, Popular, Bombay.
- 4.S.Gopal, British Policy in India, 1858-1905.
- 5.Bipan Chandra, Indian National Movement.

Core Paper XIV

HISTORY OF MODERN EUROPE II (c. 1880 - 1939) Unit-I: Liberal Democracy, Working Class Movements and Socialism in the 19th and 20th Centuries:

1. The Struggle for Parliamentary Democracy and Civil Liberties in Britain.
2. Forms of Protest during early Capitalism: Food Riots in France and England: Luddites and Chartism.
3. Early Socialist Thought; Marxian Socialism

Unit-II: The Crisis of Feudalism in Russia and Experiments in Socialism:

1. Emancipation of Serfs
2. Revolutions of 1905; the Bolshevik Revolution of 1917.
3. Programme of Socialist Construction.

Unit-III: Imperialism, War, and Crisis: c. 1880-1939:

1. Growth of Militarism; Power Blocks and Alliances: Expansion of European Empires –First World War (1914 – 1918)
2. Fascism and Nazism.
3. The Spanish Civil War.
4. Origins of the Second World War.

Unit-IV: Intellectual Developments since circa 1850: Major Intellectual Trends:

1. Mass Education and Extension of Literacy.
2. Institutionalization of Disciplines: History, Sociology and Anthropology.
3. Darwin and Freud.

Suggested Text Books:

1. C.M. Cipolla, Fontana Economic History of Europe, Volume II the Present (1981). I : The Industrial Revolution.
2. T.S. Hamerow, Restoration, Revolution and Reaction: Economics and Politics in Germany [1815 - 1871].

Reference Reading:

1. George Lichtheim, A Short History of Socialism.
2. K.B. Keswani, International Relations in Modern World (1990-1995).
3. C.D.M. Ketelby, A History of Modern Times.
4. Carr.E.H., International Relations between the Two World Wars, 1919-1939, New York, 1966.
5. Garden Green Wood, The Modern World –A History of Our Times.

Discipline Specific Elective Paper-1

History and Culture of Odisha - I

Unit-I

1. Historical Geography: Kalinga, Utkal, Kosal
2. Kalinga War (261 B.C.) and its Significance.
3. Kharavela – Career and Achievements

Unit: II

1. Matharas and Eastern Gangas and Sailodbhavas
2. Bhaumakaras
3. Somavamsis

Unit: III

1. Imperial Gangas
2. Suryavamsi Gajapatis
3. Post- Gajapati Political developments upto 1568.

Unit: IV

1. Social and Cultural Life in Early and Medieval Odisha
2. Growth and Decay of Urban Centres
3. Trade and Commerce
4. Taxation and Land Revenue

Suggested Text Books:

1. K.C. Panigrahi, History of Odisha, Kitab Mahal.
2. Sahu, Mishra & Sahu, History of Odisha.

Reference Reading:

1. S.K. Panda, Political and Cultural History of Odisha.
C Pradhan, A Study of History of Orissa
3. B.K. Mallik, etal (eds) Odia Identity, Page Maker Publications, Bhubaneswar, 2019.
4. R. D Banarjee, History of Orissa, 2 vols.
5. M.N. Das(ed), Sidelights on History and Culture of Orissa, Vidyapuri, Cuttack, 1977

Discipline Specific Elective Paper-II History and Culture of Odisha -II

Unit I Afghan Conquest and Mughal Rule in Odisha- Administration

1. Maratha rule in Odisha – Administration
2. British Occupation and Early Colonial Administration: Land Revenue, Salt Policy, Jail and Police Administration.

Unit: II

1. Resistance Movements: Ghumsar Rebellion, Paik rebellion, Revolt of 1857 and Surendra Sai, Keonjhar Uprisings.
2. Famine of 1866 – Causes and Consequences
3. Growth of Education and Language Movement

Unit: III

1. Growth of Nationalism

2. Formation of Separate Province of Orissa.
3. Prajamandal Movement

Unit: IV

1. Nationalist Politics in Odisha
2. Quit India Movement
3. Merger of Princely States

Suggested Text Books:

1. P.K. Mishra & J.K. Samal, A Comprehensive History and Culture of Orissa- Vol. I & II.
2. A. C. Pradhan, Sidelights on Freedom Struggle in Orissa.

Reference Reading:

1. K.M. Patra, Freedom Struggle in Odisha.
2. J.K. Samal, Orissa under the British Crown.
3. K.M. Patra, Orissa State Legislature & Freedom Struggle.
4. B.C. Ray, Orissa under the Mughals, Punthi Pustak.
5. B.C. Ray, Orissa under the Marathas, Punthi Pustak.

Discipline Specific Elective

Paper-III History and

Culture of Odisha - III

Unit: I

1. Buddhism in Odisha
2. Jainism in Odisha
3. Saivism in Odisha

Unit: II

1. Saktism and Tantricism in Odisha
2. Growth of Vaishnavism in Odisha and Cult of Jagannath
3. Growth of Odia Literature : Sarala Mahabharata
4. Pancha-Sakha Literature

Unit: III

1. Buddhist Art and Architecture
2. Jaina Art
3. Evolution of Temple Architecture -Parsurameswar, Mukteswar, Lingaraja, Jagannath and Konarka

Unit: IV

1. Christian Missionaries – Education and Health
2. Mahima Movement and its Impact
3. Neo-Hindu Movements – Brahmo, Arya Samaj.

Suggested Text Books:

- 1.A.C. Pradhan, A Study of the History of Odisha, Panchasheel.
2. B.K. Mallik, Paradigm of Dissent and Protest :- Social Movements in Eastern India (1400-1700 AD)

Reference Reading:

- 1.K.S. Behera, Temples of Orissa.
- 2.P.K. Mishra(ed), Comprehensive History and Culture of Orissa, Vol-I Pt. II.
- 3.N.K. Bose, Canons of Orissan Architecture
- 4.M.N. Das (ed), Sidelights on History and Culture of Orissa.
5. N.K. Sahu, Buddhism in Orissa.

Discipline Specific Elective Paper-IV

(Optional/Project) History of

Contemporary Odisha (1947-1980)

Unit I: Political Developments

1. Second Congress Ministry (1946-1950):
 - a) Integration of Princely States with Odisha
 - b) New Capital
 - c) Hirakud Dam Project
2. Years of Uncertainties (1950-1980)
 - a) Third Congress Ministry and Abolition of Zamindari System
 - b) Biju Patnaik's First Ministry Achievements

Unit II: United Political Initiatives

1. Coalition Politics-Achievements and Challenges
 - a) R.N. Singdeo,
 - b) Sadasiba Tripathy
2. Panchayati Raj Institutions-Its Working and Impacts.
 - a) Rural Stages
 - b) Urban Stages

Unit III: Economic Development

- a) Growth of Industries- Roulkela Steel Plant and Odisha Sponge Iron Ltd.
- b) Irrigation and Agricultural Infrastructure
- c) Development in Transport and State communication- National and State High Ways in Odisha

Unit IV: Social Developments and Problems

- a) Government Community Development Programmes- Its Impact
- b) Peasant Movements: Causes and Effects
- c) Growth of Art and Craft: Raghunathpur, Pipli and Bargarh

Suggested Text Books:

1. Hemant K. Mohapatra, Odisara Etihasha (Odia), Friends Publishers, Cuttack,

2019.

2. Sukadeva Nanda, Coalition Politics in Odisha, Sterling Publishers, Delhi.

Reference Reading:

1. Sunit Ghosh, Orissa in Turmoil: A Study in Political Developments, Bookland International, Bhubaneswar, 1991.
2. Basant Das, Odisha Rajanitira Gopan Katha (Odia), Anusandhan Publication, Bhubaneswar, 2001.
3. B.B. Jena & J.K. Baral (eds), Government and Politics in Orissa, Print House (India), Lucknow, 1988.
4. Chittaranjan Das, Nabakrushna Chaudhury, NBT, New Delhi.
5. Dasarathi Bhuyan, Orissa Politics: From 1936 to Contemporary Politics, Mangalam Publishers, New Delhi, 2010.

OR

Project Report

The Students may be allotted topics of their interest in the beginning of 5th Semester Classes. They may write the Project Reports on local History and Culture, local personalities with their significant contribution to change the Society and economy with historical perspective containing up to 50 double spaced typed pages. The students may consult the sources like local archaeology, manuscripts, community documents, oral traditions, oral narratives, local biographies and family sources for writing the project dissertation. The Teachers will guide the students to complete their Project assignments. The students may be allowed to fill up their forms after their submission of the projects assigned to them. The student has to secure fifty percent of marks from the evaluation of the project and fifty percent of the marks in the viva voce test which are compulsory.

Generic Elective Paper

I History of India - I (Early Times to 1750)

Unit – I : Reconstructing Ancient Indian History

1. Sources of Historical Writings.
2. Vedic Age : Society, Polity and Culture
3. Buddhism and Jainism : Principles and Impact

Unit – II : Polity and Administration

1. The Mauryan Empire : Conquest and Administration
2. Gupta Society : Land Grants, Peasantry and beginning of Feudal Society
3. Gupta Polity : Conquests and Administration
4. Harshavardhan : Achievements

Unit – III: Early Medieval Society, Economy and Culture

1. Post Gupta Trade and Commerce
2. Delhi Sultanate : Conquests and Administration
3. Bhakti and Sufi Movements in India
4. Development of Regional Language and Literature

Unit – IV: India on the Eve of the Advent of the Mughals

1. Sher Shah : Administration and Reforms
2. Mughal Administrative Institutions : Zabti, Mansab and Jagir
3. Religious Tolerance Sulh-i- Kul
4. Mughal Art and Architecture

Suggested Text Books:

1. Upinder Singh, History of Ancient & Early Medieval India.
2. Romila Thappar, The Early India

Reference Reading:

1. Irfan Habib, Medieval India, NBT, New Delhi
2. R.S. Sharma, India's Ancient Past
3. S.A.A. Rizvi, Wonder that was India, Vol.II, Rupa
4. Cultural Heritage of India, Bharatiya Vidyabhaban Series, Vol-1-IV
5. A.L. Basheon (ed), Cultural History of India, OUP, New Delhi, 2011

Generic Elective

Paper II History of

India - II (1750-1950)

Unit – I Foundation and Expansion of British Rule_

1. Battle of Plessey (1757) and Conquest of Bengal
2. Conquest of Mysore and Maharashtra
3. Expansion through Diplomacy : Subsidiary Alliance and Doctrine of Lapse

Unit – II Consolidation of British Rule and Indian Responses

1. Peasant & Tribal Resistance against British Rule: Sanyasi Rebellion (1763); Kondh Rebellion in Ghumusar, Santal Rebellion
2. Revolt of 1857 : Nature and Significance
3. Land Revenue Settlements : Permanent Settlement, Ryotwari and Mahalwari Settlement

Unit – III – Social and Cultural Policies

1. Socio-Religious Reform Movements: Brahmo Samaj, Arya Samaj, Theosophical Society, Aligarh Movement.
2. Growth of Press and Education
3. Issues of Caste and Gender : Jyotiba Phule- Women Question and Issues, Depressed Class.

Unit – IV – Indian National Movement

1. Politics of Moderates and Extremists (1885-1920)

2. Gandhian Mass Movements (Non-Cooperation, Civil Disobedience and Quit India)

- Movements), (1920-1940)
3. Communal Politics and Partition
 4. Making of the Democratic Constitution

Suggested Text Books:

1. A.R. Desai, Social Background of Indian Nationalism, Popular, Mumbai
2. Priyadarshi Kar, Comprehensive History of Modern India.

Reference Reading:

1. Sumit Sarkar, Modern India : 1885-1947, Mac Millan.
2. B.R.Mani, Debrahminising History: Dominance and Resistance in Indian Society, Manohar, New Delhi, First Published 2005.
3. Chandra Bharil, Social and Political Ideas of B.R. Ambedkar, Aalekh Publishers, Jaipur, 1977.
4. Sumit Sarkar, Modern India (1885-1947), Mac Millan, Delhi, First Published 1983.
5. Hirendra N.Mukherjee, Gandhi, Ambedkar and the Extirpation of Untouchability, PPT, New Delhi.

Generic Elective

Paper III RISE OF THE

MODERN WEST - I

Unit-I: Transition from Feudalism to Capitalism

1. The problems of Transition: Economic Expansion, Industrial production
2. Trade and Commerce
3. Urban Development, Town Life

Unit-II: Early Colonial Expansion

1. Motives, Voyages and Explorations.
2. The Conquests of America
3. Mining and Plantation, The African Slaves.

Unit-III: Renaissance and Reformation

1. Its Social Roots Spread of Humanism in Europe.
2. The Renaissance: Art, Architecture, Sculpture, Painting and Literature
3. Origins and Spread of Reformation Movements.
4. Emergence of European State system: Spain, France, England, Russia

Unit-IV: Economic Developments of the Sixteenth Century

1. Shift of economic balance from the Mediterranean to the Atlantic.
2. Commercial Revolution- Causes and Nature
3. Growth of Industries and its Impact

Suggested Text Books:

1. Charles A. Nauert, Humanism and the Culture of the Renaissance (1996).
2. Harry Miskimin, The Economy of Later Renaissance Europe: 1460 û1600.

Reference Reading:

1. Meenaxi Phukan, Rise of the Modern West: Social and Economic History of Early Modern Europe.
2. F. Rice, The Foundation of Early Modern Europe.
3. Toynbee, A.J, A Study of History (12 volumes).
4. Maurice Dobb, Transition from Feudalism to Capitalism.
5. Wallbank, T.W. & Bailey, N.M. Civilization: Past and Present.

Generic Elective Paper IV

G.E. IV: RISE OF THE MODERN WEST - II

Unit-I: The English Revolution and European Politics in the 18th century

1. Background: Socio-Economic and Political Crisis in 17th Century Europe.
2. Major Issues-Political and Intellectual Currents;
3. Parliamentary Monarchy;
4. Patterns of Absolutism in Europe

Unit-II: Rise of Modern Science

1. Development of Science from Renaissance to the 17th century
2. Impact of Modern Science on European society

Unit-III: Mercantilism and European Economics

1. Origin and spread of Mercantilism
2. Impact of Mercantilism on European economy
3. Agricultural and Scientific Background to the Industrial Revolution

Unit-IV: The American Revolution

1. Political currents
2. Socio-Economic Issues
3. Significance of the American Revolution

Suggested Text Books:

1. H. Butterfield, The Origins of Modern Science.
2. Meenaxi Phukan, Rise of the Modern West: Social and Economic History of Early Modern Europe.

Reference Reading:

1. Harry Miskimin, The Economy of Later Renaissance Europe: 1460 - 1600.
2. C.A Fisher, History of Modern Europe.
3. F. Rice, The Foundation of Early Modern Europe
4. David Thomson, Europe since Napoleon, Pelican Books, 1985
5. Swain, J.E., A History of World Civilization, Eurasia Publishing House Pvt. Ltd., New Delhi, 1994

୨୦୧୯-୨୦

CBCS : BA (Hons.) 2019-20

Core Course – ପ୍ରଧାନ ପାଠ୍ୟାଂଶ

ମୋଟ ପଢ଼ି ସଂଖ୍ୟା – ୧୪

ପ୍ରତ୍ୟେକ ପତ୍ର - ୧୦୦ ମୂଲ୍ୟାଙ୍କ ବିଶିଷ୍ଟ (୨୦ ନମ୍ବର ମହାବିଦ୍ୟାଳୟ ସ୍ତରୀୟ ଅକ୍ଟୋ ପର୍ଯ୍ୟାୟ ପରୀକ୍ଷା + ୮୦ ବିଶ୍ୱବିଦ୍ୟାଳୟ ସ୍ତରୀୟ ମାନକ ଅକ୍ଟୋ ପରୀକ୍ଷା)

ସମ୍ମାନ: ଜଣେ ସ୍ନାତକ - ସମ୍ମାନର (ଅନର୍ଥ) ବିଦ୍ୟାର୍ଥୀ - ମୋଟ ୧୪୦୦ ନମ୍ବରର ପରୀକ୍ଷା ଦେବେ ।

କ) ଅତି କମ୍ରେ (ମୋଟ) ୫୦ଟି କାର୍ଯ୍ୟ ନିର୍ଦ୍ଦେଶ (ପରିୟତ୍ତ)ରେ ଗୋଟିଏ ପତ୍ରର ପାଠଦାନ ଶେଷ ହେବ । ଗୋଟିଏ କାର୍ଯ୍ୟ ନିର୍ଦ୍ଦେଶ ବା ପରିୟତ୍ତ - ୪୫ ମିନିଟ)

ଖ) ପ୍ରତ୍ୟେକ ପତ୍ର ୪ ଗୋଟି ମୁନିଟ୍ /ଏକକ / ଉପଶରେ ବିଭକ୍ତ ହୋଇଛି ।

ଗ) ପ୍ରତ୍ୟେକ ପତ୍ର ୨ ଆସ୍ତୁଭିତ୍ତିକ କାର୍ଯ୍ୟ ନିର୍ଦ୍ଦେଶ (୪ + ୨ କ୍ରେଡିଟ୍) ପାଇବେ । ଗୋଟିଏ ଅସ୍ତୁଭିତ୍ତିକ କାର୍ଯ୍ୟ ନିର୍ଦ୍ଦେଶର ମହତ୍ତ୍ୱ ହେଉଛି - ୧୦ ପିରିୟତ୍ତ ସହିତ ସମାନ

$$\text{ମୋଟ ୧୪ ଗୋଟି ସମ୍ମାନ ପତ୍ରର ଆସ୍ତୁମୂଲ୍ୟାଙ୍କ (କ୍ରେଡିଟ୍) ହେଉଛି - } 14 \times 9 (4 + 2) = 174 \text{ ।}$$

ଏଥିମଧ୍ୟରୁ $14 \times 4 = 56$ ତାତ୍ତ୍ୱିକ ପାଠ (Theory) ରହିବ ।

ଘ) ପରୀକ୍ଷା ପର୍ଯ୍ୟାୟକ୍ରମ (Semester) ଓ ପ୍ରସ୍ତାବିତ ପାଠ ଯୋଜନା :

ପ୍ରଥମ ଶିକ୍ଷାବର୍ଷ

୧ମ ପର୍ଯ୍ୟାୟ

$$\text{ଦୁଇଟି ପତ୍ର ୧ମ ଓ ୨ୟ ପତ୍ର - } 100 + 0 = 100 \text{ ନମ୍ବ}$$

(୧ମ ଓ ୨ୟ ପ୍ରଧାନ ପାଠ୍ୟାଂଶ)

୨ ଯ ପର୍ଯ୍ୟାୟ

$$\text{ଦୁଇଟି ପତ୍ର ଗାୟ/୪ର୍ଥ ପତ୍ର } 100 + 100 = 200 \text{ ନମ୍ବର}$$

(ଗାୟ ଓ ୪ର୍ଥ ପ୍ରଧାନ ପାଠ୍ୟାଂଶ)

ଦ୍ୱିତୀୟ ଶିକ୍ଷାବର୍ଷ

୩ୟ ପର୍ଯ୍ୟାୟ

$$\text{ତିନୋଟି ପତ୍ର ୫ମ, ୬ଷ୍ଠ ଓ ୭ମ ପତ୍ର (୫ମ, ୬ଷ୍ଠ, ୭ମ ପ୍ରଧାନ ପାଠ୍ୟାଂଶ)}$$

$$100 + 100 + 100 = 300 \text{ ନମ୍ବର}$$

୪ର୍ଥ ପର୍ଯ୍ୟାୟ

$$\text{ତିନୋଟି ପତ୍ର ୮ମ, ୯ମ ଓ ୧୦ମ ପତ୍ର- (୮ମ, ୯ମ, ୧୦ମ ପ୍ରଧାନ ପାଠ୍ୟାଂଶ)}$$

$$100 + 100 + 100 = 300 \text{ ନମ୍ବର}$$

ତୃତୀୟ ଶିକ୍ଷାବର୍ଷ

୫ମ ପର୍ଯ୍ୟାୟ

$$\text{ଦୁଇଟି ପତ୍ର ୧୧ଶ ଓ ୧୨ଶ ପତ୍ର (୧୧ଶ/୧୨ଶ ପ୍ରଧାନ ପାଠ୍ୟାଂଶ)}$$

$$100 + 100 = 200 \text{ ନମ୍ବର}$$

୬ଷ୍ଠ ପର୍ଯ୍ୟାୟ

ଦୁଇଟି ପଢ଼ି ଏକାକୀ ଓଏକ ପଢ଼ି (ଏକାକୀ, ଏକ ପଢ଼ି ପାଠ୍ୟାଂଶ)

୧୦୦+ ୧୦୦ = ୨୦୦ ନମ୍ବର

ଶିକ୍ଷା ଅବଧି ୨ଟି ପରୀକ୍ଷା ଏକାକୀ ମୋଟ = ୧୪୦୦ ନମ୍ବର

୩ ବର୍ଷ ୨ଟି ପର୍ଯ୍ୟାୟ ପଢ଼ି

3 years Course/ସେମିଷ୍ଟାର-୨ Total Total paper 1400 Total credits:
14 x 6 (4+2) = 84

ବିଦ୍ୟାର୍ଥୀମାନଙ୍କ ମୁକ୍ତ ମେଧାବୃତ୍ତି ପରୀକ୍ଷା ପାଇଁ ସେମାନଙ୍କ ପସନ୍ଦ ଓ ବୋଧଜ୍ଞାନମୂଳକ ଦୀର୍ଘ ଓ ସଂକ୍ଷିପ୍ତ ପ୍ରଶ୍ନ ପରୀକ୍ଷା ନିମନ୍ତେ ଉପସ୍ଥାପନା କରାଯିବ ।

ନମ୍ବର / ମୂଲ୍ୟାଙ୍କ ବିଭାଜନ ପଦ୍ଧତି:

୧. ପ୍ରତ୍ୟେକ ପଢ଼ି ପାଠ୍ୟାଂଶ ବା ପ୍ରତ୍ୟେକ ପଢ଼ି - ୧୦୦ ନମ୍ବର ବିଶିଷ୍ଟ

୨. ମହାବିଦ୍ୟାଳୟ ସ୍ତରୀୟ ଅନ୍ତରୀକ୍ଷା - ୨୦ ନମ୍ବର

ବିଶ୍ୱବିଦ୍ୟାଳୟ ସ୍ତରୀୟ ମୁଖ୍ୟ ପରୀକ୍ଷା - ୮୦ ନମ୍ବର

୩. ବିଶ୍ୱବିଦ୍ୟାଳୟ ସ୍ତରୀୟ ମୁଖ୍ୟ ପରୀକ୍ଷା ନିମନ୍ତେ ନିମ୍ନମତେ ପ୍ରଶ୍ନ ହେବ:

କ. ପ୍ରତ୍ୟେକ ପଢ଼ିର ପ୍ରତ୍ୟେକ ଏକକରୁ ୨ଟି କରି ୮ଟି ୧୫ ନମ୍ବର ବିଶିଷ୍ଟ ଦୀର୍ଘ ପ୍ରଶ୍ନ ପଢ଼ିବ । ବିଦ୍ୟାର୍ଥୀ ସେଥିରୁ ୪ଟି ପ୍ରଶ୍ନର ଉତ୍ତର ଦେବେ । ପ୍ରତ୍ୟେକ ଏକକରୁ ଗୋଟିଏ ଲେଖାଏଁ ପ୍ରଶ୍ନର ଉତ୍ତରଦେବା ବାଧ୍ୟତାମୂଳକ (୪x୧୫ = ୬୦ ନମ୍ବର)

ଖ) ପ୍ରତ୍ୟେକ ପଢ଼ିର ପ୍ରତି ଏକକରୁ ୧୫ଟି ୨ ନମ୍ବର ବିଶିଷ୍ଟ ସଂକ୍ଷିପ୍ତ ପ୍ରଶ୍ନ ପଢ଼ିବ: ବିଦ୍ୟାର୍ଥୀ ସେଥିରୁ ୧୦ଟି ପ୍ରଶ୍ନର ଉତ୍ତର ଦେବେ (୨ x ୧୦ = ୨୦)

ବିଶେଷ ଦ୍ରଷ୍ଟବ୍ୟ -

ଓଡ଼ିଆ ସମ୍ମାନ ୧୧ଶ ପଢ଼ି, ୧୨ଶ ପଢ଼ି, ଏକାକୀ ପଢ଼ି ଓ ଏକ ପଢ଼ି ଥିବା ପ୍ରତ୍ୟେକ ପଢ଼ିର ପଞ୍ଚମ ଏକକର ପ୍ରକଳ୍ପ ପାଇଁ ୨୦ ନମ୍ବର ଓ ଅନ୍ତରୀକ୍ଷା ପାଇଁ ୧୦ ନମ୍ବର ରହିବ ।

କ) ମୋଟ ନମ୍ବର - ୧୦୦

ଖ) ଅନ୍ତରୀକ୍ଷା - ୨୦ ଓ ମୁଖ୍ୟ ପରୀକ୍ଷା - ୬୦

ଗ) ପ୍ରକଳ୍ପ ପ୍ରଭୃତି - ୨୦

ଘ) ମୁଖ୍ୟ ପରୀକ୍ଷାରେ ପ୍ରତ୍ୟେକ ପଢ଼ିର ପ୍ରଥମ ଚାରୋଟି ଏକକରୁ ଦୁଇଟି ଲେଖାଏଁ ୧୫ ନମ୍ବର ବିଶିଷ୍ଟ ୮ଟି ଦୀର୍ଘ ପ୍ରଶ୍ନ ପଢ଼ିବ; ସେଥିରୁ ପ୍ରତ୍ୟେକ ଏକକରୁ ଗୋଟିଏ ଲେଖାଏଁ ପ୍ରଶ୍ନର ଉତ୍ତର ଦେବା ବାଧ୍ୟତାମୂଳକ । (୧୫ x ୪ = ୬୦)

ଙ) ପ୍ରଥମ ୪ଟି ଏକକରୁ ୨ନମ୍ବର ବିଶିଷ୍ଟ ୧୫ଟି ସଂକ୍ଷିପ୍ତ ପ୍ରଶ୍ନ ପଢ଼ିବ । ସେଥିରୁ ୧୦ଟି ପ୍ରଶ୍ନର

ଉତ୍ତର ଦେବାକୁ ହେବ ।

(୧୦X ୨ = ୨୦)

ପ୍ରକଳ୍ପଗୁଡ଼ିକ ସାହିତ୍ୟଭିତ୍ତିକ ହେବା ଆବଶ୍ୟକ ବିଭାଗମୁଖ୍ୟଙ୍କ ଅନୁମୋଦନକ୍ରମେ ବିଭାଗର ସମସ୍ତ ଅଧ୍ୟାପକ ଓ ଅଧ୍ୟାପିକାଙ୍କ ମଧ୍ୟରେ ଦିଗ୍‌ଦର୍ଶନ ନିମନ୍ତେ ସମାନ ଭାବରେ ବାଣ୍ଟିଦିଆଯିବ ।

ଭୂମିକା

ସ୍ନାତକ ଶ୍ରେଣୀରେ ଓଡ଼ିଆ ଭାଷା ଓ ସାହିତ୍ୟ ସମ୍ବନ୍ଧୀୟ ପାଠ୍ୟଦାନ ନିମନ୍ତେ ଏହି ପାଠ୍ୟସମ୍ପାଦନା ପ୍ରସ୍ତୁତ ହୋଇଛି । ଏହାର ପ୍ରସ୍ତୁତି କ୍ଷେତ୍ରରେ ବିଶ୍ୱବିଦ୍ୟାଳୟ ଆନ୍ଦୋଳନ ପ୍ରାୟୋଜିତ “ପସନ୍ଦ ଓ ଆସ୍ଥାଭିତ୍ତିକ ନୂତନ ପାଠ୍ୟବିନ୍ୟାସ ପଦ୍ଧତିକୁ ଗ୍ରହଣ କରାଯାଇଛି । ଏହି ପାଠ୍ୟସମ୍ପାଦନା ସଦ୍ୟତମ ଭାଷା-ସାହିତ୍ୟ ସମ୍ବନ୍ଧୀୟ ଜ୍ଞାନ ବ୍ୟବସ୍ଥା ଓ ଚଳଚ୍ଚିତ୍ର ସମୟର ଉପଯୋଗିତାକୁ ଚାହିଁ ପ୍ରସ୍ତୁତ ହୋଇଛି । ଏହା ଓଡ଼ିଆ ଭାଷା ଓ ସାହିତ୍ୟର ଉନ୍ନେଷ ବିକାଶ ସହିତ ଏହାର ସାଂପ୍ରତିକ ସ୍ଥିତି, ବ୍ୟାକରଣ ଓ ଭାଷାତତ୍ତ୍ୱିକ ବୈଶିଷ୍ଟ୍ୟ ସଂପର୍କରେ ସବିଶେଷ ଧ୍ୟାନ ପ୍ରଦାନ କରିବ । ଓଡ଼ିଆ ସାହିତ୍ୟର ବ୍ୟାବହାରିକ ଦିଗ ଓ ମହତ୍ତ୍ୱ ପ୍ରତି ଏଥିରେ ଧ୍ୟାନ ଦିଆଯାଇଛି । ଓଡ଼ିଆ ସାହିତ୍ୟର ବିବିଧ ରୂପ, ସାହିତ୍ୟ-ଧାରା ଓ ବିଶିଷ୍ଟ ସାହିତ୍ୟ-ଲେଖକଙ୍କ ବହି ସହିତ ବିଦ୍ୟାର୍ଥୀଙ୍କୁ ଅବଗତ କରିବାରେ ପାଠ୍ୟସମ୍ପାଦନା ସହାୟକ । ଓଡ଼ିଆ ଭାଷା ଓ ସାହିତ୍ୟକୁ ସର୍ବଭାରତୀୟ ଭାଷା ଓ ସାହିତ୍ୟ

ତଥା ଅନ୍ତର୍ଜାତୀୟ ସାହିତ୍ୟ ବିଦ୍ୟା ସହିତ ବିଦ୍ୟାର୍ଥୀମାନଙ୍କୁ ପରିଚିତ କରାଇବାରେ ଏହା ବିଦ୍ୟାର୍ଥୀଙ୍କ
ଉପଯୋଗୀ ହୋଇପାରିବ ।

ପାଠ୍ୟକ୍ରମର ସାରାଂଶ – ସଂରଚନା

Structure of B.A. (Honours) Odia Under CBCS

ପ୍ରଧାନ ପାଠ୍ୟାଂଶ (Core Course) : 14

ପ୍ରତ୍ୟେକ ପତ୍ରର କ୍ରେଡିଟ୍ସ୍ / ସମୟ ନିର୍ଦ୍ଦେଶ = ୪ + ୨ = ୬ (୬୦ ପରିଅଡ୍ସ୍)

ପ୍ରଥମ ପର୍ଯ୍ୟାୟ :

ପ୍ରଧାନ ପାଠ୍ୟାଂଶ - ୧ (Core Course – 1) ପ୍ରାଚୀନ ଓଡ଼ିଆ ସାହିତ୍ୟର ଇତିହାସ:
(ଚର୍ଯ୍ୟାପଦଠାରୁ ପଞ୍ଚମଶା ପର୍ଯ୍ୟନ୍ତ)

୧ମ ପତ୍ର – ସମୟ ନିର୍ଦ୍ଦେଶ = ୪ + ୨ = ୬ (୬୦ ପରିଅଡ୍ସ୍)

ପ୍ରଧାନ ପାଠ୍ୟାଂଶ – ୨ (Core Course – 2) ମଧ୍ୟଯୁଗୀୟ ଓଡ଼ିଆ ସାହିତ୍ୟ:

(ପାକରିତି, ରୀତି ଓ ଗୀତି ସାହିତ୍ୟ)

୨ୟ ପତ୍ର – ସମୟ ନିର୍ଦ୍ଦେଶ = ୪ + ୨ = ୬

ଦ୍ୱିତୀୟ ପର୍ଯ୍ୟାୟ :

ପ୍ରଧାନ ପାଠ୍ୟାଂଶ – ୩ (Core Course – 3) ଆଧୁନିକ ଓଡ଼ିଆ ସାହିତ୍ୟ (ସ୍ୱାଧୀନତା ପୂର୍ବବର୍ତ୍ତୀ)

୩ୟ ପତ୍ର - ସମୟ ନିର୍ଦ୍ଦେଶ = ୪ + ୨ = ୬

ପ୍ରଧାନ ପାଠ୍ୟାଂଶ – ୪ (Core Course - 4) ସ୍ୱାଧୀନତା ପରବର୍ତ୍ତୀ ଓଡ଼ିଆ ସାହିତ୍ୟ

୪ର୍ଥ ପତ୍ର - ମୂଲ୍ୟାଙ୍କ = ୪ + ୨ = ୬

ତୃତୀୟ ପର୍ଯ୍ୟାୟ :

ପ୍ରଧାନ ପାଠ୍ୟାଂଶ – ୫ (Core Course - 5) ଭାଷାର ସଂଜ୍ଞା ଓ ସ୍ୱରୂପ

୫ମ ପତ୍ର- ସମୟ ନିର୍ଦ୍ଦେଶ ୪ + ୨ = ୬

ପ୍ରଧାନ ପାଠ୍ୟାଂଶ - ୬ (Core Course – 6) ଓଡ଼ିଆ ଭାଷାର ବୈଶିଷ୍ଟ୍ୟ ଓ ବିବିଧତା

୬ଷ୍ଠ ପତ୍ର- ସମୟ ନିର୍ଦ୍ଦେଶ ୪ + ୨ = ୬

ପ୍ରଧାନ ପାଠ୍ୟାଂଶ – ୭ (Core Course=7) ଓଡ଼ିଆ ବ୍ୟାବହାରିକ ବ୍ୟାକରଣ

ସପ୍ତମ ପତ୍ର - ସମୟ ନିର୍ଦ୍ଦେଶ = ୪ + ୨ = ୬

ଚତୁର୍ଥ ପର୍ଯ୍ୟାୟ :

ପ୍ରଧାନ ପାଠ୍ୟାଂଶ – ୮ (Core Course – 8) ଓଡ଼ିଆ ଲୋକ ସଂସ୍କୃତି ଓ ଲୋକସାହିତ୍ୟ

୮ମ ପତ୍ର - ସମୟ ନିର୍ଦ୍ଦେଶ = ୪ + ୨ = ୬

ପ୍ରଧାନ ପାଠ୍ୟାଂଶ – ୯ (Core Course – 9) ପ୍ରାଚ୍ୟ ଓ ପାଶ୍ଚାତ୍ୟ ସାହିତ୍ୟ ତତ୍ତ୍ୱ

୯ମ ପତ୍ର - ସମୟ ନିର୍ଦ୍ଦେଶ = ୪ + ୨ = ୬

ପ୍ରଧାନ ପାଠ୍ୟାଂଶ – ୧୦ (Core Course-10) ଓଡ଼ିଆ ପଦ୍ୟ ସାହିତ୍ୟ (ପ୍ରାଚୀନରୁ ସ୍ୱାଧୀନତା

ପର୍ଯ୍ୟନ୍ତ) ୧୦ମ ପତ୍ର - ସମୟ ନିର୍ଦ୍ଦେଶ = ୪ + ୨ = ୬

ପଞ୍ଚମ ପର୍ଯ୍ୟାୟ :

ପ୍ରଧାନ ପାଠ୍ୟାଂଶ-୧୧ (Core Course-11) ଓଡ଼ିଆ ନାଟକ ଓ ଏକାଙ୍କିକା

୧୧ଶ ପତ୍ର - ସମୟ ନିର୍ଦ୍ଦେଶ = ୪ + ୨ = ୬

ପ୍ରଧାନ ପାଠ୍ୟାଂଶ -୧୨ (Core Course-12) ଓଡ଼ିଆ କଥା ସାହିତ୍ୟ (ଗଳ୍ପ ଓ ଉପନ୍ୟାସ)

୧୨ଶ ପତ୍ର - ସମୟ ନିର୍ଦ୍ଦେଶ = ୪ + ୨ = ୬

ଷଷ୍ଠ ପର୍ଯ୍ୟାୟ :

ପ୍ରଧାନ ପାଠ୍ୟଶିଳ୍ପ-୧୩ (Cure Course-13) ଓଡ଼ିଆ ଗଦ୍ୟ ସାହିତ୍ୟ (ପ୍ରବନ୍ଧ, ଆତ୍ମଜୀବନୀ,
ଭ୍ରମଣକାହାଣୀ) ୧୩ଶ ପଢ଼ - ସମୟ ନିର୍ଦ୍ଦେଶ = ୪ + ୨ = ୬

ପ୍ରଧାନ ପାଠ୍ୟଶିଳ୍ପ- ୧୪ (Core Course- 14) ଓଡ଼ିଆ ଭାଷାର ବ୍ୟବହାରିକ ପ୍ରୟୋଗ
୧୪ଶ ପଢ଼ - ସମୟ ନିର୍ଦ୍ଦେଶ = ୪ + ୨ = ୬

ସବିଶେଷ ପାଠ୍ୟକ୍ରମ (Detail Syllabus) **ପ୍ରଥମ ପର୍ଯ୍ୟାୟ (Semester – 1)**

ମୂଳ ପାଠ : ଓଡ଼ିଆ ସାହିତ୍ୟର ଇତିହାସ

ପାଠ୍ୟଶିଳ୍ପ -୧ (Core Course - 1) : ପ୍ରାଚୀନ ଓଡ଼ିଆ ସାହିତ୍ୟର ଇତିହାସ

ପ୍ରଥମ ପଢ଼

୧ମ ଏକକ | ଯୁଗ - ୧ . ପ୍ରାକ୍-ସାରଳା ସାହିତ୍ୟ (ଚର୍ଯ୍ୟାଗୀତିକା ଓ ନାଥ ସାହିତ୍ୟ)

ସାମାଜିକ, ଧାର୍ମିକ, ସାହିତ୍ୟିକ ଓ ଭାଷାତାତ୍ତ୍ୱିକ ମୂଲ୍ୟାୟନ

୨ୟ ଏକକ | ଯୁଗ - ୨ : ସାରଳା ସାହିତ୍ୟର ସାମାଜିକ, ସାଂସ୍କୃତିକ ଓ ସାହିତ୍ୟିକ ମୂଲ୍ୟ

୩ୟ ଏକକ | ଯୁଗ - ୩ : ବଳରାମ ଦାସ ଓ ଜଗନ୍ନାଥ ଦାସ (ବିଶେଷ ଅଧ୍ୟୟନ)

୪ର୍ଥ ଏକକ | ଯୁଗ - ୪ ଅନନ୍ତ ଦାସ, ଯଶୋବନ୍ତ ଦାସ ଓ ଅଚ୍ୟୁତାନନ୍ଦ ଦାସ (ବିଶେଷ ଅଧ୍ୟୟନ)

ସହାୟକ ଗ୍ରନ୍ଥସୂଚୀ

୧. ଓଡ଼ିଆ ସାହିତ୍ୟର ଇତିହାସ - ସୂର୍ଯ୍ୟନାରାୟଣ ଦାଶ (୧ମ ଓ ୨ୟ ଭାଗ) – ଗ୍ରନ୍ଥ ମନ୍ଦିର, କଟକ

୨. ଓଡ଼ିଆ ସାହିତ୍ୟର ଆଦିପର୍ବ – ସୁରେନ୍ଦ୍ର ମହାନ୍ତି – କଟକ ଷ୍ଟୁଡେଣ୍ଟସ୍ ଷ୍ଟୋର, କଟକ

୩. ବର୍ଯ୍ୟା ଗୀତିକା - ଖଗେଶ୍ୱର ମହାପାତ୍ର, ଫ୍ରେଣ୍ଡସ୍ ପବ୍ଲିଶର୍ସ, କଟକ

୪. ଓଡ଼ିଶାର ନାଥ ସାହିତ୍ୟ - ବଂଶୀଧର ମହାନ୍ତି, ଫ୍ରେଣ୍ଡସ୍ ପବ୍ଲିଶର୍ସ, କଟକ

୫. ଓଡ଼ିଆ ସାହିତ୍ୟର ସଂକ୍ଷିପ୍ତ ପରିଚୟ - ବୃନ୍ଦାବନ ଚନ୍ଦ୍ର ଆଚାର୍ଯ୍ୟ, ଗ୍ରନ୍ଥ ମନ୍ଦିର, କଟକ

୬. ଓଡ଼ିଆ ସାହିତ୍ୟର ଇତିହାସ, ପ୍ରଥମ ଭାଗ, ବୈଷ୍ଣବ ଚରଣ ସାମଲ, ଫ୍ରେଣ୍ଡସ୍ ପବ୍ଲିଶର୍ସ, କଟକ

୭. ଓଡ଼ିଆ ସାହିତ୍ୟର ମଧ୍ୟପର୍ବ – ସୁରେନ୍ଦ୍ର ମହାନ୍ତି – କଟକ ଷ୍ଟୁଡେଣ୍ଟସ୍ ଷ୍ଟୋର, କଟକ

୮. ପଞ୍ଚସଖା ଓଡ଼ିଆ ସାହିତ୍ୟ – ଦେବେନ୍ଦ୍ର ମହାନ୍ତି, ଫ୍ରେଣ୍ଡସ୍ ପବ୍ଲିଶର୍ସ, କଟକ

୯. ଓଡ଼ିଆ ସାହିତ୍ୟର ଭକ୍ତେଷ ଓ ଭଉରଣ – ଦେବେନ୍ଦ୍ର ମହାନ୍ତି, ଫ୍ରେଣ୍ଡସ୍ ପବ୍ଲିଶର୍ସ, କଟକ

୧୦. ଓଡ଼ିଆ ସାହିତ୍ୟର ଇତିହାସ, ବଂଶୀଧର ମହାନ୍ତି (୧ମ ଓ ୨ୟ ଭାଗ), ଫ୍ରେଣ୍ଡସ୍ ପବ୍ଲିଶର୍ସ, କଟକ

ପ୍ରଧାନ ପାଠ୍ୟଶିଳ୍ପ - ୨ (Core Course - 2) : ମଧ୍ୟଯୁଗୀୟ ଓଡ଼ିଆ ସାହିତ୍ୟ

ଦ୍ୱିତୀୟ ପଢ଼

୧ମ ଏକକ । ୟୁନିଟ୍ - ୧ ମଧ୍ୟଯୁଗୀୟ ଓଡ଼ିଆ ସାହିତ୍ୟର ପୃଷ୍ଠଭୂମି (ସାମାଜିକ, ସାଂସ୍କୃତିକ, ରାଜନୀତିକ ଓ ଧର୍ମୀୟ ପୃଷ୍ଠଭୂମି)

୨ୟ ଏକକ । ୟୁନିଟ୍ - ୨ ; ମଧ୍ୟଯୁଗୀୟ କାବ୍ୟର ଆଙ୍ଗିକ ବୈଚିତ୍ର୍ୟ
(ବିଷୟ ବିନ୍ୟାସ, ଭାଷା, ଛନ୍ଦ ବୈଚିତ୍ର୍ୟ, ବର୍ଣ୍ଣନା ବୈଚିତ୍ର୍ୟ ଓ ଆଳଙ୍କାରିକତା)

୩ୟ ଏକକ । ୟୁନିଟ୍ - ୩ = ମଧ୍ୟଯୁଗୀୟ କାବ୍ୟର ଆତ୍ମିକ ବିଭବ
(ରସ, ସୌନ୍ଦର୍ଯ୍ୟଚେତନା ଓ ଭାବାଦର୍ଶ)

୪ର୍ଥ ଏକକ । ୟୁନିଟ୍ - ୪ ମଧ୍ୟଯୁଗୀୟ ଓଡ଼ିଆ ଗୀତି ପରମ୍ପରା (ଚଉପଦୀ, ବଘଦୀ, ଚଉତିଶା, ଭଜନ ଓ ଜଣାଣ/ଚମ୍ପୂ)

ସହାୟକ ଗ୍ରନ୍ଥସୂଚୀ

୧. ଓଡ଼ିଆ ସାହିତ୍ୟର ଇତିହାସ - ସୂର୍ଯ୍ୟନାରାୟଣ ଦାଶ (୪ର୍ଥ ଭାଗ) - ଗ୍ରନ୍ଥ ମନ୍ଦିର, କଟକ,

୨. ଭଞ୍ଜୀୟ କାବ୍ୟ ଭାବନା - ବେଣୀ ମାଧବ ପାଢୀ, ବ୍ରହ୍ମପୁର

୩. ଉପେନ୍ଦ୍ର ଭଞ୍ଜ ସାହିତ୍ୟ ଏକ ଅଧ୍ୟୟନ - ଜୟକୃଷ୍ଣ ମିଶ୍ର, ଓଡ଼ିଶା ରାଜ୍ୟ ପାଠ୍ୟ ପୁସ୍ତକ ପ୍ରଣୟନ ଓ ପ୍ରକାଶନ ସଂସ୍ଥା, ଭୁବନେଶ୍ୱର

୪. ମଧ୍ୟକାଳୀନ ଓଡ଼ିଆ ସାହିତ୍ୟ - କୃଷ୍ଣ ଚରଣ ସାହୁ, ଫ୍ରେଣ୍ଡସ୍ ପବ୍ଲିଶର୍ସ, କଟକ

୫. ଭଞ୍ଜ ସାହିତ୍ୟର ବିଭା ଓ ବିଭବ - ସଚ୍ଚିଦାନନ୍ଦ ମିଶ୍ର, ଓଡ଼ିଶା ବ୍ଲକ୍ ହୋଇ

୬. ଓଡ଼ିଆ ଗୀତିକାବ୍ୟ- ଜାନକୀବଲ୍ଲଭ ମହାନ୍ତି, ଫ୍ରେଣ୍ଡସ୍ ପବ୍ଲିଶର୍ସ, କଟକ

୭. କାବ୍ୟକୌଶଳ-ସୁଦର୍ଶନ ଆଚାର୍ଯ୍ୟ ଫ୍ରେଣ୍ଡସ୍ ପବ୍ଲିଶର୍ସ, କଟକ

ଦ୍ୱିତୀୟ ପର୍ଯ୍ୟାୟ (Semester -II)

ପ୍ରଧାନ ପାଠ୍ୟାଂଶ - ୩ (Core Course - 3) : ଆଧୁନିକ ଓଡ଼ିଆ ସାହିତ୍ୟ

ତୃତୀୟ ପତ୍ର

୧ମ ଏକକ/ ୟୁନିଟ୍ - ୧: ଆଧୁନିକ ଓଡ଼ିଆ ସାହିତ୍ୟର ପୃଷ୍ଠଭୂମି ଓ ନବଜାଗରଣ

(ଇଂରାଜୀ ଶିକ୍ଷା ବିସ୍ତାର, ପତ୍ରପତ୍ରିକା ପ୍ରକାଶନ, ମୁଦ୍ରଣଯନ୍ତ୍ର ପ୍ରତିଷ୍ଠା ଓ ଭାଷା ସୁରକ୍ଷା ଆନ୍ଦୋଳନ)

୨ୟ ଏକକ । ୟୁନିଟ୍ - ୨ : ଆଧୁନିକ ଓଡ଼ିଆ ସାହିତ୍ୟର ପ୍ରମୁଖ ସ୍ରଷ୍ଟା

(ରାଧାନାଥଙ୍କ କାବ୍ୟ, ଗଙ୍ଗାଧରଙ୍କ କାବ୍ୟ, ମଧୁସୂଦନ ରାଓଙ୍କ କବିତା ଓ ଫକୀରମୋହନଙ୍କ ଉପନ୍ୟାସ ଓ ଗଳ୍ପ)

୩ୟ ଏକକ ୟୁନିଟ୍ - ୩ - ଓଡ଼ିଆ ସାହିତ୍ୟରେ ସତ୍ୟବାଦୀଧାରା

୪ର୍ଥ ଏକକ । ୟୁନିଟ୍ - ୪: ଓଡ଼ିଆ ସାହିତ୍ୟରେ ସବୁଜଧାରା ଓ ପ୍ରଗତିବାଦୀ ଧାରା

ସହାୟକ ଗ୍ରନ୍ଥସୂଚୀ

୧. ଓଡ଼ିଆ ସାହିତ୍ୟର ଇତିହାସ (୧୮୦୩-୧୯୨୦) ନଟବର ସାମନ୍ତରାୟ, ବାଣୀ ଭବନ, ଭୁବନେଶ୍ୱର

୨. ଓଡ଼ିଆ ସାହିତ୍ୟର ଇତିହାସ - ପ୍ରେମାନନ୍ଦ ମହାପାତ୍ର, ସତ୍ୟନାରାୟଣ ବ୍ଲକ୍ ପବ୍ଲିଶର୍ସ, କଟକ

- ୩. ମେହେର ସାହିତ୍ୟରେ ମାନବୀୟ ମହନୀୟତା - ମଣୀନ୍ଦ୍ର କୁମାର ମେହେର, ଗ୍ରନ୍ଥମନ୍ଦିର, କଟକ
- ୪. କାବ୍ୟଶିଳ୍ପୀ ଗଙ୍ଗାଧର - ଗୋବିନ୍ଦଚନ୍ଦ୍ର ଉଦ୍‌ଗାତା
- ୫. ଓଡ଼ିଆ ସାହିତ୍ୟରେ ରାଧାନାଥ ଓ ସତ୍ୟବାଦୀ ଯୁଗ, ପ୍ର. ବୈଷ୍ଣବ ଚରଣ ସାମଲ, ଫ୍ରେଣ୍ଡସ ପବ୍ଲିଶର୍ସ, କଟକ
- ୬. ସବୁଜରୁ ସାଂପ୍ରତିକ - ନିତ୍ୟାନନ୍ଦ ଶତପଥୀ, ଗୁରୁ ମନ୍ଦିର, କଟକ
- ୭. ଓଡ଼ିଆ ସାହିତ୍ୟର ପ୍ରଗତିବାଦୀ ଧାରା - ବିଜୟ କୁମାର ଶତପଥୀ, ଓଡ଼ିଶା ବୁକ୍ ଷ୍ଟୋର, କଟକ

ପ୍ରଧାନ ପାଠ୍ୟାଂଶ - ୪ (Core Course - 4) : ସ୍ଵାଧୀନତା ପରବର୍ତ୍ତୀ ଓଡ଼ିଆ ସାହିତ୍ୟ

ଚତୁର୍ଥ ପତ୍ର

- ୧ମ ଏକକ | ମୁନିଟ୍ - ୧: ସ୍ଵାଧୀନତା ପରବର୍ତ୍ତୀ ଓଡ଼ିଆ କବିତା
- ୨ୟ ଏକକ | ମୁନିଟ୍ - ୨ ସ୍ଵାଧୀନତା ପରବର୍ତ୍ତୀ ଓଡ଼ିଆ କଥା ସାହିତ୍ୟ
- ୩ୟ ଏକକ | ମୁନିଟ୍ - ୩ : ସ୍ଵାଧୀନତା ପରବର୍ତ୍ତୀ ଓଡ଼ିଆ ନାଟକ ଓ ଏକାଙ୍କିକା
- ୪ର୍ଥ ଏକକ | ମୁନିଟ୍ - ୪ : ସ୍ଵାଧୀନତା ପରବର୍ତ୍ତୀ ଓଡ଼ିଆ ଗଦ୍ୟ ସାହିତ୍ୟ (ପ୍ରବନ୍ଧ, ଜୀବନୀ, ଆତ୍ମ ଜୀବନୀ ଓ ସମାଲୋଚନା)

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- ୧. ସବୁଜରୁ ସାଂପ୍ରତିକ - ନିତ୍ୟାନନ୍ଦ ଶତପଥୀ, ଗୁରୁ ମନ୍ଦିର, କଟକ
- ୨. ସତୁରୀକୁ ସହସ୍ରାଙ୍କୀ - ନିତ୍ୟାନନ୍ଦ ଶତପଥୀ
- ୩. ଶହେ ବର୍ଷର ଓଡ଼ିଆ କ୍ଷୁଦ୍ରଗଳ୍ପ ଏକ ତାତ୍ତ୍ଵିକ ବିଶ୍ଳେଷଣ - କବିତା ବାରିକ, ବିଦ୍ୟାପୁରୀ, କଟକ
- ୪. ଉପନ୍ୟାସ ସାହିତ୍ୟର ପରିଚୟ - ସଂକଳନ - ପଠାଣି ପଟ୍ଟନାୟକ ଓ ଭୋଳାନାଥ ରାଉତ (୧ମ ଓ ୨ୟ ଭାଗ) ଓଡ଼ିଶା ବୁକ୍ ଷ୍ଟୋର, କଟକ
- ୫. ଓଡ଼ିଆ କ୍ଷୁଦ୍ର ଗଳ୍ପର ଇତିବୃତ୍ତ - ବୈଷ୍ଣବ ଚରଣ ସାମଲ, ବୁକ୍ସ ଆଣ୍ଡ୍ ବୁକ୍ସ, କଟକ
- ୬. ସ୍ଵାଧୀନତା ପରବର୍ତ୍ତୀ ଓଡ଼ିଆ ସାହିତ୍ୟର ଭୂମି ଓ ଭୂମିକା- ସଂବୈଷ୍ଣବ ଚରଣ ସାମଲ, ଓଡ଼ିଶା ବୁକ୍ ଷ୍ଟୋର, କଟକ
- ୭. ଓଡ଼ିଆ ନାଟକର ଉତ୍ତର ଆଧୁନିକ ପର୍ବ - ହେମନ୍ତ କୁମାର ଦାସ, ବିଦ୍ୟାପୁରୀ, କଟକ
- ୮. ସ୍ଵାଧୀନ ଓଡ଼ିଆ ନାଟକ ନାରାୟଣ ସାହୁ, ଓ. ରା. ପା. ପ୍ର. ଓ ପ୍ରକାଶନ ସଂସ୍ଥା, ଭୁବନେଶ୍ଵର
- ୯. ଓଡ଼ିଆ ନାଟ୍ୟସାହିତ୍ୟ - ସର୍ବେଶ୍ଵର ଦାସ, ଓ. ରା. ପା. ପ୍ର. ଓ ପ୍ରକାଶନ ସଂସ୍ଥା, ଭୁବନେଶ୍ଵର
- ୧୦. ଓଡ଼ିଆ ନାଟକର ଉତ୍ସବ ଓ ବିକାଶ - ରତ୍ନାକର ଚଇନି,
- ୧୧. ଓଡ଼ିଆ ଐତିହାସିକ ନାଟକର ମୂଳସୂତ୍ର - ନୀଳାଦ୍ରି ଭୂଷଣ ହରିଚନ୍ଦନ
- ୧୨. ନାଟକର ବ୍ୟାପ୍ତି ଓ ଦୀପ୍ତି - ସଂଘମିତ୍ରା ମିଶ୍ର, ଅଗ୍ରଦୂତ, କଟକ
- ୧୩. ନାଟ୍ୟସୃଷ୍ଟି ଓ ନାଟ୍ୟଦୃଷ୍ଟି - ବିଷ୍ଣୁପ୍ରିୟା ଓତା, ଶିଶୁକଲମ, ଭୁବନେଶ୍ଵର
- ୧୪. ଓଡ଼ିଆ ସାହିତ୍ୟର ଇତିହାସ - ବାଉରୀ ବନ୍ଧୁ କର, ଫ୍ରେଣ୍ଡସ୍ ପବ୍ଲିଶର୍ସ, କଟକ
- ୧୫. ଓଡ଼ିଆ ଚରିତ ସାହିତ୍ୟ - ଲାବଣ୍ୟ ନାୟକ
- ୧୬. ଓଡ଼ିଆ ସମାଲୋଚନା ସାହିତ୍ୟ - ଅସିତ କବି

ତୃତୀୟ ପର୍ଯ୍ୟାୟ (Semester – III)

ପ୍ରଧାନ ପାଠ୍ୟାଂଶ - ୫ (Core Course - 5) : ଓଡ଼ିଆ ଭାଷା ଓ ଲିପିର ଐତିହାସିକ ବିକାଶକ୍ରମ ପଞ୍ଚମ ପତ୍ର :

୧ମ ଏକକ | ୟୁନିଟ୍ - ୧. ଓଡ଼ିଆ ଭାଷାର ଉଦ୍ଭବ ଓ ବିକାଶକ୍ରମ

୨ୟ ଏକକ | ୟୁନିଟ୍ - ୨ : ଓଡ଼ିଆ ଲିପିର ଐତିହାସିକ ବିବର୍ତ୍ତନ

୩ୟ ଏକକ | ୟୁନିଟ୍ - ୩ ଓଡ଼ିଆ ଅଭିଲେଖର ଭାଷା (ଶିଳାଲେଖ, ତାମ୍ରଲେଖ ଓ ପ୍ରାଚୀନ ସମ୍ଭାଷଣ)

୪ର୍ଥ ଏକକ | ୟୁନିଟ୍ - ୪: ଚର୍ଯ୍ୟାପଦ ଓ ସାରଳା ସାହିତ୍ୟର ଭାଷା

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୧. ଓଡ଼ିଆ ଭାଷାର ଉଦ୍ଭବ ଓ ବିକାଶ - ବାସୁଦେବ ସାହୁ, ଫ୍ରେଣ୍ଡ୍‌ସ୍ ପବ୍ଲିଶର୍ସ,

୨. ଓଡ଼ିଆ ଧ୍ୱନିତତ୍ତ୍ୱ ଓ ଶବ୍ଦ ସଂଭାଗ - ଧନେଶ୍ୱର ମହାପାତ୍ର, ଫ୍ରେଣ୍ଡ୍‌ସ୍ ପବ୍ଲିଶର୍ସ, କଟକ

୩. ଓଡ଼ିଆ ଭାଷା ଓ ଲିପିର କ୍ରମବିକାଶ - କୁଞ୍ଜ ବିହାରୀ ତ୍ରିପାଠୀ, ଓ.ରା.ପା.ପ୍ର. ଓ ପ୍ରକାଶନ ସଂସ୍ଥା, ଭୁବନେଶ୍ୱର

୪. ଓଡ଼ିଆ ଭାଷାତତ୍ତ୍ୱ ରୂପଚିତ୍ର, ନଟବର ଶତପଥୀ, ବିଜୟିନୀ ପବ୍ଲିକେଶନ, କଟକ

୫. ଧ୍ୱନିବିଜ୍ଞାନ, ଗୋଲୋକ ବିହାରୀ ଧଳ, ଓ. ରା, ପା, ପ୍ର. ଓ ପ୍ରକାଶନ ସଂସ୍ଥା, ଭୁବନେଶ୍ୱର

ପ୍ରଧାନ ପାଠ୍ୟାଂଶ - ୬ (Core Course - 6) : ଭାଷାର ସଂଜ୍ଞା ସ୍ୱରୂପ, ଓଡ଼ିଆ ଭାଷାର ବୈଶିଷ୍ଟ୍ୟ ଓ ବିବିଧତା ସ୍ପଷ୍ଟ ପତ୍ର

୧ମ ଏକକ/ୟୁନିଟ୍ - ୧ : ଭାଷାର ସଂଜ୍ଞା, ସ୍ୱରୂପ ଓ ପ୍ରକାରଭେଦ

୨ୟ ଏକକ/ୟୁନିଟ୍ - ୨: ଭାଷା ଉତ୍ପତ୍ତି ସମ୍ପର୍କୀୟ ବିଭିନ୍ନ ସିଦ୍ଧାନ୍ତ

୩ୟ ଏକକ/ୟୁନିଟ୍ - ୩ : ଓଡ଼ିଆ ଭାଷାର ଆଞ୍ଚଳିକ ରୂପ

୪ର୍ଥ ଏକକ/ୟୁନିଟ୍ - ୪ : ଓଡ଼ିଆ ଭାଷା ଉପରେ ବିଭିନ୍ନ ଭାଷାର ପ୍ରଭାବ (ଦ୍ରାବିଡ଼, ଅଷ୍ଟ୍ରିକ ଯାବନିକ ଓ ଇଂରାଜୀ)

ସହାୟକ ଗ୍ରନ୍ଥସୂଚୀ

୧. ଭାଷାବିଜ୍ଞାନର ରୂପରେଖ - ବାସୁଦେବ ସାହୁ, ଫ୍ରେଣ୍ଡ୍‌ସ୍ ପବ୍ଲିଶର୍ସ, କଟକ

୨. ଭାଷାଶାସ୍ତ୍ର ପରିଚୟ - ଗୋଲୋକ ବିହାରୀ ଧଳ, ଓ.ରା.ପା.ପ୍ର. ଓ ପ୍ରକାଶନ ସଂସ୍ଥା, ଭୁବନେଶ୍ୱର

୩. ଓଡ଼ିଆ ଭାଷାର ସୃଷ୍ଟି ଓ ବିକାଶ - ଉପେନ୍ଦ୍ର ପ୍ରସାଦ ଦଳାଇ, ଏ.କେ.ମିଶ୍ର ପବ୍ଲିଶର୍ସ, କଟକ

୪. ଓଡ଼ିଆ ଭାଷାର ଉଦ୍ଭବ ଓ ବିକାଶ - ବାସୁଦେବ ସାହୁ, ଫ୍ରେଣ୍ଡ୍‌ସ୍ ପବ୍ଲିଶର୍ସ, କଟକ

୫. ଭାଷା ଭାବନା, ସଂ. ବିଜୟଲକ୍ଷ୍ମୀ ମହାନ୍ତି, ବିଦ୍ୟାପ୍ରକାଶନୀ, ଭୁବନେଶ୍ୱର

୬. ଓଡ଼ିଆ ଭାଷା ଓ ଭାଷା ବିଜ୍ଞାନ - ଦେବୀ ପ୍ରସନ୍ନ ପଟ୍ଟନାୟକ, ଗ୍ରନ୍ଥମନ୍ଦିର, କଟକ

**ପ୍ରଧାନ ପାଠ୍ୟାଂଶ - ୭ (Core Course - 7) : ଓଡ଼ିଆ ବ୍ୟାବହାରିକ ବ୍ୟାକରଣ
୭ମ ପଢ଼**

୧ମ ଏକକ/ୟୁନିଟ୍ - ୧ : ଓଡ଼ିଆ ବର୍ଣ୍ଣ ବିଚାର, ବାକ୍ୟର ଗଠନ ଗୀତି ଓ ପ୍ରକାରଭେଦ ।

୨ୟ ଏକକ/ୟୁନିଟ୍ - ୨ : କାରକ, ବିଭକ୍ତି, କୃଦନ୍ତ ଓ ତଦ୍ଦିଗ

୩ୟ ଏକକ/ୟୁନିଟ୍ - ୩ : ଉପସର୍ଗ, ସନ୍ଧି ଓ ସମାସ

୪ର୍ଥ ଏକକ | ୟୁନିଟ୍ - ୪ : ଓଡ଼ିଆ ଶବ୍ଦସମ୍ଭାର

ସହାୟକ ଗ୍ରନ୍ଥସୂଚୀ

୧. ସର୍ବସାର ବ୍ୟାକରଣ - ନାରାୟଣ ମହାପାତ୍ର ଓ ଶ୍ରୀଧର ଦାସ, ନିୟୁତ୍ତ ଷ୍ଟୁଡେଣ୍ଟ୍ ଷ୍ଟୋର, କଟକ

୨. ଆଧୁନିକ ଓଡ଼ିଆ ବ୍ୟାକରଣ - ଧନେଶ୍ୱର ମହାପାତ୍ର, କିତାବ ମହଲ, କଟକ

୩. ବ୍ୟାବହାରିକ ଓଡ଼ିଆ ବ୍ୟାକରଣ, ବିଜୟ ପ୍ରସାଦ ମହାପାତ୍ର, ବିଦ୍ୟାପୁରୀ, କଟକ

୪. ଓଡ଼ିଆ ଭାଷା ଚର୍ଚ୍ଚାର ପରଂପରା, ପ୍ରଫେସର ଗଗନେନ୍ଦ୍ର ନାଥ ଦାସ, ଓଡ଼ିଆ ଗବେଷଣା ପରିଷଦ, କଟକ

ଚତୁର୍ଥ ପର୍ଯ୍ୟାୟ (Semester – ଆଇV)

ପ୍ରଧାନ ପାଠ୍ୟାଂଶ – ୮ (Core Course - 8) : (ଓଡ଼ିଆ ଲୋକସଂସ୍କୃତି ଓ ଲୋକସାହିତ୍ୟ)

ଅଷ୍ଟମ ପଢ଼

୧ମ ଏକକ/ୟୁନିଟ୍ - ୧ : ଲୋକ ସଂସ୍କୃତି ଓ ଲୋକସାହିତ୍ୟର ସଂଜ୍ଞା, ସ୍ୱରୂପ ଓ ପ୍ରକାରଭେଦ)

୨ୟ ଏକକ/ୟୁନିଟ୍ - ୨ ଓଡ଼ିଆ ଲୋକଗୀତର ସ୍ୱରୂପ, ପ୍ରକାରଭେଦ ଓ ବିଭିନ୍ନ ଦିଗ

୩ୟ ଏକକ/ୟୁନିଟ୍ - ୩ : ଓଡ଼ିଆ ଲୋକକାହାଣୀର ସ୍ୱରୂପ ଓ ପ୍ରକାରଭେଦ

୪ର୍ଥ ଏକକ/ୟୁନିଟ୍ - ୪: ଓଡ଼ିଆ ଲୋକନାଟକର ସ୍ୱରୂପ ଓ ପ୍ରକାରଭେଦ (ପାଲା, ଦାସକାଠିଆ,

ଦଣ୍ଡନାଟ, ଛଉନାଟ, ଲୀଳା, ଦଧି, ଡାଲଖାଇ ଓ କରମା)

ସହାୟକ ଗ୍ରନ୍ଥସୂଚୀ

୧. ଲୋକଧାରା, ଲୋକସଂସ୍କୃତି ଓ ଲୋକସାହିତ୍ୟ - କୁମୁଦ ରଞ୍ଜନ ପାଣିଗ୍ରାହୀ, ସୁଖଦୁଖ ପବ୍ଲିକେଶନ,
ସମ୍ବଲପୁର

୨. ଲୋକସଂସ୍କୃତି ଓ ଲୋକ ସାହିତ୍ୟ - କୃଷ୍ଣଚନ୍ଦ୍ର ପ୍ରଧାନ, ବିଦ୍ୟାପୁରୀ, କଟକ

୩. ଲୋକସାହିତ୍ୟ ତତ୍ତ୍ୱ- ଶ୍ୟାମ ସୁନ୍ଦର ମହାପାତ୍ର, ଓଡ଼ିଶା ବୁକ୍ ଷ୍ଟୋର, କଟକ

୪. ଓଡ଼ିଆ ଲୋକଗୀତି ସଂଚୟନ - କୁଞ୍ଜବିହାରୀ ଦାଶ, ବିଶ୍ୱ ଭାରତୀ ପ୍ରକାଶନ

୫. ପଲ୍ଲୀଗୀତି ସଂଗ୍ରହନ - କୁଞ୍ଜବିହାରୀ ଦାଶ, (୧ମ- ୨ୟ ଓ ୩ୟ ଭାଗ)

୬. ଲୋକସଂସ୍କୃତି- ଲୋକସାହିତ୍ୟ - ନାରାୟଣ ସାହୁ, ଚିନ୍ତୟ ପ୍ରକାଶନ, କଟକ

୭. ଓଡ଼ିଶାର ଦଣ୍ଡ ନାଟ - ସନ୍ତୋଷ କୁମାର ଶତପଥୀ, କେଦାର ପ୍ରିଣ୍ଟିଙ୍ଗ୍ ପ୍ରେସ୍, ଭୁବନେଶ୍ୱର

୮. ଓଡ଼ିଆ ଲୋକନାଟ୍ୟ - କଲଚରାଲ ଏକାଡେମୀ, ରାଉରକେଲା

୯. ପଶ୍ଚିମ ଓଡ଼ିଶାର ଲୋକସଂସ୍କୃତି, ଡ. ସୁଶୀଳ କୁମାର ବାଗ୍

୧୦. ପଶ୍ଚିମ ଓଡ଼ିଶାର ଲୋକଗୀତ, ଦ୍ୱାରିକାନାଥ ନାୟକ, ଓଡ଼ିଶା ବୁକ୍ ଷ୍ଟୋର, କଟକ

- ୧୧. ଲୋକବିଶ୍ୱାସ ଲୋକାଚାର, ଡ. ସଦାନନ୍ଦ ନାୟକ, ବିଜୟ ବୁକ୍ ଷୋର, ବ୍ରହ୍ମପୁର
- ୧୨. ଉତ୍କଳ ଗାଉଁଲି ଗୀତ, ଚକ୍ରଧର ମହାପାତ୍ର, ଫ୍ରେଣ୍ଡସ୍ ପବ୍ଲିଶର୍ସ, କଟକ
- ୧୩. ଉତ୍କଳ ଗ୍ରାମ୍ୟ ଗୀତି – ଚଳୁଧର ମହାପାତ୍ର, ଓଡ଼ିଆ ସାହିତ୍ୟ ଏକାଡେମୀ

ପ୍ରଧାନ ପାଠ୍ୟାଂଶ - ୯ (Core Course - 9) : ସାହିତ୍ୟ ତତ୍ତ୍ୱ (ପ୍ରାଚ୍ୟ ଓ ପାଶ୍ଚାତ୍ୟ) ୯ମ ପତ୍ର

- ୧ମ ଏକକ | ୟୁନିଟ୍ – ୧. ରସ ଓ ଧ୍ୱନି
- ୨ୟ ଏକକ | ୟୁନିଟ୍ – ୨; ରୀତି, ବକ୍ରୋକ୍ତି (ଓ ଅଳଂକାର
- ୩ୟ ଏକକ | ୟୁନିଟ୍ – ୩ ; କ୍ଲାସିସିଜିମ୍, ରୋମାଣ୍ଟିସିଜିମ୍
- ୪ର୍ଥ ଏକକ | ୟୁନିଟ୍ – ୪ ପ୍ରତୀକବାଦ, ଚିତ୍ରକଳ୍ପ

ସହାୟକ ଗ୍ରନ୍ଥସୂଚୀ

- ୧. ଅଳଙ୍କାର ପ୍ରସଙ୍ଗ - ଗୋବିନ୍ଦ ଚନ୍ଦ୍ର ଉଦ୍‌ଗାତା, ଫ୍ରେଣ୍ଡସ୍ ପବ୍ଲିଶର୍ସ, କଟକ
- ୨. ଭାରତୀୟ ସାହିତ୍ୟ ତତ୍ତ୍ୱ- ବନମାଳୀ ରଥ.ଓ.ରା.ପା.ପ୍ର. ଓ ପ୍ରକାଶନ ସଂସ୍ଥା, ଭୁବନେଶ୍ୱର
- ୩. ଓଡ଼ିଆ କାବ୍ୟ କୌଶଳ – ସୁଦର୍ଶନ ଆଚାର୍ଯ୍ୟ, ଫ୍ରେଣ୍ଡସ୍ ପବ୍ଲିଶର୍ସ, କଟକ
- ୪. ପାଶ୍ଚାତ୍ୟ ସାହିତ୍ୟ ଓ ସମୀକ୍ଷା ତତ୍ତ୍ୱ – କୃଷ୍ଣଚନ୍ଦ୍ର ପ୍ରଧାନ, ପ୍ରାଚୀ ସାହିତ୍ୟ ପ୍ରତିଷ୍ଠାନ, କଟକ
- ୫. ସାହିତ୍ୟର ସୂଚୀପତ୍ର, ବିଭୂତି ପଟ୍ଟନାୟକ, ଫ୍ରେଣ୍ଡସ୍ ପବ୍ଲିଶର୍ସ, କଟକ

ପ୍ରଧାନ ପାଠ୍ୟାଂଶ - ୧୦ (Core Course - 10) : ଓଡ଼ିଆ କବିତା ପ୍ରାଚୀନରୁ ଆଧୁନିକ ୧୦ମ ପତ୍ର

- ୧ମ ଏକକ | ୟୁନିଟ୍ – ୧ : ସାରଳା ମହାଭାରତ (ଦୁର୍ଯ୍ୟୋଧନଙ୍କ ରକ୍ତନଦୀ ସନ୍ତରଣ)
- ୨ୟ ଏକକ | ୟୁନିଟ୍ – ୨: ଭାଗବତ (୨୪ ଗୁରୁ ପ୍ରସଙ୍ଗ) - ଜଗନ୍ନାଥ ଦାସ
- ୩ୟ ଏକକ | ୟୁନିଟ୍ – ୩ : ଦୀନକୃଷ୍ଣ ଦାସଙ୍କ ରସକଲ୍ଲୋଳ(୧ମ ଛାନ୍ଦ) ଓ ଉପେନ୍ଦ୍ର ଭଞ୍ଜଙ୍କ କୋଟିବ୍ରହ୍ମାଣ୍ଡ ସୁନ୍ଦରୀ (୧ମ ଛାନ୍ଦ)
- ୪ର୍ଥ ଏକକ | ୟୁନିଟ୍ – ୪ : ଆଧୁନିକ କବିତା ମହାଯାତ୍ରା (ସପ୍ତମ ସର୍ଗ)- ଅମର୍ଷୀଙ୍କ ଉଦ୍‌ବୋଧନ (ରାଧାନାଥ ରାୟ) ମଙ୍ଗଳେ ଅଇଲା ଭଷା – ଗଙ୍ଗାଧର ମେହେର ବନ୍ଦୀର ସାକ୍ଷ୍ୟ ଅନୁଚିତ୍ରା - ଗୋପବନ୍ଧୁ ଦାସ ପ୍ରତିମା ନାୟକ - ସଚ୍ଚିଦାନନ୍ଦ ରାଉତରାୟ

ସହାୟକ ଗ୍ରନ୍ଥସୂଚୀ

- ୧. ସାରଳା ମହାଭାରତ (ଗଦା ପର୍ବ-ସାରଳା ଦାସ)

୨. ଅବଧୂତ ଓ ଯଦୁରାଜା ସମ୍ବାଦ, ବୈଷ୍ଣବ ଚରଣ ସାମଲ, ଫ୍ରେଣ୍ଡସ ପବ୍ଲିଶର୍ସ, କଟକ
୩. କହେ କୃଷ୍ଣଦାସ କବି – କୃଷ୍ଣଚରଣ ସାହୁ, ବିଦ୍ୟାପୁରୀ, କଟକ
୪. ରସକଲ୍ଲୋଳ, ସଂପାଦନା – ଦେବେନ୍ଦ୍ର ମହାନ୍ତି
୫. ଦୁର୍ଲଭ ଦାନୀକୃଷ୍ଣ - ଡ. ଜ୍ୟୋତିରଞ୍ଜନ ସାମଲ, ବିଜୟିନୀ ପବ୍ଲିକେସନ୍, କଟକ
୬. ତପସ୍ବିନୀ ଓ ମେହେର ସାହିତ୍ୟ - ଗୌରୀ କୁମାର ବ୍ରହ୍ମା

ପଞ୍ଚମ ପର୍ଯ୍ୟାୟ (Semester – V)

ପ୍ରଧାନ ପାଠ୍ୟାଂଶ - ୧୧ (Core Course - 11) : ଓଡ଼ିଆ ନାଟକ ଓ ଏକାଙ୍କିକା

୧୧ଶ ପଢ଼

- ୧ମ ଏକକ/ୟୁନିଟ୍ – ୧: ରକ୍ତମାଟି - କାଳୀଚରଣ ପଟ୍ଟନାୟକ
- ୨ୟ ଏକକ/ୟୁନିଟ୍ – ୨ ନନ୍ଦିକା କେଶରୀ - ମନୋରଞ୍ଜନ ଦାସ କିମ୍ବା ତଟନିରଞ୍ଜନା – ବିଜୟ ମିଶ୍ର
- ୩ୟ ଏକକ/ୟୁନିଟ୍ – ୩ : କୋଲୁଆ – ବିଜୟ କୁମାର ଶତପଥୀ, ଅଗ୍ରଦୂତ, କଟକ କିମ୍ବା ଭୂଷା-ମଙ୍ଗଳୁଚରଣ ବିଶ୍ୱାଳ
- ୪ର୍ଥ ଏକକ/ୟୁନିଟ୍ – ୪ ଏକାଙ୍କିକା- ସ୍ୱମୃତି ବିଭ୍ରାଟ - ପ୍ରାଣବନ୍ଧୁ କର ଓ ଛଦ୍ମବେଶୀ - ବିଶ୍ୱଜିତ ଦାସ
- ୫ମ ଏକକ/ୟୁନିଟ୍ – ୫ ପ୍ରକଳ୍ପ ପ୍ରସ୍ତୁତି

ସହାୟକ ଗ୍ରନ୍ଥସୂଚୀ

୧. ରକ୍ତମାଟି - କାଳୀଚରଣ ପଟ୍ଟନାୟକ
୨. ନନ୍ଦିକା କେଶରୀ-ମନୋରଞ୍ଜନ ଦାସ କିମ୍ବା ତଟନିରଞ୍ଜନା – ବିଜୟ ମିଶ୍ର
୩. କୋଲୁଆ – ବିଜୟ କୁମାର ଶତପଥୀ, ଅଗ୍ରଦୂତ, କଟକ କିମ୍ବା ଭୂଷା- ମଙ୍ଗଳୁଚରଣ ବିଶ୍ୱାଳ
୪. ଅଶ୍ରୁ ନୁହେଁ ଅନଳ, ହେମନ୍ତ କୁମାର ଦାସ
୫. ସ୍ୱାଧୀନତାର ଓଡ଼ିଆ ନାଟକର ମନସ୍ତାତ୍ତ୍ୱିକ ବିଶ୍ଳେଷଣ, ରଶ୍ମିତା ରାଉତରାୟ, ବିଜୟିନୀ ପବ୍ଲିକେସନ୍, କଟକ
୬. ସାହିତ୍ୟ ସାଧକ ମଙ୍ଗଳୁଚରଣ ବିଶ୍ୱାଳ – ଗୌରିଦାସ ପ୍ରଧାନ (ଚତୁର୍ଥ ପଢ଼ ନିମନ୍ତେ ପ୍ରଦତ୍ତ ସହାୟକ ପୁସ୍ତକଗୁଡ଼ିକ ଅନୁସରଣୀୟ।)

ପ୍ରଧାନ ପାଠ୍ୟାଂଶ - ୧୨ (Core Course - 12) : (ଓଡ଼ିଆ କଥା ସାହିତ୍ୟ)

୧୨ଶ ପଢ଼

- ୧ମ ଏକକ/ୟୁନିଟ୍ – ୧ : ଓଡ଼ିଆ କଥାସାହିତ୍ୟର ବିକାଶକ୍ରମ
- ୨ୟ ଏକକ/ୟୁନିଟ୍ – ୨ ମାଣ ଆଠଗୁଣ୍ଠ - ଫକୀର ମୋହନ ସେନାପତି
- ୩ୟ ଏକକ/ୟୁନିଟ୍ – ୩ ଦାନାପାଣି - ଗୋପୀନାଥ ମହାନ୍ତି କିମ୍ବା ନୟନତାରା - ଦୟାନିଧି ମିଶ୍ର
- ୪ର୍ଥ ଏକକ । ୟୁନିଟ୍ - ୪ ଗଳ୍ପ ସାହିତ୍ୟ

ମାଂସର ବିଳାପ - କାଳିନ୍ଦୀ ଚରଣ ପାଣିଗ୍ରାହୀ
ମଧୁବନର ମେଘର - ମନୋଜ ଦାସ

୫ମ ଏକକ | ୟୁନିଟ୍ - ୫ ପ୍ରକଳ୍ପ ପ୍ରସ୍ତୁତି

ସହାୟକ ଗ୍ରନ୍ଥସୂଚୀ

- ୧. ଓଡ଼ିଆ ଉପନ୍ୟାସ ସାହିତ୍ୟର ପରିଚୟ, ସଂପାଦି ପଟ୍ଟନାୟକ ଓ ଭୋଳାନାଥ ରାଉତ, ଓଡ଼ିଶା ବୁକ୍ ଷ୍ଟୋର କଟକ
- ୨. ଓଡ଼ିଆ କ୍ଷୁଦ୍ରଗଳ୍ପର ଉଦ୍ଦେଶ୍ୟ ଓ ଉତ୍ତରଣ - ବୈଷ୍ଣବ ଚରଣ ସାମଲ, ପ୍ରେସ୍‌ବ୍ ପବ୍ଲିଶର୍ସ, କଟକ
- ୩. ଛ ମାଣ ଆଠଗୁଣ୍ଠ - ଫକୀର ମୋହନ ସେନାପତି
- ୪. ଛ ମାଣ ଆଠଗୁଣ୍ଠ ଭିନ୍ନ ଦୃଷ୍ଟି ଭିନ୍ନ ବ୍ୟାଖ୍ୟା, ପଞ୍ଚାନନ ମିଶ୍ର, ବିଜୟିନୀ ପବ୍ଲିକେସନ, କଟକ
- ୧. ଦାନାପାଣି - ଗୋପୀନାଥ ମହାନ୍ତି କିମ୍ବା ନୟନତାରା - ଦୟାନିଧି ମିଶ୍ର
- ୨. କଥାଶିଳ୍ପୀ ମନୋଜ ଦାସ - ଶତ୍ରୁଘ୍ନ ପାଣ୍ଡବ, ପ୍ରେସ୍‌ବ୍ ପବ୍ଲିଶର୍ସ, କଟକ
- ୩. ମନସ୍ୱି ମନୋଜ - ମଣିନ୍ଦ୍ର କୁମାର ମେହେର, ପ୍ରେସ୍‌ବ୍ ପବ୍ଲିଶର୍ସ, କଟକ
- ୪. ଓଡ଼ିଆ ଉପନ୍ୟାସର ସମାଜତାତ୍ତ୍ୱିକ ଆଲୋଚନା - କଲ୍ୟାଣ ପଟ୍ଟନାୟକ, ବିଦ୍ୟାପୁରୀ, କଟକ

ଷଷ୍ଠ ପର୍ଯ୍ୟାୟ (Semester – VI)

ପ୍ରଧାନ ପାଠ୍ୟାଂଶ - ୧୩ (Core Course - 13) : ଓଡ଼ିଆ ଗଦ୍ୟ ସାହିତ୍ୟ

୧ମ ଏକକ

୧ମ ଏକକ/ ୟୁନିଟ୍ - ୧: ଆତ୍ମ ଜୀବନୀ, ଭ୍ରମଣ କାହାଣୀ ଓ ସମାଲୋଚନା ଚତୁ (ସଂଜ୍ଞା, ସ୍ୱରୂପ ଓ ପ୍ରକାରଭେଦ)

୨ୟ ଏକକ | ୟୁନିଟ୍ - ୨: ମୋ ପୁଟା ତଳାର କାହାଣୀ - ଫତୁରାନନ୍ଦ

୩ୟ ଏକକ | ୟୁନିଟ୍ - ୩: ପଶ୍ଚିମ ଆଫ୍ରିକାରେ ଓଡ଼ିଆ ଢେଙ୍କି - ଭୁବନେଶ୍ୱର ବେହେରା

୪ର୍ଥ ଏକକ | ୟୁନିଟ୍ - ୪: ପ୍ରବନ୍ଧ - ଭାଷା ଓ ଜାତୀୟତା - ଗୋପବନ୍ଧୁ ଦାସ

ମୁଁ ସତ୍ୟଧର୍ମା କହୁଛି - ଚନ୍ଦ୍ରଶେଖର ରଥ

ବିବେକାନନ୍ଦ ଏକ ଗୁହାଣୁକ୍ତିର ପ୍ରୟାସ - ଚିତ୍ତରଞ୍ଜନ ଦାସ

୫ମ ଏକକ | ୟୁନିଟ୍ - ୫: ପ୍ରକଳ୍ପ ପ୍ରସ୍ତୁତି

ସହାୟକ ଗ୍ରନ୍ଥସୂଚୀ

- ୧. ମୋ ପୁଟା ତଳାର କାହାଣୀ - ଫତୁରାନନ୍ଦ
- ୨. ପଶ୍ଚିମ ଆଫ୍ରିକାରେ ଓଡ଼ିଆ ଢେଙ୍କି - ଭୁବନେଶ୍ୱର ବେହେରା
- ୩. ଜୀବନୀ ସାହିତ୍ୟ ଏକ ଅଧ୍ୟୟନ - ପାଣି ପଟ୍ଟନାୟକ, ଓଡ଼ିଶା ପା.ପୁ.ପ୍ର.ଓ.ପ୍ର.ସଂଜ୍ଞା, ଭୁବନେଶ୍ୱର
- ୪. ସମାଲୋଚନାର ଦିଗଦିଗନ୍ତ ଖଗେଶ୍ୱର ମହାପାତ୍ର, ପ୍ରେସ୍‌ବ୍ ପବ୍ଲିଶର୍ସ, କଟକ
- ୫. ସାହିତ୍ୟ ଓ ସମାଲୋଚନା - କୁଞ୍ଜବିହାରୀ ଦାଶ, ଓଡ଼ିଶା ବୁକ୍ ଷ୍ଟୋର, କଟକ

ପ୍ରଧାନ ପାଠ୍ୟାଂଶ - ୧୪ (Core Course - 14) : ଓଡ଼ିଆ ଭାଷାର ବ୍ୟାବହାରିକ ପ୍ରୟୋଗ

୧୪ଶ ପତ୍ର ୧ମ ଏକକ | ୟୁନିଟ୍ - ୧ ଭାଷଣ କଳା, ଦଳଗତ ଆଲୋଚନା ଓ ସାକ୍ଷାତକାର

୨ୟ ଏକକ | ୟୁନିଟ୍ - ୨ : ସମ୍ବାଦ ପ୍ରସ୍ତୁତି, ଫିଚର ରଚନା ଓ ବିଜ୍ଞାପନ ପ୍ରସ୍ତୁତି

୩ୟ ଏକକ | ୟୁନିଟ୍ - ୩ କାର୍ଯ୍ୟାଳୟରେ ଓଡ଼ିଆ ଲିଖନ ବିଧି

(ନଥି ପ୍ରସ୍ତୁତି, ଅନୁବିଧି, ଚିତ୍ରଣା, ପ୍ରସ୍ତାବ, ଅନୁମୋଦନ, ଚିଠା ପ୍ରସ୍ତୁତି, ଅଧିସୂଚନା, ବିଜ୍ଞପ୍ତି, ଘୋଷଣା ଲିଖନ, ପତ୍ରଲିଖନ (ବ୍ୟକ୍ତିଗତ, ବ୍ୟାବସାୟିକ ଓ ସମ୍ପାଦକଙ୍କୁ ପତ୍ର)

୪ର୍ଥ ଏକକ | ୟୁନିଟ୍ - ୪ ଓଡ଼ିଆ ଭାଷାର କମ୍ପ୍ୟୁଟରୀକରଣ, ସଫ୍ଟୱେୟାର ଏବଂ ହାର୍ଡୱେୟାର, ଓଡ଼ିଆ

ଫଣ୍ଟସ୍.କମ-ବୋର୍ଡ, ୱାର୍ଡ ପ୍ରୋସେସିଂ, ବନାନ ଓ ବ୍ୟାକରଣଯାଞ୍ଚକ ପ୍ରକ୍ରିୟା, ଓଡ଼ିଆରେ ଇଣ୍ଟରନେଟର ବ୍ୟବହାର, ଓଡ଼ିଆ ସାମାଜିକ ୱେବସାଇଟ୍

୫ମ ଏକକ | ୟୁନିଟ୍ -- ୫. ପ୍ରକଳ୍ପ ପ୍ରସ୍ତୁତି

ସହାୟକ ଗ୍ରନ୍ଥସୂଚୀ

- ୧. ଯୋଗାଯୋଗମୂଳକ ମାତୃଭାଷା - ବିରଞ୍ଚି ନାରାୟଣ ସାମଲ, ସତ୍ୟନାରାୟଣ ବୁକ୍ ଷ୍ଟୋର, କଟକ
- ୨. ଭାଷଣ କଳା ଓ ଅନ୍ୟାନ୍ୟ ପ୍ରସଙ୍ଗ - କୃଷ୍ଣଚନ୍ଦ୍ର ପ୍ରଧାନ, ସତ୍ୟନାରାୟଣ ବୁକ୍ ଷ୍ଟୋର, କଟକ
- ୩. ସମ୍ବାଦପତ୍ର ଓ ଗଣମାଧ୍ୟମ - ମୃଣାଳ ଚାଟ୍ଟାର୍ଜୀ, ଶେଫାଳା କମ୍ପ୍ୟୁନିକେଶନ, ସଞ୍ଚାରମାର୍ଗ, ଢେଙ୍କାନାଳ
- ୪. ପ୍ରାୟୋଗିକ ଭାଷା ଓ ବିଜ୍ଞାପନର ଦିଗବିଦିଗ - କେ.ବି. ପଟ୍ଟନାୟକ, ଓ.ରା.ପା.ପ୍ର.ଓ.ପ୍ରକାଶନ ସଂସ୍ଥା, ଭୁବନେଶ୍ୱର
- ୫. ସଂଯୋଗ ଅନୁବିଧି-ସଂକ୍ଷେପ କୁମାର ତ୍ରିପାଠୀ, ନାଳନ୍ଦା, କଟକ
- ୬. କାର୍ଯ୍ୟାଳୟ ନଥି - ଓଡ଼ିଆ ଭାଷା ପ୍ରତିଷ୍ଠାନ, ଭୁବନେଶ୍ୱର

- ୭. ଓଡ଼ିଆରେ କମ୍ପ୍ୟୁଟର ଶିକ୍ଷା - ରୁଦ୍ରନାରାୟଣ ମହାପାତ୍ର, ସତ୍ୟନାରାୟଣ ବୁକ୍ ଷ୍ଟୋର, କଟକ
- ୮. ଓଡ଼ିଆ ଭାଷାରେ କମ୍ପ୍ୟୁଟରର ପ୍ରୟୋଗ - ସୁଧିର ଚନ୍ଦ୍ର ମହାନ୍ତି, ଏ.କେ. ମିଶ୍ର ପବ୍ଲିକେଶନ, ଭୁବନେଶ୍ୱର
- ୯. କମ୍ପ୍ୟୁଟରରେ ଓଡ଼ିଆ ଭାଷାର ବ୍ୟବହାର ଓ ପ୍ରୟୋଗ, ରୁଦ୍ରପ୍ରସାଦ ମିଶ୍ର, ଆଜିଅନ୍ତା ପବ୍ଲିଶର୍ସ, ଜଗତସିଂହପୁର

ଶୃଙ୍ଖଳାକୈନ୍ଦ୍ରିକ ଇଚ୍ଛାଧୀନ ପାଠ – ଓଡ଼ିଆ

Discipline Specific Elective - Odia DSE

ସାଧାରଣ (Pass) ଶ୍ରେଣୀ ପାଇଁ ଉଦ୍ଦିଷ୍ଟ

୫ମ ଓ ୬ଷ୍ଠ ପର୍ଯ୍ୟାୟ (Semester-V, II)

୫ମ ପର୍ଯ୍ୟାୟ (Semester – Vi- ପ୍ରଥମ ଓ ଦ୍ୱିତୀୟ ପଢ଼)

୧୦୦+ ୧୦୦ = ୨୦୦ ନମ୍ବର

୬ଷ୍ଠ ପର୍ଯ୍ୟାୟ (Semester-VI) ତୃତୀୟ ପଢ଼ ଓ ଚତୁର୍ଥ ପଢ଼

୧୦୦+୧୦୦ = ୨୦୦ ନମ୍ବର

(୨୦ ନମ୍ବର ଅନ୍ତଃ ପରୀକ୍ଷା ଓ ୮୦ ନମ୍ବର ମୁଖ୍ୟ ପରୀକ୍ଷା = ୧୦୦ ନମ୍ବର)

ଚତୁର୍ଥ ପଢ଼ – ପ୍ରକଳ୍ପ ପ୍ରସ୍ତୁତି ୧୦୦ ନମ୍ବର

(ଅନୁବାଦ ବା ସଂପାଦନା ବା ଓଡ଼ିଆ ସଂସ୍କୃତି ଉପରେ ଅନୁ୍ୟନ ୫୦ ପୃଷ୍ଠା ମଧ୍ୟରେ ନିବନ୍ଧଟି ଲେଖିବାକୁ ହେବ ।)
 (୮୦ ନମ୍ବର ପ୍ରକଳ୍ପ ଲେଖା । ୨୦ ନମ୍ବର ସାକ୍ଷାତକାର ପରୀକ୍ଷା = ୧୦୦ ନମ୍ବର)

ମୋଟ - ୪୦୦ ନମ୍ବର

ମୂଲ୍ୟାଙ୍କନ ବିଭାଜନ ପଦ୍ଧତି

- (କ) ପ୍ରତ୍ୟେକ ପାଠ୍ୟର ସବୁ ଏକକ (ୟୁନିଟ୍) ରୁ ୧୫ଟି ୨ ନମ୍ବର ବିଶିଷ୍ଟ ଅତି ସଂକ୍ଷିପ୍ତ ପ୍ରଶ୍ନ ପଢ଼ିବ ।
 ବିଦ୍ୟାର୍ଥୀଙ୍କୁ ସେଥିରୁ ଯେକୌଣସି ୧୦ ଟି ପ୍ରଶ୍ନର ଉତ୍ତର ଦେବାକୁ ହେବ । (୨x୧୦=୨୦)
- (ଖ) ପ୍ରତ୍ୟେକ ପାଠ୍ୟର ସବୁ ଏକକ (ୟୁନିଟ୍)ରୁ ଅନ୍ତତଃ ୨ଟି ଲେଖାଏଁ ମୋଟ ୮ଟି ୧୫ ନମ୍ବର ବିଶିଷ୍ଟ ଦୀର୍ଘ ପ୍ରଶ୍ନ ପଢ଼ିବ ।
 ବିଦ୍ୟାର୍ଥୀଙ୍କୁ ସେଥିରୁ ଯେକୌଣସି ୪ଟି ପ୍ରଶ୍ନର ଉତ୍ତର ଦେବାକୁ ପଢ଼ିବ । (୧୫ x ୪=୬୦)
- (ଗ) ମହାବିଦ୍ୟାଳୟ ସ୍ତରୀୟ ଅନ୍ତଃ ପର୍ଯ୍ୟାୟ ପରୀକ୍ଷା - (୨୦ ନମ୍ବର)

ମୋଟ ମୂଲ୍ୟାଙ୍କନ - ୧୦୦ ନମ୍ବର

ଭୂମିକା :

ଏହି ପାଠ୍ୟକ୍ରମଟି ବିଦ୍ୟାର୍ଥୀମାନଙ୍କୁ ଓଡ଼ିଶାର ସାମାଜିକ, ସାଂସ୍କୃତିକ ଓ ଐତିହାସିକ ବିବର୍ତ୍ତନ ବିଷୟରେ ଜ୍ଞାନ ଆହରଣ ପାଇଁ ସୁଯୋଗ ସୃଷ୍ଟିକରିବ । ଓଡ଼ିଆ ସାହିତ୍ୟରେ ସମାଜ ଓ ସଂସ୍କୃତିର ପ୍ରତିଫଳନ, ସାହିତ୍ୟର ବିବିଧତା ଏବଂ କମ୍ପ୍ୟୁଟର ଭିତ୍ତିକ ବିଦ୍ୟା ଶିକ୍ଷଣ ଦିଗକୁ ଧ୍ୟାନ ଦିଆଯାଇ ଏହା ପ୍ରସ୍ତୁତ ହୋଇଛି ।

ଏହି ପାଠ୍ୟକ୍ରମରେ ମୋଟ ୪ ଗୋଟି ପାଠ୍ୟ ବାଧ୍ୟତାମୂଳକ । ସମ୍ମାନ (Hons) ଶ୍ରେଣୀର ଛାତ୍ରଛାତ୍ରୀମାନେ ଏହି ଚାରୋଟିଯାକ ପାଠ୍ୟ ପଢ଼ିବେ । ଏଥିମଧ୍ୟରୁ ଗୋଟିଏ ପାଠ୍ୟକୁ ଆଧାର କରି ତା' ସହିତ ଅନ୍ୟ ବିଦ୍ୟାକୁ ସଂଯୋଗ କରି ଷଷ୍ଠ ପର୍ଯ୍ୟାୟ (ସେମିଷ୍ଟର-୨) ପରୀକ୍ଷା ବେଳକୁ ପ୍ରକଳ୍ପ (୫୦ ପୃଷ୍ଠା ମଧ୍ୟରେ) ପ୍ରସ୍ତୁତ କରିବେ । ପ୍ରକଳ୍ପଟି ୪ର୍ଥ ପତ୍ର ଭାବରେ ବିବେଚିତ ହେବ

ବିଶେଷ୍ୟ ଦ୍ରଷ୍ଟବ୍ୟ: ସାଧାରଣ (Pass) ଶ୍ରେଣୀର ଛାତ୍ରଛାତ୍ରୀମାନେ ପାଠ୍ୟ-୧ ରୁ ୫ ପର୍ଯ୍ୟାୟରେ DSE-IA କିମ୍ବା DSE-IIA ଭାବେ ଏବଂ ପାଠ୍ୟ-୨କୁ ଏ ପର୍ଯ୍ୟାୟରେ DSE-IB କିମ୍ବା DSE-JIB ଭାବେ ପଢ଼ିବେ ।

ସବିଶେଷ ପାଠ୍ୟକ୍ରମ

ମୋଟ ୪ ଗୋଟି ପାଠ୍ୟ

ପତ୍ର ସଂଖ୍ୟା ୧୪

ପ୍ରତ୍ୟେକ ପତ୍ର - ୧୦୦ ନମ୍ବର (୨୦ ନମ୍ବର ଅନ୍ତଃପରୀକ୍ଷା + ୮୦ ନମ୍ବର ମୁଖ୍ୟ ପରୀକ୍ଷା)

ସମୟ ନିର୍ଦ୍ଦିଷ୍ଟ = ୨x ୪ = ୨୪

ପ୍ରତ୍ୟେକ ପତ୍ର ପାଇଁ ୪୦ଟି ପରିୟତ୍ତ, ପ୍ରତି ପରିୟତ୍ତ - ୪୫ ମିନିଟ୍

୫ମ ଓ ୬ମ ପର୍ଯ୍ୟାୟ (ସେମିଷ୍ଟର - ୦୫ ଓ ୦୬)

ପାଠ୍ୟ-୧ / Course-1 : ଓଡ଼ିଶାର ସାଂସ୍କୃତିକ ଇତିହାସ ଓ ଓଡ଼ିଆ ସାହିତ୍ୟ (Pass)

(ସମୟ ନିର୍ଦ୍ଦିଷ୍ଟ ୪+୨=୬)

୧ମ ଏକକ : ଓଡ଼ିଶାର ସଂକ୍ଷିପ୍ତ ଇତିହାସ ।

୨ୟ ଏକକ ଓଡ଼ିଶାରେ ବୌଦ୍ଧ ସଂସ୍କୃତି, ଶୈବ ସଂସ୍କୃତି ଓ ବୈଷ୍ଣବ ସଂସ୍କୃତି ।
 ୩ୟ ଏକକ : ଶ୍ରୀଜଗନ୍ନାଥ ସଂସ୍କୃତି ଓ ଆଦିବାସୀ ସଂସ୍କୃତି ।
 ୪ର୍ଥ ଏକକ ଓଡ଼ିଆ ଓଷା ବ୍ରତ ଓ ପର୍ବପର୍ବାଣି ।

ସହାୟକ ଗ୍ରନ୍ଥସୂଚୀ :

- ୧. ଓଡ଼ିଶାର ସାଂସ୍କୃତିକ ଇତିହାସ – ସଂସ୍କୃତି ବିଭାଗ, ଓଡ଼ିଶା
- ୨. ଓଡ଼ିଶାର ସାଂସ୍କୃତିକ ଇତିହାସ - ପ୍ରବୋଧ କୁମାର ମିଶ୍ର, ବିଦ୍ୟାପୁରୀ, କଟକ
- ୩. ଓଡ଼ିଆ ସାହିତ୍ୟର ସାମାଜିକ ଓ ସାଂସ୍କୃତିକ ଇତିହାସ – ଚିତ୍ତରଞ୍ଜନ ଦାସ, ଓ.ରା.ପା.ପ୍ର. ଓ ପ୍ରକାଶନ ସଂସ୍ଥା, ଭୁବନେଶ୍ୱର
- ୪. ଓଡ଼ିଶାର ଧର୍ମଧାରା - କାହ୍ନୁଚରଣ ମିଶ୍ର, ଓ.ରା.ପା.ପ୍ର. ଓ ପ୍ରକାଶନ ସଂସ୍ଥା, ଭୁବନେଶ୍ୱର
- ୫. ବୈଷ୍ଣବ ସାହିତ୍ୟ ତତ୍ତ୍ୱ - ଆଶୁତୋଷ ପଟ୍ଟନାୟକ, ଫ୍ରେଣ୍ଡ୍‌ସ୍ ପବ୍ଲିଶର୍ସ, କଟକ
- ୬. ଓଡ଼ିଆ ସାହିତ୍ୟରେ ଶୈବଧର୍ମ – କୃଷ୍ଣଚନ୍ଦ୍ର ପ୍ରଧାନ, ଫ୍ରେଣ୍ଡ୍‌ସ୍ କଟକ
- ୭. ଓଡ଼ିଆ ସାହିତ୍ୟରେ ଶ୍ରୀଜଗନ୍ନାଥ - ବାସୁଦେବ ସାହୁ, ଫ୍ରେଣ୍ଡ୍‌ସ୍ ପବ୍ଲିଶର୍ସ, କଟକ
- ୮. ଲୀଳାମୟ ନୀଳାଦ୍ରୀଶ – ସଂପାଦନା, ଭୁବନେଶ୍ୱର ଭଞ୍ଜ ଭାରତୀ (୧ମ ଭାଗ ଓ ୨ୟ ଭାଗ)
- ୯. ଓଡ଼ିଆ ବ୍ରତ ସାହିତ୍ୟ - ଅରବିନ୍ଦ ପଟ୍ଟନାୟକ, ଓଡ଼ିଶା ସାହିତ୍ୟ ଏକାଡେମୀ
- ୧୦. ଓଡ଼ିଶାର ଧର୍ମଧାରା, ଡ. ପ୍ରଦୀପ୍ତ କୁମାର ପଣ୍ଡା
- ୧୧. ଲୋକଧର୍ମ ଓ ଲୋକସାହିତ୍ୟ, ଡ. ସଦାନନ୍ଦ ନାୟକ, ବିଜୟ ବୁକ୍ ଷୋର, ବ୍ରହ୍ମପୁର

ପାଠ୍ୟ-୨ | Course – 2 ଓଡ଼ିଆ ଶିଶୁ ସାହିତ୍ୟ ଓ ବିଜ୍ଞାନଭିତ୍ତିକ ସାହିତ୍ୟ (Pass)

୧ମ ଏକକ ଓଡ଼ିଆ ଶିଶୁ ସାହିତ୍ୟର ସ୍ୱରୂପ ଓ ପ୍ରକାରଭେଦ
 ୨ୟ ଏକକ ଓଡ଼ିଆ ବିଜ୍ଞାନଭିତ୍ତିକ ସାହିତ୍ୟର ସ୍ୱରୂପ ଓ ବିକାଶଧାରା
 ୩ୟ ଏକକ: ପୃଥ୍ୱୀ ବାହାରେ ମଣିଷ - ଗୋକୁଳାନନ୍ଦ ମହାପାତ୍ର
 ୪ର୍ଥ ଏକକ ବିଚିତ୍ର ବିଶ୍ୱ - ଦେବକାନ୍ତ ମିଶ୍ର

ସହାୟକ ଗ୍ରନ୍ଥସୂଚୀ :

- ୧. ଓଡ଼ିଆ ଶିଶୁ ସାହିତ୍ୟର ଇତିବୃତ୍ତ - ମନୀନ୍ଦ୍ର ମହାନ୍ତି, ଫ୍ରେଣ୍ଡ୍‌ସ୍ ପବ୍ଲିଶର୍ସ, କଟକ
- ୨. ପୃଥ୍ୱୀ ବାହାରେ ମଣିଷ - ଗୋକୁଳାନନ୍ଦ ମହାପାତ୍ର
- ୩. ବିଚିତ୍ର ବିଶ୍ୱ - ଦେବକାନ୍ତ ମିଶ୍ର
- ୪. ଓଡ଼ିଆ ସାହିତ୍ୟ, ମହେଶ୍ୱର ମହାନ୍ତି
- ୫. ଆଧୁନିକ ଶିଶୁ ଓଡ଼ିଆ ସାହିତ୍ୟ –ଜାନକୀ ବଲ୍ଲଭ ମହାନ୍ତି, ଗଛମନ୍ଦିର, କଟକ

ପାଠ୍ୟ-୩ | Course – 3 : ଓଡ଼ିଆ ପଦ୍ୟ ସାହିତ୍ୟ (Pass)

୧ମ ଏକକ : ଜଗନ୍ନାଥ ଜଣାଣ - କବିସୂର୍ଯ୍ୟ ବଳଦେବ ରଥ

ଆକାଶ ପ୍ରତି - ମଧୁସୂଦନ ରାଓ

ଯାତ୍ରା ସଂଗୀତ - ବୈକୁଣ୍ଠନାଥ ପଟ୍ଟନାୟକ

ମୌସୁମୀ - ରାଧାମୋହନ ଗଡ଼ନାୟକ

୨ୟ ଏକକ କ୍ଷୁଦ୍ରଗଳ୍ପ

ଡିମିରି ଫୁଲ - ଅଶ୍ୱଳ ମୋହନ ପଟ୍ଟନାୟକ

ଭଙ୍ଗା ଖେଳନା - କିଶୋରୀ ଚରଣ ଦାଶ

ଅନ୍ଧ ରାତିର ସୂର୍ଯ୍ୟ - ମହାପାତ୍ର ନୀଳମଣି ସାହୁ

ବାସି ମଢ଼ା - ସୁରେନ୍ଦ୍ର ମହାନ୍ତି

୩ୟ ଏକକ : ପ୍ରବନ୍ଧ ଓ ସମାଲୋଚନା

ମହାସ୍ରୋତ - ବିଶ୍ୱନାଥ କର

ଚିତ୍ରଗ୍ରୀବର ଉଚିତ ଅଭିମାନ - ଗୋଲୋକ ବିହାରୀ ଧଳ

ତିନୋଟି ସମାଲୋଚନା – ବାଉରୀବନ୍ଧୁ କର, ଫ୍ରେଣ୍ଡ୍‌ସ୍ ପବ୍ଲିଶର୍ସ, କଟକ

ଉପନ୍ୟାସ – ମାଟିର ମଣିଷ - କାଳିନ୍ଦୀ ଚରଣ ପାଣିଗ୍ରାହୀ

ସହାୟକ ଗ୍ରନ୍ଥସୂଚୀ

୧. ଓଡ଼ିଆ ଉପନ୍ୟାସ ସାହିତ୍ୟର ପରିଚୟ, ସ ପଠାଣୀ ପଟ୍ଟନାୟକ ଓ ଭୋଳାନାଥ ରାଉତ, ଓଡ଼ିଶା ବୁକ୍ ଷ୍ଟୋର, କଟକ

୨. କାଳିନ୍ଦୀ ଚରଣଙ୍କ କଥାସାହିତ୍ୟ – ବିଷ୍ଣୁପ୍ରିୟା ଓତା, ଫ୍ରେଣ୍ଡ୍‌ସ୍ ପବ୍ଲିଶର୍ସ, କଟକ

୩. ଓଡ଼ିଆ ପ୍ରବନ୍ଧ ସାହିତ୍ୟ – ବାଉରୀବନ୍ଧୁ କର

୪. ଓଡ଼ିଆ ସମାଲୋଚନା ସାହିତ୍ୟ - ଓଡ଼ିଶା ସାହିତ୍ୟ ଏକାଡେମୀ

୫. ମାଟିର ମଣିଷ - କାଳିନ୍ଦୀ ଚରଣ ପାଣିଗ୍ରାହୀ

ପାଠ୍ୟ-୪ | Course – 4 : ପ୍ରବନ୍ଧ ପ୍ରସ୍ତୁତି ଓ ଉପସ୍ଥାପନା (Pass)

ସମ୍ବର୍ଦ୍ଧ ଲିଖନ - ୮୦ + ମୌଖିକ - ୨୦ = ୧୦୦

ଅନୁବାଦ ବା ସଂପାଦନା ବା ଓଡ଼ିଆ ସଂସ୍କୃତି ଉପରେ ଅନୁଧ୍ୟାନ ୫୦ ପୃଷ୍ଠା ମଧ୍ୟରେ ନିବନ୍ଧ ପ୍ରସ୍ତୁତି କିମ୍ବା

(ସମାଲୋଚନା, ଅନୁବାଦ, ସମ୍ପାଦନା, ଗବେଷଣା)

୧. ପ୍ରଥମ ଏକକ ; ସମାଲୋଚନାର ସଂଜ୍ଞା, ସ୍ୱରୂପ ଓ ପ୍ରକାରଭେଦ

୨. ଦ୍ୱିତୀୟ ଏକକ ଅନୁବାଦର ସଂଜ୍ଞା, ସ୍ୱରୂପ ଓ ପ୍ରକାରଭେଦ

୩. ତୃତୀୟ ଏକକ : ସମ୍ପାଦନା ବିଧି

୪. ଚତୁର୍ଥ ଏକକ : ଗବେଷଣା ପ୍ରବିଧି

ସହାୟକ ଗ୍ରନ୍ଥସୂଚୀ

୧. ଗବେଷଣା ଅନୁବାଦ ସମ୍ପାଦନା କଳା – ସିଂ ନାରାୟଣ ସାହୁ, ସତ୍ୟନାରାୟଣ ବୁକ ୱୋର, କଟକ
୨. ଗବେଷଣା ପ୍ରବିଧି - ଡ. ସୁବୋଧ ଚାଟ୍ଟାର୍ଜୀ, ବିଦ୍ୟାପୁରୀ, କଟକ
୩. ଗବେଷଣା ପ୍ରକରଣ; ସଂପାଦନା ଓ ଅନୁବାଦ ପ୍ରବିଧି - କୃଷ୍ଣଚନ୍ଦ୍ର ପ୍ରଧାନ ଓ ନିର୍ମଳା କୁମାରୀ ରାଉତ

ଅନ୍ତର୍ବିଷୟ ଲକ୍ଷ୍ୟାଧୀନ ପାଠ - ଓଡ଼ିଆ Generic Electives (GE) - Course - Odia

ସୂଚନା : ଅନ୍ୟ ସମ୍ମାନର ବିଦ୍ୟାର୍ଥୀ ଏଥିମଧ୍ୟରୁ ୨ଗୋଟି କିମ୍ବା ୪ଗୋଟି ପଢ଼ି ଅଧ୍ୟୟନ କରିପାରିବେ ; କିନ୍ତୁ ପାସ୍ ବିଦ୍ୟାର୍ଥୀ ଏଥିମଧ୍ୟରୁ ୧ମ ଓ ୨ୟ ପଢ଼ିକୁ ଯଥାକ୍ରମେ ୫ମ ଓ ୬ଷ୍ଠ ପର୍ଯ୍ୟାୟରେ ପଢ଼ିବେ ।

୧. ପଢ଼ି ସଂଖ୍ୟା ୪
୨. ପ୍ରତ୍ୟେକ ପଢ଼ି - ୧୦୦ ନମ୍ବର ବିଶିଷ୍ଟ ମୋଟ ୪୦୦ ନମ୍ବର ୨.
୩. ପ୍ରତ୍ୟେକ ପଢ଼ିରେ ୪ଗୋଟି ଏକକ ରହିବ ।

ନମ୍ବର ବିଭାଜନ ବିଧି :

- କ) ପ୍ରତ୍ୟେକ ପଢ଼ିର ମୋଟ ନମ୍ବର – ୧୦୦
- ଖ) ଅନ୍ତଃପରୀକ୍ଷା – ୨୦ ଓ ମୁଖ୍ୟ ପରୀକ୍ଷା – ୮୦
- ଗ) ମୁଖ୍ୟ ପରୀକ୍ଷାରେ ପ୍ରତ୍ୟେକ ଏକକରୁ ଦୁଇଟି ଲେଖାଏଁ ୧୫ ନମ୍ବର ବିଶିଷ୍ଟ ପସନ୍ଦମୂଳକ ବୋଧଜ୍ଞାନମାପକ ୮ଟି ଦୀର୍ଘ ପ୍ରଶ୍ନ ପଢ଼ିବ ୮ ଟି ଦୀର୍ଘ ପ୍ରଶ୍ନରୁ ୪ଟିର ଉତ୍ତର ଦେବାକୁ ହେବ ।
(୧୫x୪=୬୦)
- ଘ) ସମସ୍ତ ଏକକରୁ ୨ ନମ୍ବର ବିଶିଷ୍ଟ ଲକ୍ଷ୍ୟଜ୍ଞାନମୂଳକ ୧୫ଟି ସଂକ୍ଷିପ୍ତ ପ୍ରଶ୍ନ ପଢ଼ିବ । ମୋଟ ୧୫ ଗୋଟି ପ୍ରଶ୍ନରୁ ୧୦ ଗୋଟି ପ୍ରଶ୍ନର ଉତ୍ତର ଦେବାକୁ ହେବ ।
(୨ x ୧୦ = ୨୦)

ସବିଶେଷ ପାଠ୍ୟକ୍ରମ ପ୍ରଥମ ପର୍ଯ୍ୟାୟ (Semester –1)

ପାଠ୍ୟ - ୧ | ପଢ଼ - ୧ (Core Course - 1): ଗଣମାଧ୍ୟମ, ବେତାର କଳା ଓ ବିଜ୍ଞାପନ କଳା

୧ମ ଏକକ : ଗଣମାଧ୍ୟମ ଓ ତା'ର ପ୍ରକାରଭେଦ

୨ୟ ଏକକ : ବିଜ୍ଞାପନର ପରିଭାଷା, ପରିସର ଓ ଉଦ୍ଦେଶ୍ୟ

୩ୟ ଏକକ ସ୍ତମ୍ଭ ଲିଖନ ଓ ଫିଟର ଲିଖନ

୪ର୍ଥ ଏକକ : ପତ୍ରଲିଖନ (ବାଣିଜ୍ୟିକ, କାର୍ଯ୍ୟାଳୟ ଭିତ୍ତିକ, ବ୍ୟକ୍ତିଗତ ଓ ସମ୍ପାଦକଙ୍କୁ ପତ୍ର)

ସହାୟକ ଗ୍ରନ୍ଥସୂଚୀ

- ୧. ଓଡ଼ିଆ ସାହିତ୍ୟକୁ ଆକାଶବାଣୀର ଦାନ - ବ୍ରଜମୋହନ ମହାନ୍ତି, ଓଡ଼ିଶା ବୁକ ସ୍ଟୋର
- ୨. ସମ୍ବାଦପତ୍ର ଓ ଗଣମାଧ୍ୟମ -ମୃଣାଳ ଚାଟ୍ଟାର୍ଜୀ, ଶେଫାଳୀ କମ୍ପ୍ୟୁନିକେଶନ, ଢେଙ୍କାନାଳ
- ୩. ସମ୍ବାଦ ଓ ସାମ୍ବାଦିକତା - ଚନ୍ଦ୍ରଶେଖର ମହାପାତ୍ର, ଓ.ରା.ପା.ପ୍ର. ଓ ପ୍ରକାଶନ ସଂସ୍ଥା, ଭୁବନେଶ୍ୱର
- ୪. ସଂଯୋଗ ଅନୁବିଧି,-ସନ୍ତୋଷ କୁମାର ତ୍ରିପାଠୀ, ନାଳନ୍ଦା, କଟକ
- ୫. ଯୋଗାଯୋଗମୂଳକ ମାତୃଭାଷା - ବିରଞ୍ଚି ନାରାୟଣ ସାମଲ, ସତ୍ୟନାରାୟଣ ବୁକ୍ ଷ୍ଟୋର
- ୬. ଯୋଗାଯୋଗର ଭାଷା - ସୁଧୀର ଚନ୍ଦ୍ର ମହାନ୍ତି, ପ୍ରାଚୀ ପ୍ରକାଶନ, କଟକ

ଦ୍ୱିତୀୟ ପର୍ଯ୍ୟାୟ (Semester –II)

ପାଠ୍ୟ - ୨ | ପଢ଼ - ୨ (Core Course -2) : ସାହିତ୍ୟ ଅଧ୍ୟୟନ

୧ମ ଏକକ : ଗଳ୍ପ ସାହିତ୍ୟ

ବୁଢ଼ା ଶଙ୍ଖାରି - ଲକ୍ଷ୍ମୀକାନ୍ତ ମହାପାତ୍ର

ମାଗୁଣୀର ଶଗଡ଼ - ଗୋଦାବରୀଶ ମହାପାତ୍ର

ଶିକାର - ଭଗବତୀ ଚରଣ ପାଣିଗ୍ରାହୀ

୨ୟ ଏକକ : ଉପନ୍ୟାସ ସାହିତ୍ୟ

ଶାସ୍ତି - କାହ୍ନୁଚରଣ ମହାନ୍ତି, ଫ୍ରେଣ୍ଡ୍‌ସ୍ ପବ୍ଲିଶର୍ସ, କଟକ

୩ୟ ଏକକ : ନାଟକ

ଶେଷ କଥା - ଡକ୍ଟର ନାରାୟଣ ସାହୁ, ସତ୍ୟନାରାୟଣ ବୁକ୍ ଷ୍ଟୋର, କଟକ

୪ର୍ଥ ଏକକ- ରମ୍ୟ ରଚନା

ବାଇ ମହାରି ପାଞ୍ଜି (ପ୍ରଥମ ବିଡ଼ା) - ଗୋପାଳ ଚନ୍ଦ୍ର ପ୍ରହରାଜ

ବରୁଆ - ଗୋବିନ୍ଦ ତ୍ରିପାଠୀ

ସାଧୁ ସଙ୍ଗ - ଚୌଧୁରୀ ନେମକାନ୍ତ ମିଶ୍ର

ସହାୟକ ଗ୍ରନ୍ଥସୂଚୀ

- ୧. କାହ୍ନୁଚରଣ ବିଶେଷଜ୍ଞ, କୋଣାର୍କ, ଓଡ଼ିଶା ସାହିତ୍ୟ ଏକାଡେମୀ
- ୨. ଓଡ଼ିଆ କ୍ଷୁଦ୍ରଗଳ୍ପର ଇତିହାସ, ବୈଷ୍ଣବ ଚରଣ ସାମଲ, ଫ୍ରେଣ୍ଡ୍‌ସ୍ ପବ୍ଲିଶର୍ସ, କଟକ

- ୩. ଓଡ଼ିଆ କଥାସାହିତ୍ୟର କଥା ଓ ରମ୍ୟରଚନା, ମହାପାତ୍ର ନୀଳମଣି ସାହୁ, ଓଡ଼ିଶା ବ୍ଲକ୍ ଷ୍ଟୋର, କଟକ
- ୪. ଶାସ୍ତ୍ର - କାହ୍ନୁଚରଣ ମହାନ୍ତି, ଫ୍ରେଣ୍ଡସ୍ ପବ୍ଲିଶର୍ସ, କଟକ
- ୫. ଉତ୍ତର ସତୁରୀ ଓଡ଼ିଆ ନାଟକ, ହେମନ୍ତ କୁମାର ଦାସ, ଗ୍ରନ୍ଥମନ୍ଦିର, କଟକ
- ୬. ଶେଷ କଥା - ନାରାୟଣ ସାହୁ, ସତ୍ୟନାରାୟଣ ବ୍ଲକ୍ ଷ୍ଟୋର, କଟକ

ତୃତୀୟ ପର୍ଯ୍ୟାୟ (Semester –III)

ପାଠ୍ୟ - ୩/ପଢ଼ - ୩ (Core Course -3); ପ୍ରାଚୀନ, ମଧ୍ୟଯୁଗ ଓ ଆଧୁନିକ ଓଡ଼ିଆ ସାହିତ୍ୟ
 ୧ମ ଏକକ ସାରଳା ମହାଭାରତରେ କାହାଣୀ

ସତ୍ୟଆତ୍ମ

ତୁଳସୀବଣ ବାଘ

ଗଙ୍ଗା ବୋଇଲେ ଥୁବି ଗଙ୍ଗା ବୋଇଲେ ଯିବି

୨ୟ ଏକକ: ବଳରାମ ଦାସ ଓ ଜଗନ୍ନାଥ ଦାସଙ୍କ କାହାଣୀ

ବଳରାମ ଦାସଙ୍କ ବଉଳା ଅଧ୍ୟାୟ ଓ ମୃଗୁଣୀ ସ୍ମୃତି

ଜଗନ୍ନାଥ ଦାସଙ୍କ କପୋତ ଉପାଖ୍ୟାନ ଓ ପିଙ୍ଗଳା ଉପାଖ୍ୟାନ

୩ୟ ଏକକ: ମଧ୍ୟକାଳୀନ ସାହିତ୍ୟ ସ୍ରଷ୍ଟାଙ୍କ ସଂକ୍ଷିପ୍ତ ପରିଚୟ

ଦୀନକୃଷ୍ଣ ଦାସ, ଅଭିମନ୍ୟୁ ସାମନ୍ତସିଂହାର, କବିସମ୍ରାଟ ଉପେନ୍ଦ୍ର ଭଞ୍ଜ

କବିସୂର୍ଯ୍ୟ ବଳଦେବ ରଥ

୪ର୍ଥ ଏକକ :ଆଧୁନିକ ଯୁଗର ସାହିତ୍ୟ ସ୍ରଷ୍ଟା ସଂକ୍ଷିପ୍ତ ପରିଚୟ

ରାଧାନାଥ ରାୟ, ଫକୀର ମୋହନ ସେନାପତି, ଗଙ୍ଗାଧର ମେହେର, ମାୟାଧର ମାନସିଂହ

ସହାୟକ ଗ୍ରନ୍ଥସୂଚୀ

- ୧. ଓଡ଼ିଆ ସାହିତ୍ୟର ଇତିହାସ - ମାୟାଧର ମାନସିଂହ, ଗ୍ରନ୍ଥ ମନ୍ଦିର, କଟକ
- ୨. ଓଡ଼ିଆ ସାହିତ୍ୟର ଇତିହାସ - ସୂର୍ଯ୍ୟନାରାୟଣ ଦାଶ (୨ୟ ଓ ୩ୟ ଭାଗ) - ଗୁନ୍ଥ ମନ୍ଦିର, କଟକ
- ୩. ଓଡ଼ିଆ ସାହିତ୍ୟର ଇତିହାସ (୧୮୦୩-୧୯୨୦) ନଟବର ସାମନ୍ତରାୟ, ବାଣୀ ଭବନ,
ଭୁବନେଶ୍ୱର
- ୪. ଆଲୋକ ଓ ଅମୃତର କବି ଗଙ୍ଗାଧର ମଣିନ୍ଦ୍ର କୁମାର ମେହେର, ପଢ଼ାପଢ଼ି, ଭୁବନେଶ୍ୱର

ଚତୁର୍ଥ ପର୍ଯ୍ୟାୟ (Semester – IV)

ପାଠ୍ୟ - ୪ | ପଢ଼ - ୪ (Core Course - 4) : ଓଡ଼ିଆ କମ୍ପ୍ୟୁଟର ଶିକ୍ଷା

୧ମ ଏକକ | ୟୁନିଟ୍-୧ କମ୍ପ୍ୟୁଟର କ'ଣ ଓ କାହିଁକି

କମ୍ପ୍ୟୁଟର ର ବିଭିନ୍ନ ଅଂଶବିଶେଷ ଓ କାର୍ଯ୍ୟ

୨ୟ ଏକକ | ୟୁନିଟ୍-୨: ୟୁନିକୋଡ଼ ମାଧ୍ୟମରେ ଓଡ଼ିଆ ଡିଟିପି ଶିକ୍ଷା

୩ୟ ଏକକ | ୟୁନିଟ୍-୩: ଇଣ୍ଟରନେଟ୍‌ରେ ଓଡ଼ିଆ ଚିଠି

ଇଣ୍ଟରନେଟ୍‌ରେ ସାମାଜିକ ଗଣମାଧ୍ୟମର ବ୍ୟବହାର

୪ର୍ଥ ଏକକ/ୟୁନିଟ୍-୪: ପାଖାର ପଏଣ୍ଟ୍ ମାଇକ୍ରୋ ପ୍ରସ୍ତୁତି, ଚେରୁଲ, ଫିଗର୍ସ ଏବଂ ପିକଚର୍ସ/ସ୍କାଲଡ
ଏକସେଲର ବ୍ୟବହାର ପ୍ରସ୍ତୁତି

ସହାୟକ ଗ୍ରନ୍ଥସୂଚୀ

୧. ମୌଳିକ କମ୍ପ୍ୟୁଟର ଶିକ୍ଷା – ଦେବକାନ୍ତ ମିଶ୍ର, ପ୍ରେସ୍ ପବ୍ଲିଶର୍ସ, କଟକ
୨. ଓଡ଼ିଆରେ କମ୍ପ୍ୟୁଟର ଶିକ୍ଷା – ରୁଦ୍ରନାରାୟଣ ମହାପାତ୍ର, ସତ୍ୟନାରାୟଣ ବ୍ଲକ୍ ଷ୍ଟୋର, କଟକ
୩. ଓଡ଼ିଆ ଭାଷାରେ କମ୍ପ୍ୟୁଟରର ପ୍ରୟୋଗ - ସୁଧୀର ଚନ୍ଦ୍ର ମହାନ୍ତି, ଏ.କେ. ମିଶ୍ର ପବ୍ଲିକେଶନ, ଭୁବନେଶ୍ୱର
୪. କମ୍ପ୍ୟୁଟରରେ ଓଡ଼ିଆ ଭାଷାର ବ୍ୟବହାର ଓ ପ୍ରୟୋଗ – ରୁଦ୍ରପ୍ରସାଦ ମିଶ୍ର, ଆଜିଅନ୍ତା ପବ୍ଲିଶର୍ସ,
ଜଗତସିଂହପୁର
୫. କମ୍ପ୍ୟୁଟର ଶିକ୍ଷା –ରାମୁ ବନିକ, ପ୍ରେସ୍ ପବ୍ଲିଶର୍ସ, କଟକ

ପାଠ୍ୟକ୍ରମର ସାରାଂଶ – ସଂରଚନା
Structure of B.A. Pass (DSC-Odia) Under CBCS

ପ୍ରଧାନ ପାଠ୍ୟ (Core Course): ୪

ପ୍ରତ୍ୟେକ ପତ୍ରର କ୍ରେଡିଟ୍‌ସ୍ = ୪ + ୨ = ୬

ପ୍ରଥମ ପର୍ଯ୍ୟାୟ : (1st Semester)

ପ୍ରଧାନ ପାଠ୍ୟ - ୧ (Core Course – 1) ଓଡ଼ିଆ କବିତା ପ୍ରାଚୀନରୁ ଆଧୁନିକ

ପ୍ରଥମ ପତ୍ର - କ୍ରେଡିଟ୍‌ସ୍ = ୪ + ୨ = ୬

ଦ୍ୱିତୀୟ ପର୍ଯ୍ୟାୟ (2nd Semester)

ପ୍ରଧାନ ପାଠ୍ୟାଂଶ - ୨ (Core Course –2) ଓଡ଼ିଆ ନାଟକ ଓ ଏକାଙ୍କିକା

୨ୟ ପତ୍ର - କ୍ରେଡିଟ୍‌ସ୍ = ୪ + ୨ = ୬

ତୃତୀୟ ପର୍ଯ୍ୟାୟ : (3rd Semester)

ପ୍ରଧାନ ପାଠ୍ୟାଂଶ - ୩ (Core Course - 3) ଓଡ଼ିଆ କଥା ସାହିତ୍ୟ

୩ୟ ପତ୍ର- କ୍ରେଡିଟ୍‌ସ୍ = ୪ + ୨ = ୬

ଚତୁର୍ଥ ପର୍ଯ୍ୟାୟ : (4th Semester)

ପ୍ରଧାନ ପାଠ୍ୟାଂଶ -4 (Core Course-4) ବ୍ୟାବହାରିକ ଓଡ଼ିଆ ବ୍ୟାକରଣ

୪ର୍ଥ ପତ୍ର - କ୍ରେଡିଟ୍‌ସ୍ = ୪ + ୨ = ୬

**ପଞ୍ଚମ ଓ ଆସ୍ଥାଭିତ୍ତିକ ପାଠ୍ୟସମୂହ : ସ୍ନାତକ (ଓଡ଼ିଆ ଇଚ୍ଛାଧୀନ)
2019-20**

Core Course -- ପ୍ରଧାନ ପାଠ୍ୟ

ମୋଟ ପତ୍ର ସଂଖ୍ୟା - ୦୪ (Four Paper – Discipline-I/ Four Paper – Discipling-2) ପ୍ରତ୍ୟେକ ପତ୍ର - ୧୦୦ ନମ୍ବର ବିଶିଷ୍ଟ (୨୦ ନମ୍ବର ମହାବିଦ୍ୟାଳୟ ସ୍ତରୀୟ ଅନ୍ତଃ ପର୍ଯ୍ୟାୟ ପରୀକ୍ଷା + ୮୦ ବିଶ୍ୱବିଦ୍ୟାଳୟ ସ୍ତରୀୟ ମାନକ ପରୀକ୍ଷା)

ଇଚ୍ଛାଧୀନ ଓଡ଼ିଆ : ଜଣେ ସ୍ନାତକ – (ଇଚ୍ଛାଧୀନ)– ମୋଟ ୪୦୦ ନମ୍ବରର ପରୀକ୍ଷା ଦେବେ

କ) ଅତି କମ୍ରେ (ମୋଟ) ୫୦ଟି କାର୍ଯ୍ୟ ନିର୍ଦ୍ଦେଶ (ପିରିୟଡ୍)ରେ ଗୋଟିଏ ପତ୍ରର ପାଠଦାନ ଶେଷ ହେବ ।

ଗୋଟିଏ କାର୍ଯ୍ୟ ନିର୍ଦ୍ଦେଶ ବା ପିରିୟଡ୍-୪୫ ମିନିଟ୍)

ଖ) ପ୍ରତ୍ୟେକ ପତ୍ର ୪ ଗୋଟି ମୁନିଟ୍ (ଏକକ) ଉପାଂଶରେ ବିଭକ୍ତ

ଗ) ପ୍ରତ୍ୟେକ ପତ୍ର ୨ ଆସ୍ଥାଭିତ୍ତିକ କାର୍ଯ୍ୟ ନିର୍ଦ୍ଦେଶ (୪ + ୨ କ୍ରେଡିଟ୍) ବିଶିଷ୍ଟ । ଗୋଟିଏ ଆସ୍ଥାଭିତ୍ତିକ କାର୍ଯ୍ୟ ନିର୍ଦ୍ଦେଶର ମହତ୍ତ୍ୱ ହେଉଛି - ୧୦ ପିରିୟଡ୍ ସହିତ ସମାନ

ମୋଟ ୪ ଗୋଟି ଇଚ୍ଛାଧୀନ ପତ୍ରର କ୍ରେଡିଟ୍ ହେଉଛି - $4 \times 9 (4 + 2) = 36$

ଘ) ପର୍ଯ୍ୟାୟ (Semester) ଓ ପ୍ରସ୍ତାବିତ ପାଠ ଯୋଜନା;

ପ୍ରଥମ ଶିକ୍ଷାବର୍ଷ

୧ମ ପର୍ଯ୍ୟାୟ ୧ମ –ପତ୍ର - ୧୦୦ ନମ୍ବର

୨ୟ ପର୍ଯ୍ୟାୟ ୨ୟ –ପତ୍ର - ୧୦୦ ନମ୍ବର

ତୃତୀୟ ଶିକ୍ଷାବର୍ଷ

୩ୟ ପର୍ଯ୍ୟାୟ ୩ୟ –ପତ୍ର - ୧୦୦ ନମ୍ବର

୪ର୍ଥ ପର୍ଯ୍ୟାୟ ୪ର୍ଥ – ପତ୍ର - ୧୦୦ ନମ୍ବର

ଙ) ନମ୍ବର | ମୂଲ୍ୟାଙ୍କ ବିଭାଜନ ପଦ୍ଧତି:

ମହାବିଦ୍ୟାଳୟ ସ୍ତରୀୟ ଅନ୍ତଃପରୀକ୍ଷା - ୨୦ ନମ୍ବର

ବିଶ୍ୱବିଦ୍ୟାଳୟ ସ୍ତରୀୟ ମୁଖ୍ୟ ପରୀକ୍ଷା - ୮୦ ନମ୍ବର

ବିଶ୍ୱବିଦ୍ୟାଳୟ ସ୍ତରୀୟ ପରୀକ୍ଷାରେ ନିମ୍ନମତେ ପ୍ରଶ୍ନ ପଡ଼ିବ -

କ) ପ୍ରତ୍ୟେକ ପତ୍ରର ପ୍ରତ୍ୟେକ ଏକକରୁ ବିକଳ୍ପ ସହ ୮ଟି ୧୫ ନମ୍ବର ବିଶିଷ୍ଟ ଦୀର୍ଘ ପ୍ରଶ୍ନ ପଡ଼ିବ । ବିଦ୍ୟାର୍ଥୀ ୪ଟି ପ୍ରଶ୍ନର ଉତ୍ତର ଦେବେ । (୧୫ × ୪ = ୬୦ ନମ୍ବର)

ଖ) ପ୍ରତ୍ୟେକ ପତ୍ରର ପ୍ରତ୍ୟେକ ଏକକରୁ ୧୫ଟି ୨ ନମ୍ବର ବିଶିଷ୍ଟ ସଂକ୍ଷିପ୍ତ ପ୍ରଶ୍ନ ପଡ଼ିବ । ବିଦ୍ୟାର୍ଥୀ ୧୦ଟି

ପ୍ରଶ୍ନର ଡରଲ ଦେବେ । (୨x ୧୦ = ୨୦) ଉତ୍ତର

ସବିଶେଷ ପାଠ୍ୟକ୍ରମ (Detail Syllabus)

(କ) ପ୍ରଥମ ପର୍ଯ୍ୟାୟ (Semester – 1) DSC 1/2 A
ପ୍ରଥମ ପତ୍ର ଓଡ଼ିଆ କବିତା ପ୍ରାଚୀନରୁ ଆଧୁନିକ

ପ୍ରଧାନ ପାଠ (Core Course -1): ଓଡ଼ିଆ ସାହିତ୍ୟ ପ୍ରାଚୀନକୁ ଆଧୁନିକ
୧ମ ଏକକ / ୟୁନିଟ୍ – ୧ ସାରଳା ମହାଭାରତ (ଦୁର୍ଯ୍ୟୋଧନଙ୍କ ରକ୍ତନଦୀ ସନ୍ତରଣ)
୨ୟ ଏକକ / ୟୁନିଟ୍ – ୨ : ଭାଗବତ (୨୪ ଗୁରୁ ପ୍ରସଙ୍ଗ) - ଜଗନ୍ନାଥ ଦାସ
୩ୟ ଏକକ / ୟୁନିଟ୍ – ୩ - ଦୀନକୃଷ୍ଣ ଦାସଙ୍କ କସକଲ୍ଲୋଳ(୧ମ ଛାନ୍ଦ) ଓ ଉପେନ୍ଦ୍ରଭଞ୍ଜ କୋଟିବ୍ରହ୍ମାଣ୍ଡ
ସୁନ୍ଦରୀ(୧ମ ଛାନ୍ଦ)
୪ର୍ଥ ଏକକ | ୟୁନିଟ୍ – ୪ ଆଧୁନିକ କବିତା
ମହାଯାତ୍ରା (ସପ୍ତମ ସର୍ଗ)- ଅମର୍ଷୀଙ୍କ ଉଦ୍‌ବୋଧନ, ରାଧାନାଥ ରାୟ
ମଙ୍ଗଳେ ଅଇଲା ଉଷା – ଗଙ୍ଗାଧର ମେହେର
ବନ୍ଦୀର ସାକ୍ଷ୍ୟ ଅନୁଚିତ୍ରା - ଗୋପବନ୍ଧୁ ଦାସ
ପ୍ରତିମା ନାୟକ - ସଚ୍ଚିଦାନନ୍ଦ ରାଉତରାୟ

ସହାୟକ ଗ୍ରନ୍ଥସୂଚୀ

- ୧. ସାରଳା ମହାଭାରତ (ସାରଳା ଦାସ)
- ୨. ଅବଧୂତ ଓ ଯଦୁରାଜା ସମ୍ବାଦ, ବୈଷ୍ଣବ ଚରଣ ସାମଲ, ଫ୍ରେଣ୍ଡ୍‌ସ୍ ପବ୍ଲିଶର୍ସ, କଟକ
- ୩. କହେ କୃଷ୍ଣଦାସ କବି – କୃଷ୍ଣଚରଣ ସାହୁ, ବିଦ୍ୟାପୁରୀ, କଟକ
- ୪. ରସକଲ୍ଲୋଳ, ସଂପାଦନା – ଦେବେନ୍ଦ୍ର ମହାନ୍ତି
- ୫. ଦୁର୍ଲଭ ଦୀନକୃଷ୍ଣ, ଜ୍ୟୋତିରଞ୍ଜନ ସାମଲ, ବିଜୟିନୀ ପବ୍ଲିକେସନ୍, କଟକ

(ଖ) ଦ୍ୱିତୀୟ ପର୍ଯ୍ୟାୟ (Semester – II) DSC 1/2 B

ପ୍ରଧାନ ପାଠ୍ୟାଂଶ - ୨ (Core Course - 2) : ଓଡ଼ିଆ ନାଟକ ଓ ଏକାଙ୍କିକା

ଦ୍ୱିତୀୟ ପତ୍ର

୧ମ ଏକକ | ୟୁନିଟ୍ – ୧ : ଭକ୍ତମାଟି - କାଳୀଚରଣ ପଟ୍ଟନାୟକ
୨ୟ ଏକକ | ୟୁନିଟ୍ – ୨ : ନନ୍ଦିକା କେଶରୀ ମନୋରଞ୍ଜନ ଦାସ

ଗାୟ ଏକକ | ୟୁନିଟ୍ – ୩ କୋକୁଆ – ବିଜୟ କୁମାର ଶତପଥୀ, ଅଗ୍ରଦୂତ, କଟକ
 ୪ର୍ଥ ଏକକ | ୟୁନିଟ୍ – ୪ : ଏକାଙ୍କିକା- ସ୍ମୃତି ବିଭାଗ – ପ୍ରାଣବନ୍ଧୁ କର ଓ ଛକ୍ଷୁବେଶୀ - ବିଶ୍ୱଜିତ ଦାସ
 ୫ମ ଏକକ | ୟୁନିଟ୍ – ୫ ପ୍ରକଳ୍ପ ପ୍ରସ୍ତୁତି

ସହାୟକ ଗ୍ରନ୍ଥସୂଚୀ

୧ ଅଭିଯାନ – କାଳୀଚରଣ ପଟ୍ଟନାୟକ

୨. ନନ୍ଦିକା କେଶରୀ-ମନୋରଞ୍ଜନ ଦାସ କିମ୍ବା ତଟନିରଂଜନା – ବିଜୟ ମିଶ୍ର

୩. କୋକୁଆ – ବିଜୟ କୁମାର ଶତପଥୀ, ଅଗ୍ରଦୂତ, କଟକ କିମ୍ବା ମୁଖା - ମଙ୍ଗୁଳୁ ଚରଣ ବିଶ୍ୱାଳ

୪. ଅଶ୍ରୁ ନୁହେଁ ଅନଳ, ହେମନ୍ତ କୁମାର ଦାସ

୫. ସ୍ୱାଧୀନୋତ୍ତର ଓଡ଼ିଆ ନାଟକର ମନସ୍ତାତ୍ତ୍ୱିକ ବିଶ୍ଳେଷଣ, ରଞ୍ଜିତା ରାଉତରାୟ, ବିଜୟିନୀ ପବ୍ଲିକେସନ, କଟକ

୬. ସାହିତ୍ୟସାଧକ ମଙ୍ଗଳବରଣ – ଗୌରିଦାସ ପ୍ରଧାନ (ଚତୁର୍ଥ ପତ୍ର ନିମନ୍ତେ ପ୍ରଦତ୍ତ ସହାୟକ ପୁସ୍ତକଗୁଡ଼ିକ ଅନୁସରଣୀୟ।

ତୃତୀୟ ପର୍ଯ୍ୟାୟ (Semester – III) DSC 1/2 C

ପ୍ରଧାନ ପାଠ୍ୟାଂଶ - ୩ (Core Course - 3): ଓଡ଼ିଆ କଥା ସାହିତ୍ୟ

ତୃତୀୟ ପତ୍ର :

୧ମ ଏକକ | ୟୁନିଟ୍ – ୧ : ଓଡ଼ିଆ କଥାସାହିତ୍ୟର ବିକାଶକ୍ରମ

୨ୟ ଏକକ | ୟୁନିଟ୍ – ୨ - ଛ ମାଣ ଆଠଗୁଣ୍ଠ - ଫକୀର ମୋହନ ସେନାପତି

୩ୟ ଏକକ | ୟୁନିଟ୍ – ୩ ; ଦାନାପାଣି - ଗୋପୀନାଥ ମହାନ୍ତି କିମ୍ବା ନୟନତାରା -ଦୟାନିଧି ମିଶ୍ର

୪ର୍ଥ ଏକକ | ୟୁନିଟ୍ – ୪ : ଗଳ୍ପ ସାହିତ୍ୟ

ପାଠ୍ୟ ଗଳ୍ପ:ଦେବତାର ବିଧାତା – ଗୋଦାବରୀଶ ମହାପାତ୍ର

ମାଂସର ବିଳାପ – କାଳିନ୍ଦୀ ଚରଣ ପାଣିଗ୍ରାହୀ

ମଧୁବନର ମେଘର - ମନୋଜ ଦାସ

୫ମ ଏକକ | ୟୁନିଟ୍ – ୫ ପ୍ରକଳ୍ପ ପ୍ରସ୍ତୁତି

ସହାୟକ ଗ୍ରନ୍ଥସୂଚୀ

୧. ଓଡ଼ିଆ ଉପନ୍ୟାସ ସାହିତ୍ୟର ପରିଚୟ ସଂ ପଠାଣି ପଟ୍ଟନାୟକ ଓ ଭୋଳାନାଥ ରାଉତ ଓଡ଼ିଶା ବୁକ ସୋର, କଟକ

୨. ଓଡ଼ିଆ କ୍ଷୁଦ୍ରଗଳ୍ପର ଉଦ୍ଦେଶ୍ୟ ଓ ଉତ୍ତରଣ – ବୈଷ୍ଣବ ଚରଣ ସାମଲ, ଫ୍ରେଣ୍ଡ୍‌ସ୍ ପବ୍ଲିଶର୍ସ, କଟକ

୩. ଛ ମାଣ ଆଠଗୁଣ୍ଠ - ଫକୀର ମୋହନ ସେନାପତି

୪. ଛ ମାଣ ଆଠଗୁଣ୍ଠ ଭିନ୍ନ ଦୃଷ୍ଟି ଭିନ୍ନ ବ୍ୟାଖ୍ୟା, ପଞ୍ଚାନନ ମିଶ୍ର, ବିଜୟିନୀ ପବ୍ଲିକେସନ, କଟକ

- ୫. ଦାନାପାଣି - ଗୋପୀନାଥ ମହାନ୍ତି
- ୬. ନୟନତାରା - ଦୟାନିଧି ମିଶ୍ର
- ୭. କଥାଶିଳ୍ପୀ ମନୋଜ ଦାସ, ଶତ୍ରୁଘ୍ନ ପାଣ୍ଡବ, ଫ୍ରେଣ୍ଡ୍‌ସ୍ ପବ୍ଲିଶର୍ସ, କଟକ
- ୮. ମନସ୍ତୀ ମନୋଜ, ମଣୀନ୍ଦ୍ର କୁମାର ମେହେର, ଫ୍ରେଣ୍ଡ୍‌ସ୍ ପବ୍ଲିଶର୍ସ, କଟକ
- ୯. ଓଡ଼ିଆ ଉପନ୍ୟାସର ସମାଜତାତ୍ତ୍ୱିକ ଆଲୋଚନା, କଲ୍ୟାଣ ପଟ୍ଟନାୟକ, ବିଦ୍ୟାପୁରୀ, କଟକ

ଚତୁର୍ଥ ପର୍ଯ୍ୟାୟ (Semester – 1V)

ପ୍ରଧାନ ପାଠ୍ୟାଂଶ - ୪ (Core Course -4) : ବ୍ୟାବହାରିକ ଓଡ଼ିଆ ବ୍ୟାକରଣ (DSC 1/2 D) ୪ର୍ଥ ପତ୍ର

- ୧ମ ଏକକ | ୟୁନିଟ୍ - ୧ ଓଡ଼ିଆ ବର୍ଣ୍ଣ ବିଚାର, ବାକ୍ୟର ଗଠନ ରୀତି ଓ ପ୍ରକାରଭେଦ ।
- ୨ୟ ଏକକ | ୟୁନିଟ୍ - ୨ : କାରକ, ବିଭକ୍ତି, କୃଦନ୍ତ ଓ ତଦ୍ଦିତ
- ୩ୟ ଏକକ | ୟୁନିଟ୍ - ୩ : ଉପସର୍ଗ, ସନ୍ଧି ଓ ସମାସ
- ୪ର୍ଥ ଏକକ | ୟୁନିଟ୍ - ୪ ଓଡ଼ିଆ ଶବ୍ଦସମ୍ଭାର

ସହାୟକ ଗୁରୁସୂଚୀ

- ୧. ସର୍ବସାର ବ୍ୟାକରଣ – ନାରାୟଣ ମହାପାତ୍ର ଓ ଶ୍ରୀଧର ଦାସ, ନିୟୁ ଷ୍ଟୁଡେଣ୍ଟ୍‌ସ୍ ଷ୍ଟୋର, କଟକ
- ୨. ଆଧୁନିକ ଓଡ଼ିଆ ବ୍ୟାକରଣ - ଧନେଶ୍ୱର ମହାପାତ୍ର, କିତାବ ମହଲ, କଟକ
- ୩. ବ୍ୟାବହାରିକ ଓଡ଼ିଆ ବ୍ୟାକରଣ, ବିଜୟ ପ୍ରସାଦ ମହାପାତ୍ର, ବିଦ୍ୟାପୁରୀ, କଟକ
- ୪. ଓଡ଼ିଆ ଭାଷାର ଉଦ୍ଦେଶ୍ୟ ଓ ବିକାଶ – ବାସୁଦେବ ସାହୁ, ଫ୍ରେଣ୍ଡ୍‌ସ୍ ପବ୍ଲିଶର୍ସ, କଟକ
- ୫। ଓଡ଼ିଆ ଭାଷା ଚର୍ଚ୍ଚାର ପରଂପରା, ଗଗନେନ୍ଦ୍ର ନାଥ ଦାସ, ଓଡ଼ିଆ ଗବେଷଣା ପରିଷଦ, କଟକ

ଦକ୍ଷତାବର୍ଧକ ବାଧ୍ୟତାମୂଳକ ପାଠ୍ୟକ୍ରମ Ability Enhancement Compulsory Course (AECC) ଯୋଗାଯୋଗମୂଳକ ମାତୃଭାଷା – ଓଡ଼ିଆ (2019-20)

MIL (Communications) - Odia

ଦ୍ୱିତୀୟ ପର୍ଯ୍ୟାୟ (2nd Semester) କଳା, ବିଜ୍ଞାନ ଓ ବାଣିଜ୍ୟ ସାଧାରଣ (Pass) | ସମ୍ମାନ (Hons)
ଶ୍ରେଣୀ ପାଇଁ ଉଦ୍ଦିଷ୍ଟ

ମୋଟ କ୍ରେଡିଟ୍-୪, ମୋଟ ଶ୍ରେଣୀ ପାଠଦାନ ନିର୍ଦ୍ଦିଷ୍ଟ - ୪୦, ଗୋଟିଏ ଶ୍ରେଣୀ ପାଠଦାନର {ପିରିୟଡ୍ ସମୟ
ଅବଧି-୪୫ ମିନିଟ୍ ପାଠ୍ୟକ୍ରମ - ୨, ପୂର୍ବସଂଖ୍ୟା - ୧୦୦

(Credits - 4) Total Classes - 40, One Period - 45 Minutes, Course - II, Full Marks - 100

ପାଠ୍ୟକ୍ରମର ଭୂମିକା:

ଏହି ପାଠ୍ୟଶାସ୍ତ୍ରଟି ପସନ୍ଦ ଓ ଆସ୍ଥାଭିତ୍ତିକ (CBCS / ସିବିସିଏସ୍) ପାଠ୍ୟ ପ୍ରଣାଳୀ ଅନୁସାରେ ପ୍ରସ୍ତୁତ ହୋଇଛି । ବିଭିନ୍ନ ସ୍ତରରେ ଆବଶ୍ୟକ ଅନୁସାରେ ସମସାମୟିକ ପରିସ୍ଥିତିକୁ ନେଇ ଭାବବିନିମୟ ଓ ପାରସ୍ପରିକ ଯୋଗାଯୋଗ ସ୍ଥାପନ କିପରି ଓଡ଼ିଆ ଭାଷାରେ ସହଜରେ, ସରଳରେ ହୋଇପାରିବ – ଏ ଦିଗ ପ୍ରତି ଏଥିରେ ପାଠ ଦିଆଯାଇଛି । ଓଡ଼ିଆ ଭାଷା ଓ ସାହିତ୍ୟିକ ପ୍ରାୟୋଗିକ ଜ୍ଞାନର ବିକାଶ ନିମିତ୍ତ + ଗା ସ୍ତରୀୟ ବିଦ୍ୟାର୍ଥୀଙ୍କୁ ଏହି ପାଠ୍ୟକ୍ରମର ଶାସ୍ତ୍ରଟି ସାହାଯ୍ୟ କରିବ । ସେଥିପାଇଁ ପ୍ରଚଳିତ ଭାଷାର ବୈଜ୍ଞାନିକ, ବ୍ୟାବହାରିକ ଓ ପ୍ରାୟୋଗିକ ଦିଗ ପ୍ରତି ଏଥିରେ ସ୍ଥାନ ଦିଆଯାଇଛି । ଏଥିରେ ସଂଯୋଗ ପ୍ରକ୍ରିୟାର ଅନୁବିଧି, ଯୋଗାଯୋଗର ତଥ୍ୟ ଓ ଗୁଡ଼ି ପ୍ରତି ଗୁରୁତ୍ୱ ଦିଆଯାଇଛି । ସରକାରୀ କାର୍ଯ୍ୟାଳୟରେ ଓଡ଼ିଆ ଭାଷାର ବ୍ୟବହାରରେ ଏହା ଦକ୍ଷତା ବୃଦ୍ଧି କରିବ । ଓଡ଼ିଆ ଭାଷାର ପ୍ରୟୋଗରେ ସେମାନେ ଶୁଦ୍ଧ ଓ ପରିଚ୍ଛନ୍ନ ଭାବରେ ଯେକୌଣସି ପ୍ରକାର ଜ୍ଞାନର ସୂଚନା ତଥ୍ୟ ଓ ସିଦ୍ଧାନ୍ତକୁ ମୌଖିକ ଓ ଲିଖିତ ସ୍ତରରେ ସହଜରେ ପ୍ରକାଶ କରିପାରିବେ ଏବଂ ସେମାନଙ୍କ ମାତୃଭାଷା ପ୍ରୟୋଗର ବିକାଶ ଘଟିପାରିବ ।

ମୂଲ୍ୟ ବିଭାଜନ ପଦ୍ଧତି : (ସବୁଥିରୁ ବିକଳ୍ପ ପଡ଼ିବ)

- କ) ନିର୍ଦ୍ଧାରିତ ପାଠ୍ୟର ସବୁ ଏକକ (ୟୁନିଟ୍) ରୁ ବିକଳ୍ପସହ ଦୁଇଟି ଲେଖାଏଁ ମୋଟ ୮ଟି ୧୫ନମ୍ବର ବିଶିଷ୍ଟଦୀର୍ଘପ୍ରଶ୍ନ ପଡ଼ିବ । ବିଦ୍ୟାର୍ଥୀଙ୍କୁ ୪ଟି ପ୍ରଶ୍ନର ଉତ୍ତର ଦେବାକୁ ହେବ । (୧୫ x ୪ = ୬୦)
- ଖ) ନିର୍ଦ୍ଧାରିତ ପାଠ୍ୟର ସବୁ ଏକକରୁ ୧୨ଟି ଅତିସଂକ୍ଷିପ୍ତ ପ୍ରଶ୍ନ ପଡ଼ିବ । ସେଥିରୁ ୧୦ଟି ପ୍ରଶ୍ନର ଉତ୍ତର ଦେବାକୁ (୧୦x୨ = ୨୦)
- ଗ) ମହାବିଦ୍ୟାଳୟସ୍ତରୀୟ ଅନ୍ତଃ ପରୀକ୍ଷା (୨୦)

ମୋଟ ମୂଲ୍ୟାଙ୍କ – ୧୦୦

ସବିଶେଷ ପାଠ୍ୟ

ଯୋଗାଯୋଗମୂଳକ ମାତୃଭାଷା - ଓଡ଼ିଆ

ପାଠ୍ୟ-୧ | Course – 1 ଯୋଗାଯୋଗ ଅନୁବିଧି, ରୀତି ଓ ମାଧ୍ୟମ

- ୧ମ ଏକକ : ଯୋଗାଯୋଗର ପରିଭାଷା, ଅନୁବିଧି, ପରିସମ୍ପଦ ଓ ପ୍ରକାରଭେଦ
- ୨ୟ ଏକକ : ସାକ୍ଷାତକାର, ଭାଷଣ କଳା
- ୩ୟ ଏକକ : ସମ୍ବାଦର ପରିଭାଷା, ପରିସର ଓ ସମ୍ବାଦ ପ୍ରସ୍ତୁତି

୪ର୍ଥ ଏକକ : ଓଡ଼ିଆ ଭାଷାର ବର୍ଣ୍ଣମାଳା, ବର୍ଣ୍ଣାଶୁଦ୍ଧିର ନିରୀକରଣ । (ବନ୍ଦନା ତୃତି - ସାଦୃଶ୍ୟଜନିତ ଅଶୁଦ୍ଧି, ଲିଙ୍ଗ ଗତ ଅଶୁଦ୍ଧି, ସନ୍ଧିଗତ ଅଶୁଦ୍ଧି, ସମାସଗତ ଅଶୁଦ୍ଧି, ବଚନ ଓ ବିଭକ୍ତିଗତ ଅଶୁଦ୍ଧି, ବାକ୍ୟ ବିଧିଜନିତ ଅଶୁଦ୍ଧି ସମାର୍ଥବୋଧକ ଶବ୍ଦାଶୁଦ୍ଧି ପ୍ରତ୍ୟୟ ଜନିତ ଅଶୁଦ୍ଧି, ଶବ୍ଦ ସଂଯୋଗାତ୍ମକ ଓ ସ୍ୱରସଙ୍ଗତି ଜନିତ ଅଶୁଦ୍ଧି)

ସହାୟକ ଗ୍ରନ୍ଥସୂଚୀ (ପାଠ୍ୟ-୧ | Course – 1)

୧. ଯୋଗାଯୋଗ ମୂଳକ ମାତୃଭାଷା (ଓଡ଼ିଆ) ସାମଲ ବିରଞ୍ଚି ନାରାୟଣ, ସତ୍ୟନାରାୟଣ ରାଜା, ଖୋର୍ଦ୍ଧା,

କଟକ ।

୨. ସଂଯୋଗ ଅନୁବିଧି, ସହୋଷ କୁମାର ତ୍ରିପାଠୀ, ନୀଳମ୍ବୀ, କଟକ

୩. ଭାଷଣ କଳା ଓ ଅନ୍ୟାନ୍ୟ ପ୍ରସଙ୍ଗ - କୃଷ୍ଣଚନ୍ଦ୍ର ପ୍ରଧାନ, ସତ୍ୟନାରାୟଣ ବ୍ଲକ୍ ଷ୍ଟୋର, କଟକ

୪. ପ୍ରାୟୋଗିକ ଓଡ଼ିଆ ଭାଷା - ଓଡ଼ିଶା ରାଜ୍ୟପାଠ୍ୟ ପୁସ୍ତକ ପ୍ରଣୟନ ଓ ପ୍ରକାଶନ ସଂସ୍ଥା, ଭୁବନେଶ୍ୱର

୧. ସମ୍ବାଦ ଓ ସାମ୍ବାଦିକତା - ଚନ୍ଦ୍ରଶେଖର ମହାପାତ୍ର, ଓଡ଼ିଶା ରାଜ୍ୟ ପାଠ୍ୟପୁସ୍ତକ ପ୍ରଣୟନ ଓ ପ୍ରକାଶନ ସଂସ୍ଥା, ଭୁବନେଶ୍ୱର

୧. ନିର୍ଭୁଲ ଲେଖାର ମୂଳସୂତ୍ର, ନୀଳାଦ୍ରି ଭୂଷଣ ହରିଚନ୍ଦନ, ପି.ସି.ଆର ପବ୍ଲିକେସନ, ଭୁବନେଶ୍ୱର

୨. ସର୍ବସାର ବ୍ୟାକରଣ - ନୀରାୟଣ ମହାପାତ୍ର ଓ ଶ୍ରୀଧର ଦାସ, ନିୟୁ ଷ୍ଟୁଡେଣ୍ଟସ୍ ଷ୍ଟୋର, କଟକ

**COMPULSORY LANGUAGE/LITERATURE COURSE MIL
(ODIA)- ARTS**

**ବାଧ୍ୟତାମୂଳକ ଭାଷା ଓ ସାହିତ୍ୟ - ଆଧୁନିକ ଭାରତୀୟ ଭାଷା (ଓଡ଼ିଆ)
+ ୩, ପ୍ରଥମ ବର୍ଷ କଳା ସାଧାରଣ (PASS) ଶ୍ରେଣୀ ପାଇଁ ଉଦ୍ଦିଷ୍ଟ
ପଢ଼ ସଂଖ୍ୟା - ପ୍ରଥମ**

ପ୍ରଥମ ପର୍ଯ୍ୟାୟ (1st SEMESTER)

ପ୍ରତ୍ୟେକ ପଢ଼ର ମୂଲ୍ୟ - ୧୦୦ ନମ୍ବର

(୨୦ ନମ୍ବର ଅକ୍ଟ ୫ ପରୀକ୍ଷା + ୮୦ ନମ୍ବର ମୁଖ୍ୟ ପରୀକ୍ଷା)

ମୂଲ୍ୟ ବିଭାଜନ

(କ) ପ୍ରଥମ ଏକକ (ଗଦ୍ୟ ସାହିତ୍ୟ)ରୁ ୧୫ ନମ୍ବର ବିଶିଷ୍ଟ ୨ଟି ଦୀର୍ଘ ପ୍ରଶ୍ନ ଆସିବ ।

ବିଦ୍ୟାର୍ଥୀଙ୍କୁ ପସନ୍ଦ ଅନୁସାରେ ଗୋଟିଏ ପ୍ରଶ୍ନର ଉତ୍ତର ଦେବାକୁ ହେବ । (ମୋଟ ମୂଲ୍ୟ - ୧୫)

(ଖ) ଦ୍ୱିତୀୟ ଏକକ (ପଦ୍ୟ ସାହିତ୍ୟ) ରୁ ୧୫ ନମ୍ବର ବିଶିଷ୍ଟ ୨ଟି ଦୀର୍ଘ ପ୍ରଶ୍ନ ଆସିବ ବିଦ୍ୟାର୍ଥୀଙ୍କ ପସନ୍ଦ ଅନୁସାରେ ଗୋଟିଏ ପ୍ରଶ୍ନର ଉତ୍ତର ଦେବାକୁ ହେବ । (ମୋଟ ମୂଲ୍ୟ - ୧୫)

(ଗ) ତୃତୀୟ ଏକକ (ଅତିରିକ୍ତ ପାଠ୍ୟ) ରୁ ୧୫ ନମ୍ବର ବିଶିଷ୍ଟ ୨ଟି ଦୀର୍ଘ ପ୍ରଶ୍ନ ଆସିବ ବିଦ୍ୟାର୍ଥୀଙ୍କ ପସନ୍ଦ ଅନୁସାରେ ଗୋଟିଏ ପ୍ରଶ୍ନର ଉତ୍ତର ଦେବାକୁ ହେବ । (ମୋଟ ମୂଲ୍ୟ - ୧୫)

(ଘ) ବହୁର୍ଥ ଏକକରୁ ୧୫ ନମ୍ବର ବିଶିଷ୍ଟ ୨ଟି ପ୍ରଶ୍ନରୁ ଗୋଟିକର ଉତ୍ତର ଦେବାକୁ ହେବ । (ମୋଟ ମୂଲ୍ୟ - ୧୫)

(ଢ) ପ୍ରତ୍ୟେକ ଏକକରୁ ତିନୋଟି କରି ୧୨ଟି ପ୍ରଶ୍ନ ଆସିବ, ସେଥିରୁ ବିଦ୍ୟାର୍ଥୀ ୧୦ ଗୋଟି ପ୍ରଶ୍ନର ଉତ୍ତର ଦେବେ । (ମୋଟ ୨ x ୧୦ = ୨୦)

ସବିଶେଷ ଅଧ୍ୟୟନ ଅନୁମୋଦିତ ପାଠ୍ୟ

ପ୍ରଥମ ଏକକ- ଗଦ୍ୟ ସାହିତ୍ୟ

୧- ଜାତୀୟ ଜୀବନ - ମଧୁସୂଦନ ଦାସ

୨- ସୌନ୍ଦର୍ଯ୍ୟ ଓ ପ୍ରେମ - ଶଶିଭୂଷଣ ରାୟ

୩- ସାହିତ୍ୟ ଓ ଗଣମାଧ୍ୟମ - ଶରତ କୁମାର ମହାନ୍ତି

ଦ୍ୱିତୀୟ ଏକକ - ପଦ୍ୟ ସାହିତ୍ୟ

୧- କେଶବ କୋଇଲି - ମାର୍କଣ୍ଡ ଦାସ

୨- ମନବୋଧ ଚଉତିଶା - ଭକ୍ତଚରଣ ଦାସ

୩- କାକ ବାରତା - ନନ୍ଦକିଶୋର ବଳ

୪- ଝିଅ ପାଇଁ ଗୋଟିଏ କବିତା - ରାଜେନ୍ଦ୍ର କିଶୋର ପଣ୍ଡା

ତୃତୀୟ ଏକକ - ଅତିରିକ୍ତ ପାଠ୍ୟ (ଗଳ୍ପ ସାହିତ୍ୟ)

୧- ଅଶ୍ରୁତ ପୁତ୍ରର କାହାଣୀ - ଅଚ୍ୟୁତାନନ୍ଦ ପତି

୨- ସୁଲତାନ - ରାଜକିଶୋର ପଟ୍ଟନାୟକ

୩- ପାଟଦେଇ - ବୀଣାପାଣି ମହାନ୍ତି

ଚତୁର୍ଥ ଏକକ - ବ୍ୟାକରଣ

ପାଠ : ପଦ ପ୍ରକରଣ - (ବିଶେଷ୍ୟ, ବିଶେଷଣ, ସର୍ବନାମ, ଅବ୍ୟୟ ଓ କ୍ରିୟା)

ସହାୟକ ଗ୍ରନ୍ଥସୂଚୀ :

୧) ସର୍ବସାର ବ୍ୟାକରଣ - ପଣ୍ଡିତ ନାରାୟଣ ମହାପାତ୍ର ଏବଂ ଶ୍ରୀଧର ଦାଶ - ନିଉ ଷ୍ଟୁଡେଣ୍ଟସ୍ ଷ୍ଟୋର, କଟକ ।

୨) ପ୍ରଚଳିତ ଓଡ଼ିଆ ଭାଷାର ବ୍ୟାକରଣ - ବିଜୟ ପ୍ରସାଦ ମହାପାତ୍ର - ବିଦ୍ୟାପୁରୀ, କଟକ

୩) ଆଧୁନିକ ଓଡ଼ିଆ ବ୍ୟାକରଣ - ଧନେଶ୍ୱର ମହାପାତ୍ର - କିତାବ ମହଲି, କଟକ

୪) ଶେଷ ଦଶକର ରଚନା - ଶରତ କୁମାର ମହାନ୍ତି ।

COMPULSORY LANGUAGE / LITERATURE COURSE
MIL (ODIA)- ARTS
ବାଧତାମୂଳକ ଭାଷା ଓ ସାହିତ୍ୟ - ଆଧୁନିକ ଭାରତୀୟ ଭାଷା (ଓଡ଼ିଆ)
+୩, ପ୍ରଥମ ବର୍ଷ କଳା ସାଧାରଣ (PASS) ଶ୍ରେଣୀ ପାଇଁ ଉଦ୍ଦିଷ୍ଟ
2019-20
ପଢ଼ ସଂଖ୍ୟା – ଦ୍ଵିତୀୟ

ଦ୍ଵିତୀୟ ପର୍ଯ୍ୟାୟ (3RD SEMESTER)
(୨୦ ନମ୍ବର ଅକ୍ଟୋ ପରୀକ୍ଷା + ୮୦ ନମ୍ବର ମୁଖ୍ୟ ପରୀକ୍ଷା = ୧୦୦ ନମ୍ବର)

ମୂଲ୍ୟ ବିଭାଜନ

- (କ) ପ୍ରଥମ ଏକକ (ଗଦ୍ୟ ସାହିତ୍ୟ)ରୁ ୧୫ ନମ୍ବର ବିଶିଷ୍ଟ ୨ଟି ଦୀର୍ଘ ପ୍ରଶ୍ନ ଆସିବ ।
ବିଦ୍ୟାର୍ଥୀଙ୍କୁ ପସନ୍ଦ ଅନୁସାରେ ଗୋଟିଏ ପ୍ରଶ୍ନର ଉତ୍ତର ଦେବାକୁ ହେବ । (ମୋଟ ମୂଲ୍ୟ -୧:୫)
- (ଖ) ଦ୍ଵିତୀୟ ଏକକ (ପଦ୍ୟ ସାହିତ୍ୟ) ରୁ ୧୫ ନମ୍ବର ବିଶିଷ୍ଟ ୨ଟି ଦୀର୍ଘ ପ୍ରଶ୍ନ ଆସିବ । ବିଦ୍ୟାର୍ଥୀଙ୍କ ପସନ୍ଦ ଅନୁସାରେ ଗୋଟିଏ ପ୍ରଶ୍ନର ଉତ୍ତର ଦେବାକୁ ହେବ । (ମୋଟ ମୂଲ୍ୟ – ୧୫)
- (ଗ) ତୃତୀୟ ଏକକ (ଅତିରିକ୍ତ ପାଠ୍ୟ) ରୁ ୧୫ ନମ୍ବର ବିଶିଷ୍ଟ ୨ଟି ଦୀର୍ଘପର୍ଯ୍ୟାୟ ପ୍ରଶ୍ନ ଆସିବ । ବିଦ୍ୟାର୍ଥୀଙ୍କ ପସନ୍ଦ ଅନୁସାରେ ଗୋଟିଏ ପ୍ରଶ୍ନର ଉତ୍ତର ଦେବାକୁ ହେବ । (ମୋଟ ମୂଲ୍ୟ -୧୫)
- (ଘ) ଚତୁର୍ଥ ଏକକରୁ ୧୫ ନମ୍ବର ବିଶିଷ୍ଟ ୨ଟି ପ୍ରଶ୍ନରୁ ଗୋଟିକର ଉତ୍ତର ଦେବାକୁ ହେବ ।
(ମୋଟ ମୂଲ୍ୟ – ୧୫)
- (ଙ) ପ୍ରତ୍ୟେକ ଏକକରୁ ତିନୋଟି କରି ୧୨ଟି ପ୍ରଶ୍ନ ଆସିବ, ସେଥିରୁ ବିଦ୍ୟାର୍ଥୀ ୧୦ ଗୋଟି ପ୍ରଶ୍ନର ଉତ୍ତର ଦେବେ ।
(ମୋଟ ୨ x ୧୦ = ୨୦)

ଅନୁମୋଦିତ ପାଠ୍ୟ

ପ୍ରଥମ ଏକକ- ଗଦ୍ୟ ସାହିତ୍ୟ

୧- ଅଛୁ ଓ ହେବୁ - ନୀଳକଣ୍ଠ ଦାସ

୨- ସ୍ତ୍ରୀ ଶିକ୍ଷା - ରେବା ରାୟ

୩- ଇଚ୍ଛନ୍ତି ଦାମିକେ - ବୈଷ୍ଣବ ଚରଣ ସାମଲ

ଦ୍ୱିତୀୟ ଏକକ - ପଦ୍ୟ ସାହିତ୍ୟ

୧- ସବୁଥିରୁ ବଞ୍ଚିତ କରି - କାନ୍ତକବି ଲକ୍ଷ୍ମୀକାନ୍ତ ମହାପାତ୍ର

୨- ଅକ୍‌ରୁର ଉବାଚ - ଗୁରୁ ପ୍ରସାଦ ମହାନ୍ତି

୩- ଓଡ଼ିଶା - ସୀତାକାନ୍ତ ମହାପାତ୍ର

୪- ହେ ମୋ ଦେଶ - ବଜନାଥ ରଥ

ତୃତୀୟ ଏକକ - ଅତିରିକ୍ତ ପାଠ୍ୟ (ଜୀବନୀ)

୧-ପିତୃ ପ୍ରସଙ୍ଗ (ସଭାବ କବି ଗଙ୍ଗାଧର ମେହେରଙ୍କ ଜୀବନୀ -କେବଳ ଜୀବନୀ ଅଂଶ)- ଭଗବାନ ମେହେର

ଚତୁର୍ଥ ଏକକ - ବ୍ୟାକରଣ- ବାକ୍ୟର ସଂଜ୍ଞା, ସ୍ୱରୂପ, ଲକ୍ଷଣ ଓ ରୂପାନ୍ତର, ଲୋକୋକ୍ତିର ଅର୍ଥ ଓ ପ୍ରୟୋଗ

ସହାୟକ ଗ୍ରନ୍ଥସୂଚୀ :

୧) ସର୍ବସାର ବ୍ୟାକରଣ - ପଣ୍ଡିତ ନାରାୟଣ ମହାପାତ୍ର ଏବଂ ଶ୍ରୀଧର ଦାଶ - ନିଉ ଷ୍ଟୁଡେଣ୍ଟସ୍ ଷ୍ଟୋର, କଟକ

୨) ପ୍ରାୟୋଗିକ ଓଡ଼ିଆ ଭାଷା, ଓଡ଼ିଶା ରାଜ୍ୟପାଠ୍ୟ ପୁସ୍ତକ ପ୍ରଣୟନ ଓ ପ୍ରକାଶନ ସଂସ୍ଥା, ଭୁବନେଶ୍ୱର

ପାଠ୍ୟକ୍ରମ ସଂପର୍କରେ ଶିକ୍ଷକଙ୍କ ପ୍ରଶିକ୍ଷଣ ଯୋଜନା (୨୧ ଦିନ)

୨-ବୌଦ୍ଧ, ଶୈବ, ବୈଷ୍ଣବ, ଜଗନ୍ନାଥ ତତ୍ତ୍ୱ

୩-ଗବେଷଣା ପ୍ରବିଧି

୪ - ସାହିତ୍ୟତତ୍ତ୍ୱ (ପ୍ରାଚ୍ୟ-ପଶ୍ଚ୍ୟାତ୍ୟ)

୫- ଭାଷାବିଜ୍ଞାନ ଓ ଭାଷାତତ୍ତ୍ୱ

୬- ଲୋକସାହିତ୍ୟ ଓ ସଂସ୍କୃତି

୭-କଥା ସାହିତ୍ୟ (ଗଳ୍ପ ଉପନ୍ୟାସ)

୮ -ଅନୁବାଦ ଓ ସଂପାଦନା

୯-କମ୍ପ୍ୟୁଟର ଶିକ୍ଷା

U.G. Course Structure Philosophy

Semester		CORE COURSE (14)	Ability Enhancement Compulsory Course (AECC) (2)	Skill Enhancement Compulsory Course (SECC)(2)	Elective: Discipline Specific DSE (4)	Elective: Generic (GE) (4)
I	CC I	General Philosophy	Environmental Science or English/MIL Communication			GE-I Symbolic Logic
	CCII	Logic and Scientific Method				
II	CCIII	Systems of Indian Philosophy –I	Environmental Science or			GE-II Indian
	CCIV	Symbolic Logic				
III	CCV	Ethics		SECC -I		GE-III History of Modern European Philosophy
	CCVI	History of Greek Philosophy				
	CCVII	Systems of Indian Philosophy (II)				
IV	CCVIII	Contemporary Indian Philosophy		SECC-II		GE-IV Ethics: Theory and Practice
	CCIX	History of Modern European Philosophy				
	CCX	Philosophy of Language				
V	CCXI	Western Classics: Meditations of Rene Descartes			DSE-I PHILOSOPHY OF BHAGAVAD GITA	
	CCXII	Indian Text: Isa Upanishad			DSE-II PHILOSOPHY OF RELIGION	
VI	CCXIII	Social & Political Philosophy			DSE-III GANDHIAN STUDIES	
	CC XIV	Applied Ethics			DSE-IV RECENT WESTERN PHILOSOPHY/ PROJECT	

PHILOSOPHY

PHILOSOPHY-HONOURS

Core course – 14 papers

Discipline Specific Elective – 4 papers

Skill Enhancement Compulsory Course-2 papers Generic Elective for non Philosophy students

– 4 papers. In case University offers 2 subjects as GE, then papers 1 and 2 will be the GE paper.

Marks per paper - Midterm : 20 marks, End term : 80 marks, Total – 100 marks

Credit per paper – 6, Teaching hours per paper – 50 hours + 10 hours tutorial

CC I: GENERAL PHILOSOPHY

- Unit-I:** Definition, Nature & Function of Philosophy, and Philosophy in relation to other modes of thinking like Science & Religion.
- Unit-II:** Metaphysics: Monism, Pluralism, Realism, Idealism, Metaphysical issues: Substance, Universal, Mind & Body.
- Unit-III:** Problem of knowledge: What is knowledge? Sources of knowledge: Empiricism, Rationalism, Theories of Truth: Correspondence, coherence and pragmatic theory
- Unit-IV:** Problems of Ethics: (1) Theories of Goodness: The good and the evil (2) Theories of conduct: Egoism & Altruism.

Prescribed Books:

1. John Hospers: An Introduction to Philosophical Analysis (relevant portions)
2. J.N. Sinha : Introduction to Philosophy

Reference books:

- (1) G.T.W. Patrick: Introduction to Philosophy
- (2) A.C. Ewing: The Fundamental Questions of Philosophy
- (3) G.W. Cunningham: Problems of Philosophy
- (4) Richard Taylor: Metaphysics
- (5) D.W. Hamlyn: Metaphysics

CC II: LOGIC AND SCIENTIFIC METHOD

- Unit-I:** Definition of Logic, Laws of Thought, Deductive and Inductive Arguments, Validity & Soundness of Arguments.
- Unit-II:** Classification of Propositions (from stand-point of Quality & Quantity), Distribution of Terms, Square of oppositions, Existential Import of Propositions, Interpretation of categorical proposition.
- Unit-III:** Inference- Immediate Inference (Conversion and Obversion), Mediate Inference (Syllogism): Figure & Moods, Testing of Validity of Arguments by syllogistic Rules.
- Unit-4:** Inductive Reasoning & Scientific Enquiry: Causation & Mills Experimental Methods.

Prescribed Book:

1. Cohen & Nagel- Introduction to Logic & Scientific Method.

Reference Book:

1. Copi, Cohen & Mac Mahan- Introduction to Logic (14th Edition)
2. Alex Rosenberg- Philosophy of Science: A Contemporary Introduction
3. John Hospers: An Introduction to Philosophical Analysis.

CC III:SYSTEMS OF INDIAN PHILOSOPHY-I

- Unit-I:** Salient Features of Indian Philosophy, Basic concepts like Rta, Rna, Carvakas- Epistemology and Metaphysics (Lokayatamata)
- Unit-II-** Jainism - Syadvada, Anekantavada, Jaina ethics (concept of Triratna)
- Unit-III:** Buddhism: Four Noble Truths, Doctrine of Momentariness, Dependant Origination, No Soul Theory, Nirvana
- Unit-IV:** Samkhya-Dualistic System: Purusa, Prakriti, Theory of Causation, Theory of Evolution, Astanga Yoga of Patanjali

Prescribed Books:

- (1) Dutta&Chatterjee - An Introduction to Indian Philosophy
- (2) C. D. Sharma - A Critical Survey of Indian Philosophy

Reference Books:

- (1) R. K. Puligandla- Fundamentals of Indian Philosophy.
- (2) M. Hiriyana- Outlines of Indian Philosophy
- (3) J. N. Sinha- Indian Philosophy
- (4) S. Radhakrishnan- Indian Philosophy(Vol.1 & 2)

CC IV:SYMBOLIC LOGIC

- Unit-I:** Chapter- I Introduction
- Chapter- II-The Calculus of Propositions
- Unit- II:** Chapter-III Calculus of Propositions (Sec 1 to 6)
- Unit-III:** Chapter-IV Calculus of Propositions (Sec 7 to 9)
The Elements of Predicate Calculus (Section 1 to 9 of chapter V)
- Unit-IV:** Appendix (Sec-I to Sec-IV)

Prescribed Books: -Basson & O' Corner: Introduction to Symbolic Logic

CC V:ETHICS

- Unit-I:** Definition, Nature & Scope of Ethics, Ethics in relation to Politics, Sociology and Religion
- Unit-II:** Distinction between moral and non-moral action, Moral and factual Judgement. Object of Moral Judgement.
- Unit-III:** Theories of Morality: Hedonism, Utilitarianism, Rigorism, Perfectionism
- Unit-IV:** Theories of punishment; Retributive, Reformative and Preventive theory. **Prescribed Book:**

- (1)J. N. Sinha- A Manual of Ethics

Reference Books:

- (1) W. Frankena– Ethics
- (2) William Lily- An Introduction to Ethics

CC VI:HIISTORY OF GREEK PHILOSOPHY

Page 421 of

Unit-I: Nature of Greek Philosophy: What is Philosophy? Origin, development and Salient features of early Greek Thought

- Unit-II:** Pre-Socratic Thought: The Being of Parmenides, Becoming of Heraclitus and Atomism of Democritus
- Unit-III:** Socrates: Problem before Socrates, Dialectical method, epistemology And ethics of Socrates.
- Unit-IV:** Plato: Theory of Knowledge, Theory of Idea, and Theory of Soul
Aristotle: Theory of Form and Matter, Theory of Causation.

Prescribed Book:

- (1) W. T. Stace - Greek Philosophy

Reference books:

- (1) Burnet - Greek Philosophy
(2) B. A. G. Fuller - A History of Greek Philosophy
(3) B. Russell - A History of Western Philosophy
(4) Y. Masih - A Critical History of Philosophy

CC VII: SYSTEMS OF INDIAN PHILOSOPHY (II)

- Unit-I:** UPANISHADic view of Atman and Brahman, Vidya and Avidya, Para vidya and Aparavidya
- Unit-II:** Nyaya theory of Inference, Prama and Aprama, Concept of God
- Unit-III:** Vaishesika: Categories (Padarthas), Nyaya: Pramanas
- Unit-IV:** Sankara and Ramanuja's view on Maya, Jiva, Isvara, Brahman and Liberation

Prescribed Books: -

1. Dutta and Chatterjee: An Introduction to Indian Philosophy
2. C.D. Sharma: A Critical Survey of Indian Philosophy
3. M. Hiriyana: Outlines of Indian Philosophy

Books for Reference: -

1. J.N Sinha: Indian Philosophy
2. R.K Puligandla: Fundamentals of Indian Philosophy
3. S. Radhakrishnan: Indian Philosophy (Vol-I and II)

CC VIII: CONTEMPORARY INDIAN PHILOSOPHY

- UNIT-I:** Tagore: Nature of man God, Reality and Religion, Vivekananda: The concept of man, Universal Religion and Practical Vedanta
- Unit-II:** Sri Aurobindo: World, Maya, Evolution and Reality (Sacchidananda), Integral yoga
- Unit- III:** Gandhi: Truth, God and Non-violence, Ideal social order Dr B.R. Ambedkar: Vision of a just society
- Unit- IV:** S. Radhakrishnan: Man, Reality and Religion
J Krishna Murty: Man and Nature, Human Crisis

Prescribed Book: -

1. B.K Lal: Contemporary Indian Philosophy

Books for Reference: -

1. H. Sahoo (Ed): Contemporary Indian Philosophy
2. T.M.P Mahadevan and V. Saroja: Contemporary Indian Philosophy

PHILOSOPHY

- Unit- I** Bacon: Theory of Idola, Inductive Method
Descartes: Universal Doubt, Cogito-Ergo-Sum, Existence of God
- Unit-II** Spinoza: Substance, Attribute and Modes
Leibnitz: Theory of Monads, Pre-established harmony
- Unit- III** Locke: Refutation of Innate ideas, Sources of knowledge
Berkeley: Subjective idealism, Esse-est-percipii Hume: Impression and Idea, Skepticism and Causality
- Unit- IV** Kant: Reconciliation between empiricism and Rationalism
Possibility of Synthetic-a priori judgment

Prescribed Book: -

1. R.K. Pati: History of Modern European Philosophy

Books for Reference: -

1. Y Masih: History of Western Philosophy
2. Ira Sen Gupta: A History of Western Philosophy
3. Frank Thilly: History of Western Philosophy

CC X:PHILOSOPHY OF LANGUAGE

- Unit-I** Word Meaning: Meaning of the word “meaning”, Ambiguity and Vagueness
- Unit- II** Definitions: Denotative, Connotative and Ostensive
Defining and Accompanying Characteristics
Stipulative, Reportive and Persuasive definition
- Unit- III** Sentence Meaning: Proposition and sentence
Word Meaning and sentence meaning, Criteria of sentence meaning
- Unit-IV** Concept: Nature and source
Truth: Correspondence, Coherence and Truth as it works

Prescribed book: -

1. John Hospers: An Introduction to Philosophical Analysis

Books for Reference: -

1. Alston: Philosophy of Language
2. Das P: Life Language & Reality: An Introduction to Philosophy of Language

CCXI:WESTERN CLASSICS: MEDITATIONS OF RENE DESCARTES

- Unit- I** Meditation I: Sceptical Doubts
Meditation II: Cogito-ergo-sum, Sum- res-cogitans, The Wax argument
- Unit- II** Meditation III: Clear and Distinct perceptions
Theory of Ideas, Existence of God
- Unit- III** Meditation IV: God is no deceiver, will, intellect and possibility of Error
Meditation V: Essence of Material things, Existence of God
- Unit- IV** Meditation- VI Mind- body Dualism, Primary and Secondary Quality

Prescribed Book: -

1. Rene Descartes: Meditations on first Philosophy

Books for Reference: -

1. Rae Langton: A Study Guide to Descartes Meditations
2. Amelie Rorty: Essays on Descartes Meditations

CCXII:INDIAN TEXT: ISA UPANISHAD

Unit-I What are Upanishads? Place of Upanishad in Indian Philosophy and Isa Upanishad

Unit-II Mantra 1 to 9

Unit- III Mantra 10 to 14

Unit- IV Mantra 15 to 18

Prescribed Book: -

1. Swami Gambhirananda, Eight Upanishads (Vol-I) God and Reality, Advaita Ashrama, Calcutta

Books for Reference: -

1. S. Radhakrishnan: The Principal Upanishads
2. Satyabadi Mishra: Central Philosophy of the Upanishads
3. Aditya Ku. Mohanty: Upanishads Rediscovered

CCXIII:SOCIAL & POLITICAL PHILOSOPHY

Unit-I: Sociality, Social science & Social laws, Philosophy of Social Science-Relation Between Individual&Society (Mechanical,Organic &Idealistic view)

Unit- II: Political Ideals- Justice, Liberty, Equality
Political Doctrines- Humanism, Secularism, Feminism, Philosophy of Ecology.

Unit- III: Democratic Ideals- Democratic Government, Conditions for Successful Functioning of Democracy,Human Rights

Unit-IV: Political Ideologies- (a) Anarchism (b) Marxism (c) Sarvodaya

Prescribed Book-

1. O.P. Gauba - An Introduction to Political Philosophy.

Reference Books-

1. Mackenzie: Social & Political Philosophy
2. Sukhvir Singh- Social and Political Philosophy
3. Sushila Ramaswamy- Political Theories: Ideas &Concepts
4. D.D. Raphael- Problems of Political Philosophy
5. Patitapaban Das- Social and Political Philosophy

CCXIV:APPLIED ETHICS

Unit- I: What is Applied Ethics: Nature &Scope of Applied Ethics- Ethical Theories- Deontology, Utilitarianism, Relativism &Subjectivism

Unit-II: Taking Life: Animals- Animals rights, Reverence for life
Taking Life: Humans- Types of Euthanasia, Abortion

Unit-III: Environmental Ethics: Anthropocentrism, Non-anthropocentrism, Deep Ecology

Unit-IV: Professional Ethics: (a) Business Ethics- Rights and Obligations,Justice& Honesty in Ethics.(b) Bio-medical Ethics- Hippocratic Oath, Rights and Obligations of Health Professionals, Doctor- Patient-Relationship

Prescribed Book-

1. Peter Singer- Practical Ethics

Reference Books-

1. J. Jagadeb- Bio-medical Ethics
2. Tom Regan - Animal Rights
3. J. P. Theroux- Ethics: Theory & Practice
4. P.K Mohapatra :Ethics and Society

DISCIPLINE SPECIFIC ELECTIVE

DSE I: PHILOSOPHY OF BHAGAVAD GITA

Unit-I:Dharma:-Varnadharma, Swabhava, Swadharma- Paradharm

Unit-II:Karma:-Classification of Karma; Agency Niskama Karma, Lokasamgraha, Relation between Karma Yoga and Jnana yoga

Unit-III:Jnana:- Distinction between Jnana and Vijnana. Criteria of True Knowledge (Buddhi Yoga & JnanaYoga), Kshetra, Kshetrajna, Purusottama.Sattvika, Rajasika and TamasikaJnana

Unit-IV:Bhakti Yoga:- Four kinds of devotee, Characteristics of Ideal Bhakti- Saranagati & Prapattikrupa (grace); Relation between Bhakti Yoga & Jnana Yoga

Prescribed Books-

1. The Bhagavad Gita- S. Radhakrishnan (Trs&Ed)

Reference Books-

1. Concept of Yoga in the Gita- S. C. Panigrahi
2. Bhagavad Gita & Modern Life- K. M. Munshi& R. R. Diwakar
3. The Lord Speaks (2016)- B. K. Tripathy
4. Srimad Bhagavad Gita Bhasya of Sri Sankaracharya- A. G. K. Warriar(Trs)
5. The Ethical Philosophy of Gita- P. N. Srinivasachari

DSE-II: PHILOSOPHY OF RELIGION

Unit-I: Judaic- Christian Concept of God (Chapter-1) Introduction to Philosophy of Religion
Grounds for belief in existence of God (Chapter- 2)

Unit-II: Grounds for belief against existence of God (Chapter-3)

Unit-III: The Problem of Evil (Chapter- 4)

Unit-IV: Problems of Religious Language

Prescribed Book-

1. John Hick- Philosophy of Religion

Reference Books-

1. Y. Masih-Introduction to Religious Philosophy
2. Arvind Sharma- Philosophy of Religion

DSE –III:GANDHIAN STUDIES

Unit-I :Gandhi's concept of a Just society. Basic Ideals- Truth, Non-violence, Equality and Human Freedom.

Unit-II: Gandhi's idea of Social Engineering, Constructive Programme. Fight against social Evils (Injustice, Caste system, Untouchability) upliftment of Women.

Unit-III: Social Ideals of Gandhi Sarvodaya, Criticism of industrial civilization, Anarchism, Trusteeship.

Unit –IV: Method of Social Action, Satyagraha- Kinds of Satyagraha, Methods of Satyagraha. Mercy- Killing, Ideals of Basic Education. Basic Norms & Method of Education, Education for a Happier & Peaceful Society. World Peace.

Prescribed Book-

1. The Philosophy of Mahatma Gandhi, by D.M Datta

Reference Books-

1. Social & Political Thought of M.K. Gandhi- Jaya Tanuja Bandopadhyay
2. Mahatma Gandhi- R.R. Diwakar

DSE-IV: RECENT WESTERN PHILOSOPHY

Unit-1: Arther, Schopenhauer: The world as representation. The world as will, theory of perception, Ethics

Unit-2: Nietzsche: Critique of enlightenment Perspectivism, Appollonian and Dyonysian will to power, concept of superman

Unit-3: Sartre, J.P.: Concept of Freedom, Bad-faith, Humanism

Unit-4: William James: Meaning & Truth, Varieties of Religious experience

Recommended Text

1. B.A.G Fuller & McMurrin , A History of Philosophy
2. D.M.Dutta Chief Currents of Contemporary Philosophy
3. Frank Thilly, History of Western Philosophy

Reference Book

1. M.K. Bhadra, A critical Survey of Phenomenology & Existentialism
2. H.J. Blackham, Six Existential Thinkers
3. W.Mc. Neil & K.S. Feldman, Continental Philosophy: An Anthology

Project (Optional)

Eligibility: Students who have scored more than 60% marks in Semester –I, II, III &IV are eligible to opt for project paper. The student has to prepare a project of his own selecting a topic from philosophical perspective (For example-some broad themes are given below). The dissertation carries 60 marks which will be evaluated by an external examiner and he / she will face a viva-voice test of 40 marks by an external examiner along with his / her supervisor of the concerned project.

1. Philosophy, value and culture
2. Existentialism and Phenomenology
3. Philosophy of religion
4. Philosophy of Language
5. Socio-Political Philosophy
6. Indian Philosophy/Contemporary Indian Philosophy
7. Ethics/Applied ethics
8. Philosophy of Mind

GE I General Philosophy

Unit 1: Chapter I- Introductory

Chapter II- The Calculus of Propositions

Unit II: Chapter III- The Calculus of Propositions (Sec 1 to 6)

Unit III: Chapter IV- The Calculus of Propositions
(Sec 7 to 9) Chapter V- The Elements of
Predicate Calculus

Unit IV: Appendix Sec 1 to Sec 4

Prescribed Book: -

1. Basson and O. Conner: Introduction to symbolic Logic

GEII: INDIAN PHILOSOPHY

Unit I: Salient features of Indian philosophy and key concepts, Carvaka epistemology and metaphysic, Jainism Syadvada and Anekantavada

Unit II: Buddhism- The Four Noble Truth, Doctrine of Dependent origination, No Soul Theory, Nirvana

Unit III: Samkhya- Purusa, Prakrti, Theory of Evolution Yoga- Patanjali's CittaVrtti Nirodha, Astanga Yoga

Unit IV: Nyaya- Theory of Inference, Vaishesika- Padarthas (Categories)

Prescribed Books:-

1. Dutta and Chatterjee: An Introduction to Indian Philosophy

Reference Books:-

1. C.D Sharma: A critical Survey of Indian Philosophy
2. G.C Nayak: Bharatiya Darshana (Odia)
3. B.B. Choudhury: Bharatiya Darshana Ruparekha (Odia Translated book)

GE III:HISTORY OF MODERN EUROPEAN PHILOSOPHY

Unit I : Bacon: Theory of Idolas, Inductive Method Descartes: Methods of Doubt, Cogito ergo Sum

Unit II: Spinoza: Substance, Attributes and Model Leibnitz: Theory of Monads, Pre-Established Harmony

Unit III: Locke: Refutation of Innate Ideas, Theory of Knowledge Berkeley: Esse est percipi, Subjective Idealism

Unit IV: Hume: Ideas and Impressions Skepticism Kant: Reconciliation of Empiricism and Rationalism

Prescribed Book: -

1. R.K Pati- A History of Modern European Philosophy

Reference Books: -

1. Ira Sengupta- A History of Western Philosophy
2. Barlingay and Kulkarni- A History of Western Philosophy
3. Ray and Das- Paschatya Darshanra Itihasa
4. Y. Masih- A Critical History of Western Philosophy
5. Falkenberg- A History of Philosophy

GE IV: ETHICS: THEORY AND PRACTICE

Unit I: Definition, Nature and Scope of Ethics, Distinction between moral and Non-moral action.

Unit II: Distinction between factual and moral judgement, objects of moral judgement.

Unit III: Moral Standards: Hedonism, Mill's Utilitarianism, And Kant's Rigorism and Perfectionism.

Unit IV: Environmental Ethics: Anthropocentrism and Non-Anthropocentrism Bio-centric Egalitarianism, Deep Ecology, Responsibility for future Generation

Prescribed Book: -

1. J.N. Sinha- A Manual of Ethics
2. Peter Singer- Practical Ethics

Reference Book:

1. H. Sahoo(ed) Ethics theory and practice

Course structure of UG Political Science Honours

Semester	Course	Course Name	Credits	Total marks
I	AECC-I	AEC-I	04	100
	C-I	Understanding Political Theory	06	100
	C-II	Constitutional Government and Democracy in India	06	100
	GE-I	Feminism: Theory and Practice	06	100
			22	
II	AECC-II	AEC-II	4	100
	C-III	Political Theory-Concepts and Debates	06	100
	C-IV	Political Process in India	06	100
	GE-II	Governance: Issues and Challenges	06	100
			22	
III	C-V	Introduction to Comparative Government and Politics	06	100
	C-VI	Introduction to Public Administration	06	100
	C-VII	Perspectives on International Relations	06	100
	GE-III	Gandhi and the Contemporary World	06	100
	SEC-I	SEC-I(to be selected by the University/College from the Repertoire of SEC courses)	04	100
			28	
IV	C-VIII	Political Processes and Institutions in Comparative Perspective	06	100
	C-IX	Public Policy and Administration in India	06	100
	C-X	Global Politics	06	100
	GE-IV	United Nations and Global Conflicts	06	100

	SEC-II	SEC-II (to be selected by the University/College from the Repertoire of SEC courses)	04	100
			28	
Semester	Course	Course Name	Credits	Total marks
V	C-XI	Western Political Philosophy	06	100
	C-XII	Indian Political Thought(Ancient & Medieval)	06	100
	DSE-I	Introduction to Human Rights	06	100
	DSE-II	Development Process and Social Movements in Contemporary India	06	100
			24	
VI	C-XIII	Contemporary Political Philosophy	06	100
	C-XIV	Modern Indian Political Thought	06	100
	DSE-III	India's Foreign Policy in a Changing world	06	100
	DSE-IV	Women, Power and Politics	06	100
	OR			
	DSE-IV	Dissertation	06	100*
			24	

Discipline Specific Elective Papers: (Credit: 06 each) (4 papers to be selected by students of Political Science Honours): DSE 1-IV

1. Human Rights in a Comparative Perspective
2. Development Process and Social Movements in Contemporary India (PROJECT)
3. India's Foreign Policy in a Globalizing world
4. Women, Power and Politics
5. Project *Dissertation (can be opted as alternative of DSE-IV only and of 6 credits.

Dissertation content: 50, Seminar: 30, Viva: 20) as per regulation

POLITICAL SCIENCE

HONOURS PAPERS:

Core course – Designated as CI to C XIV i.e. 14 papers

Discipline Specific Elective (DSE) – 4 papers

Generic Elective (GE) for non Public Administration students– 4 papers. In case University offers 2 subjects as GE, then papers 1 and 2 will be the GE paper.

Marks per paper - Midterm: 20 marks, End term : 80 marks, Total – 100 marks

Credit per paper – 6

Teaching hours per paper – 50 hours + 10 hours tutorial

Core Paper I (C- I) UNDERSTANDING POLITICAL THEORY

Introduction: This course is divided into two sections. Section ‘A’ introduces the students to the idea of political theory, its history and approaches and an assessment of its critical and contemporary trends. Section ‘B’ is designed to reconcile political theory and practices through reflections on the ideas and practices related to democracy.

UNIT-1: Introducing Political Theory

- (i) What is Politics: Theorizing the ‘Political’
- (ii) Traditions of Political Theory: Liberal, Marxist, Anarchist and Conservative
- (iii) Approaches to Political Theory: Normative, Historical, Behavioural and Post-behavioural

UNIT-II: Critical and Contemporary Perspectives in Political Theory

- (i) Theories of Feminism: Feminist and Postmodern
- (ii) Modernism and Post -modernism

UNIT-III: Political theory and Practice

- (i) Democracy: Liberal and Marxist.
- (ii) Procedural Democracy and its critique

UNIT-IV: The Grammar of Democracy

- (i) Deliberative Democracy
- (ii) Participation and Representation

Text Books

- Bhargava, R. and Ashok Acharya (2008) '*Political Theory: An Introduction*'. New Delhi: Pearson Longman.
- Vinod, M.J and Deshpande, Meena (2013) '*Contemporary Political Theory*', PHI, New Delhi
- Verma, S. P. (1996) '*Modern Political Theory*', Vikash Publishing, 3rd Reprint, New Delhi.
- Ramaswamy, Sushila (2010), '*Political Theory: Ideas and Concepts*', PHI Learning, New Delhi
- Bellamy, R. (1993), (ed.) '*Theories and Concepts of Politics*'. New York: Manchester University Press.
- Marsh, D. and Stoker, G. (eds.) '*Theory and Methods in Political Science*'. London: Macmillan.
- Heywood, Andrew (2016) (Reprint) '*Political Theory: An Introduction*', Palgrave, UK.

Further Reading

- Kukathas, Ch. and Gaus, G. F. (2004) (eds.) '*Handbook of Political Theory*'. New Delhi, Sage.
- Vincent, A. (2004) '*The Nature of Political Theory*'. New York: Oxford University Press.
- Mckinnon, C. (ed.) (2008) '*Issues in Political Theory*', New York: Oxford University Press.
- Arblaster, A. (1994) '*Democracy*', (2nd Edition), Buckingham: Open University Press.
- Parekh, B. (2000), '*Rethinking Multiculturalism: Cultural Diversity and Political Theory*', Macmillan Press, London.

Core Paper II(C-II)

CONSTITUTIONAL GOVERNMENT AND DEMOCRACY IN INDIA

Introduction: This course acquaints students with the Constitutional design of state structures and institutions, and their actual working over time. The Indian Constitution accommodates conflicting impulses (of liberty and justice, territorial decentralization and a strong union, for instance) within itself. The course traces the embodiment of some of these conflicts in constitutional provisions, and shows how these have played out in political practice. It further encourages a study of state institutions in their mutual interaction, and in interaction with the larger extra-constitutional environment.

UNIT-I: The Constituent Assembly and the Constitution

- i) Formation and working of the Constituent Assembly
- ii) The Philosophy of the constitution: The Preamble and its Features.
- iii) Fundamental Rights, Directive Principles of State Policy, Fundamental Duties

UNIT-II: Organs of Government

- i) The Legislature and the Executive
- ii) The Judiciary: Supreme Court and High Courts

UNIT-III: Federalism

- i) Federalism: Centre-State relations
- ii) Recent trends in federalism

UNIT-IV: Decentralization

- i) Panchayati Raj Institutions: Composition, Powers and functions of Gram Panchayat, Panchayat Samiti and Zilla Parishad.
- ii) Municipalities: Composition Powers and function of Municipal Corporation, Municipal Council and Notified Area Council

Text Books

- G. Austin, (2010) ‘The Indian Constitution: Cornerstone of a Nation’, New Delhi, Oxford University Press, 15th print.
- R. Bhargava (ed.) ‘Politics and Ethics of the Indian Constitution’, New Delhi, Oxford University Press.
- D. Basu, (2012) ‘Introduction to the Constitution of India’, New Delhi, Lexis Nexis.
- S. Chaube, (2009) ‘The Making and Working of the Indian Constitution’, New Delhi, National Book Trust.
- G. Austin, (2000) ‘Working a Democratic Constitution’, New Delhi, Oxford University Press.
- B. Shankar and V. Rodrigues, (2011), ‘The Indian Parliament: A Democracy at Work’, New Delhi: Oxford University Press.
- P. Mehta and N. Jayal (2010) (eds.) ‘The Oxford Companion to Politics in India’, New Delhi, Oxford University Press.

Reference Books

- Mehra and G. Kueck (eds.) ‘The Indian Parliament: A Comparative Perspective’, New Delhi, Konark.
- B. Kirpal et.al (eds.) ‘Supreme but not Infallible: Essays in Honour of the Supreme Court of India’, New Delhi, Oxford University Press.
- L. Rudolph and S. Rudolph, (2008) ‘Explaining Indian Institutions: A Fifty Year Perspective, 1956-2006’, Volume 2, New Delhi, Oxford University Press.
- M. Singh, and R. Saxena (2011) (eds.), ‘Indian Politics: Constitutional Foundations and Institutional Functioning’, Delhi: PHI Learning Private Ltd.
- K. Roy, C. Saunders and J. Kincaid (2006) (eds.) ‘A Global Dialogue on Federalism’, Volume 3 Montreal, Queen’s University Press

Core Paper III (C - III)

POLITICAL THEORY-CONCEPTS AND DEBATES

Introduction: This course is divided into two sections. Section A helps the student familiarize with the basic normative concepts of political theory. Each concept is related to a crucial political issue that requires analysis with the aid of our conceptual understanding. This exercise is designed to encourage critical and reflective analysis and interpretation of social practices through the relevant conceptual tool kit. Section B introduces the students to the important debates in the subject. These debates prompt us to consider that there is no settled way of understanding concepts and that in the light of new insights and challenges, besides newer ways of perceiving and interpreting the world around us, we inaugurate new modes of Political debates.

UNIT-I: Importance of Freedom

- (i) Negative Freedom and Positive Freedom, Freedom of belief, expression and dissent
- (ii) Equality: Meaning and Types, Egalitarianism: Social Exclusion & Affirmative action

UNIT-II: Indispensability of Justice

- (i) Justice: Meaning and Types
- (ii) Procedural, Distributive and Global Justice.

UNIT-III: The Universality of Rights

- (i) Rights: Natural, Moral and Legal
- (ii) Three Generations of Rights

UNIT-IV: Major debates

- (i) Political obligation: Grounds
- (ii) Cultural Relativism and Multiculturalism.

Text Book

- Verma, S. P. (1996) 'Modern Political Theory', Vikash Publishing, 3rd Reprint, New Delhi.
- Vinod, M.J and Deshpande, Meena (2013) Contemporary Political Theory, PHI, New Delhi
- Ramaswamy, Sushila (2010), 'Political Theory: Ideas and Concepts', PHI Learning, New Delhi
- Bellamy, R. (1993), (ed.) *Theories and Concepts of Politics*. New York: Manchester University Press.
- Marsh, D. and Stoker, G. (eds.) 'Theory and Methods in Political Science'. London, Macmillan.
- Heywood, Andrew (2016) (Reprint), 'Political Theory: An Introduction', Palgrave, UK.

Reference Books

- Bellamy, Richard and Mason, Andrew (1993) (eds.) 'Political Concepts' Manchester, Manchester University Press.
- Knowles, Dudley. (2001) 'Political Philosophy', London, Routledge.
- Mckinnon, Catriona (2008) (ed.) 'Issues in Political Theory', New York: Oxford University Press.
- Swift, Adam. (2001) 'Political Philosophy: A Beginners Guide for Student's and Politicians', Cambridge, Polity Press.
- La Follett, Hugh (2003) (ed.) 'The Oxford Handbook of Practical Ethic'. New York, Oxford University Press.
- Knowles, Dudley. (2001) 'Political Philosophy', London, Routledge.

Core Paper IV (C-IV) POLITICAL PROCESS IN INDIA

Introduction: Actual politics in India diverges quite significantly from constitutional legal rules. An understanding of the political process thus calls for a different mode of analysis - that offered by political sociology. This course maps the working of 'modern' institutions, premised on the existence of an individuated society, in a context marked by communitarian solidarities, and their mutual transformation thereby. It also familiarizes students with the working of the Indian state, paying attention to the contradictory dynamics of modern state power.

Political Parties, the Party system and Determinants

of Voting Behaviour UNIT-I: Indian party system

- (i) Party System in India: Features and Trends
- (ii) Voting Behaviour and Its determinants: Caste, Class, Gender and Religion.
- (iii) Election Commission: Constitution and Functions, Electoral Reforms

UNIT-II: Regionalism, Religion and Politics

- (i) Regionalism: Causes and its trends,
- (ii) Secularism and Communalism: Debates

UNIT-III: Caste and Politics

- i) Caste and Politics: Politicisation of Caste
- ii) Affirmative Action: Policies, Women, Caste and Marginalized Class

UNIT-IV: The Changing Nature of the India State

- (i) Developmental and Welfare Dimensions
- (ii) Coercive Dimension

Text books

- Kaviraj, Sudipta(2009) 'Politics in India', Oxford University Press, New Delhi
- Kohli, Atul (2004) (ed.) 'The Success of India's Democracy', New Delhi, Cambridge University Press.
- Kothari,R (1970) 'Caste in Indian Politics', Delhi, Orient Longman.
- M. John, (ed) (2008) 'Women in India: A Reader, Penguin , India
- P. Brass, (1999) 'The Politics of India since Independence, New Delhi, Cambridge University Press and Foundation Books.
- P. Mehta and N. Jayal (2010) (eds.) 'The Oxford Companion to Politics in India', New Delhi, Oxford University Press.
- Z. Hasan (2002) (ed.) 'Parties and Party Politics in India', New Delhi: Oxford University Press.
- Z. Hasan, E. Sridharan and R. Sudarshan (2002) (eds.) 'India's Living Constitution: Ideas, Practices, Controversies', New Delhi, Permanent Black.

Reference Books

- N. Menon and A. Nigam, (2007) 'Power and Contestation: India since 1989', London, Fernwood Publishing, Halifax and Zed Books.

- R. Vora and S. Palshikar (eds.) 'Indian Democracy: Meanings and Practices', New Delhi, Sage.
- Shah, G (ed.) 'Social Movements and the State', New Delhi, Sage Publications.
- P. deSouza and E. Sridharan (eds.) 'India's Political Parties', New Delhi, Sage Publications.
- A S. Ganguly, L. Diamond and M. Plattner (eds.) 'The State of India's Democracy', Baltimore, John Hopkins University Press.

Core Paper V (C - V)

INTRODUCTION TO COMPARATIVE GOVERNMENT AND POLITICS

Introduction: This is a foundational course in comparative politics. The purpose is to familiarize students with the basic concepts and approaches to the study of comparative politics. More specifically the course will focus on examining politics in a historical framework while engaging with various themes of comparative analysis in developed and developing countries.

UNIT-1: Understanding Comparative Politics

- (i) Meaning, Nature, scope and Evolution
- (ii) Approaches to the study of Comparative Politics

UNIT-II: Historical context of modern government

- (i) Capitalism: meaning and development
- (ii) Globalization: Features & impact

UNIT-III: Historical context of Modern Government- II

- (i) Socialism: Meaning, Types and its growth
- (ii) Rise and Decline of Communism as a Ruling Ideology
- (iv) Colonialism and decolonization: meaning, context, forms of colonialism

UNIT-IV: Themes of Comparative Politics

- (i) A comparative study of Governments of USA & China
- (ii) US: President, Congress, Supreme Court
- (iii) China: People's Congress, National Assembly, Role of Communist Party of China

Text books:

- Bhagwan, Vishnoo et al (2012) 'World Constitutions', Sterling Publishers, New Delhi
- Chilcote, Ronald (1994) 'Theories of Comparative Politics: The Search for a Paradigm Reconsidered', Westview Press, Boulder.
- G. Ritzer, (2002) 'Globalization: A Basic Text'. London, Wiley-Blackwell.
- Huntington, Samuel, (1968) 'Political Order in Changing Societies', Yale University Press, New Haven.
- Kapur, A.C and K.K. Mishra (2010) 'Select Constitutions', S. Chand, New Delhi

- Suresh. R(2010), 'Economy and Society : Evolution of Capitalism', Sage , New Delhi

Reference Books

- P. Burnell, et. al, 'Politics in the Developing World'. New Delhi: Oxford University Press,
- J. McCormick, (2007) 'Comparative Politics in Transition', UK, Wadsworth.
- L. Barrington et. al (2010) 'Comparative Politics - Structures and Choices', Boston, Wadsworth,
- M. Kesselman, J. Krieger and William (2010), 'Introduction to Comparative Politics: Political Challenges and Changing Agendas', UK, Wadsworth.
- J. Kopstein and M. Lichbach. (eds.) 'Comparative Politics: Interest, Identities and Institutions in a Changing Global Order'. Cambridge: Cambridge University Press.

Core Paper VI (C-VI)

INTRODUCTION TO PUBLIC ADMINISTRATION

Introduction: The course provides an introduction to the discipline of public administration. This paper encompasses public administration in its historical context with an emphasis on the various classical and contemporary administrative theories. The course also explores some of the recent trends, including feminism and ecological conservation and how the call for greater democratization is restructuring public administration. The course will also attempt to provide the students a comprehensive understanding on contemporary administrative developments.

UNIT-1 : Public Administration as a Discipline

- (i) Meaning, Scope and Significance of the Discipline, Public and Private Administration
- (ii) Evolution of Public Administration

UNIT-II: Theoretical Perspectives

Classical Theories

- (i) Scientific management (F. W. Taylor), Ideal-type bureaucracy (Max Weber)
- (ii) Administrative Management (Gullick, Urwick and Fayol)

UNIT-III: Neo-Classical and Contemporary Theories

- (i) Human Relations theory (Elton Mayo), Rational decision-making (Herbert Simon)
- (ii) Ecological approach (Fred Riggs), Innovation and Entrepreneurship (Peter Drucker)

UNIT-IV: Public Policy and Major Approaches in Public Administration

- (i) Public Policy-Concept and approaches, Formulation, implementation and evaluation
- (ii) New Public Administration, New Public Management, New Public Service Approach

(iii) Good Governance, Feminist Perspectives in Governance

Text Books

- B. Chakrabarty and M. Bhattacharya (eds), 'Administrative Change and Innovation: A Reader', New Delhi, Oxford University Press.
- Basu, Rumki, (2014) 'Public Administration: Concepts and Theories', Sterling Publishers, New Delhi
- D. Ravindra Prasad, Y. Pardhasaradhi, V. S. Prasad and P. Satyarnarayana, (2010) (eds.) 'Administrative Thinkers', Sterling Publishers.
- J. Shafritz, and A. Hyde, (2004) (eds.) 'Classics of Public Administration', 5th Edition. Belmont, Wadsworth.
- M. Bhattacharya, (2008) 'New Horizons of Public Administration', 5th Revised Edition. New Delhi, Jawahar Publishers.
- M. Bhattacharya, (2011) 'New Horizons of Public Administration', New Delhi: Jawahar Publishers.
- M. Bhattacharya, (2012) 'Restructuring Public Administration: A New Look', New Delhi, Jawahar Publishers,
- N. Henry, (2013) 'Public Administration and Public Affairs', 12th edition. New Jersey, Pearson,
- Shafritz, J. and Hyde, A. , (1997) (eds.) 'Classics of Public Administration', 4th Edition. Forth Worth, Hartcourt Brace, TX.

Reference Books

- B. Chakrabarty and M. Bhattacharya (2003) (eds.), 'Public Administration: A Reader', New Delhi, Oxford University Press.
- B. Chakrabarty, (2007) 'Reinventing Public Administration: The India Experience'. New Delhi, Orient Longman,
- B. Miner, (2006) 'Organisational Behaviour: Historical Origins and the Future'. New York,
- F. Riggs, (1964) 'Administration in Developing Countries: The Theory of Prismatic Society'. Boston, Houghton Mifflin.
- F. Riggs, (1961) 'The Ecology of Public Administration', Part 3, New Delhi, Asia Publishing House.
- M. Bhattacharya, (2006) 'Social Theory, Development Administration and Development Ethics', New Delhi, Jawahar Publishers.
- Nivedita Menon (1999), (ed.) 'Gender and Politics', New Delhi, Oxford University Press.
- Peter F. Ducker, (2006) 'The Practice of Management', Harper Collins.
- S. Maheshwari, (2009) 'Administrative Thinkers', New Delhi: Macmillan

Core Paper VII (C-VII)

PERSPECTIVES ON INTERNATIONAL RELATIONS

Introduction: This paper seeks to equip students with the basic intellectual tools for understanding International Relations. It introduces students to some of the most important theoretical approaches for studying international relations. The course begins by historically contextualizing the evolution of the international state system before discussing the agency-structure problem through the levels-of-analysis approach. After having set the parameters of the debate, students are introduced to different theories in International Relations. It provides a fairly comprehensive overview of the major political developments and events starting from the twentieth century. Students are expected to learn about the

key milestones in world history and equip them with the tools to understand and analyze the same from different perspectives. A key objective of the course is to make students aware of the implicit Eurocentricism of International Relations by highlighting certain specific perspectives from the Global South.

UNIT-I: Studying International Relations

- (i) International Relations: Meaning, Scope and Evolution, Emergence of International State System
- (ii) National Interest-Key Determinants of International Relations
- (iii) Power-Cornerstone of International Relations

UNIT-II: Theoretical Perspectives

- (i) Classical Realism & Neo-Realism, Liberalism & Neo-liberalism
- (ii) Marxist Approaches, Feminist Perspectives, Euro-centricism & Perspective from the Global South

UNIT-III: An Overview of Twentieth Century IR History-I

- (i) World War I: Causes & Consequences, significance of Bolshevik Revolution
- (ii) Rise of Fascism / Nazism, World war II-Causes &Consequences

UNIT-IV: An Overview of Twentieth Century IR -II

- (i) Cold War Evolution& Different Phases (4 Lectures) Disintegration of USSR
- (ii) Emergence of the Third World, End of the Cold War

Text Books

- Basu, Rumki (2012) (ed.) 'International Politics: Concepts, Theories and Issues', New Delhi.
- Baylis & S. Smith (2002) (eds.), 'The Globalization of World Politics', Oxford University Press, UK, 4th edition, 2007 W.Bello, Deglobalization, Zed Books, London.
- M. Nicholson, (2002) 'International Relations: A Concise Introduction', New York, Palgrave.
- P. Viotti and M. Kauppi, (2007) 'International Relations and World Politics: Security, Economy, Identity', Pearson Education.
- R. Jackson and G. Sorensen, (2007) 'Introduction to International Relations: Theories and Approaches', 3rd Edition, Oxford, Oxford University Press.
- S. Joshua. Goldstein and J. Pevehouse, (2007) 'International Relations', New York, Pearson Longman.

Reference Books

1. Calvocoressi, P. (2001) 'World Politics: 1945—2000'. Essex, Pearson.
1. Dey, Dipankar (2007)(ed.), 'Sustainable Development: Perspectives and Initiatives', ICFAI University Press, Hyderabad,
2. K. Booth and S. Smith, (eds), 'International Relations Theory Today', Pennsylvania, The Pennsylvania State University Press.
3. M. Smith and R. Little (2000) (eds.), 'Perspectives on World Politics', New York, Routledge

Core Paper VIII(C-VIII)

POLITICAL PROCESSES AND INSTITUTIONS IN COMPARATIVE PERSPECTIVE

Introduction: In this course students will be trained in the application of comparative methods to the study of politics. The course is comparative in both what we study and how we study. In the process the course aims to introduce undergraduate students to some of the range of issues, literature, and methods that cover comparative political.

UNIT-I: Approaches to Studying Comparative Politics

- (i) Political Culture –Meaning, Types &relevance.
- (ii) New Institutionalism –Meaning, Background, Significance

UNIT-II: Election& Party System

- (i) Definition and procedures: Types of election system (First Past the Post, Proportional Representation, Mixed Representation)
- (ii) Party System -Evolution, Theories and types

UNIT-III: Nation-state

- (i) Nation-state; Meaning and Evolution in West Europe
- (ii) Nation and State; Debates in Post-colonial contexts

UNIT-IV: Democratization in Post- colonial societies

- (i) Democratization in Post-authoritarian countries and in Post-communist countries
- (ii) Federalism: Meaning and Features, Federation& Confederation: Debates around territorial division of power.

Text Books

- A. Heywood, (2002) 'Politics', New York, Palgrave.
- J. Bara and M. Pennington, (eds.) *Comparative politics*. New Delhi: Sage Publications.
- J. Bara and Pennington. (2009) (eds.) 'Comparative Politics: Explaining Democratic System', Sage Publications, New Delhi.
- J. Ishiyama, and M. Breuning, (2011) (eds) '21st Century Political Science: A Reference Book', Los Angeles, Sage Publications.
- M. Lichback and A. Zuckerman, (eds.) 'Comparative Political: Rationality, Culture, and Structure'. Cambridge, Cambridge University Press.

Reference Books

- R. Watts, (2008) 'Comparing Federal Systems'. Montreal and Kingston, McGill

Queen's University Press.

- Saxena, R (2011) (eds.) 'Varieties of Federal Governance: Major Contemporary Models', New Delhi, Cambridge University Press.
- T. Landman, (2003) 'Issues and Methods of Comparative Methods: An Introduction'. London, Routledge.

Core Paper IX (C-IX)

PUBLIC POLICY AND ADMINISTRATION IN INDIA

Introduction: The paper seeks to provide an introduction to the interface between public policy and administration in India. The essence of public policy lies in its effectiveness in translating the governing philosophy into programs and policies and making it a part of the community living. It deals with issues of decentralization, financial management, citizens and administration and social welfare from a non-western perspective.

UNIT-I: Public Policy

- i) Definition, characteristics and models
- ii) Public Policy Process in India

UNIT-II: Decentralization

- (i) Meaning, significance, types and approaches to decentralization.
- (ii) Local Self Governance: Rural and Urban

UNIT-III: Budget and Social Welfare Administration

- (i) Concept and Significance of Budget, Budget cycle in India, Types of Budgeting
- (ii) Concept and Approaches of Social Welfare.
- (iii) Social Welfare Policies:
 - (a) **Education:** Right to Education,
 - (b) **Health:** National Health Mission,
 - (c) **Food:** Right to Food Security,
 - (d) **Employment:** MNREGA

UNIT-I V: Citizen and Administration Interface

- (i) Public Service Delivery System;
- (ii) Redressal of Public Grievances: RTI, Lokpal, Citizens' Charter and e-Governance

Text Books

- Basu Rumki (2015) 'Public Administration in India Mandates, Performance and Future Perspectives', New Delhi, Sterling Publishers

- Bidyut Chakrabarty, (2007) 'Reinventing Public Administration: The Indian Experience', Orient Longman,
- Henry, N. (1999) 'Public Administration and Public Affairs', New Jersey, Prentice Hall
- Jean Drèze and Amartya Sen, (1995) 'India, Economic Development and Social Opportunity', Oxford, Oxford University Press.
- R.B. Denhardt and J.V. Denhardt, (2009) 'Public Administration', New Delhi, Brooks/Cole
- Satyajit Singh and Pradeep K. Sharma (2007) (eds.) 'Decentralization: Institutions and Politics in Rural India', Oxford University Press, New Delhi.
- Singh, S. and Sharma, P. (2007) (eds.) 'Decentralization: Institutions and Politics in Rural India', New Delhi, Oxford University Press.
- Vasu Deva, (2005) 'E-Governance In India: A Reality', Commonwealth Publishers.
- Vijaya Kumar, (2012) 'Right to Education Act 2009: Its Implementation as to Social Development in India', Delhi: Akansha Publishers.

Reference Books

- 'World Development Report', (1992) World Bank, Oxford University Press,.
- Anderson, (1975) 'Public Policy Making', New York, Thomas Nelson and sons Ltd.
- Gabriel Almond and Sidney Verba, (1965) 'The Civic Culture', Boston, Little Brown.
- J.Dreze and Amartya Sen, (1997) 'Indian Development: Selected Regional Perspectives', Oxford, Clarendon Press
- Jayal, N.G (1999) 'Democracy and The State: Welfare, Secular and Development in Contemporary India', Oxford, Oxford University Press.
- Jugal Kishore, (2005) National Health Programs of India: National Policies and Legislations, Century Publications.
- Lee and Mills, (1983) 'The Economic of Health In Developing Countries', Oxford, Oxford University Press.
- M. Howlett, M. Ramesh, and A. Perl, (2009), 'Studying Public Policy: Policy Cycles and Policy subsystems', 3rd edition, Oxford University Press, New Delhi
- Marma Mukhopadhyay and Madhu Parhar (2007) (ed.) 'Education in India: Dynamics of Development' New Delhi, Shipra Publications.
- Noorjahan Bava, (2001) 'Development Policies and Administration in India', Delhi, Uppal Publishers.
- R. Putnam, (1993) 'Making Democracy Work', Princeton University Press.
- T. Dye, (2002) 'Understanding Public Policy', New Delhi, Pearson
- United Nation Development Programme, (1997) 'Reconceptualising Governance', New York
- Y. Dror, (1989) 'Public Policy Making Reexamined'. Oxford, Transaction Publication.

Core Paper X (C-X)

GLOBAL POLITICS

Introduction: This course introduces students to the key debates on the meaning and nature of globalization by addressing its political, economic, social, cultural and technological dimensions. In keeping with the most important debates within the globalization discourse, it imparts an understanding of the working of the world economy, its anchors and resistances offered by global social movements while analyzing the changing nature of relationship between the state and trans- national actors and networks. The course also offers insights into key contemporary global issues such as the proliferation of nuclear weapons, ecological issues, international terrorism, and human security before concluding with a debate on the phenomenon of global governance. UNIT-I: Globalization: Conceptions

- (i) Understanding Globalization and its Alternative Perspectives, Non-Proliferation Regimes
- (ii) Global Economy: Its significance & anchors of Global Political Economy: IMF, World Bank, WTO, TNCs

UNIT-II: Globalization: Perspectives

- (i) Political Debates on Sovereignty and Territoriality
- (ii) Cultural and Technological Dimensions
- (iii) Global Resistances (Global Social Movements and NGOs)
- (iv) Ecological Issues: International Environmental Agreements, Climate Change

UNIT-III: Contemporary Global Issues-I

- (i) Proliferation of Nuclear Weapons
- (ii) International Terrorism: Non-State Actors and State Terrorism; Post 9/11 developments

UNIT-IV: Contemporary Global Issues-II

- (i) Migration & Human Security
- (ii) Global Shifts: Power and Governance

Text Books

- G. Ritzer, (2010) 'Globalization: A Basic Text', Sussex: Wiley-Blackwell.
- M. Strager, (2009) 'Globalization: A Very Short Introduction', London, Oxford University Press.
- Heywood, (2011) 'Global Politics', New York, Palgrave-McMillan.
- J. Baylis, S. Smith and P. Owens (2011) (eds.) 'Globalization of World Politics: An Introduction to International Relations', New York, Oxford University Press.
- W. Ellwood, (2005) 'The No-nonsense Guide to Globalization', Jaipur, Rawat Publications.
- D. Held and A. McGrew (2000) (eds.) 'The Global Trans-Formations Reader', Cambridge, Polity Press.

Reference Books

- A. Narlikar, (2005) 'The World Trade Organization: A Very Short Introduction', New York, Oxford University Press.
- Goldstein, (2006) 'International Relations', New Delhi, Pearson.
- P. Hirst, G. Thompson and S. Bromley, (2009) 'Globalization in Question', Cambridge, Polity Press.
- D. Held et al, (1999) 'Global Transformations: Politics, Economics and Culture', California, Stanford University Press.
- F. Lechner and J. Boli (ed.), (2004) 'The Globalization Reader', London, Blackwell.(WTO).
- G. Ritzer, (2010) 'Globalization: A Basic Text', Sussex, Wiley-Blackwell.
- T. Cohn, (2009) 'Global Political Economy', New Delhi, Pearson.
- D. Held and A. McGrew (eds.), (2002) 'Global Transformations Reader: Politics, Economics and Culture', Cambridge, Polity Press.
- A. Vanaik, (ed.), (2004) 'Globalization and South Asia: Multidimensional Perspectives', New Delhi, Manohar Publications.

Core Paper XI (C-XI)

WESTERN POLITICAL PHILOSOPHY

Introduction: This course goes back to Greek antiquity and familiarizes students with the manner in which the political questions were first posed. Machiavelli comes as an interlude inaugurating modern politics followed by Hobbes and Locke, Rousseau, Marx. This is a basic foundation course for students.

UNIT-I : Text and Interpretation: Antiquity

- (i) Plato
- (ii) Aristotle

UNIT-II

- (i) Machiavelli
- (ii) Hobbes

UNIT-III

- (i) Locke
- (ii) Rousseau

UNIT-IV

- (i) J. S. Mill
- (ii) Karl Marx

Text Books

- C. Kukathas and G. Gaus, (eds.) 'Handbook of Political Theory', London, Sage Publications Ltd.
- D. Boucher and P. Kelly (2009), (eds) 'Political Thinkers: From Socrates to the Present', Oxford, Oxford University Press.
- J. Coleman, (2000) 'A History of Political Thought: From Ancient Greece to Early Christianity, Oxford, Blackwell Publishers.
- Mukherjee, Subrato and Susheela Ramaswamy(2011) 'History of political Thought: Plato to Marx', PHI Publishers , New Delhi
- Okin, S. (1992), 'Women in Western Political Thought', Princeton, Princeton University Press.
- R. Kraut (1996) (ed.) 'The Cambridge Companion to Plato', Cambridge, Cambridge University Press.

Reference Books

1. A. Skoble and T. Machan, (2007) 'Political Philosophy: Essential Selections', New Delhi, Pearson Education.
2. J. Barnes (1995) (ed.), 'The Cambridge Companion to Aristotle'. Cambridge, Cambridge University Press.

Core Paper XII (C-XII)

INDIAN POLITICAL THOUGHT (ANCIENT AND MEDIEVAL)

Introduction: This course introduces the specific elements of Indian Political Thought spanning over two millennia. The basic focus of study is on individual thinkers whose ideas are however framed by specific themes. The course as a whole is meant to provide a sense of the broad streams of Indian thought while encouraging a specific knowledge of individual thinkers and texts. Selected extracts from some original texts are also given to discuss in class. The list of Reference books is meant for teachers as well as the more interested students.

UNIT-I: Traditions of Pre-colonial Indian Political Thought

- i) Brahmanic and Shramanic
- ii) Islamic and Syncretic.

UNIT-II : Ved Vyasa (Shantiparva) and Manu

- (i) Ved Vyasa : Rajadharmā
- (ii) Manu : Social Laws

UNIT-III: Kautilya, Barani and Aggannasutta

- (i) Kautilya: Theory of State, Foreign Policy, Role of King
- (ii) Aggannasutta- Theory of Kingship
- (iii) Barani: Ideal Polity

UNIT-IV :Kabir and Abul Faza

- (i) AbulFazal-Monarchy
- (ii) Kabir: Syncretism

Text Books

- A. Appodoroy, (2002) 'Political Thought in India, Delhi, Khama Publication.
- A. B. M, (1976), 'The Foundation of Muslim Rule in India', Allahabad, Central Book Depot.
- Brown, (2003) 'The Verses of Vemana', Asian Educational Services, Delhi.
- Habib, Irfan.(1995) 'Essays in Indian History', New Delhi, Tulika Publications.
- Roy, Himanshu and Singh, M. (2017), 'Indian Political Thought: Themes and Thinker', Second Edition, New Delhi, Pearson.
- S. Saberwal, (2008) 'Spirals of Contention', New Delhi, Routledge,
- Sharma, R. S (1991) 'Aspects of Political Ideas Institutions in Ancient India, Delhi, Motilal Banarsidas.
- T. Pantham, and K. Deutsch (1986) (eds.), Political Thought in Modern India, New Delhi, Sage Publications.
- Thapar, Romila, (1997) 'Ashok and the Decline of the Mauryas, ' New York, Oxford University Press.
- V. Mehta, (1992) 'Foundations of Indian Political Thought, New Delhi, Manohar Publications.
- V.P. Varma, (1974) 'Studies in Hindu Political Thought and Its Metaphysical Foundations', New Delhi, Motilal Banarsidass.

Reference Books

- A. Fazl, (1873) ‘The Ain-i Akbari ‘ (translated by H. Blochmann), Calcutta: G. H. Rouse.
- J. Spellman, (1964) ‘Political Theory of Ancient India: A Study of Kingship from the Earliest time to Ceirca AD 300, Oxford, Clarendon Press.
- L. Hess and S. Singh, (2002) ‘The Bijak of Kabir’, New Delhi, Oxford University Press.
- R. Kangle (ed. and trns.), ‘Arthasastra of Kautilya’, New Delhi, Motilal Publishers.
- S. Collins, (2001) ‘Agganna Sutta: The Discussion on What is Primary (An Annotated Translation from Pali), Delhi, Sahitya Akademi.

Core Paper XIII (C-XIII)

CONTEMPORARY POLITICAL PHILOSOPHY

Introduction: Philosophy and politics are closely intertwined. Students will be exposed to the manner in which the questions of politics have been posed in terms that have implications for larger questions of thought and existence. Contemporary political philosophy and debates are introduced to the students here.

UNIT-I

i) Lenin

UNIT-II

i) Mao Zedong (Mao Tse Tung)

UNIT-III

(i) Antonio Gramsci

UNIT-IV

(i) John Rawls

Text Books

- B. Nelson, (2008) ‘Western Political Thought’. New York, Pearson Longman.
- D. Boucher, and P. Kelly, (2003) (eds.) ‘Political Thinkers: From Socrates to the Present’. New York, Oxford University Press.
- Gramsci, Antonio(1996), ‘Selections from the Prison Notebooks’, Orient Longman, Hyderabad
- Hacker, A. (1961), ‘Political Theory: Philosophy, Ideology, Science’, Macmillan, New York.
- Mukherjee, Subrato and Susheela Ramaswamy(2011) ‘History of political Thought: Plato to Marx’, PHI Publishers , New Delhi
- Rawls, John (2011), ‘A Theory of Justice’, Universal Law Publishing Co., New Delhi.

- Sabine, George, H. (1973). 'A History of Political Theory', Oxford and I.B.H. Publishing, New Delhi.
- Wayper. C.L (1989), 'Political Thought', B.I. Publications, Bombay.

Reference Books

- D. Germino (1972). Modern Western Political Thought: Machiavelli to Marx, Chicago University Press, Chicago.
- F.W. Coker (1971). Recent Political Thought, The World Press Pvt. Ltd., Calcutta.
- J.H. Hallowell (1960). Main Currents in Modern Political Thought, Holt, New York.

Core Paper XIV (C-XIV)

MODERN INDIAN POLITICAL THOUGHT

Introduction: Based on the study of individual thinkers, the course introduces a wide span of thinkers and themes that defines the modernity of Indian political thought. The objective is to study general themes that have been produced by thinkers from varied social and temporal contexts. Selected extracts from original texts are also given to discuss in the class. The list of Reference books is meant for teachers as well as the more interested students.

UNIT-I: Introduction

- (i) Rammohan Roy: Rights, Reform Movement, Liberalism
- (ii) Pandita Ramabai: Gender, critique of orthodoxy
- (iii) Vivekananda: Ideal Society, Humanism, Nationalism

UNIT-II: Gandhi & Ambedkar

- (i) Gandhi: Swaraj, Swadeshi (8 lectures)
- (ii) Ambedkar: Social Justice

UNIT-III : Tagore&Savarkar

- (i) Tagore Critique of Nationalism (8 lectures)
- (ii) Savarkar: Hindutwa-A critical Assessment

UNIT-IV: Nehru,Lohia and J.P. Narayan

- (i) Nehru: Secularism, Socialism
- (ii) Lohia: Socialism,
- (iii) J.P.Narayan: Total Revolution

Text books:

-] A. Sen, (2003) 'Swami Vivekananda', Delhi, Oxford University Press.

-] D. Dalton, (1982) 'Indian Idea of Freedom: Political Thought of Swami Vivekananda, Aurobindo Ghose, Rabindranath Tagore and Mahatma Gandhi', Academic Press, Gurgaon.
-] G. Omvedt, (2008) 'Ramabai: Women in the Kingdom of God', in *Seeking Begumpura: The Social Vision of Anti Caste Intellectuals*, New Delhi, Navayana.
-] M. Kosambi (2000) (ed.), 'Pandita Ramabai Through her Own Words: Selected Works', New Delhi, Oxford University Press.
-] Raghuramaraju, (2007) 'Debates in Indian Philosophy: Classical, Colonial, and Contemporary', Delhi, Oxford University Press.
-] S. Sarkar, (1985) 'A Critique on Colonial India', Calcutta, Papyrus.
-] Sh. Kapila (2010) (ed.), 'An intellectual History for India', New Delhi: Cambridge University Press.
-] T. Pantham and K. Deutsch (1986), (eds.) 'Political Thought in Modern India', New Delhi, Sage.
-] V. Mehta and T. Pantham (eds.), (2006) 'A Thematic Introduction to Political Ideas in Modern India: Thematic Explorations, History of Science, Philosophy and Culture in Indian civilization' Vol. 10, Part: 7, New Delhi, Sage Publication.

Reference Books

-] P. Chatterjee, (1986) 'Nationalist Thought and the Colonial World: A Derivative Discourse?' London, Zed Books.
-] S. Hay (1991) (ed.), 'Sources of Indian Tradition', Vol. 2. Second Edition, New Delhi, Penguin.
-] S. Thorat and Aryama (2007) (eds.), 'Ambedkar in Retrospect - Essays on Economics, Politics and Society', Jaipur, IIDS and Rawat Publications.

Discipline Specific Elective Paper-I

INTRODUCTION TO HUMAN RIGHTS

Introduction: This course attempts to build an understanding of human rights among students through a study of specific issues in a comparative perspective. It is important for students to see how debates on human rights have taken distinct forms historically and in the contemporary world. The course seeks to anchor all issues in the Indian context, and pulls out another country to form a broader comparative frame.

Human Rights: Theory and Institutionalization UNIT-I:

- i) Understanding Human Right
- ii) Three Generations of Rights

UNIT-II

- i) Universal Declaration of Human Rights

UNIT-III

- i) Rights in National Constitutions: South Africa and India

UNIT-IV

i) International Refugee Law, International Humanitarian Law

Text Books

- Alston Philip (1995), 'The United Nations and Human Rights-A Critical Appraisal', Oxford, Clarendon.
- Baxi, Upendra (1995) (ed.), 'The Right to be Human', Delhi, Lancer,
- Beetham, David (1987) (ed.), 'Politics and Human Rights', Oxford, Blackwell.
- Desai, A R. (1986)(ed), 'Violations of Democratic Rights in India', Bombay, Popular Prakashan.
- Evans, Tony (2001), 'The Politics of Human Rights: A Global Perspective', London, Pluto Press.
- Hargopal. G.(1999) 'Political Economy of Human Rights', Hyderabad, Himalaya.
- J. Hoffman and P. Graham, (2006) 'Introduction to Political Theory', Delhi, Pearson.

Reference Books

- Kothari, Smitu and Sethi, Harsh (1991)(eds.), 'Rethinking Human Rights', Delhi, Lokayan.
- Saksena, K.P. (1999) (ed.), 'Human Rights: Fifty Years of India's Independence', Delhi, Gyan.
- Subramanian, S.(1997), 'Human Rights: International Challenges', Delhi, Manas Publications.
- Vistaar Iyer, V.R. Krishna (1999), 'The Dialectics and Dynamics of Human Rights in India', Delhi, Eastern Law House.

Discipline Specific Elective Paper II

DEVELOPMENT PROCESS AND SOCIAL MOVEMENTS IN CONTEMPORARY INDIA (Project)

Introduction: Under the influence of globalization, development processes in India have undergone transformation to produce spaces of advantage and disadvantage and new geographies of power. The high social reproduction costs and dispossession of vulnerable social groups involved in such a development strategy condition new theories of contestation and struggles. A variety of protest movements emerged to interrogate and challenge this development paradigm that evidently also weakens the democratic space so very vital to the formulation of critical consensus. This course proposes to introduce students to the conditions, contexts and forms of political contestation over development paradigms and their bearing on the retrieval of democratic voice of citizens.

UNIT-I: Development Process since Independence

- (i) Welfare State, Development and the role of Planning commission
- (ii) Development in the era of Liberalization and Reforms

UNIT-II: Development Strategy and its Impact on the Social Structure

- (i) Industrial Development and its impact on organized and unorganized labour

- (ii) Agricultural Development and Agrarian Crisis, Land Reforms and Green Revolution,

UNIT-III: Social Movements

- i) Social Movements: Meaning and Approaches, New Social Movements
ii) Women's Movement, Environmental Movements

UNIT-IV: Social Movements

- i) Dalit Movement, Tribal Movement,
ii) Left wing Extremism: Issues and Challenges

Text Books

-] A. Desai, (1986) (ed.), 'Agrarian Struggles in India After Independence', Delhi, Oxford University Press
-] A. F. Frankel, (2005) 'India's Political Economy (1947-2004): The Gradual Revolution', Delhi, Oxford University Press.
-] B. Nayar, (2007) (ed.), 'Globalization and Politics in India', Delhi, Oxford University Press.
-] G. Omvedt, (1983) 'Reinventing Revolution, New Social Movements and the Socialist Tradition in India', New York, Sharpe.
-] G. Rath, (2006) (ed.), 'Tribal development in India: The Contemporary Debate', New Delhi, Sage Publications.
-] G. Shah, (2004) 'Social Movements in India: A Review of Literature', New Delhi, Sage Publications.
-] G. Shah, (ed.), (2002) 'Social Movements and the State'. New Delhi, Sage Publications.
-] R. Mukherji (2010) (ed.) 'India's Economic Transition: The Politics of Reforms', Delhi, Oxford University Press.
-] S. Roy and K. Debal, (2004) 'Peasant Movements in Post-Colonial India: Dynamics of Mobilization and Identity', Delhi, Sage.

Reference Books

-] J. Harris, (2009) 'Power Matters: Essays on Institutions, Politics, and Society in India', Delhi, Oxford University press.
-] J. Harris, (2006) (ed) 'Power Matters: Essays on Institutions, Politics, and Society in India,' Delhi. Oxford University Press.
-] K. Suresh, (ed.), (1982) 'Tribal Movements in India', Vol I and II, New Delhi, Manohar (emphasis on the introductory chapter).
-] L. Fernandes, (2007) 'India's New Middle Class: Democratic Politics in an Era of Economic Reform', Delhi, Oxford University Press.
-] M. Jayal, and P. Mehta, (2010) (eds.), 'The Oxford Companion to Politics in India', Delhi, Oxford University Press.
-] M. Mohanty, P. Mukherji and O. Tornquist, (1998)(eds.) 'People's Rights: Social Movements and the State in the Third World', New Delhi, Sage.
-] N. Jayal (2012)(ed.) 'Democracy in India', New Delhi, Oxford India Paperbacks, Sixth impression.

Discipline Specific Elective Paper III

INDIA'S FOREIGN POLICY IN A CHANGING WORLD

Introduction: This course's objective is to teach students the domestic sources and the structural constraints on the genesis, evolution and practice of India's foreign policy. The endeavour is to highlight integral linkages between the 'domestic' and the 'international' aspects of India's foreign policy by stressing on the shifts in its domestic identity and the corresponding changes at the international level. Students will be instructed on India's shifting identity as a postcolonial state to the contemporary dynamics of India attempting to carve its identity as an 'aspiring power'. India's evolving relations with the superpowers during the Cold War and after, bargaining strategy and positioning in international politics facilitate an understanding of the changing positions and development of India's role as a global player since independence.

UNIT-I : India's Foreign Policy in a changing world

- i) India's Foreign Policy: Major bases and determinants
- ii) India's Foreign Policy: Postcolonial Perspective

UNIT-II : India's Relation with USA& Russia

- i) India's Relations with the USA
- ii) India's Relation with USSR/Russia,

UNIT-III : India-China Relations, India and South Asia

- (i) India-China Relations
- (ii) India and South Asia: SAARC, Look East Policy, Act East Policy

UNIT-IV : India and Contemporary World

- (i) India as an emerging Global Power, Myth and Reality
- (ii) India in the Contemporary World

Text Books :

- Appadorai, A. and M.S. Rajan(1988), 'India's Foreign Policy and Relations', New Delhi, South Asian Publishers Pvt. Ltd.
- Bahadur, Kalim (ed.)(1986), 'South Asia in transition: Conflicts and Tensions', New Delhi, Patriots.
- Bandyopadhyaya, J.(2006), 'The making of India's Foreign Policy', New Delhi, Allied Publishers Pvt. Ltd.
- Banerjee, A.K. (ed.)(1998), 'Security issues in South Asia: Domestic and External Sources of Threats to Security', Calcutta, Minerva.
- Bidwai, Praful and Achin Vanaik (eds.)(1999), 'South Asia on a Short Fuse: Nuclear Politics and the Future of Global Disarmament', New Delhi, Oxford University Press.
- D. Scott (2011)(ed.), 'Handbook of India's International Relations', London, Routledge.
- Dutt, V.P.(2007), 'India's Foreign Policy Since Independence', New Delhi, National Book Trust.
- Tellis and S. Mirski (2013) (eds.), 'Crux of Asia: China, India, and the Emerging Global Order', Carnegie Endowment for International Peace, Washington.

Reference Books

- A. Ganguly, S. and Rahul Mukherji(2011), India since 1980, New Delhi: Cambridge University Press.
- Ghosh, Partha S.(1989), Cooperation and conflict in South Asia, New Delhi: Manohar.
- Gould, H.A. and Sumit Ganguly (eds.)(1993), The Hope and the Reality: U.S.-Indian Relations from Roosevelt to Reagan, New Delhi: Oxford & IBH.
- Gujral, I.K.(1998), A foreign policy for India, Delhi: External publicity division, MEA, Government of India.
- Mansingh, Surjeet(1984), India's search for power: Indira Gandhi's foreign policy, 1966-1982 New Delhi: Sage.
- Muni, S.D.(2010), India's Foreign Policy the democracy dimension, New Delhi: Foundation Books.
- Nayar, B.R. and T.V. Paul(2004), India in the world order searching for major power status, New Delhi: Cambridge University Press.
- S. Cohen, (2002) *India: Emerging Power*, Brookings Institution Press.
- S. Mehrotra, (1990) 'Indo-Soviet Economic Relations: Geopolitical and Ideological Factors', in *India and the Soviet Union: Trade and Technology Transfer*, Cambridge University Press: Cambridge.
- Sengupta, Bhabani(1998), Fulcrum of Asia relations among China, India, Pakistan and the USSR, New Delhi: Konark Publishers.
- W. Anderson, (2011) 'Domestic Roots of Indian Foreign Policy', in W. Anderson, *Trusts with Democracy: Political Practice in South Asia*, Anthem Press: University Publishing Online.

Discipline Specific Elective Paper IV

WOMEN, POWER AND POLITICS

Introduction: This course opens up the question of women's agency, taking it beyond 'women's empowerment' and focusing on women as radical social agents. It attempts to question the complicity of social structures and relations in gender inequality. This is extended to cover new forms of precarious work and labour under the new economy. Special attention will be paid to feminism as an approach and outlook.

UNIT-I: Feminism

- (i) Meaning and Development
- (ii) Liberal, Socialist and Radical Feminism

UNIT-II: Issues

- i) Patriarchy
- ii) Sex and Gender
- iii) Gender, Power and Politics

UNIT-III: Issues

- (i) Women Movement in India

- (ii) Women Empowerment: Policies and Practices
- (iii) Violence against Women

UNIT-IV: Women and Development

- i) WID (Women in Development), WAD (Women and Development), GAD (Gender and Development)
- ii) Women and Work (Visible and Invisible)

Text Books

- B. Hooks, (2010) 'Feminism: A Movement to End Sexism', in C. Mc Cann and S. Kim (eds), M. John.(2008) (ed) *Women's Studies in India*, New Delhi: Penguin.
- M. Kosambi, (2007) *Crossing the Threshold*, New Delhi, Permanent Black. Menon, (2008) 'Power', in R. Bhargava and A. Acharya (eds), *Political Theory: An Introduction*, Delhi: Pearson.
- *Naarivaadi Rajneeti: Sangharsh evam Muddey*, University of Delhi: Hindi Medium Implementation Board.
- T. Shinde, (1993) 'Stree Purusha Tulna', in K. Lalitha and Susie Tharu (eds), *Women Writing in India*, New Delhi, Oxford University Press.
The Feminist Reader: Local and Global Perspectives, New York: Routledge.
- U. Chakravarti, (2001) 'Pitrasatta Par ek Note', in S. Arya, N. Menon & J. Lokneeta (eds.)
- V Geetha, (2002) *Gender*, Kolkata, Stree Publications.

Reference Books

- N. Gandhi and N. Shah, (1992) *Issues at Stake – Theory and Practice in the Women's Movement*, New Delhi: Kali for Women.
- N. Menon, (2004) 'Sexual Violence: Escaping the Body', in *Recovering Subversion*, New Delhi: Permanent Black.
- P. Swaminathan, (2012) 'Introduction', in *Women and Work*, Hyderabad: Orient Blackswan.
- R. Kapur, (2012) 'Hecklers to Power? The Waning of Liberal Rights and Challenges to Feminism in India', in A. Loomba *South Asian Feminisms*, Durham and London: Duke University Press.
- U. Chakravarti, (2003) *Gendering Caste through a Feminist Lens*, Kolkata, Stree publications.
- V. Bryson, (1992) *Feminist Political Theory*, London: Palgrave-MacMillan.

DSE Paper – IV DISSERTATION / RESEARCH PROJECT

(College can give this choice only for students with above 60% aggregate marks)

Project Paper- Development Process and Social Movements in Contemporary India (DSE- II)

Introduction:

The research experience of students is greatly enriched by early exposure to conducting research. There are numerous benefits of undergraduate students who get involved in research. They are better off in understanding published works, determine an area of interest, can discover their

passion for research and may start their career as a researcher. Further students will be able to develop ability for scientific inquiry and critical thinking, ability in the knowledge base and communication. This course is included to promote above mentioned abilities among the students.

Learning Objectives:

- To help students to learn how to develop scientific research designs in the study of public administration.
- To guide students to understand the previous research in their field of interest and review them to arrive at a research problem
- To encourage the students to learn ways to describe and evaluate public policy implementation.
- To help students understand the logic of hypothesis testing in both quantitative and qualitative research.
- To make students to learn the methods of writing a research report.

Expected outcomes: Students will be able to

- Independently prepare a research design to carry out a research project
- Review the related research papers to find out a research problem and relevant hypotheses
- Understand the dynamics of citizen – administrative interface and administrative behaviours.
- Learn the use of statistical techniques for interpretation of data.
- Learn the APA style of reporting a research project.

A student is required to carry out a project on an issue of interest to him / her under the guidance and supervision of a teacher. In order to do so s/he must have the knowledge in research methodology and of steps in planning and conducting a research. The supervisors may help the students to go on field study / study tour relevant to their work. Thirty hours of class may be arranged in the routine to help students understand research methodology, and planning, conduction and reporting on the research. An external examiner with the supervisor as the internal examiner will evaluate the research project on the basis of scientific methodology in writing the report, and presentation skill and performance in the viva.

□ Format

- **Abstract** – 150 words including problem, method and results.
- **Introduction** – Theoretical considerations leading to the logic and rationale for the present research
- **Review**- Explaining current knowledge including substantive findings and theoretical and methodological contributions to the topic, objectives and hypotheses of the present research
- **Method** – Design, Sample, Methods of data collection, Procedure
- **Results**- Quantitative analysis of group data-- (Raw data should not be attached in Appendix) Graphical representation of data wherever required. Qualitative analysis wherever done should indicate the method of qualitative analysis.
- **Discussion**
- **References (APA Style) & Appendices**
- Project should be in Soft binding. It should be typed in Times New Roman 14 letter size with 1.5 spacing on one sides of the paper. Total text should not exceed 50 pages (References & Appendices extra).
- Two copies of the project should be submitted to the College.
- ***Project - American Psychological Association (APA) – Publication Manual 2006 to be followed for project writing***

Mark distribution for dissertation / Research project

Identification of problem	Review of Literature	Methodology	Analysis	Findings	Viva-voce	Total
10	10	10	25	20	25	100

Broad areas identified for Project: Social Movements: Environment, Women, Dalit, Peasant, Social Development, Political Development in Odisha, Political Socialization, Political Participation, Political Modernization and Communication, Decentralized democracy: Rural and Urban Local Self Governance, Functionary of Gram Sabha, Empowerment of Women and other marginals in PRIs, Development, Displacement, Rehabilitation, Resettlement in Odisha, Role of NGOs in Development, Regional Development and Regional Imbalances, Implementation of ORTPS- 2012, RTE-2009, Food Security Act, 2013, FRA, 2007.

Generic Elective Paper I

FEMINISM: THEORY AND PRACTICE

Introduction: The aim of the course is to introduce students to contemporary debates on feminism and the history of feminist struggles. The course begins with a discussion on construction of gender and an understanding of complexity of patriarchy and goes on to analyze theoretical debates within feminism. It offers a gendered analysis of Indian society, economy and polity with a view to understanding the structures of gender inequalities. And the last section aims to understand the issues with which contemporary Indian women's movements are engaged with.

UNIT-I: Understanding Feminism

- (i) Feminist theorizing of the sex/gender distinction; Public Man and Private Woman
- (ii) Understanding Patriarchy and Feminism

UNIT-II: Theories of Feminism

- (i) Liberal and Socialist,
- (ii) Radical feminism and Eco-feminism

UNIT-III: Feminist issues and women's participation: The Indian Experience

- (i) Women's participation in anti-colonial and national liberation movements with special focus on India
- (ii) Traditional Historiography and Feminist critiques; Social Reforms Movement and position of women in India, History of Women's struggle in Post- Independent India

UNIT-IV: Family in contemporary India and Understanding Woman's Work and Labour

- (i) Family in contemporary India - patrilineal and matrilineal practices. Gender Relations in the Family, Patterns of Consumption: Intra Household Divisions, entitlements and bargaining, Property Rights
- (ii) Understanding Woman's Work and Labour – Sexual Division of Labour, Productive and Reproductive labour, Visible - invisible work – Unpaid (reproductive and care), Underpaid and Paid work,- Methods of computing women's work , Female headed households

Text Books

- Bina Agarwal, (2013) 'Gender And Green Governance', Oxford University Press, Oxford,
- Forbes, Geraldine (1998) 'Women in Modern India'. Cambridge, Cambridge University Press
- Geetha, V. (2002) 'Gender'. Calcutta, Stree Publications.
- Geetha, V. (2007) 'Patriarchy'. Calcutta, Stree Publications.
- Jagger, Alison. (1983) 'Feminist Politics and Human Nature'. U.K, Harvester Press.
- John, Mary (
- John, Mary(2008) 'Women studies in India: A Reader', Peguin, New Delhi
- Lerner, Gerda. (1986) 'Creation of Patriarchy'. New York. Oxford University Press.

Reference Books

- Banarjee, Sikata. (2007) 'Ghadiyally, Rehana. (ed.) 'Urban Women in Contemporary India: A Reader'. New Delhi, Sage.
- Chakravarti, Uma. (1988) 'Beyond the Altekarian Paradigm: Towards a New Understanding of Gender Relations in Early Indian History', Social Scientist, Volume 16, No. 8.
- Desai, Neera & Thakkar, Usha. (2001) 'Women in Indian Society'. New Delhi: National Book Trust.
- Gandhi, Nandita & Shah, Nandita. (1991) 'Contemporary Women's Movement in India'. Delhi, Zubaan.
- Gupta, A and Sinha Smita, (2005) 'Empowerment of women: Language and Other Facets', Mangal Deep, New Delhi.
- Jayawardene, Kumari. (1986) 'Feminism and Nationalism in the Third World'. London, Zed Books and Conclusion.
- Nayak, Smita (2016) (eds.) 'Combating Violence Against Women: A Reality in the Making', Kalpaz, Gyan Books Pvt, Ltd, New Delhi
- Nayak, Smita (2016) (eds.) 'Gender Dynamics: The Emerging Frontiers', Research India Publications, New Delhi.
- Nayak, Smita, (2016), 'Whither Women: A Shift from Endowment to Empowerment', Edupedia, New Delhi.
- Rege, Sharmila. (2003) (ed.) 'The Sociology of Gender: The Challenge of Feminist Sociological Knowledge'. New Delhi, Sage.
- Rowbotham, Shiela. (1993) 'Women in Movements', New York and London, Routledge.
- Sangari, Kumkum & Chakravarty, Uma.(1999) (eds.) 'From Myths to Markets: Essays on Gender'. Delhi, Manohar.
- Sarkar, Tanika & Butalia, Urvashi. (1995) (eds.) 'Women and the Hindu Right'. Delhi, Kali for Women.

Generic Elective Paper II

GOVERNANCE: ISSUES AND CHALLENGES

Objectives: This paper deals with concepts and different dimensions of governance highlighting the major debates in the contemporary times. There is a need to understand the importance of the concept of governance in the context of a globalizing world, environment, administration, development. The essence of governance is explored through the various good governance initiatives introduced in India.

UNIT-I: Government and governance: concepts

- (i) Governance: Meaning, Nature and Types
- (ii) Role of State in the Era of Globalisation: State, Market and Civil Society

UNIT-II : Good Governance

- i) Good Governance
- ii) Sustainable Development and Governance

UNIT-III: Local Governance

- (i) Democratic Decentralization: Institutions of Local Governance (PRIs),
- (ii) People' Participation in Local Governance & Deepening Democracy

UNIT-IV : Good Governance Initiatives In India

- i) Public Service Guarantee Acts & Electronic Governance
- ii) Citizens Charter & Right to Information, Corporate Social Responsibility iii)

Text Books

- A Baviskar, ((1995) The Belly of the River: Tribal Conflict Over Development in the Narmada Valley', Delhi, Oxford University Press.
- A. Parel (2000) (ed) 'Gandhi, Freedom and Self-Rule', New Delhi, Lexington Books.
- B. Parekh, (1997) 'Gandhi: A Brief Insight', Delhi, Sterling Publishing Company.
- B. Parekh, (1999) 'Colonialism, Tradition and Reform: An Analysis of Gandhi's Political Discourse', New Delhi, Sage Publication.
- D. Hardiman, (2003) 'Gandhi in his Time and Ours'. Delhi, Oxford University Press.

Reference Books

- R Iyer, (ed) (1993) 'The Essential Writings of Mahatma Gandhi', New Delhi, Oxford University Press.
- R. Ramashray, (1984) 'Self and Society: A Study in Gandhian Thought', New Delhi, Sage Publication.

Generic Elective Paper III

GANDHI AND THE CONTEMPORARY WORLD

Introduction: Locating Gandhi in a global frame, the course seeks to elaborate Gandhian thought and examine its practical implications. It will introduce students to key instances of Gandhi's continuing influence right up to the contemporary period and enable them to critically evaluate his legacy.

UNIT-I-

- i) Theories: Satyagraha, Ahimsa

UNIT-II-

- i) Swaraj, Swadeshi

UNIT-III-

- i) Relevance Gandhi: Gandhi & Environment, Gandhi & Women, Gandhi & Social Harmony

UNIT-IV-

- Gandhi & Global Peace: Gandhian Philosophy in Contemporary World

Text Books

- B. C. Smith (2007), 'Good Governance and Development', Palgrave.
- B. Chakrabarty and M. Bhattacharya, (1998) (eds.) 'The Governance Discourse'. New Delhi, Oxford University Press.
- B. Nayar (1995) (ed.), 'Globalization and Politics in India', Delhi, Oxford University Press.
- Neera Chandhoke, (1995) 'State and Civil Society Explorations In Political Theory', Sage Publishers.
- Panda, Smita Mishra (2008), 'Engendering Governance Institutions: State, Market and Civil Society', Sage Publications.
- Surendra Munshi and Biju Paul Abraham (2004) (eds.), 'Good Governance, Democratic Societies and Globalisation', Sage.
- United Nation Development Programme, (1997) 'Reconceptualising Governance', New York.
- World Bank Report, (1992) 'Governance and Development'.

Reference Books

- Burns H Weston and David Bollier (2013), 'Green Governance: Ecological Survival, Human Rights, and the Law of the Commons', Cambridge University Press.
- Emilio F. Moran, (2010) 'Environmental Social Science: Human - Environment interactions and Sustainability', Wiley-Blackwell.
- Pardeep. Sachdeva, (2011) 'Local Government in India', Pearson Publishers, New Delhi.
- Pranab Bardhan and Dilip Mookherjee (2006), 'Decentralization And Local Governance In Developing Countries: A Comparative Perspective', MIT Press.
- T.R. Raghunandan (2013), 'Decentralization and Local Governments: The Indian Experience, Readings on The Economy, Polity and Society', Orient Blackswan.
- D. Crowther (2008), 'Corporate Social Responsibility', Deep and Deep Publishers, New

Delhi.

Generic Elective Paper IV

UNITED NATIONS AND GLOBAL CONFLICTS

Introduction: This course provides a comprehensive introduction to the most important multilateral political organization in international relations. It provides a detailed account of the organizational structure and the political processes of the UN, and how it has evolved since 1945, especially in terms of dealing with the major global conflicts. The course imparts a critical understanding of the UN's performance until now and the imperatives as well as processes of reforming the organization in the context of the contemporary global system.

UNIT-I : The United Nations

- i)** An Historical Overview of the United Nations.
- ii)** Principles and Objectives

UNIT-II

- i)** Structures and Functions: General Assembly, Security Council, Economic and Social Council,.
- ii)** The International Court of Justice, The Specialized Agencies (International Labour Organisation (IOL), United Nations Educational, Scientific and Cultural Organisation (UNESCO), World Health Organisation (WHO), UN Programmes Funds: United Nations Children's Fund (UNICEF), United Nations Development Programme (UNDP), United Nations High Commissioner for Refugees (UNHCR)
- iii)** Peace Keeping, Peace Making and Enforcement, Peace Building and Responsibility to Protect
- iv)** Millennium Development Goals.

UNIT-III Major Global Conflicts since the Second World war

- i)** Korean war
- ii)** Vietnam War
- iii)** Afghanistan War
- iv)** Balkans Serbia and Bosnia

UNIT-IV

Assessment of the United Nations as an International Organisation: Imperatives of Reforms and the Process of Reforms

Text Books

- Basu, Rumki (2014) 'United Nations: Structure and Functions of an international

- organization', New Delhi, Sterling Publishers
- Baylis, J. and Smith, S. (2008) (eds.) 'The Globalization of World Politics: An Introduction to International Relations'. 4th edn. Oxford, Oxford University Press.
 - Gareis, S.B. and Varwick, J. (2005) 'The United Nations: an introduction'. Basingstoke, Palgrave.
 - Goldstein, J. and Pevehouse, J.C. (2006) 'International Relations'. 6th edn. New Delhi, Pearson.
 - Saxena, J.N. (1986) et.al. 'United Nations for a Better Worl', New Delhi, Lancers.
 - White, B. et al. (eds.) (2005) 'Issues in World Politics', 3rd edn. New York, Macmillan.
 - Whittaker, D.J. (1997) 'United Nations in the Contemporary World', London, Routledge.

Reference Books

- Armstrong, D., Lloyd, L. and Redmond, J. (2004) 'International Organisations in World Politics'. 3rd edn. New York, Palgrave, Macmillan.
- Calvocoressi, P. (2001) 'World Politics: 1945-2000', 3rd edn. Harlow, Pearson Education.
- Moore, J.A. Jr. and Pubantz, J. (2008) 'The new United Nations', Delhi, Pearson Education.
- United Nations Department of Public Information. (2008) 'The United Nations Today'. New York, UN.

PSYCHOLOGY

Framework of CBCS Syllabus for PSYCHOLOGY (Honours) from 2019-20					
Full Forms of Course Codes Used: CC = Core Course, AECC = Ability Enhancement Compulsory Course, SEC = Skill Enhancement Course, DSE = Discipline Specific Elective (Related to Core Subject), GE = Generic Elective (Not related to Core Subject; 2 different subjects of 2 papers each). Total Marks: CC (1400) + AECC (200) + SEC (200) + DSE (400) + GE (400) = 2600					
Semester	CC	AECC	SEC	DSE	GE
	14 papers 100 X 14 = 1400; Credits=14x6=84	2 Papers 100 X 2 = 200 Credits=4x2=8	2 Papers 100 X 2 = 200 Credits=4x2=8	4 Papers 100 X 4 = 400 4x6=24 credits	4 Papers 100 X 4 = 400 4x6=24 credits
I	CC-I: Introductory Psychology	AECC-I: MIL Communication (Odia/English)			GE Paper-I: Introductory Psychology
	CC-II: Basic Developmental Processes				
II	CC-III: Basic Psychological Processes	AECC-II: Environmental Science			GE Paper-II: Basic Developmental Processes
	CC – IV: Processes of Human Empowerment				
III	CC – V: Statistics		SEC-I:		GE Paper-III: Basic Psychological Processes
	CC – VI: Social Psychology				
	CC – VII: Environmental Psychology				
IV	CC – VIII: Psychopathology		SEC-II:		GE Paper-IV: Processes of Human Empowerment
	CC – IX: Educational Psychology				
	CC – X: Psychological Assessment				
V	CC – XI: Organizational Behavior			DSE-I: Psychological Research and Measurement	
	CC – XII: Health Psychology			DSC-II: Ethics, Integrity and Aptitude	
VI	CC – XIII: Counseling Psychology			DSC-III: Psychology of the Disability	
	CC – XIV: Positive Psychology			DSC-IV: Project & Field work/ Psychology of Crime	

PSYCHOLOGY Papers for HONOURS Students

Core course – 14 papers, Discipline Specific Elective – 4 papers, Generic Elective for non-psychology honours students – 4 papers. In case University offers 2 subjects as GE, then papers 1 and 2 will be the GE paper.

Scoring System for Papers with Practical:

Marks per paper - Midterm: 15 marks, Practical: 25 marks, End term: 60 marks, Total: 100 marks, Credit per paper – 6, Teaching hours per paper – 40 hours theory + 20 hours practical

Scoring System for Papers without Practical:

Marks per paper - Midterm: 20 marks, End term: 80 marks, Total: 100 marks, Credit per paper – 6, Teaching hours per paper – 50 hours + 10 hours tutorial

Core Paper- I INTRODUCTORY PSYCHOLOGY

Introduction: The course is designed to provide the student a basic understanding of the psychology of human behavior. The students will be given exposure to concepts, terminology, principles, and theories that comprise an introductory course in psychology.

Learning Objectives:

-] To help the students know the sources and processes of development of modern scientific psychology.
-] To help the students develop a scientific temperament in studying and understanding human behavior.

Expected outcomes: Students will be able to

-] Define the term psychology and demonstrate command of the basic terminology, concepts, and principles of the discipline.
-] Gain knowledge of scientific methodology—the variety of ways in which psychological data are gathered and evaluated / interpreted.
-] Identify and compare the major perspectives in psychology: Recognize how each approach views human thought and behavior.
-] Understand the physiological and biochemical links of human behavior.

UNIT-I: Introducing Psychology

- (i) Concept and definition of psychology, Roots of psychology, Psychology as a scientific discipline.
- (ii) Key Perspectives in Psychology- Behavioral, Cognitive, Humanistic, Psychodynamic, and Socio-cultural.

UNIT- II: Methods in Psychology

- (i) Natural Observation, Survey and Case Study - Nature, advantages and limitations.
- (ii) Experimental and Correlational methods -Nature, advantages and limitations.

UNIT –III: Biological Bases of Behavior

- (i) Structure and functions of the neurons, Communication within and between neurons, Chemical regulation of the endocrine glands.
- (ii) Structure and functions of the Central nervous system and Autonomic nervous system

UNIT-IV: States of Mind

- (i) Nature of consciousness; changes in consciousness- sleep-wake schedules
- (ii) Extended states of Consciousness - Hypnosis, Meditation and Hallucinations

Practical:

- (i) **R.L. by Method of Limits:** To find out the R. L. of volar surface of the right arm of a subject by method of limits
- (ii) **D.L. by Method of Constant Stimuli:** To find out the D.L. for lifted weight of your subject by method of constant stimuli.

Text Books:

-] Baron, R. A. (2002). Psychology (5th Edition), New Delhi: Pearson Education.
-] Hilgard & Atkinson- Introduction to Psychology (2003) 14th Edition, Thomson Learning Inc.

-] Mohanty, N., Varadwaj, K. & Mishra, H.C. (2014). Explorations of Human Nature and Strength: Practicals in Psychology, DivyaPrakashani, Samantarapur, Bhubaneswar.

Reference Books:

-] Morgan, C.T., King, R.A., Weisz, J.R., & Schopler, J. (2008). Introduction to psychology (7th edition) Bombay: Tata-McGraw Hill.
-] Feldman, R.S. (2004). Understanding Psychology (6th Edition), New Delhi, Tata-McGraw Hill.

Core Paper-II BASIC DEVELOPMENTAL PROCESSES

Introduction: The course is designed to expose students to a basic understanding about the fundamental concerns of developmental psychology and provide examples of the following three dimensions of development: growth, differentiation, and orderly progression.

Learning Objectives:

- To help students gain some key ideas about human development and the perspectives to understand and explain such developments.
- To help the students understand the significance of prenatal period for human development.
- To help the students understand the developmental preparations of the childhood and the implications of developmental milestones for the normal human development.

Expected outcomes: Students will be able to

-] Understand the nature, types, and principle of development.
-] Understand the processes of formation of life and development during pre- and post-natal periods.
-] Understand about the different aspects of preparation for future life.

UNIT-I: Basics of development

- (i) Meaning, nature, and types of development; Principles of development; Factors influencing development
- (ii) Perspectives of development- Psychoanalytic; Mechanistic; Organismic; Humanistic

UNIT- II: Life in formation

- (i) Fertilization, determination of sex, multiple birth; Prenatal development- germinal stage, embryonic stage, fetal stage; Factors influencing prenatal development. Impact of perinatal processes on development
- (ii) Physical and motor developments, Social and emotional developments during childhood.

UNIT –III: Life in preparation

- (i) Physical and motor developments, Social and emotional developments during adolescence.
- (ii) Piaget’s stage of cognitive development; Kohlberg’s stages of moral development

Unit- IV: Self and identity

- (i) Emergence of self; Structure of the self; Development of personal identity
- (ii) Development of self-control; Development of gender differences and gender roles

Practical:

- (i) **Locus of Control:** To assess the Locus of Control of four college students by using Rotter’s

Locus of Control Scale.

- (ii) **Emotional Intelligence:** To measure the emotional intelligence of four college students by using the Schutte's Emotional Intelligence Scale.

Text Books:

-] Sigelman, G.K. & Schaffer, D.R. (1995). Life-span Human Development, Brooks / Cole Publishing Co. Pacific Grove, California
-] Berk, L. E. (2010). Child Development (8th Ed.). New Delhi: Prentice Hall.
-] Mohanty, N., Varadwaj, K. & Mishra, H.C. (2014). Explorations of Human Nature and Strength: Practicals in Psychology, Divya Prakashani, Samantarapur, Bhubaneswar.

Reference Books:

-] Papalia, Diane E., Sally Wendos Olds (2006). Human Development. 9th Edition. New Delhi: Tata McGraw Hill
-] Baron, R. A. (2002). Psychology (5th Edition), New Delhi, Pearson Education.

Core Paper III BASIC PSYCHOLOGICAL PROCESSES

Introduction: The course is designed to provide the student a basic understanding of the psychological processes from sensation to thought and communication. The student will be given exposure to the concepts, terminology, principles, and theories relating to each of the mental processes that constitute human psychology.

Learning Objectives:

-] To help the students to understand the mental processes to begin with sensation and perception up to how it results in thoughts and communication.
-] To help the students gather knowledge about the structural and functional dynamics of each of the mental processes and their interconnectedness.

Expected outcomes: Students will be able to

-] Understand the basic sensory actions and the processes of integration of sensory actions in creating and interpreting perceptual events.
-] Gain knowledge of the important processes and principles of human learning as well as the structural functional attributes of human memory to help conserve the learning outcomes.
-] Understand the structural and functional properties of language and the way it helps thought, communication, problem solving and decision making through development of concepts, ideas, images, and so on.

UNIT-I: Sensation and Perception

- (i) Basics of sensation- Sensory receptors (eye and ear), transduction, sensory thresholds, and sensory adaptation
- (ii) Nature of perceptual process- Figure and ground, Grouping (Gestalt laws), Perceptual constancies, and illusions, Perception of distance and depth.

UNIT- II: Learning and Memory

- (i) Nature and principles of Classical conditioning, Operant conditioning, and Observational learning
- (ii) The Atkinson and Shiffrin Model of Memory; Types of Memory- episodic, semantic and procedural; Causes of Forgetting- interference, repression, and amnesia

UNIT –III: Language and Communication

- (i) Properties and structure of language, Linguistic hierarchy, Language acquisition-predisposition, Nature of effective communication
- (ii) Stages of language development; critical period controversy; speech error and its implications

UNIT- IV: Thinking and Reasoning

- (i) Thinking process; concepts, categories and prototypes, Decision making and factors of influencing decision making.
- (ii) Inductive and deductive reasoning; Problem solving approaches; Steps in problem solving

Practical:

- (i) **Learning Curve:** To demonstrate the Learning Curve as a function of Learning trials using Non-sense Syllables.
- (ii) **Serial Position Effect:** To demonstrate the serial position effect on memory in learning a list of nonsense syllables.

Text Books:

-] Baron, R. A. (2002). Psychology (5th Edition), New Delhi, Pearson Education.
-] Feldman, R.S. (2004). Understanding Psychology (6th Edition), New Delhi, Tata Mc. Graw Hill.
-] Dash, U.N., Dash, A.S., Mishra, H.C., Nanda, G.K. & Jena, N. (2004). Practical Exercises in Psychology: Learning about Yourself and Others. Panchasila, Bhubaneswar
-] Mohanty, N., Varadwaj, K. & Mishra, H.C. (2014). Explorations of Human Nature and Strength: Practicals in Psychology, Divya Prakashani, Samantarapur, Bhubaneswar.

Reference Books:

-] Morgan, C.T., King, R.A., Weisz, J.R., & Schopler, J. (2008). Introduction to psychology (7th edition) Bombay: Tata-McGraw Hill.

Core Paper-IV PROCESSES OF HUMAN EMPOWERMENT

Introduction: Human empowerment is ultimately an individual condition of gaining the power to control and modulate changes in one's own life those are considered important to one's identity and adjustment. The purpose of the course is to introduce to the students the basics of human empowerment and how the empowerment processes are strengthened and improved.

Learning Objectives:

-] To help students gain ideas about intelligence and personality as foundations of human empowerment.
-] To make students understand how motivation and emotion are empowering processes to human development.
-] To help students gain insight into human behavior as products of empowerment.
-]

Expected outcomes: Students will be able to

-] Know the structural components and functional dynamics of both intelligence and personality.
-] Understand the significance of emotion and motivation in behavior management.
-] Understand significant aspects of social behavior as resulting in happiness, well-being

and personal growth.

UNIT-I: Basics of empowerment

- (i) Intelligence- Heredity, environment, and intelligence, Theories of Gardner, Stenberg, & PASS
- (ii) Measuring Intelligence: intelligence tests; Interpretation of test score, Cross-cultural issues in testing intelligence

UNIT- II: Sources of Power (1)

- (i) Personality- Freud's theory, and Social cognitive theory
- (ii) Personality-Trait and type approach, Biological and sociocultural determinants, Psychometric and projective assessment.

UNIT –III: Sources of Power(2)

- (i) Motivation-Drive theory, Arousal theory, Expectancy theory, Maslow's need hierarchy
- (ii) Emotion-Theories of James-Lange, Cannon-Bard, & Schachter-Singer

UNIT –IV: Proving empowered

- (i) Social behavior- Meaning of attribution and errors in attribution, Meaning of social cognition and processing of social information
- (ii) Positive Psychology-Scope and aims, Nature and characteristics of happiness, Subjective well-being and personal growth

Practical:

- (i) **Intelligence test-** To test the non-verbal intelligence of Two college students using Raven's Standard Progressive Matrices
- (ii) **Personality Type-** To assess the personality type of a student obtaining responses from the student and two other significant persons in his /her life by using Glazer's test of Personality Type

Text Books:

-] Baron, R.A. (1995). Psychology- The Essential Science, Pearson Education Company of India Pvt. Ltd.
-] Gerrig, R.J. & Zimbardo, P.G. (2010). Psychology and Life (19th Ed.). Delhi: Allyn & Bacon
-] Snyder, C.R. & Shane, J.L. (2005) Handbook of Positive Psychology: Oxford University Press.
-] Mohanty, N., Varadwaj, K. & Mishra, H.C. (2014). Explorations of Human Nature and Strength: Practicals in Psychology, DivyaPrakashani, Samantarapur, Bhubaneswar.

Reference Books:

-] Baron, R. A. & Byrne, D. (2003). Social Psychology, 10th Edition, Prentice Hall
-] Misra, G. (2009). Psychology in India, Vol 1: Basic Psychological Processes and Human Development. India: Pearson
-] Dash, U.N., Dash, A.S., Mishra, H.C., Nanda, G.K. & Jena, N. (2004). Practical Exercises in Psychology: Learning about Yourself and Others. Panchasila, Bhubaneswar

Core Paper- V PSYCHOLOGICAL STATISTICS

Introduction: The course is designed to equip students with knowledge in the fundamentals of statistics and research methods so that they understand the application of statistics to different research problems in psychology.

Learning Objectives:

-] To help students develop knowledge and understanding of the application of Statistics within Psychology
- To help students develop critical thinking for application of appropriate statistical analysis in Psychological research

Expected outcomes: Students will be able to understand

-] The nature of psychological variables and how to measure them using appropriate scale.
-] The processes of describing and reporting statistical data.
-] The methods of drawing inferences and conclusions for hypothesis testing by using appropriate statistical analysis.

UNIT-I: Fundamentals of statistics

- (i) Meaning and scope of statistics, Nature of variables- Categorical and Continuous, Levels of Measurement- Nominal, Ordinal, Interval, and Ratio
- (ii) Drawing frequency distribution; Graphical representation of grouped data-Polygon, Histogram, Ogive.

UNIT- II: Measures of Statistics

- (i) Measures of Central Tendency- Characteristics of mean, median and mode; Computation of mean, median, and mode
- (ii) Measures of Variability- Concept of variability, computation of semi-inter quartile range, Standard deviation and variance, Co-efficient of variation

UNIT- III: Sources and Applications

- (i) Concept of Probability; Characteristics of Normal Probability curve, Applications of NPC, Deviation from NPC- Skewness and Kurtosis
- (ii) Concept of correlation, Product-moment correlation (ungrouped data), Rank order correlation, Chi-square test (Contingency Table)

UNIT –IV: Hypothesis Testing

- (i) Level of significance; Type I and Type II error; Computation of ‘t’ for independent and dependent samples
- (ii) Purpose and assumptions of ANOVA; One-way and two-way ANOVA

Practical:

- (i) **Reporting of Statistical Results:** To collect data of 60 (30 boys and 30 girls) High School students about their Annual examination marks in four subjects and to report by descriptive statistical analyses.
- (ii) **Computer Awareness:** To be familiar with software packages of statistics and their applications.

Text Books:

-] Aron, A., Aron, E.N., & Coups, E.J. (2007). Statistics for Psychology. (4thEd.) India: Pearson Education, Prentice Hall.
-] Ferguson, G.A. & Takane, Y. (1989). Statistical Analysis in Psychology & Education, Tata McGraw Hill Publishing Company, New Delhi
-] Garrett, H. E. & Woodworth, R.S. (1985). Psychology in Statistics and Education, Vakils, Feffer & Simons Ltd. Mumbai
-] Mohanty, N., Varadwaj, K. & Mishra, H.C. (2014). Explorations of Human Nature and Strength: Practicals in Psychology, DivyaPrakashani, Samantarapur, Bhubaneswar.

Reference Books:

-] Mishra, G.C. (2018). Applications of Statistics in Psychology and Education, Kalyani Publisher, New Delhi
-] Mohanty, B. and Misra, S. (2017). A text book of Basic Statistics. LaxmiPrakashans, Bhubaneswar, Odisha
-] Siegal, S. (1994). Nonparametric Statistics. McGraw Hill, New Delhi

Core Paper-VI SOCIAL PSYCHOLOGY

Introduction: Social psychology is the scientific study of the nature and causes of human behavior in a social context. This course is designed to introduce the students to the field of social psychology, to explain how social psychologists think about and study human behavior; to introduce the body of knowledge and underlying principles that currently exist in the field and to encourage reflection about the implications of social psychology for the situations we encounter in everyday life.

Learning Objectives:

-] To help students develop awareness of the concepts, problems and issues in the discipline of social psychology
-] To make students understand the individuals and groups in respect to patterns of social behavior and attitudes
-] To help students gain insight into the dynamics of intergroup relationships, conflict, prejudice and cooperation.

Expected outcomes: Students will be able to

-] Know the scope of studying social psychology and the methods to gather data in the social context to explain them.
-] Understand the significance of social cognition, attitudes, stereotypes and prejudices in explaining human behavior in the social contexts.
-] Understand the significant aspects group behavior and social influence that constitute the core of human relationships.

UNIT-I: Introduction

- (i) Nature, goal, and scope of Social Psychology; Methods of Social Psychology- Observation; Questionnaire, Interview, and Experiment
- (ii) Social Cognition- Perceiving ourselves: self-concept, self-esteem, self-presentation and self-expression; Perceiving others and forming impressions

UNIT- II: Attitude, Prejudice and Stereotypes

- (i) Attitudes- Nature, characteristics and functions of attitude; Attitude formation and change; Attitude measurement
- (ii) Prejudice and Stereotypes- Nature and components of prejudice, Acquisition of prejudice, Reduction of prejudice

UNIT –III: Group and Leadership

- (i) Group - Group structure and function, Task performance: Social facilitation, Social loafing; Conformity, Obedience and social modeling; Group cohesiveness.
- (ii) Leadership- Definitions and functions, Trait, situational, interactional and contingency approaches to leadership; Leadership effectiveness, The charismatic leadership.

UNIT- IV: Social Behavior

- (i) Pro-social behavior- Cooperation and helping, personal, situational and socio-cultural determinants, Theoretical explanations of pro-social behavior
- (ii) Aggression- Theoretical perspectives, Trait, situational and social learning approaches, social and personal determinants of aggression, prevention and control of aggression.

Practical:

- (i) **Ethical Values:** To assess the ethical values of five adolescents by using Donelson's Ethical Position Questionnaire (EPQ)
- (ii) **Attitude towards Women:** To measure the attitude of three boys and three girls towards Women by using Spence, Helmrich & Stapps' Attitude towards Women scale.

Text Books:

-] Baron R. A & Byrne. D. (2003). Social Psychology. 10th Edition, Prentice Hall
-] Baron. R.A., Byrne, D. & Bhardwaj. G (2010). Social Psychology (12th Ed). New Delhi: Pearson
-] Mohanty, N., Varadwaj, K. & Mishra, H.C. (2014). Explorations of Human Nature and Strength: Practicals in Psychology, DivyaPrakashani, Samantarapur, Bhubaneswar.
-] Dash, U.N., Dash, A.S., Mishra, H.C., Nanda, G.K. & Jena, N. (2004). Practical Exercises in Psychology: Learning about Yourself and Others. Panchasila, Bhubaneswar

Reference Books:

-] Developments (ICSSR survey of advances in research). New Delhi: Pearson.
-] Misra, G. (1990). Applied Social Psychology. New Delhi: Sage.
-] Misra, G. (2009). Psychology in India, Volume 4: Theoretical and Methodological Implications

Core Paper- VII ENVIRONMENTAL PSYCHOLOGY

Introduction: Environmental psychology is an interdisciplinary field focussed on the interplay between individuals and their surroundings. The field defines the term environment broadly, encompassing natural environments, social settings, built environments, learning environments, and informational environments. The course is designed to introduce to the students about all these aspects of environment.

Learning Objectives:

-] To highlight the simultaneous mutual interaction of environment and behavior.
-] To delineate psychological approaches to the study of environment.
-] To discuss the impact of ecological degradation and the need for enhanced awareness programs

Expected outcomes: Students will be able to

-] understand the interactional relationships between environment and behavior
-] understand the problems occurring to ecology and environment at the present time
-] understand different psychological approaches to the study of man-environment relationship.

UNIT -I: Environment and Behavior

- (i) Earth as a living system: The Gaia hypothesis, Deep ecology; Man-environment relationship-physical, social, cultural, orientation and product.
- (ii) Effects of Environment on behavior: Noise pollution, Air pollution, Crowding and Population explosion.

UNIT- II: Ecology and Development

- (i) Human behavior and Environmental Problems: Global warming, Greenhouse effect, Energy depletion; Pro-environmental behaviors.
- (ii) Ecosystem and their components; Sustainable development; Resource use: Common property resources. Ecology: Acculturation and psychological adaptation

UNIT –III: Psychological Approaches to environment

- (i) Field theory approach; Eco-cultural Psychology (Berry); Biosocial Psychology (Dawson);
- (ii) Ecological Psychology (Barker); Ecological system approach (Bronfenbrenner)

UNIT- IV: Environmental Assessment

- (i) Socio-psychological dimensions of environmental impact; Environmental deprivation-nature and consequences.
- (ii) Creating environmental awareness; Social movements- Chipko, Tehri, Narmada.

Practical:

- (i) To assess the environmental literacy of 4 college students using Bob Simpson’s Environment literacy and awareness survey questionnaire.
- (ii) To assess the environmental attitude, concern and sensitivity of 4 college students using Bob Simpson’s Environment literacy and awareness survey questionnaire.

Text Books:

-] Dreze, J. and Sen, A. (1992). Indian Development. Delhi: Oxford University Press.
- [Gadgil, M. and Guha. R. (1995). Ecology and Equity. New Delhi, Penguin Books
- [Mohanty, B. and Misra, S. (2017). A text book on Environmental Psychology. Krupajala Books, Bhubaneswar, Odisha
-] Mohanty, N., Varadwaj, K. & Mishra, H.C. (2014). Explorations of Human Nature and Strength: Practicals in Psychology, DivyaPrakashani, Samantarapur, Bhubaneswar.

Reference Books:

-] Goldsmith, E. (1991). The way: The ecological World View. Boston: Shambhala

Core Paper VIII PSYCHOPATHOLOGY

Introduction: Psychopathology refers to the study of mental illness. This course is designed to expose students to the key concepts in psychopathology as well as the major theories associated with the etiology and treatment of psychological disorders and disabilities. Students will be able

to understand the distinction between normal and abnormal and the qualities that are used to differentiate what is typical versus atypical through citations of different disorders.

Learning Objectives:

-] To help students define and understand the basic concepts underlying psychopathology and the perspectives which contributed to the development of modern psychopathology.
-] To help students understand the assessment techniques for identifying and classifying maladaptive behavior and mental disorders.
-] To guide students to gain specific knowledge about different types of mental disorders.

Expected outcomes: Students will be able to

- Understand the differences between normality and abnormality along with the perspectives explaining them.
- Know the importance and the use of assessment techniques in identifying different forms of maladaptive behaviour.
- Learn the symptoms, causes and treatment of anxiety disorders, mood disorders and schizophrenia.

UNIT-I: Basics of Pathology

- (i) Concept of abnormality; Perspectives of abnormal behavior- Psychodynamic, Behavioral, Cognitive, Humanistic-Existential, and Sociocultural
- (ii) Classification of maladaptive behavior-DSM-IV; Assessment techniques- Diagnostic tests, Rating scales, History taking interview, Projective tests

UNIT- II: Anxiety and Mood disorder

- (i)Symptoms, causes and treatment of Generalized anxiety disorder, Phobic disorder, Obsessive-Compulsive disorder
- (ii) Depressive disorder –Symptoms, causes and treatment of Bipolar affective disorder, and Dysthymia

UNIT- III: Personality Disorders

- (i) Paranoid, Schizoid, Dissociative, Impulsive
- (ii) Borderline, Anxious, Avoidance, Dependent personality

UNIT –IV: Schizophrenia and Therapies

- (i) Characteristics, Major subtypes, Causes and treatment of Schizophrenia
- (ii) Psychodynamic, and Cognitive Behaviour therapy.

Practical:

- (i) **Anxiety:** Assessment of Anxiety of a subject by Hamilton Anxiety Rating Scale (HARS)
- (ii) **Depression:** Assessment of Depression Profile of a subject by Beck’s Depression Inventory (BDI)

Text Books:

-] Carson R.C., Butcher J.N., Mineka, S., & Hooley J.M. (2007). Abnormal Psychology (13th Ed.).ND: Pearson Education.
-] Irwin G. Sarason, Barbara Sarason (2005). Abnormal Psychology. New Delhi: Prentice Hall Publication
-] Mohanty, N., Varadwaj, K. & Mishra, H.C. (2014). Explorations of Human Nature and Strength: Practicals in Psychology, DivyaPrakashani, Samantarapur, Bhubaneswar.

Reference Books:

-] Kring, A.M., Johnson, S.L., Davison G.C. & Neale J.M. (2010). Abnormal Psychology (11th Ed.). NY: John Wiley

Core Paper IX EDUCATIONAL PSYCHOLOGY

Introduction: This course provides an introduction to concepts, theories, and research in educational psychology. The topics covered include cognitive development during the school years, classroom management, instructional approaches, motivation, assessment, and individual differences.

Learning Objectives:

-] To provide students with an overview of the purposes and uses of educational psychology.
-] To help students understand human development focusing mainly on the years of formal education including those with ability differences
-] To make students understand the ways that educators motivate their students to learn and strive for excellence
- To make students explore the ways that educators manage learning environments to maximize learning and social cohesion

Expected outcomes: Students will be able to

-] Define educational psychology and give examples of the different topics educational psychologists study.
-] Describe the developmental issues faced by school age children.
-] Describe the challenges presented by children with ability differences.
-] Explain the role of motivation on learning and classroom behavior.
-] Describe classroom management techniques.
-] Identify commonly used standardized tests, their strengths and limitations, and use in school settings.

UNIT-I: Foundations of Educational Psychology

- (i) Concepts and principles of educational psychology, The teaching-learning process, Goals of teaching and objectives for learning, transfer of training, reinforcements in learning process
- (ii) Theories of cognitive development-Piaget, Bruner, and Vygotsky.

UNIT- II: Motivation and Classroom Management

- (i) Meaning of motivation, Intrinsic and extrinsic motivation, Approaches to understand classroom motivation, Motivational techniques in classroom teaching
- (i) The goals of classroom management, Creating a positive learning environment, Characteristics of an effective teacher, Teacher expectation and students' performance

UNIT- III: Creativity and Aptitude

- (i) Nature and characteristics of creativity; Theories of creativity; Fostering creativity among children
- (ii) Nature and characteristics of aptitude; Types of aptitude; Measurement of aptitude; Utility of aptitude tests

UNIT –IV: Dealing with ability differences and Testing

- (i) Teaching children with mental retardation, learning disability, social class differences and

educational difficulties, and attention deficit Hyperactive disorder.

(ii) Types of standardized tests- Achievement test, and aptitude tests, Advantages and limitations of standardized test.

Practical:

(i) **Academic Behaviour:** To assess the academic attitude and behavior of college students by using Sia's Academic Behavior Scale

(ii) **Academic Stress:** To assess the academic stress of two higher Secondary students using Rao's Academic Stress Scale.

Text Books:

-] Gage, N. L., & Berliner, D. C. (2009) *Educational psychology* (5th ed.). Boston, MA: Houghton Mifflin.
-] Woolfolk, A.E. (2004). *Educational Psychology* (9th Ed.), Allyn& Bacon, London / Boston
-] Mohanty, N., Varadwaj, K. & Mishra, H.C. (2014). *Explorations of Human Nature and Strength: Practicals in Psychology*, DivyaPrakashani, Samantarapur, Bhubaneswar.

Reference Books:

-] Chauhan, S. S. (2010). *Advanced Educational Psychology*, Vikash Publishing.

Core Paper-X PSYCHOLOGICAL ASSESSMENT

Introduction: The course is designed to expose students to a basic understanding about approaches to psychological assessment and develop skill in the administration and interpretation of psychological tests.

Learning Objectives:

- To train students in various psychological assessment techniques
- To impart skills necessary for selecting and applying different tests for different purposes such as evaluation, training, rehabilitation etc.

Expected outcomes: Students will be able to

-] Understand the basic facts about psychological assessment.
-] Understand the processes of test construction and standardization.
-] Understand about the assessment of different types of skills and abilities.

UNIT-I: Introduction

- (i) Nature and Scope of human assessment; Parameters of assessment
- (ii) Psychological scaling, Methods of scaling

UNIT- II: Psychological Tests

- (i) Principles of test construction and standardization- Item analysis, reliability, validity and development of norms
- (ii) Types of psychological tests- Individual, group, performance, verbal, nonverbal

UNIT –III: Assessment of Ability

- (i) Assessment of general abilities- Intelligence, interest, interpersonal interaction
- (ii) Assessment of personality- Use of self-report inventories, interview, projective and non-

projective tests

UNIT- IV: Classroom Assessment

- (i) Classroom as assessment context, Traditional tests, Alternative assessment
- ((ii) Grading and reporting of performance, Computer and assessment

Practical:

- (i) **Empathy:** To assess the empathy behavior of Five college students using Spreng's Empathy questionnaire.
- (i) **Sense of Humor:** To assess the Sense of Humor of 4 College Students Using McGhee's Scale of Sense of Humor (MSSH)

Text Books:

-] Anastasi, A. (1988). Psychological Testing. New York: MacMillan
-] Mishra, G.C. & Others (2018). Psychological Assessment. Kalyani Publisher, New Delhi

Reference Books:

-] Kerlinger, F.N. (1983). Foundations of Behavioral Research. New York: Surjeet Publications
-] Minium, E.W., King, B.M. & Bear, G. (1993). Statistical Reasoning in Psychology and Education. New York: John Wiley

Core Paper XI ORGANIZATIONAL BEHAVIOR

Introduction: The course provides an overview of the main fields of organizational and personnel psychology. It focuses on topics such as organizational system; work behavior, attitudes and motivation as related to organizational set up; management of power and politics in the organizations; and finally development and evaluation of human resources for sustainable growth of an organizations.

Learning Objectives:

-] To help students understand the structure, functions, and designs of different organizations.
-] To make students understand the processes of group decision making and leadership functions in different organizations.
-] To make students understand the theories of work motivation and related issues of power and politics in the organizational set up.
-] To help students demonstrate professional skills in the evaluation, management, and development of human resources in the organizations.

Expected outcomes: Students will be able to

-] Understand different concepts and dynamics related to organizational system, behavior, and management.
-] Identify steps managers can take to motivate employees in the perspectives of the theories of work motivation.
-] Understand the tricks of power and politics management in the organizations.
-] Understand significance of human resource development, evaluation and management for the interest and benefit of the organization.

UNIT I: Historical context of organizational behavior

- (i) Contributions of Taylor, Weber and Fayoll; Challenges, Scope and opportunities for OB
- (ii) OB perspectives-Open system approach, Human relations perspective, Socio-technical

approach, OB model responsive to Indian realities

UNIT-II: Organization System

- (i) Structure and functions of organization, Common organizational designs, Management roles, functions and skills
- (ii) Group decision making processes in organizations, Organizational leadership and types of leadership in organizations

UNIT- III: Work, Power and Politics

- (i) Contemporary theories of work motivation- ERG theory, McClelland's theory of needs, Cognitive evaluation theory, Goal-setting theory, Reinforcement theory
- (ii) Defining power in organization, Bases of power, Power tactics, Nature of organizational politics, Impression management, and defensive behavior

UNIT –IV: Human resource development and Evaluation

Human Skills and Abilities, Selection Practices for Optimal Use of Human Resources; Training Programs for the Development of Human Resources

- (i) Performance Evaluation- Purpose, Methods, Potential Problems and methods to overcome them

Practical:

- (i) **Leadership Style:** To measure his basic leadership style of 4 college students by using Greenberg Basic Leadership Style scale
- (ii) **Conflict-Handling:** To measure the conflict-handling style of 4 college students by using Rahim's scale to identify their conflict handling style.

Text Books:

-] Robbins, S.P.; Timothy, A.J. &Vohra, N. (2012). Organizational Behavior, 15th Edn. Pearson Education: New Delhi
-] Luthans, F. (2009). Organizational behavior. New Delhi: McGraw Hill.
-] Mohanty, N., Varadwaj, K. & Mishra, H.C. (2014). Explorations of Human Nature and Strength: Practicals in Psychology, DivyaPrakashani, Samantarapur, Bhubaneswar.

Reference Books:

-] Greenberg, J. & Baron, R.A. (2007). Behaviour in Organizations (9th Ed.). India: Dorling Kindersley.

Core Paper XII HEALTH PSYCHOLOGY

Introduction: Health psychology is a specialty area that focuses on how biology, psychology, behavior and social factors influence health and illness. This course is designed to provide an introduction to the area of health psychology to help students understand how Health Psychology as a specialty within psychology addresses the role of behavioral factors in health and illness. Basic theories, models and applications are also included.

Learning Objectives:

-] To help the students understand the issues of Health Psychology and how to address them by the bio-psychosocial model of health and illness.
-] To help the students to describe behavioral factors that influence health and illness.

-] To guide the students understand about health enhancing behaviors including coping with illness.

Expected outcomes: Students will be able to

-] Know the basics of health and illness from the Bio-psychosocial perspectives.
-] Understand the significance of behavioral and psychological correlates of health and illness.
-] Understand the significant aspects of coping and importance of health enhancing behavior.

UNIT-I: Introduction

- (i) Goals of Health Psychology, , Biopsychosocial model of health and illness
- (ii) Basic nature of stress, Cognitive appraisal of stressors, Some major causes of stress, Management of stress

UNIT- II: Health and Illness

- (i) Behavioral and psychological correlates of illness, Approaches to promoting wellness, Some common health beliefs and their implications
- (ii) Models of health- The cognition models- The health belief model, The protection motivation model, Leventhal's self-regulatory model.

UNIT –III: Health and Coping

- (i) Individual differences in symptom perception, Coping with the crises of illness; Compliance behavior and improving compliance.
- (ii) Health enhancing behavior- Diet management, Yoga and Exercise

UNIT- IV: Health Issues

- (i) Children health issues- Malnutrition, Immunization, Autism, ADHD
- (ii) Health issues of women and elderly: **Diabetes, Osteoporosis, Alzheimer's Disease, Depression**

Practical:

- (i) **Sleep Quality:** To assess the Sleep quality of 4 college students The Pittsburgh Sleep Quality Index (PSQI)
- (ii) **Coping Strategies:** To assess of the Coping Strategies of 4 college students by Tobin's Coping Strategy Inventory (TCSI)

Text Books:

-] Taylor, S.E. (2006). Health Psychology (6th Ed.). New York: Tata McGraw Hill
-] Brannon and Feist. Health Psychology.
-] Mohanty, N., Varadwaj, K. & Mishra, H.C. (2014). Explorations of Human Nature and Strength: Practicals in Psychology, DivyaPrakashani, Samantarapur, Bhubaneswar.

Reference Books:

-] Ogden, J. (2007). Essentials of Health Psychology. McGraw Hill.

Core Paper XIII COUNSELING PSYCHOLOGY

Introduction: The course is designed to develop entry level counseling psychologists who will be capable of understanding and demonstrating behavior and attitudes in the basic areas of professional counseling.

Learning Objectives:

-] To help students understand and integrate current scientific knowledge and theory into counseling practice.
-] To make students learn the history and professional issues related to counseling psychology.
-] To help students integrate and convey information in the core areas of counseling practice.
-] To help students demonstrate professional behavior in their various roles as counseling psychologists.

Expected outcomes: Students will be able to

-] Understand the purpose of counseling and practice of counseling ethically following different approaches.
-] Understand the basics of counseling process and use them for counseling students, families, couples, distressed, and handicaps.

UNIT-I: Basics of Counseling

- (i) Meaning, scope and purpose of counseling with special reference to India; The counseling process, counseling relationship, counseling interview
- (i) Characteristics of a good counselor, Ethics and values in counseling; Education and training of the counselor

UNIT –II: Theories and Techniques of Counseling

- (i) Psychodynamic approach-Freud and Neo Freudians; Humanistic approach-Existential and Client centered
- (ii) Cognitive approach- Rational-emotive and transaction analysis; Behavioral approach-Behavior modification; Indian contribution- yoga and meditation

UNIT- III: Counseling Programs

- (i) Working in a counseling relationship, transference and counter transference, termination of counseling relationship, Factors influencing counseling
- (ii) Student counseling, Emphases, roles and activities of the school, and college counselor.

UNIT –IV: Counseling application

- (i) Family and Marriage Counseling, Family life and family cycle, Models and methods of family counseling
- (ii) Alcohol and drug abuse counseling; Counseling the persons with Suicidal tendencies, and Victims of Harassment and Violence

Practical:

- (i) **Marital Relationship-** To assess the marital relationship of 2 couples using Lerner's Couple adjustment scale
- (ii) **Case Reporting:** To complete four case studies of high school students with problem

behavior in the appropriate case record proforma

Text Books:

-] Gladding, S.T. (2009). Counseling: A comprehensive profession (6th Ed.). New Delhi: Pearson India
-] Mishra, H.C. & Varadwaj, K. (2009). Counseling Psychology: Theories, Issues and Applications, DivyaPrakashini, Samantarapur, Bhubaneswar, Odisha
-] Burnard Philip. (1995). Counseling Skills Training – A sourcebook of Activities. New Delhi: Viva Books Private Limited.
-] Gibson, R.L & Mitchell M.H. (2003). Introduction to counseling and Guidance. 6thedn. Delhi: Pearson Education
-] Mohanty, N., Varadwaj, K. & Mishra, H.C. (2014). Explorations of Human Nature and Strength: Practicals in Psychology, DivyaPrakashani, Samantarapur, Bhubaneswar.

Reference Books:

-] Feltham, C and Horton, I. (2000). Handbook of Counseling and Psychotherapy. London: Sage.
-] Misra, G. (Ed) (2010). Psychology in India, Volume 3: Clinical and Health Psychology. New Delhi: Pearson India.
-] Nelson-Jones. (1995). The theory and practice of counseling. 2ndEdn. London: Holt, Rinehart and Winston Ltd
-] Mohanty, G. B. (2018). Counseling Psychology, Kalyani Publisher, New Delhi.

Core Paper XIV POSITIVE PSYCHOLOGY

Introduction: Positive psychology is the scientific study of optimal human functioning to help people flourish. This is a foundation course in positive psychology to help students not only to understand the core themes of positive psychology, but also to equip them with the helpful positive interventions in various areas of professional psychology, such as clinical, health, education, organization and community.

Learning Objectives:

-] To help students to understand the rationale behind positive psychology.
-] To guide students to identify and analyze the key conceptual and theoretical frameworks underpinning positive psychology.
-] To encourage students to appreciate the contributions of scholars from a range of disciplines and their influence on developing a positive approach to mental health.
-] To make students understand and apply a strengths-based approach to mental health issues.

Expected outcomes: Students will be able to understand

-] The goal of positive psychology and the basic behavior patterns that result in positive human growth from the point of view of leading positive psychologists.
-] The concepts of flow and happiness and the related theories and models explaining happiness behavior and its consequences.
-] All the precursors to positive psychology from character strength and altruism to resilience.

UNIT-I: Foundations

- (i) Historical roots and goals of positive psychology, Positive emotions, Positive Individual traits, and positive subjective experience
- (ii) Contribution of Martin Seligman, Albert Bandura, Carol Dweck and Abraham Maslow to positive psychology

UNIT- II: Flow and Happiness

- (i) Components of flow, Conditions and mechanisms of flow, Positive and negative consequences of flow experience
- (ii) Meaning and nature of happiness, Sources of happiness, Theories of happiness- Set-point theory, Life satisfaction and Affective state theories.

UNIT –III: Precursors to Positive Psychology

- (i) Character strength, Altruism, Hope and Optimism, Positive thinking, Resilience
- (ii) Psychology of well-being: Meaning of well-being, The well-being models, Factors affecting well-being, Promoting well-being among people

UNIT- IV: Ways to Positive Psychology

- (i) Discovering strength, Increasing optimism, Self-direction, Purpose, gratitude, Mindfulness, and Activities and experience
- (ii) Effects of exercise, Yoga, meditation and spiritual intelligence on development of positive psychology; Positive psychology in building relationship

Practical:

- (i) **Happiness:** To measure the happiness of 4 adults using Oxford Happiness questionnaire
- (ii) **Spiritual Intelligence:** To measure the spiritual intelligence of 4 adults using King's Spiritual Intelligence test.

Text Books:

-] Seligman, M.E. (2002). Authentic Happiness: Using the New Positive Psychology to Realize Your Potential for Lasting Fulfillment: Oxford University Press
-] Carr, A. (2004). Positive Psychology: The science of happiness and human strength. UK: Routledge.
-] Mohanty, G.B. (2018). Positive Psychology. Kalyani Publisher, New Delhi
-] Mohanty, N., Varadwaj, K. & Mishra, H.C. (2014). Explorations of Human Nature and Strength: Practicals in Psychology, DivyaPrakashani, Samantarapur, Bhubaneswar.

Reference Books:

-] Peterson, C. (2006). A Primer in Positive Psychology; Oxford University Press
-] Seligman, M.E. (2012). Flourish: A Visionary New Understanding of Happiness and Well-being. Oxford University Press
-] Snyder, C.R. & Shane, J.L. (2005). Handbook of Positive Psychology. Oxford University Press
-] Snyder, C.R., & Lopez, S.J. (2007). Positive psychology: The scientific and practical explorations of human strengths. Thousand Oaks, CA: Sage.

Discipline Specific Elective Paper-I **PSYCHOLOGICAL RESEARCH AND** **MEASUREMENT**

Introduction: The research methods course is among the most frequently required in the psychology and with good reason. It helps the students know about the difference between an experiment and a correlational study, the function of independent and dependent variables, the importance of reliability and validity in psychological measurement, and the need for replication in psychological research. In other words, psychologists' research methods are at the very core of their discipline. The course is designed to train the students in psychological research and measurement.

Learning Objectives:

-] To provide an overview of scientific approaches to psychological research in term of sampling techniques, scientific method, and experimental designs.
-] To acquaint the students with respect to psychometric, projective techniques and non-testing approaches like interview

Expected outcomes: Students will be able to

-] Understand the nature of psychological research and characteristics of scientific methods of research.
-] Know the methods of test construction and standardization
-] Know the different approaches to assessment of personality.

UNIT-I: Psychological Research

- (i) Assumptions of science, Characteristics of scientific methods, Psychological research: Correlational and experimental
- (ii) Sampling frame: probability and non-probability samples, sample size, sampling error

UNIT- II: Psychological Scaling and Construction of test

- (i) Purpose of scaling and types of psychological data, Psychological scaling methods: Familiarity with Thurstone, Likert and Guttman scale
- (ii) Construction of test: Theory of measurement error; Operationalizing a concept, Generating items, Item analysis, Item response theory

UNIT –III:

- (i) **Experimental Designs:** Pretest- post-test design, Factorial designs, Randomized Block design
- (ii) **Standardization of tests:** Reliability and validity of tests, Development of norms and interpreting test scores

UNIT- IV:

- (i) **Assessment of Personality:** Psychometric and projective techniques, Familiarity with MMPI, Rorachs, WAT, and TAT
- (ii) **Interviewing:** Principles and procedures of interviewing, gaining cooperation, motivating respondents, training of interviewers, ethics of interviewing

Practical:

- (i) **TAT:** To administer the TAT on a subject and give summary report
- (ii) **Word Association test:** To administer the Jung / Kent-Rosanoff list of WAT on a subject and report on his areas of emotional difficulties

Text Books:

-] Anastasi, A. (1988). Psychological Testing. New York: MacMillan
-] Minium, E.W., King, B.M. & Bear, G. (1993). Statistical Reasoning in Psychology and Education. New York: John Willey

Reference Books:

-] Kerlinger, F.N. (1983). Foundations of Behavioral Research. New York: Surjeet Publications
-] Best, W.J. & Kahn, J.V. (2006)- Research in Education. Pearson

Discipline Specific Elective Paper-II **PSYCHOLOGY AND SOCIAL ISSUES**

Introduction: Psychologists can play a larger role in the solution of important social problems. Psychology brings two important qualities to the study of social problems: attention to psychological process and rigorous methodology. The key task in the designed course is to define social problems in part as psychological problems.

Learning Objectives:

- The course will provide social psychological analysis of some major social issues in India.

Expected outcomes: Students will be able to

-] Understand the nature and characteristics of different social systems and social integration in India.
-] Understand the aspects of health and wellbeing of Indian people.
-] Understand about the political behavior of Indian people

UNIT-I

- (i) **Understanding Social Systems:** Indian Family System; Social stratification; caste, class, power, Religious ethics
- (ii) **Poverty and Deprivation:** Theories of poverty, Concomitants of poverty, Sources of deprivation, inequality and social justice.

UNIT- II

- (i) **Health and wellbeing:** Role of behavior in health problems, Behavioral sciences in disease prevention and control, India's health scenario
- (ii) **Political Behavior:** Development of ideology, Use of small groups in politics, Issues of human and social development, Quality of life and development

UNIT –III: Antisocial Behavior

- (i) Corruption and bribery, Juvenile delinquency, terrorism,
- (ii) Crime and criminal behavior, Alcoholism and drug abuse, Psychopath

UNIT- IV

(i) **Social integration:** The concept of social integration; Causal factors of social conflicts and prejudices; Psychological strategies for handling the conflicts and prejudices; Measures to achieve social integration.

(ii) **Violence:** Nature and categories of violence, violence in family and marriage, rape, Collective violence for social change

Practical:

(i) **Quality of Life:** To assess the quality of life family of 4 families using Beach Center Family Quality of Life Scale

(ii) **Community Integration:** To assess the community integration of a village by using Community integration questionnaire (CIQ) of Barry Willer

Text Books:

-] Srinivas, M.N. (1966). Social change in modern India, .Bombay: Allied
-] Mohanty, A .K. and Mishra, G. (Eds.) (2000). Psychology of Poverty and Disadvantage. New Delhi: Concept
-] Mishra, H.C. and Misra, S. (2009). Psychology of Deviants, DivyaPrakashani, Bhubaneswar

Reference Books:

-] Banerjee, D. (1998). Poverty, class and health culture in India, Vol. I, Delhi PrachiPrakashan
-] Dube, S.C. (1987) Modernization and Development. ND: Sage
-] Mishra, G. (1999). Psychological perspectives on stress and Health. New Delhi: Concept
-] Sen, A. & Sen A.K. (Eds.). (1998). Challenges of contemporary Realities: A psychological Perspective. New Delhi: New Age International

Discipline Specific Elective Paper-III PSYCHOLOGY OF DISABILITY

Introduction: According to WHO, disability is any restriction or lack resulting from an impairment of ability to perform an activity in the manner or within the range considered normal for a human being. While individuals may have physical or psychological impairments, it is often the society and environment that contributes to the experience of disability by failing to accommodate people with impairments. Inclusion and access is a fundamental human right and inclusive and accessible communities are vital for individual and community wellbeing. Study of psychology of disability would help the students understand this social responsibility.

Learning Objectives:

-] The objective of the course is to provide students with an overview of the disability from the psychological perspective.

-] Drawing from the four units, students will be exposed to varying disability definitions, cultural meanings and representations.
-] What does it mean to be “disabled”? How has this meaning changed over time in India? What factors affect a person’s experience of disability? Why should people in psychology learn about these matters?

Expected outcomes: Students will be able to

- Know about different types of disability and their prevalence in India.
- Understand various socio-cultural models of disability
- Gain knowledge about disability policies in India
- Understand about intervention and rehabilitation of disables in India

UNIT I

- (i) Conceptualizing Disability: Meaning and Definition, Types of disability, Assessment and Diagnosis
- (ii) Understanding Disability Policy in India: Equal opportunities Bill, Rehabilitation Council of India, National Trust

UNIT-II

- (i) Theorizing Disability: Charity Model: Welfare Model; Medical Model
- (ii) Social Model: culture as disability; Empowerment Model

UNIT- III

- (i) Disability support: Beliefs and attitudes towards disability; Family, care, and support structure
- (ii) Issues of Access: Built and Psychological; Education and Employment, learning disability

UNIT -IV

- (i) Designing Interventions: Psychotherapeutic approaches; Rehabilitation
- (ii) Contemporary Debates: euthanasia, prenatal selection

Practical:

- (i) To assess the attitude of 8 college students by using ‘Attitude towards Disabled Persons Scale’ (Yuker et al., 1998).
- (ii) To assess the knowledge of 4 college students about Disability Policy in India using a Questionnaire.

Text Books:

-] Chib, M. (2011). One Little Finger. New Delhi: Sage Publications Pvt. Ltd.
-] Dalal, A. K. (2011). Folk wisdom and traditional healing practices: Some lessons for modern psychology. In MatthijsCornelissen, GirishwarMisra, &SuneetVarma (eds) Foundations of Indian Psychology: Practical applications (Vol. 2) Longman, Pearson Education, New Delhi
-] Mohanty, N., Varadwaj, K. & Mishra, H.C. (2014). Explorations of Human Nature and Strength: Practicals in Psychology, Divya Prakashani, Samantarapur, Bhubaneswar

Reference Books:

-] Ghai, A. (2015). Rethinking Disability in India. India: Routldge. Ghai, A. (2010). Psychology of Disabled in G.Misra (Ed.) Psychology in India: Advances in research. New Delhi: Pearson education. Ghai, A. (2006 [2003]) (Dis)Embodied Form: Issues of Disabled Women. New Delhi: Shakti Books.

-] Goodley, D & Lawthom, R. (2006). Disability and Psychology: Critical Introductions and Reflections. Palgrave Macmillan.

Discipline Specific Elective Paper-IV **DISSERTATION / RESEARCH PROJECT**

Introduction: The research experience of students is greatly enriched by early exposure to conducting research. There are numerous benefits of undergraduate students who get involved in research. They are better off in understanding published works, determine an area of interest, can discover their passion for research and may start their career as a researcher. Further, students will be able develop ability for scientific inquiry and critical thinking, ability in the knowledge base and communication of psychology. This course is included to promote above mentioned abilities among the students.

Learning Objectives:

-] To help students to learn how to develop scientific research designs in the study of psychology.
-] To guide students to understand the previous research in their field of interest and review them to arrive at a research problem
-] To encourage the students to learn ways to describe and measure human behavior.
-] To help students understand the logic of hypothesis testing and application of appropriate statistical analysis.
-] To make students to learn the methods of writing a research report.

Expected outcomes: Students will be able to

-] Independently prepare a research design to carry out a research project
-] Review the related research papers to find out a research problem and relevant hypotheses
 - Understand the administration, scoring and interpretation of the appropriate instrument for measurement of desired behavior
-] Learn the use of statistical techniques for interpretation of data.
 - Learn the APA style of reporting a research project.

Unit I

A student is required to carry out a project on an issue of interest to him / her under the guidance and supervision of a teacher. In order to do so s/he must have the knowledge in research methodology and of steps in planning and conducting a research. The supervisors may help the students to go on field study / study tour relevant to their work. Thirty hours of class may be arranged in the routine to help students understand research methodology, and planning, conduction and reporting on the research. An external examiner with the supervisor as the internal examiner will evaluate the research project on the basis of scientific methodology in writing the report, and presentation skill and performance in the viva.

• **Format**

- **Abstract** – 150 words including problem, method and results.
- **Introduction** – Theoretical considerations leading to the logic and rationale for the present research
- **Review**- Explaining current knowledge including substantive findings and theoretical and methodological contributions to the topic, objectives and hypotheses of the present research

- **Method** – Design, Sample, Measures, Procedure
- **Results**- Quantitative analysis of group data (Raw data should not be attached in Appendix) Graphical representation of data wherever required. Qualitative analysis wherever done should indicate the method of qualitative analysis.
- **Discussion**
- **References (APA Style) & Appendices**
-] Project should be in Soft binding. It should be typed in Times New Roman 14 letter size with 1.5 spacing on one sides of the paper. Total text should not exceed 50 pages (References & Appendices extra).
-] Two copies of the project should be submitted to the College.
- ***Project - American Psychological Association (APA) – Publication Manual 2006 to be followed for project writing***

Mark distribution for dissertation / Research project						
Identification of problem	Review of Literature	Methodology	Analysis	Findings	Viva-voce	Total
10	10	10	25	20	25	100

Or

**DSE Paper-IV /Alternative to dissertation
PSYCHOLOGY OF CRIME**

Introduction: This course provides an introduction to psychology of crime and criminal behavior. The topics covered in this paper include meaning, nature and theories of criminal behavior; crime prevention and control; and about the trauma of some victims of crime.

Learning Objectives:

-] To provide students with an overall knowledge of psychology of crime.
-] To help students understand the psychosocial perspectives of crime.
-] To make students aware about the processes of crime prevention and control.
- To help students understand the trauma of victims of some types of crime.

Expected outcomes: Students will be able to

-] Define criminal behavior and explain the psychosocial factors of crime and criminal behavior.
-] Discuss the social and psychological theories of crime and criminal behavior.
-] Describe how crimes are prevented and controlled by police and other agencies.
-] Describe the behavior and mental health of the victims of crimes.

UNIT-I: Introduction to crime

- (i) Definition, meaning, and nature of criminal behavior; Factors of criminal behavior: Antisocial values; Peer influence; Antisocial personality; Dysfunctional family; Substance abuse
- (ii) Major types of crimes: Homicide; Robbery, Sexual offences; Cybercrimes.

UNIT- II: Theories of Criminal Behavior

- (i) Social disorganization theory; Rational choice theory; Strain theory
- (ii) Social learning theory; Social control theory, Labeling theory; Genetic theory

UNIT –III: Crime prevention and Control

- (i) Crime prevention models: Primary prevention, Secondary prevention; Tertiary prevention
- (ii) Crime control: Crime control model and Due process model

UNIT –IV: Special Victims

- (i) Rape and sexual assault; Domestic violence; Bullying and school violence
- (ii) Workplace violence, Victims of terrorism

Practical:

- (i) **Guilt quotient:** Test your subject's Guilt Quotient Using Chattopadhyay's "What is your guilt quotient?" scale.
- (ii) **Domestic Violence:** Using the "Domestic Violence Scale (Michale, 2008)" assess your subject's attitude towards domestic violence.

Text Books:

-] Counseling Crime Victims: Practical Strategies for Mental Health Professionals; Laurence Miller, Springer Publishing Company, USA.
-] Criminal Psychology; Nabin Kumar; LexisNexis, USA

Reference Books:

-] Inside the Criminal Mind, S. E. Samenow; BDWY/ Newyork

Generic Elective Paper-I INTRODUCTORY PSYCHOLOGY

Introduction: The course is designed to provide the students a basic understanding of the psychology of human behavior. The students will be given exposure to concepts, terminology, principles, and theories that comprise an introductory course in psychology.

Learning Objectives:

To help the students know the sources and processes of development of modern scientific psychology.

-] To help the students develop a scientific temperament in studying and understanding human behavior.

Expected outcomes: Students will be able to

-] Define the term psychology and demonstrate command of the basic terminology, concepts, and principles of the discipline.
-] Gain knowledge of scientific methodology—the variety of ways in which psychological data are gathered and evaluated / interpreted.
-] Identify and compare the major perspectives in psychology: Recognize how each approach views human thought and behavior.
-] Understand the physiological and biochemical links of human behavior.

UNIT-I: Introducing Psychology

- (i) Concept and definition of psychology, Roots of psychology, Psychology as a scientific discipline.
- (ii) Key Perspectives in Psychology- Behavioral, Cognitive, Humanistic, Psychodynamic, and Sociocultural

UNIT- II: Methods in Psychology

- (i) Natural Observation, Survey and Case Study- Nature, advantages and limitations.
- (ii) Experimental and Correlational methods-Nature, advantages and limitations.

UNIT –III: Biological Bases of Behavior

- (i) Structure and functions of the neurons, Communication within and between neurons, Chemical regulation of the endocrine glands.
- (ii) Structure and functions of the Central nervous system and Autonomic nervous system

UNIT-IV: States of Mind

- (i) Nature of consciousness; changes in consciousness- sleep-wake schedules
- (ii) Extended states of Consciousness- Hypnosis, Meditation and Hallucinations

Practical:

- (i) **R.L. by Method of Limits:** Students are required to find out the R. L. of volar surface of the right arm of a subject by method of limits
- (ii) **D.L. by Method of Constant Stimuli:** To find out the D.L. for lifted weight of your subject by method of constant stimuli.

Text Books:

-] Baron, R. A. (2002). Psychology (5th Edition), New Delhi: Pearson Education.
-] Hilgard & Atkinson- Introduction to Psychology (2003) 14th Edition, Thomson Learning Inc.
-] Mohanty, N., Varadwaj, K. & Mishra, H.C. (2014). Explorations of Human Nature and Strength: Practicals in Psychology, DivyaPrakashani, Samantarapur, Bhubaneswar.

Reference Books:

-] Morgan, C.T., King, R.A., Weisz, J.R., & Schopler, J. (2008). Introduction to psychology (7th edition) Bombay: Tata-McGraw Hill.
-] Feldman, R.S. (2004). Understanding Psychology (6th Edition), New Delhi, Tata-McGraw Hill.

Generic Elective Paper-II

BASIC DEVELOPMENTAL PROCESSES

Introduction: The course is designed to expose students to a basic understanding about the fundamental concerns of developmental psychology and provide examples of the following three dimensions of development: growth, differentiation, and orderly progression.

Learning Objectives:

- To help students gain some key ideas about human development and the perspectives to understand and explain such developments.
- To help the students understand the significance of prenatal period for human development.
- To help the students understand the developmental preparations of the childhood and the

implications of developmental milestones for the normal human development.

Expected outcomes: Students will be able to

-] Understand the nature, types, and principle of development.
-] Understand the processes of formation of life and development during pre- and post-natal periods.
-] Understand about the different aspects of preparation for future life.

UNIT-I: Basics of development

- (i) Meaning, nature, and types of development; Principles of development; Factors influencing development
- (ii) Perspectives of development- Psychoanalytic; Mechanistic; Organismic; Humanistic

UNIT- II: Life in formation

- (i) Fertilization, determination of sex, multiple birth; Prenatal development- germinal stage, embryonic stage, fetal stage; Factors influencing prenatal development
- (ii) Physical and motor developments, Social and emotional developments during childhood.

UNIT –III: Life in preparation

- (i) Physical and motor developments, Social and emotional developments during adolescence.
- (ii) Piaget's stage of cognitive development; Kohlberg's stages of moral development

Unit- IV: Self and identity

- (i) Emergence of self; Structure of the self; Development of personal identity
- (ii) Development of self-control; Development of gender differences and gender roles

Practical:

- (i) **Locus of Control:** To assess the Locus of Control of four college students by using Rotter's Locus of Control Scale.
- (ii) **Emotional Intelligence:** To measure the emotional intelligence of four college students by using the Schutte's Emotional Intelligence Scale.

Text Books:

-] Sigelman, G.K. & Schaffer, D.R. (1995). Life-span Human Development, Brooks / Cole Publishing Co. Pacific Grove, California.
-] Berk, L. E. (2010). Child Development (8th Ed.). New Delhi: Prentice Hall.
-] Mohanty, N., Varadwaj, K. & Mishra, H.C. (2014). Explorations of Human Nature and Strength: Practicals in Psychology, DivyaPrakashani, Samantarapur, Bhubaneswar.

Reference Books:

-] Papalia, Diane E., Sally Wendos Olds (2006). Human Development. 9th Edition. New Delhi: Tata McGraw Hill
-] Baron, R. A. (2002). Psychology (5th Edition), New Delhi, Pearson Education.

Generic Elective Paper-III **BASIC PSYCHOLOGICAL PROCESSES**

Introduction: The course is designed to provide the student a basic understanding of the psychological processes from sensation to thought and communication. The student will be given exposure to the concepts, terminology, principles, and theories relating to each of the mental

processes that constitute human psychology.

Learning Objectives:

-] To help the students to understand the mental processes to begin with sensation and perception up to how it results in thoughts and communication.
-] To help the students gather knowledge about the structural and functional dynamics of each of the mental processes and their interconnectedness.

Expected outcomes: Students will be able to

-] Understand the basic sensory actions and the processes of integration of sensory actions in creating and interpreting perceptual events.
-] Gain knowledge of the important processes and principles of human learning as well as the structural functional attributes of human memory to help conserve the learning outcomes.
-] Understand the structural and functional properties of language and the way it helps thought, communication, problem solving and decision making through development of concepts, ideas, images, and so on.

UNIT-I: Sensation and Perception

- (i) Basics of sensation- Sensory receptors (eye and ear), transduction, sensory thresholds, and sensory adaptation
- (ii) Nature of perceptual process- Figure and ground, Grouping (Gestalt laws), Perceptual constancies, and illusions, Perception of distance and depth.

UNIT- II: Learning and Memory

- (i) Nature and principles of Classical conditioning, Operant conditioning, and Observational learning
- (ii) The Atkinson and Shiffrin Model of Memory; Types of Memory- episodic, semantic and procedural; Causes of Forgetting- interference, repression, and amnesia

UNIT –III: Language and Communication

- (i) Properties and structure of language, Linguistic hierarchy, Language acquisition- predisposition, Nature of effective communication
- (ii) Stages of language development; critical period controversy; speech error and its implications

UNIT –IV: Thinking and Reasoning

- (i) Thinking process; concepts, categories and prototypes, Decision making and factors of influencing decision making.
- (ii) Inductive and deductive reasoning; Problem solving approaches; Steps in problem solving

Practical:

- (i) **Learning Curve:** To demonstrate the Learning Curve as a function of Learning trials using Non-sense Syllables.
- (ii) **Serial Position Effect:** To demonstrate the serial position effect on memory in learning a list of nonsense syllables.

Text Books:

-] Baron, R. A. (2002). Psychology (5th Edition), New Delhi, Pearson Education.

-] Feldman, R.S. (2004). Understanding Psychology (6th Edition), New Delhi, Tata Mc. Graw Hill.
-] Dash, U.N., Dash, A.S., Mishra, H.C., Nanda, G.K. & Jena, N. (2004). Practical Exercises in Psychology: Learning about Yourself and Others. Panchasila, Bhubaneswar
-] Mohanty, N., Varadwaj, K. & Mishra, H.C. (2014). Explorations of Human Nature and Strength: Practicals in Psychology, DivyaPrakashani, Samantarapur, Bhubaneswar.

Reference Books:

-] Morgan, C.T., King, R.A., Weisz, J.R., & Schopler, J. (2008). Introduction to psychology (7th edition) Bombay: Tata-McGraw Hill.

Generic Elective Paper-IV **PROCESSES OF HUMAN** **EMPOWERMENT**

Introduction: Human empowerment is ultimately an individual condition of gaining the power to control and modulate changes in one's own life those are considered important to one's identity and adjustment. The purpose of the course is to introduce to the students the basics of human empowerment and how the empowerment processes are strengthened and improved.

Learning Objectives:

-] To help students gain ideas about intelligence and personality as foundations of human empowerment.
-] To make students understand how motivation and emotion are empowering processes to human development.
-] To help students gain insight into human behavior as products of empowerment.

Expected outcomes: Students will be able to

-] Know the structural components and functional dynamics of both intelligence and personality.
-] Understand the significance of emotion and motivation in behavior management.
-] Understand significant aspects of social behavior as resulting in happiness, well-being and personal growth.

UNIT-I: Basics of empowerment

- (i) Intelligence- Heredity, environment, and intelligence, Theories of Gardner, Stenberg, & PASS
- (ii) Measuring Intelligence: intelligence tests; Interpretation of test score, Cross-cultural issues in testing intelligence

UNIT- II: Sources of Power (1)

- (i) Personality- Freud's theory, and Social cognitive theory
- (ii) Personality-Trait and type approach, Biological and sociocultural determinants, Psychometric and projective assessment.

UNIT- III: Sources of Power(2)

- (i) Motivation-Drive theory, Arousal theory, Expectancy theory, Maslow's need hierarchy
- (ii) Emotion-Theories of James-Lange, Cannon-Bard, & Schachter-Singer

UNIT –IV: Proving empowered

- (i) Social behavior- Meaning of attribution and errors in attribution, Meaning of social cognition

and processing of social information

(ii) Positive Psychology-Scope and aims, Nature and characteristics of happiness, Subjective well-being and personal growth

Practical:

(i) **Intelligence test-** To test the non-verbal intelligence of Two college students using Raven's Standard Progressive Matrices

(ii) **Personality Type-** To assess the personality type of a student obtaining responses from the student and two other significant persons in his /her life by using Glazer's test of Personality Type

Text Books:

-] Baron, R.A. (1995). Psychology- The Essential Science, Pearson Education Company of India Pvt. Ltd.
-] Gerrig, R.J. & Zimbardo, P.G. (2010). Psychology and Life (19th Ed.). Delhi: Allyn & Bacon
-] Snyder, C.R. & Shane, J.L. (2005) Handbook of Positive Psychology: Oxford University Press.
-] Mohanty, N., Varadwaj, K. & Mishra, H.C. (2014). Explorations of Human Nature and Strength: Practical in Psychology, DivyaPrakashani, Samantarapur, Bhubaneswar.

Reference Books:

-] Baron, R. A. & Byrne, D. (2003). Social Psychology, 10th Edition, Prentice Hall
-] Misra, G. (2009). Psychology in India, Vol 1: Basic Psychological Processes and Human Development. India: Pearson
-] Dash, U.N., Dash, A.S., Mishra, H.C., Nanda, G.K. & Jena, N. (2004). Practical Exercises in Psychology: Learning about Yourself and Others. Panchasila, Bhubaneswar

COURSESTRUCTUREFOR+3B.A.SANSKRIT(HONS.-CC,DSE&GENERICSELECTIVE)

1st Year (08 Papers : 800 Marks)					
Sl. No.	Semester – I	Marks-Credits	Sl. No.	Semester-II	Marks-Credits
1	Core Course (SKT.)-1	(100 -6)	5	Core Course (SKT.)-3	(100-6)
2	Core Course (SKT.)-2	(100 -6)	6	Core Course (SKT.)-4	(100-6)
3	AECC-1 Env. Studies	(100 -4)	7	AECC-2 M.I.L. (A.ENG/ ODIA/ SANS/ HINDI)	(100-4)
4	Generic Elective- 1 (If SKT.)	(100-6)	8	Generic Elective- 2 (If SKT.)	(100-6)
	(6+6+4+6 = 22 Credits)	400 Marks		(6+6+4+6 = 22 Credits)	400 Marks
2nd Year (10 Papers : 1000 Marks)					
Sl. No.	Semester – III	Marks-Credits	Sl. No.	Semester-IV	Marks-Credits
9	Core Course (SKT.)-5	(100 -6)	14	Core Course (SKT.)-8	(100-6)
10	Core Course (SKT.)-6	(100 -6)	15	Core Course (SKT.)-9	(100-6)
11	Core Course (SKT.)-7	(100 -6)	16	Core Course (SKT.)-10	(100-6)
12	SEC-1 Eng. Communicative	(100-4)	17	SEC-2 Office Management	(100-4)
13	Generic Elective- 3 (If SKT.)	(100-6)	18	Generic Elective- 4 (If SKT.)	(100-6)
	(6+6+6+6+4+6 = 28 Credits)	500 Marks		(6+6+6+6+4+6 = 28 Credits)	500 Marks
3rd Year (8 Papers : 800 Marks)					
Sl. No.	Semester – V	Marks-Credits	Sl. No.	Semester-VI	Marks-Credits
19	Core Course (SKT.)-11	(100 -6)	23	Core Course (SKT.)-13	(100-6)
20	Core Course (SKT.)-12	(100 -6)	24	Core Course (SKT.)-14	(100-6)
21	DSE (SKT) – 1	(100 -6)	25	DSE (SKT) – 3	(100-6)
22	DSE (SKT) – 2	(100-6)	26	DSE (SKT) – 4 (Project)	(100-6)
	(6+6+6+6 = 24 Credits)	400 Marks		(6+6+6+6 = 24 Credits)	400 Marks

Grand Total: 26 Papers
Grand Total Credits:148(22+22+28+28+24+24)
Grand Total Marks: 2600 (400+400+500+500+400+400)
CC= Core Course-1400
DSE= Discipline Specific Elective-400
GE= Generic Elective- 400
SEC= Skill Enhancement Course- 200
AECC= Ability Enhancement Compulsory Course- 200

ABBREVIATION: 1. CC= Core Course, 2. DSE= Discipline Specific Elective, 3. GE= Generic Elective, 4. SEC= Skill Enhancement Course, 5. AECC= Ability Enhancement Compulsory Course

NAME OF THE PAPERS AND ABBREVIATIONS AT A GLANCE

1st YEAR

SEMESTER-I

- | | |
|---|---------------|
| 1. CC- 1 MORAL TEACHINGS AND BASICS OF SANSKRIT | -[MTBS] |
| 2. CC-2 DRAMA-I & HISTORY OF SANSKRIT LITERATURE -I | -[D-1& HSL-1] |
| 3. AECC-1 ENVIRONMENTAL SCIENCE | -[ENVSC] |
| 4. GE-1 KHANDAKAVYA & DARSANAKAVYA | -[KK & DK] |

SEMESTER-II

- | | |
|---|-------------|
| 5. CC-3 DRAMA -II & DRAMATURGY | -[D-2 & DT] |
| 6. CC-4 AN INTRODUCTION TO THE TECHNIQUE OF PANINIAN GRAMMAR& PROSODY | -[TPGM] |
| 7. AECC-2 M.I.L. | |
| 8. GE – 2 MORAL TEACHINGS AND BASICS OF SANSKRIT | -[MTBS] |

2nd YEAR

SEMESTER-III

- | | |
|--|----------------|
| 9. CC-5 POETRY & HISTORY OF SANSKRIT LITERATURE- II | -[PT & HSL-2] |
| 10. CC-6 META-RULES OF PANINIAN GRAMMAR, POETICS AND FIGURES OF SPEECH | -[PG-2 & SD] |
| 11. CC-7 CASES AND CASE ENDINGS IN PANINIAN GRAMMAR & TRANSLATION- I | -[PG-3 & TR-1] |
| 12. SEC-1 COMMUNICATIVE ENGLISH | -[COMLIS] |
| 13. GE-3 TECHNICAL LITERATURE IN SANSKRIT | -[TELISA] |

SEMESTER-IV

- | | |
|---|--------------------|
| 14. CC-8 UPANISAD, RAMAYANA & BHAGAVADGITA | -[UP, RM & BG] |
| 15. CC-9 CASE AND CASE ENDINGS OF PANINIAN GRAMMAR, TRANSLATION- II & LEXICON | -[PG-4, TR-2 & LX] |
| 16. CC-10 ORNATE PROSE IN CLASSICAL SANSKRIT | -[OPRCS] |
| 17. SEC-2 MODERN OFFICE MANAGEMENT | -[MOFM] |
| 18. GE-4 ETHICAL LITERATURE IN SANSKRIT | -[ETLS] |

3rd YEAR

SEMESTER-V

- | | |
|---|----------|
| 19. CC-11 ORNATE POETRY IN SANSKRIT | -[OPS] |
| 20. CC-12 VEDA, VEDIC GRAMMAR & HISTORY OF VEDIC LITERATURE | -[VDGRL] |
| 21. DSE-1 SOCIO – POLITICAL THOUGHT IN ANCIENT INDIA | -[DSE-1] |
| 22. DSE-2 ETHICAL LITERATURE IN SANSKRIT | -[ETLS] |

SEMESTER-VI

23. CC-13 AYURVEDA & VRKSAYURVEDA	-[ARV & VRV]
24. CC-14 TECHNICAL LITERATURE IN SANSKRIT	-[TELISA]
25. DSE-3 TRANSLATION, EDITING AND WRITING SKILL	-[TEWS]
26. DSE-4 (PROJECT PREPARATION AND PRESENTATION)	-[PROJECT]

1st YEAR

SEMESTER-I

CC- 1 MORAL TEACHINGS AND BASICS OF SANSKRIT [Term end: 80 +

Midterm 20 = 100 marks] Marks

1. <i>Hitopadesa</i>	32
2. <i>Yaksaprasna of Mahabharata (Aranyakaparva, ch.313)</i>	32
3. <i>Sabdarupa & Dhaturupa</i>	16

CC-2 DRAMA-I & HISTORY OF SANSKRIT LITERATURE -I [Term end : 80 + Midterm20= 100 marks]

1. <i>Abhijnanasakuntalam (Act I-IV)</i>	40
2. <i>History of Sanskrit Literature-I</i> (<i>Ramayana, Mahabharata, General out lines of Puranas, Mahakavya & Sanskrit Drama</i>)	40

SEMESTER-II

CC-3 DRAMA -II & DRAMATURGY [Term end: 80 + Midterm 20= 100 marks]

1. <i>Abhijnanasakuntalam (Act V-VII)</i>	40
2. <i>Dramaturgy</i>	40

CC-4 AN INTRODUCTION TO THE TECHNIQUE OF PANINIAN GRAMMAR &

PROSODY [Term end: 80 + Midterm 20= 100 marks]

1. <i>Vocabulary Relevant to Sanskrit Grammar and Arrangement of Paninian Grammar</i>	20
2. <i>Samjnaprakaranam</i>	40
3. <i>Chandas</i>	20

2nd YEAR

SEMESTER-III

CC-5 POETRY & HISTORY OF SANSKRIT LITERATURE- II [Term end: 80 + Midterm 20= 100 marks]

1. <i>Meghadutam- (Purvamegha)</i>	40
2. <i>History of Sanskrit Literature-II</i> (<i>Gitikavyas/Khandakavyas, Campu, Gadyakavyas, Kathasahitya</i>)	40

CC-6 META-RULES OF PANINIAN GRAMMAR, POETICS AND FIGURES OF

SPEECH [Term end: 80 + Midterm 20= 100 marks]

1. <i>Paribhasa Prakaranam</i>	40
2. <i>Sahityadarpanah(Ch. I & II)</i>	40
3. <i>Sahityadarpanah (Alamkaras)</i>	20

CC-7 CASES AND CASE ENDINGS IN PANINIAN GRAMMAR & TRANSLATION-

I [Term end: 80 + Midterm 20= 100 marks]

- | | |
|---|----|
| 1. <i>Siddhantakaumudi(Karaka- Vibhakti I-IV)</i> | 60 |
| 2. <i>Translation from Sanskrit- Odia/ Eng</i> | 20 |

SEMESTER-IV

CC-8 UPANISAD, RAMAYANA & BHAGAVADGITA [Term end: 80 + Midterm 20= 100 marks]

- | | |
|---|----|
| 1. <i>Kathopanisad (Adhyaya-I, Vallis-I,II&III)</i> | 40 |
| 2. <i>Ramayana (Ch.IX of Aranyakand, Ahimsa Prasamsa)</i> | 20 |
| 3. <i>Bhagavatagita(Ch.XV)</i> | 20 |

CC-9 CASE AND CASE ENDINGS OF PANINIAN GRAMMAR, TRANSLATION- II & LEXICON [Term end: 80 + Midterm 20= 100 marks]

- | | |
|---|----|
| 1. <i>Siddhantakaumudi(Karaka- Vibhakti V-VII)</i> | 40 |
| 2. <i>Translation from Odia/ Eng passage-Sanskrit</i> | 20 |
| 3. <i>Amarakosa</i> | 20 |

CC-10 ORNATE PROSE IN CLASSICAL SANSKRIT [Term end: 80 + Midterm 20= 100 marks]

- | | |
|--|----|
| 1. <i>Inscription</i> | 20 |
| 2. <i>Dasakumaracharitam (Purvapithika Dvitiya Ucchvasa)</i> | 20 |
| 3. <i>Sukanasopadesa</i> | 40 |

3rd YEAR

SEMESTER-V

CC-11 ORNATE POETRY IN CLASSICAL SANSKRIT

[Term end: 80 + Midterm 20= 100 marks]

- | | |
|---|----|
| 1. <i>Sisupalabadham(Canto-I Verses 01-48)</i> | 40 |
| 2. <i>Kiratarjuniyam (Canto-I)</i> | 40 |

CC-12 VEDA,VEDIC GRAMMAR &HISTORY OF VEDIC LITERATURE [Term end: 80 + Midterm 20= 100 marks]

- | | |
|---------------------------------------|----|
| 1. <i>Vedic Suktas</i> | 40 |
| 2. <i>Vedic Grammar</i> | 20 |
| 3. <i>History of Vedic Literature</i> | 20 |

SEMESTER-VI

CC-13 AYURVEDA AND VRKSAYURVEDA [Term end: 80 +

Midterm 20= 100 marks]

- | | |
|---|----|
| 1. <i>Ayurveda (Carakasamhita- Sutrasthana, dhirgham jivitiyadhyaya)</i> | 60 |
| 2. <i>Vrksayurveda (Vrksayurvedadhyaya of Brhatsamhita)</i> | 20 |

CC-14 TECHNICAL LITERATURE IN SANSKRIT [Term end: 80 + Midterm 20= 100 marks] (JYOYISA & VASTU)

1. <i>Jyotisha</i> (<i>Jyotihsara-ratnavali</i> Chap- I) (<i>Grahanaksatraparicayaprakaranam</i>)	40
2. <i>Vastu</i> (<i>Vasturatnakara</i> Chap-I) (<i>Bhuparigrahaprakaranam</i>)	40

GENERIC ELECTIVE (GE)

04 Papers in Generic Elective such as 1, 2, 3 & 4

(One examinee may choose SANSKRIT as GE- A or GE-B)

GE- 1 KHANDAKAVYA & DARSANA -KAVYA

80+20 = 100 Marks

1. <i>Meghadutam-</i> (<i>Purvamegha</i>)	60
2. <i>Bhagavatagita</i> (<i>Ch.XV</i>)	20

GE-2 MORAL TEACHING AND BASICS OF SANSKRIT

80+20 = 100 Marks

1. <i>Hitopadesa</i>	32
2. <i>Yaksaprasna of Mahabharata</i> (<i>Aranyakaparva, ch.313</i>)	32
3. <i>Sabdarupa & Dhaturupa</i>	16

GE-3 TECHNICAL LITERATURE IN SANSKRIT 80+20 = 100 Marks (JYOYISA & VASTU)

1. <i>Jyotisa</i> (<i>Jyotihsara-ratnavali</i> Chap- I) (<i>Grahanaksatraparicayaprakaranam</i>)	40
2. <i>Vastu</i> (<i>Bhuparigrahaprakaranam</i>)	(<i>Vasturatnakara</i> Chap-I)40

GE-4 ETHICAL LITERATURE IN SANSKRIT

80+20 = 100 Marks

1. <i>Cāṇakyanīti</i> (Chaps- I, II, III and IV from <i>Cāṇakyanītidarpaṇa</i>)	40 marks
2. <i>Nītiśataka</i> of Bhartṛhari (Verses 1-50)	40 marks

DISCIPLINE SPECIFIC ELECTIVE (DSE)

SEMESTER-VI

Total 04 Papers DSE- 1, 2, 3 & 4 (Paper 4 is meant for Project Preparation & Presentation)

DSE- 1

SOCIO-POLITICAL THOUGHT IN ANCIENT INDIA

80+20 = 100 Marks

1. <i>Arthasastra</i> (<i>Adhikarana I.1- 4</i>)	40 Marks
2. <i>Dharmasastra</i> <i>Yājñavalkyasmṛti</i> (<i>Vyavahārādhyāya</i> verses 1-65)	40 Marks

DSE-2

ETHICAL LITERATURE IN SANSKRIT

80+20 = 100 Marks

1. <i>Cāṇakyanīti</i> (Chaps- I, II, III and IV from <i>Cāṇakyanītidarpaṇa</i>)	40 marks
2. <i>Nītiśataka</i> of Bhartṛhari (Verses 1-50)	40 marks

DSE-3

TRANSLATION, EDITING AND WRITING SKILL

80+20 = 100 Marks

1. Anuvada Kala-	20
2. Precises Writing-	20
3. Proof Correction and Transliteration	20
4. Essay	20

DSE – 4 INDIAN PHILOSOPHY : GENERAL IDEAS

- | | |
|------------|----------|
| 1. Astika | 60 Marks |
| 2. Nastika | 20 Marks |

OR

DSE-04 PREPARATION AND PRESENTATION OF PROJECT

80+20 = 100 Marks

Project- 80 Marks

Presentation- 20 Marks

(The Project work should be done preferably on Creative writings and Translation works of Sanskrit Language.)

+3 M.I.L.(Sanskrit) Paper-1

(For Hons. Students as AECC-2 if Sanskrit M.I.L.-1) Full Marks- 80 + 20 = 100Marks

- | | |
|--------------------|----------|
| 1. SANSKRIT PROSE | 40 Marks |
| 2. SANSKRIT POETRY | 40 Marks |

SYLLABUS IN DETAIL

1st YEAR

SEMESTER-I

CC- 1 MORAL TEACHINGS AND BASICS OF SANSKRIT 80+20 = 100
Marks

- | | |
|--|----------|
| 1. <i>Hitopodeśa Mitralabha (Prastavana, Kathāmukha, Brddhavyaghrapathiakakatha, Mrgajambukakatha & Ḡdhravidalakatha)</i> | 32 Marks |
| 2. <i>Yaksaprasna of Mahabharata(Aranyakaparva, ch.313 from Verses no. 41 to 133)</i> | 32 Marks |

3. **Śabdarupa & Dhaturupa** ('a' karanta, 'i' karanta, 'ī' karanta, 'u' karanta, 'ū' karanta, 'in' bhaganta, Mātr, Pitṛ, Asmad, Yusmad, Tad (**Sabdarupas**)).

16 Marks

Lat, Lan, Vidhiliṅ, Lrt, Lot and Litlakaras path, Ni, Kṛṣṇ, Han, Pā, Dā, Śru, Śī and Krīṅ in the form of *Ātmanepada, Parasmaipada* or *Ubhayapada* whichever is applicable. (**Dhaturupas**)

Unit-I & II Hitopodeśa Mitralabha and Sabdarupa

40 Marks

Short Questions -2 (About 50 words each) 5×2=10 Marks

Translation of a textual verse 6 Marks
Sabdarupa – 4 2 x 4 = 8 Marks

Unit-III & IV Yaksaprasna of Mahabharata and Dhaturupa 40 Marks

Long Questions-1 (About 300 words) 16 Marks

Explanation - 1(About 150 words) 10 Marks

Translation of a textual verse 6 Marks
Dhaturupa – 4 2 x 4 = 8 Marks

Core Readings :

1. *Hitopadesah (Mitralabhah)* (Ed.) Kapildev Giri, Chaukhamba Publications, Varanasi.
2. *Mahabharata*, Gitapress, Gorakhpur (Prescribed Text)
3. *Vyakaranadarpana*, The Odisha State Bureau of Text Book Preparation and Production, Bhubaneswar, 2013

Suggested Readings :

1. *Hitopadesah (Mitralabhah)* (Ed.) N.P. Dash and N.S. Mishra, Kalyani Publishers, New Delhi
2. *Hitopadesah (Mitralabhah)* (Ed.) B.S. Mishra, Vidyapuri, Cuttack
3. *Yaksaprasna*, T. K. Ramaayiyar, R. S. Vadhyar & Sons. Palkad, Kerala
4. *Yaksaprasna*, Ed. Dr. Nirmal Sundar Mishra, A.K. Mishra Agency, Cuttack, 2016

CC-2 DRAMA-I & HISTORY OF SANSKRIT LITERATURE – I 80+20 = 100 Marks

1. Abhijnanasakuntalam (Act I-IV) 40 Marks

2. History of Sanskrit Literature-I 40 Marks

(*Ramayana, Mahabharata, General out lines of Puranas, Mahakavyas and Sanskrit Dramas*)

1. Abhijnanasakuntalam (Act I-IV) 40 Marks

Unit-I & II Long Question -1(About 300 words) 12 Marks

Short Questions -2 (About 50 words each) 5×2=10 Marks

Translation of Textual Verse- 1 06 Marks

Textual Grammar 12 Marks

i) *Sandhi*- (4) 1×4= 4 Marks

ii) *Karaka&Vibhakti*-(2) 2×2= 4 Marks

iv) *Samasa*-(2) 2×2= 4 Marks

2. History of Sanskrit Literature-I 40 Marks

Unit- III *Ramayana & Mahabharata, General out lines of Puranas (Defination & Number)*

Long Question -1(About 150 words) 12 Marks

Short Questions -2(About 50 words each) 4×2= 08 Marks

Unit- IV (General Outlines of *Mahakavyas with special refence to Ashvaghosa, Kalidasa, Bharavi, Magha and Sriharsa and Sanskrit Dramas with special refence to Bhasa, Kalidasa, Sudraka, Visakhadatta, Ashvaghosa, Bhattanarayana*)

Long Questions -1(About 150words)
Short Questions -2(About 50 words each)

12 Marks
4x2= 08 Marks

Core Readings :

1. *Abhijnanasakuntalam* (Ed.) M.R. Kale, Motilal Banarsidass Publishers Pvt. Ltd., NewDelhi-11007, 8th Reprint-2010
2. *History of Sanskrit literature*, Baladev Upadhyay, Chaukhamba Publications, Varanasi.

Suggested Readings :

1. *Abhijnanasakuntalam* (Ed.) R.M. Bose, Modern Book Agency Pvt. Ltd., 10 BankimChatterjee Street, Calcutta
2. *Abhijnanasakuntalam* (Ed.) R.M.Mohapatra, Books &Books , Cuttack
3. *Abhijnanasakuntalam* (Ed.) H.K. Satapathy, Kitab Mahal, Cuttack
4. *Sanskrit Drama*, A.B.Keith , Oxford University Press, London
5. *Samskrta Sahiytara Itihasa*, (Odia) H.K. Satapathy, Kitab Mahal, Cuttack- 753003.

GENERIC ELECTIVE -1

KHANDAKAVYA & DARSANAKAVYA

80 +20 = 100 Marks

1. Meghadutam(Purvamegha)

60 Marks

2. Gita (Chapter.XV)

20 Marks

1. Meghadutam- (Purvamegha)

60 Marks

Unit-I Long Question – 2 (About 150 words each)

12 x 2= 24 Marks

Unit- II Short Questions - 4(About 50 words each)

5 x 4 = 20Marks

Unit-III i) Explanation of One Verse (About 150 words)

10 Marks

ii) Translation of One Verse into Odia/ English

06 marks

2. Bhagavadgita (Chap.XV)

20 Marks

Unit-IV

Long Question - 1(About 150 words)

12Marks

Explanation of One Verse (About 150 words)

08 Marks

Core Reading:

1. *Meghadutam* (Ed.) M.R. Kale, Motilal Banarsidass, Delhi
2. *Shrimad-bhagavad-gita*, Gita Press, Gorakhpur

Suggested Reading:

1. *Meghadutam* (Ed.) B.S. Mishra, Vidyapuri, Cuttack, 1st Edn-1999
2. *Meghadutam* (Ed.) Radhamohan Mahapatra, Books and Books, Vinodvihari, Cuttack, 1984
3. *Shrimad-bhagavad-gita* (Ed.) S. Radhakrishnan, Bharatiya Vidya Bhavan
4. *Shrimad-bhagavad-gita* (Ed.) Gambhirananda, Ramakrishna Mission

SEMESTER-II

CC - 3 DRAMA - II & DRAMATURGY

80+20 = 100 Marks

1. Abhijnanasakuntalam (Acts V-VII)

40 Marks

2. Dramaturgy

40 Marks

(*Nandi, Prastavana, Purvaranga, Panca-arthaprakṛti, Pancasandhi, Panca-arthopaksepaka, Nataka, Prakarana from sahyadarpana*)

1. Abhijnanasakuntalam (Acts V-VII)

40 Marks

Unit-I & II

Long Question -1 (About 300 words)

12 Marks

Short Questions -2 (About 50 words)

5×2= 10 Marks

Explanation of textual verse- 1 (About 150 words)

8 Marks

Translation from Sanskrit to Odia/ English-1 verse

5 Marks

Translation from Prakrit to Sanskrit-1

5 Marks

2. Dramaturgy (Sahyadarpana, Chapter- VI)

40 Marks

Unit-III

Nandi, Prastavana, Purvaranga, Nataka, Prakarana

Short Notes on any four

5× 4= 20 Marks

Unit-IV

Pancasandhi, Panca - arthaprakṛti and Panca-arthopaksepaka

Short Notes on any four

5× 4= 20 Marks

Core Readings :

1. *Abhijnanasakuntalam* (Ed.) M.R. Kale, Motilal Banarsidass Publishers Pvt. Ltd., New Delhi-11007, 8th Reprint-2010
2. *Sahitya Darpana* with Laksmi Tika (Sanskrit) and Vimala Tika, (Hindi) (Ed.) K.M.Sastri, Chaukhamba Publications, Varanasi.

Suggested Readings :

1. *Abhijnanasakuntalam* (Ed.) H.K. Satapathy, Kitab Mahal, Cuttack
2. *Sahitya Darpana* (Ed.) P.V.Kane, Motilal Banarsidass Publishers Pvt. Ltd., New Delhi
3. *Odia Translation of Sahityadarpana* by Narayana Mohapatra, Odisha Sahitya Academy, Bhubaneswar.
4. *Sahityadarpana* evam Chanda (Ed.) Dr. Braja Sundar Mishra, Satyanarayan Book Store, Cuttack
5. *Sahityadarpana o Chanda* (Ed.) Niranjan Pati, Vidyapuri, Cuttack

CC- 4 AN INTRODUCTION TO THE TECHNIQUE OF PANINIAN GRAMMAR & PROSODY

80+20 = 100 Marks

1. **Vocabulary relevant to Sanskrit Grammar and Arrangement of Paninian Grammar** **20 Marks**
2. **Samjna-prakaranam from Vaiyakarana Siddhanta Kaumudi** **40 Marks**
3. **Chanda from Srutabodha** **20 Marks**

1. **Vocabulary relevant to Sanskrit Grammar and Arrangement of Paninian Grammar**

Unit- I **20 Marks**

(Sutra, Vartika, Bhasya, Astadhyayi, Siddhantakaumudi, Dhatupatha, sthani, Agama, Adesa, Nadi, Nistha, Krdanta, Taddhita, Tinanta, Nijanta, Sananta, Yananta, Namadhatu, Vikarana, Luk, Lopa, Sarvadhatuka, Ardhadhatuka, ti & Upadha = 26)

Short Notes on any - 4 5×4= 20 Marks

2. **Samjnaprakaranam** **40 Marks**

Unit- II From beginning upto **najjhalau** 5×4=20 Marks
four questions to be answered

Unit- III Rest of the Sutras 5x4 = 20
four questions to be answered Marks

3. **Chanda (Prosody)- Srutabodhah** **20 Marks**

(Chandas such as -: Arya, Anustubh, Indravajra, Upendravajra, Upajati, Vamsastha, Vasantatilaka, Mandakranta, Malini, Shikharini, Shardulavikridita, Sragdhara.)

Unit- IV Definition and Examples of 4 Chandas - out of 7 5×4= 20 Marks
asked (The students are advised to compose slokas in seminar period)

Core Readings :

1. *Siddhanta-kaumudi* with *Balamananorama* and *Tattvabodhini*, Vol.I (Ed.) Giridhara Sharma Chaturveda, Motilal Banarsidass
2. *Vyakaranadarpana*, The Odisha State Bureau of Text Book Preparation and Production, Bhubaneswar- 2013
3. *Shrutabodha*, Hari Prasad Sharma, Nirnaya Sagar Press. Bombay

Suggested Readings:

1. *Siddhanta-kaumudi* (Ed.) Prof. G.K. Dash & Dr(Mrs) K.Dash with Navanita tika, A.K.Mishra Publishers Pvt. Ltd, Cuttack.
2. *Siddhanta-kaumudi* (Ed.) Minati Mishra, Vidyapuri, Cuttack
3. *Siddhanta-kaumudi* (Ed.) Dr. Niranjan Pati, Kalyani Publishers, New Delhi
4. *Siddhanta-kaumudi* (Ed.) P.R.Ray, Sailabala Womens College, (Skt.Deptt.) Cuttack.
5. *Sahityadarpana Evam Chhanda* (Ed.) Dr. Brajasundar Mishra, Satyanarayana Book Store, Cuttack.

GENERIC ELECTIVE -2

MORAL TEACHINGS AND BASICS OF SANSKRIT

80+20 = 100 Marks

1. *Hitopadesa Mitralabha* (*Prastavana, Kathamukha, Brddhavyaghrapathiakakatha, Mrgajambukakatha & Grdhravidalakatha*) **32 Marks**
2. *Yaksaprasna of Mahabharata* (*Aranyakaparva, ch.313*) **Page 501 o**

from Verses no. 41 to 133
3. Śabdarupa & Dhaturupa

32 Marks
16 Marks

('a' karanta, 'i' karanta, 'ī' karanta, 'u' karanta, 'ū' karanta, 'in' bhaganta, Mātr, Pitṛ, Asmad, Yusmad, Tad(**Sabdarupas**).

Lat, Lan, Vidhiliṅ, Lṛt, Lot and Litlakaraspath, Ni, Kṛ, Sev, Han, Pā, Dā, Śru, Śī and Kṛi in the form of Ātmanepada, Parasmaipada or Ubhayapada whichever is applicable. (**Dhaturupas**)

Unit-I & II Hitopodeśa Mitralabha and Sabdarupa

40 Marks

Long Question -1 (About 300 words)

16 Marks

Short Questions -2 (About 50 words each)

5×2=10 Marks

Translation of a textual verse
Sabdarupa – 4

6 Marks
2 x 4 = 8 Marks

Unit-III & IV Yaksaprasna of Mahabharata and Dhaturupa

40 Marks

Long Question-1 (About 300 words)

16 Marks

Explanation - 1(About 150 words)

10 Marks

Translation of a textual verse
Dhaturupa – 4

6 Marks
2 x 4 = 8 Marks

Core Readings :

1. *Hitopadesah (Mitralabhah)* (Ed.) Kapildev Giri, Chaukhamba Publications, Varanasi.
2. *Mahabharata*, Gitapress, Gorakhpur (Prescribed Text)
3. *Vyakaranadarpana*, The Odisha State Bureau of Text Book Preparation and Production, Bhubaneswar, 2013

Suggested Readings :

1. *Hitopadesah (Mitralabhah)* (Ed.) N.P. Dash and N.S. Mishra, Kalyani Publishers, New Delhi
2. *Hitopadesah (Mitralabhah)* (Ed.) B.S. Mishra, Vidyapuri, Cuttack
3. *Yaksaprasna*, T. K. Ramaayiyar, R. S. Vadhyar & Sons. Palkad, Kerala
4. *Yaksaprasna*, Ed. Dr. Nirmal Sundar Mishra, A.K. Mishra Agency, Cuttack, 2016

SEMESTER-III

CC-5 POETRY & HISTORY OF SANSKRIT LITERATURE- II

80+20 = 100 Marks

1. Meghadutam- (Purvamegha)

40 Marks

2. History of Sanskrit Literature-II

40 Marks

(Gitikavyas / Khandakavyas, Campu, Gadyakavyas and Kathasahitya)

1. Meghadutam- (Purvamegha)

40 Marks

Unit-I & II Long Question - 1(About 300 words)

12 Marks

Short Questions – 3 (About 50 words each)

4×3= 12 Marks

i) Explanation of One Verse (About 150 words)

10 Marks

ii) Translation of One Verse into Odia/ Sanskrit

06 Marks

2. History of Sanskrit Literature-II

40 Marks

Unit-III Gitikavyas / Khandakavya(Kalidas, Bhatrhari & Jayadev)

Long Questions -1(About 300 words)

12 Marks

Short Questions -2 (About 50 words each)

4x2= 08 Marks

Unit- IV Campu (Ramayana campu, Bharata campu, Nala campu & Nilakantha campu)

Gadyakavyas (Suvandhu, Banabhatta & Dandi)

Kathasahitya (Gunadhya, Somadeva, Visnusarma & Pandita Narayana)

Long Question -1 (About 150 words)

12 Marks

Short Questions -2 (About 50 words each)

4x2= 08 Marks

Core Readings :

1. Meghadutam (Ed.) M.R. Kale, Motilal Banarsidass, Delhi

2. Samskrta Sahitya ka Itihasa, Baladeva Upadhyaya, Choukhamba, Varanasi.

Suggested Readings:

1. Meghadutam (Ed.) Dr. Braja Sundar Mishra, Vidyapuri, Cuttack, 1st Edn-1999

2. Meghadutam (Ed.) Radhamohan Mahapatra, Books and Books, Vinodvihari, Cuttack,1984

3. Samskrta Sahitya ka Ruparekha, Vacaspati Goreilla, Choukhamba Vidyabhavan, Varanasi.

4. Samskrta Sahitya Itihasa, H.K. Satapathy, Kitab Mahal, Cuttack

5. Samskrta Sahitya Itihasa, Text Book Bureau, Govt. of Odisha, Bhubaneswar

CC-6 META - RULES OF PANINIAN GRAMMAR, POETICS & FIGURES OF SPEECH

80+20 = 100 Marks

1. *Paribhasaprakaranam of Vaiyakarana Siddhantakaumudi* **20 Marks**
2. *Sahityadarpanah (Ch.I & II)* **40 Marks**
3. *Sahityadarpanah (Selected Alamkaras from Ch.X)* **20 Marks**

1. *Paribhasaprakaranam* **20 Marks**
Unit- I Four *Sutras* to be explained. **5×4= 20 Marks**

2. Poetics **40 Marks**

Unit- II *Sahityadarpana Ch. I (Kavya laksana, Kavya prayojana, Kavya hetu, Kavya bheda)*
Long Question -1 (About 300 words) **12 Marks**
Short Notes – 2 (About 50 words each) **4x2 = 8 Marks**

Unit- III *Sahityadarpana Ch. II (Vakya, Pada, Abhidha, Laksana, Vyanjana)*
Long Question -1(About 300 words) **12 Marks**
Short Questions -2 (About 50 words each) **4x2= 8 Marks**

3. Figures of speech (without Sub-division) **20 Marks**
Sahityadarpana(Ch.X)

(*Alamkaras* such as-
Anuprasa, Yamaka, Slesa, Upama, Rupaka, Utpreksa, Bhrantiman, Nidarsana, Arthantaranyasa, Aprastuta-prasamsa, Apahnuti, Vyatireka, Vibhavana, Visesokti, Samasokti, Svabhavokti)

Unit- IV **5×4= 20 Marks**
Definition and Examples of **Four Alamkaras** (figures of speech) out of **seven** asked.

Core Readings :

1. *Vaiyakarana Siddhanta-kaumudi* with Balamanorama and Tattvabodhini, Vol.I (Ed.) Giridhara Sharma Chaturveda, Motilal Banarsidass, Delhi
2. *Sahitya Darpana* with Laksmi Tika (Sanskrit) and Vimala Tika, (Hindi) (Ed.) K.M.Sastri, Chaukhamba Publications, Varanasi.

Suggested Readings:

1. *Siddhanta-kaumudi* (Ed.) Prof. G.K. Dash & Dr(Mrs) K.Dash with Navanita tika, A.K. Mishra Publishers Pvt. Ltd, Cuttack.
2. *Sahitya Darpana* (Ed.) P.V.Kane, Motilal Banarsidass Publishers Pvt. Ltd., New Delhi
3. *Odia Translation of Sahityadarpana* by Narayana Mohapatra, Odisha Sahitya Academy, Bhubaneswar.
4. *Sahitya Darpana* with Laksmi Tika (Sanskrit) and Vimala Tika, (Hindi) (Ed.) K.M.Sastri, Chaukhamba Publications, Varanasi.
5. *Sahityadarpana* evam Chanda (Ed.) Dr. Braja Sundar Mishra, Satyanarayan Book Store, Cuttack.
6. *Sahityadarpana*, Dr. Niranjan Pati, Kalyani Publishers, Ludhiana.

CC-7 CASES AND CASE ENDINGS IN PANINIAN GRAMMAR & TRANSLATION – I

80+20 = 100 Marks

- 1. Vaiyakarana Siddhantakaumudi(Karaka-Vibhakti I-IV) 60 Marks**
2. Translation from Sanskrit unseen passage to Odia/ English 20 Marks

1. Siddhantakaumudi(Karaka-Vibhakti I-IV) 60 Marks

Unit- I (Prathama&Dvitiya)

Two Sutras/ Vrtti/ Vartika to be explained. 10×2= 20 Marks

Unit- II (Trtiya)

Two Sutras/ Vrtti/ Vartika to be explained 10×2= 20 Marks

Unit- III (Caturthi)

Two Sutras/ Vrtti/ Vartika to be explained. 10×2= 20 Marks

Unit -V Translation from Sanskrit unseen passage into Odia/ English

20 Marks

One unseen Sanskrit Passage is to be given for Translation into Odia/ English

(At least 08 sentences)

2.5 x 8 = 20 Marks

Core Readings :

1. *Vaiyakarana Siddhanta-kaumudi* with Balamanorama and Tattvabodhini, Vol.I (Ed.) Giridhara Sharma Chaturveda, Motilal Banarsidass
2. *Vyakaranadarpana*, The Odisha State Bureau of Text Book Preparation and Production, Bhubaneswar- 2013

Suggested Readings:

1. *Siddhanta-kaumudi* (Ed.) Prof. G.K. Dash & Dr(Mrs) K.Dash with Navanita tika, A.K. Mishra Publishers Pvt. Ltd, Cuttack.
2. *Siddhanta-kaumudi* (Ed.) Minati Mishra, Vidyapuri, Cuttack
3. *Siddhanta-kaumudi* (Ed.) Dr. Niranjan Pati, Kalyani Publishers, New Delhi
4. *A Guide to Sanskrit Composition and Translation*, M.R.Kale, Motilal Banarsidass, New Delhi
5. *Brhat Anuvada Candrika*, Chakradhara Hamsa Nautial Shastri, Motilal Banarsidass, New Delhi

GENERIC ELECTIVE -3

TECHNICAL LITERATURE IN SANSKRIT (JYOTISA & VASTU) 80+20 = 100 Marks

1. Jyotisa (Jyotih-sara-ratnavali, Chap I) 40 Marks

(Graha-naksatra-paricaya-prakaranam)

2. Vastu (Vasturatnakara, Chap-I) 40 Marks

(Bhuparigraha-prakaranam)

1. Jyotisa 40 Marks

Unit-I & II

Long Question -2 (About 150 words each)

12 x 2 = 24Marks

Short Questions - 4 (About 50 words each)

4x4 = 16 Marks

2. Vastu 40 Marks

Unit-III & IV

Long Question -2 (About 150 words each)

12x2=24Marks

Short Questions - 4 (About 50 words each)

Page 505 of

404 = 16 Marks

Core Readings :

1. *Jyotih-sara-ratnavali*(Part-I) (Ed.) Pandit Baikoli Mahapatra, Radhakrishna Pustakalaya, Satyanarayan Temple Road, Berhampur, Ganjam, Odisha
2. *Vasturatnakar* (Ed.) Vindhyeshwari Prasad Dwivedi, Chowkhamba Krishnadas Academy, Varanasi

Suggested Readings:

1. *Grahanaksatra paricaya prakaranam*, Dr. N.S. Mishra, Kalyani Publishers, Ludhiana.
2. *Bhuparagraha – prakaranam*, Dr. N.S. Mishra, Kalyani Publishers, Ludhiana.
3. *Jyotisavisvakosa*, Haridutta Sharma, Subodh Publication, New Delhi
4. *Vaidika jyotisa*, Dr.G.S.Shastri, Chaukhamba Samskriti bhabana, Varanasi
5. *Bharatiya jyotisa*, Dr.Nemichandra Shastri, Bharatiya Jnanapitha, New Delhi-110003
6. *Jyotisa- tattvanka*, Gitapress, Gorakhpur (2014)
7. *Rajaballavam Vastusatram*, Ed. Dr Sshrkrishna Jugnu, Parimal Publication, Delhi, 2005
8. *Vastu, Astrology & Architecture*, (Copmilation of Research Paper of ANational Conference on Vastu & Jyotisa), Ed.by Gayatri Dev Vasudev, MLBD, New Delhi, (4th reprint-2015)

CC-8 UPANISAD, RAMAYANA & BHAGAVADGITA

80 +20 = 100 Marks

1. **Kathopanisad (Vallis-I,II&III)** 40Marks
2. **Ramayana (Ch.IX of Aranyakanda, Ahimsa prasamsa** 20Marks
3. **Bhagavadgita (Chap.XV)** 20 Marks

1. Kathopanisad (Adhyaya I, Vallis-I, II & III)

40 Marks

Unit- I & II

Long Questions -2 (About 150 words each)

12x2=24 Marks

- i) Explanation - 1 Mantra (About 150 words)
- ii) Translation- 1

10 Marks

06 Marks

2. Ramayana (Ch. IX of Aranyakanda, Ahimsa prasamsa)

20 Marks

Unit- III

Long Question-1(About 150 words)

12 Marks

Two short questions (About 50 words each)

4x2 = 08 Marks

Unit-IV Bhagavadgita (Chap.XV)

20 Marks

12 Marks

Long Question-1(About 150 words)

08 Marks

Explanation - 1 Mantra (About 150 words)

2. *Shrimad-bhagavad-gita*, Gita Press, Gorakhpur

3. *Srimad Valimkiya Ramayanam*, Gita Press, Gorakhpur (Prescribed Text)

Core Readings :

1. *Kathopanisad with Sankarabhasya* (Ed.) V.K. Sharma, Sahitya
Bhandar, Subhas Bazar, Meerut

2. *Shrimad-bhagavad-gita*, Gita Press, Gorakhpur

3. *Srimad Valimkiya Ramayanam*, Gita Press, Gorakhpur (Prescribed Text)

Suggested Readings:

1. *Kathopanisad with Sankarabhasya*, Ed. Dr. Haramohan Mishra, Vidyapuri, Cuttack.
2. *The Message of the Upanisad*, Swami Ranganathananda, Bharatiya VidyaBhavan, K.M. Munsii Marg Mumbai.
3. *Valmiki Ramayana*, (Critical Edition), Oriental Institute, Baroda
4. *Shrimad-bhagavad-gita* (Ed.) S. Radhakrishnan, Bharatiya Vidya Bhavan
5. *Shrimad-bhagavad-gita* (Ed.) Gambhirananda, Ramakrishna Mission
6. *Shrimad-bhagavad-gita*(Ed.) Swami Ranganathananda, Advaita Ashrama, Kolkata- (8th reprint 2014.

CC 9 CASE AND CASE ENDING OF PANINIAN GRAMMAR, TRANSLATION- II AND LEXICON

80 +20 = 100 Marks

1. *Vaiyakarana Siddhantakaumudi (Karaka – vibhakti V-VII)* **40 Marks**
2. *Translation of an unseen Odia / English passage into Sanskrit* **20 Marks**
3. *Amarakosa* **20 Marks**

Siddhantakaumudi (Karaka – Vibhakti V – VII)

Unit - I(CASE –V)

Explanation of any two sutras / Vrttis / Vartikas 10 x 2 = 20 Marks

Unit – II (CASE VI & VII)

Explanation of any two sutras / Vrttis / Vartikas 10 x 2 = 20 Marks
(One from VIth and one from VIIth)

Unit – III **Translation – II**

20 Marks

One unseen Passage of Odia is to be translated into Sanskrit.

2.5 x 8 = 20 Marks

(At least Eight sentences)

3. Amarakosa (Devata, Svarga, Visnu, Laksmi, Durga, Surya, Brahma,Siva, Kartikeya,

Ganesa, Sarasvati from Svargavarga)

20 Marks

Unit- V Short notes on any two out of four asked

10×2= 20Marks

Core Readings :

1. *Vaiyakarana Siddhanta-kaumudi* with Balamanorama and Tattvabodhini, Vol.I (Ed.) Giridhara Sharma Chaturveda, Motilal Banarsidass
2. *Vyakaranadarpana*, The Odisha State Bureau of Text Book Preparation and Production, Bhubaneswar- 2013
3. *Amarakosa* with Ramasrami tika, Choukhamba Sanskrit Series office, Varanasi

Suggested Readings:

1. *Siddhanta-kaumudi* (Ed.) Prof. G.K. Dash & Dr(Mrs) K.Dash with Navanita tika, A.K. Mishra Publishers Pvt. Ltd, Cuttack.
2. *Siddhanta-kaumudi* (Ed.) Minati Mishra, Vidyapuri, Cuttack
3. *Siddhanta-kaumudi* (Ed.) Dr. Niranjan Pati, Kalyani Publishers, New Delhi

5. Brhat Anuvada Candrika, Chakradhara Hamsa Nautial Shastri, Motilal Banarsidass, New Delhi.

6. *Namalinganuasanam (Amarakosa)*, D.G. Padhye, Choukhamba Sanskrit Series, New Delhi

CC-10 ORNATE PROSE IN CLASSICAL SASNKRIT

80 +20 = 100 Marks

1 *Inscriptions*

20 Marks

. 2. *Dasakumaracaritam (Purvapithika, Dvitiya Ucchvasa)*

20 Marks

40 Marks

3 *Sukanasopadesa of Kadambari*

1 *Inscriptions (Girnar inscription of Rudradaman, Prayaga*

20 Marks

. *(Allahabad) stone pillar inscription of Samudragupta & Mandasore inscription of Yasovarman)*

Unit-I Long Question - 1 (About 150 words)

12 Marks

Short Questions – 2 (About 50 words each)

4x2= 8Marks

2. *Dasakumaracaritam(Purvapithika, Dvitiya Ucchvasa)*

20 Marks

Unit- II Long Question-1 (About 150 words)

12 Marks

Short Questions -2 (About 50 words each)

4x2= 08 Marks

3. *Sukanasopadesa of Kadambari*

40 Marks

Unit- Long Question-1 (About 300 words)

16Marks

III & Short Questions -2 (About 50 words each)

5x2 =10 Marks

IV *Textual Sentence Translation into Odia/ English*

06 Marks

Explanation - 1 (About 150 words)

08 Marks

Core Reading :

1. *Dasakumaracarita* (Ed.) M.R. Kale, Motilal Banarsidass, Delhi.
2. *Sukanasopadesa* (Ed.) Ramakanta Jha, Choukhamba Vidyabhavan, Varanasi.
3. Selected Sanskrit inscriptions (Ed.) by D.B. Pusalkar, Classical Publisher, New Delhi.

Suggested Reading :

1. *Dasakumaracarita*, Chaukhamba Publications, Varanasi.
2. *Sukanasopadesa* (Ed.) Nirmal Sundar Mishra, Kalyani Publishers, New Delhi.
3. *Abhilekhamala* (Ed.) sujata Dash, Kalyani Publisher, New Delhi.
4. *Abhilekhacayana* (Ed.) Jayanta Tripathy, Vidyapuri, Cuttack
5. *Kadambari (Purvardham)* with the com. of Bhanuchandra Siddhanjani, MLBD, New Delhi

GENERIC ELECTIVE -4

ETHICAL LITERATURE IN SANSKRIT

80+20 = 100 Marks

1. *Cāṇakyanīti* (Chaps- I, II, III and IV from *Cāṇakyanītidarpaṇa*)
2. *Nītiśataka* of Bhartrhari (Verses 1-50)

40 marks

40 marks

1. Cāṇakyanīti

40 Marks

Unit-I & II Long Question -2 (About 150 words each)

12x2= 10 Marks
24

Short Questions – 4 (About 50 words each)

Marks 3 × 2 = 06 Marks

4x4=16 Marks

2. Nītiśataka

Unit-III & IV Long Question -2 (About 150 words each)

40Marks

12x2= 10 Marks
24

Short Questions – 4 (About 50 words each)

Marks 3 × 2 = 06 Marks

4x4=16 Marks

Core Readings:

1. *Cāṇakyanītidarpaṇa* (Ed.) Gunjeswar Choudhury, Choukhamba SurabharatiPrakashan, Varanasi
2. *Nītiśataka* (Ed.) M.R. Kale, MLBD, New Delhi(Text)

Suggested Readings:

1. *Sampurna Canakyaniti* (Ed.), Dr. N.S. Mishra, A.K. Mishra Agencies, Cuttack
2. *Nītiśataka* (Ed.) Naresh Jha, Choukhamba Prakashan, New Delhi
3. *Bhartrhari Satakattrayam*, B. S. Mishra, Vidyapuri, Cuttack.

3rd Year

SEMESTER-V

CC-11 ORNATE POETRY IN SANSKRIT -

80 +20 = 100 Marks

1. *Sisupalabadham*(Canto-I Verses 01-48) **40 Marks**
2. *Kiratarjuniyam* (Canto-I) **40Marks**
1. *Sisupalabadham*(Canto-I Verses 01-48) **40 Marks**
 - Unit-I & Long Question -1 (About 300 words) **15 Marks**
 - II i) Explanation of One Verse (About 150 words) **10 Marks**
5x 3=15 Marks
 - Short Questions- 3
2. *Kiratarjuniyam* (Canto-I) **40 Marks**
 - Unit-III Long Question -1 (About 300 words) **15 Marks**
 - Unit- IV Explanation of One Verse (About 150 words) **10 Marks**
Short Questions - 3 **5x 3=15 Marks**

Core Readings:

1. *Sisupalabadham* (Ed.) S.R. Ray, Vallabhatika, Bharatiya Vidya Prakashan, New Delhi.
2. *Kiratarjuniyam* (Cantos I-III) (Ed.) M.R. Kale, Motilal Banarsidass Publishers Pvt. Ltd., Delhi, 4th Edn-1966, Rpt-1993

Suggested Readings:

1. *Sisupalabadham* - Canto-I (Ed.), Devanarayan Mishra, (With *Sarvankasa-tika* of Mallinatha) Sahitya Bhandar, Meerut
2. *Kiratarjuniyam* (Canto- I) (Ed.) Niranjan Pati, Vidyapuri, Cuttack.
3. *Sisupalabadham* – H.K. Satpathy, Kitab Mahal, Cuttack

CC- 12 VEDA, VEDIC GRAMMAR & HISTORY OF VEDIC LITERATURE 80 +20 = 100 Marks

1. *Vaidika Suktas* **40 Marks**
2. *Vedic Grammar* **20 Marks**
3. *History of Vedic Literature* **20 Marks**
1. *Veda* **40 Marks**
 - Vedic Suktas from different *Samhitas*
Agni (RV- I.1), Indra (RV- II.12) , Savitr (RV- I.35), Usas (RV- I.48), Purusa-sukta (YV XXXI.1.16), Siva-samkalpa (YV-XXX.1.6), Samjnana(RV X.191), Vak(RV X.125)
 - Unit-I & II i) Long Question -2 (About 150 words each) **12x2= 24 Marks**

ii) Explanation – 2 Mantra(About 150 words each) 8x2= 16 Marks

2. Vedic Grammar

20 Marks

Unit – III

The following Sutras are to be taught:

Chandasi pare'pi, Vyavahitasca, Caturthyarthe bahulam chandasi, Chandasi lun-lan-litah,

Linarthe let,Leto'datau, Sibbahulam leti, Itasca lopah parasmaipadesu, Sa uttamasya, Ata ai, Vaito'nyatra, Hr-grahor bhaschandasi, Chandasi ubhayatha, Tumarthe se-sen-ase-asen- kse- ksen-adhyai-adhyain-kadhyai-kadhyain-shadhyai-shadhyain-tavai-taven-tavenah, Va chandasi, Ses chandasi bahulam, Prakrtya'ntapadam avyapare, Nipatasya ca, Supam suluk purva-savarnac che-ya-da-dya- ya-jalah, Idanto masi, Ajjaserasuk, Dirghadati samanapade

Two *sutras* to be explained

5×2=10Marks

Two *sadhanas* to be worked out

5×2=10 Marks

3. History of Vedic Literature

20Marks

(*Samhita, Brahmana, Aranyaka, Upanisad*)

Unit-IV Long Question -1 (About 150 words)

12 Marks

Short Questions – 2(About 50 words each)

4 ×2= 8 Marks

Core Readings :

1. *New Vedic Selection* (Part-I) (Ed.) Telang and Chaubey, Bharatiya VidyaPrakashan, NewDelhi
2. *Vaidika Sahitya aur Samskriti*, Baladeva Upadhyaya, Chaukhamba, Varanasi

Suggested Readings:

1. *Vaidika sahitya o Samskriti* , A.C. Das, Grantha Mandira, Cuttack
2. *Veda O Vaidika Prakarana*,(Ed) Niranjan Pati, Vidyapuri, Cuttack.
3. *History of Indian Literature* Vol. I, M.Winternitz, MLBD, New Delhi
4. *Vaidik sahitya ki Ruparekha*,Umashankar Sharma Rsi,Chawkhamba Vidyapublishan, Varanasi
5. *Vaidika Sahitya O Samskriti*, Bholanath Rout, Chitrotpala Publication, Salipur

DISCIPLINE SPECIFIC ELECTIVE (DSE)-1

DSE-1 SOCIO-POLITICAL THOUGHT IN ANCIENT INDIA

3. *Arthasastra (Adhikarana I.1- 4)* **80+20 = 100 Marks**
4. *Dharmasastra* **40 Marks**
Yājñavalkyasmṛti (Vyavahārādhyāya verses 1-65) **40 Marks**

1. Arthasastra (Adhikarana I.1-4 from the beginning up to vinayadikarana)

- Unit- I Long Questions -2 (About 16 Marks
& II 150 words each)
Short Questions – 4 (About 4 ×4= 16 Marks
50 words each)

40 Marks

12x2= 24 Marks
4x4 = 16 Marks

2. Dharmasastra

a) Yājñavalkyasmṛti

Units- III & IV –

- Long Question -2 (About 150 words each)
Short Questions - 4(About 50 words each)

40Marks

12x2= 24 Marks
4x4=16 Marks

Core Readings:

1. *Kautilya Arthashastra*, (Ed. &Trans.) R.P. Kangle, 3 Vols., Motilal Banarsidass, New Delhi
2. *Yājñavalkyasmṛti (Vyavahārādhyāya)*, (Ed.) Kishore Chandra Mahapatra, Jageswarilane, Balighat, Puri

Suggested Readings:

1. *TheArthashastra*. (Ed.& Trans), L.N. Rangarajan, Penguin Classics, India, 1992
2. *TheArthashastra*. (Ed.) N.P. Unni, Bharatiya Vidya Prakashan, New Delhi
3. *Arthashastra* (Odia Trans.) Anantarma Kar, Odisha Sahitya Academy, Bhubaneswar
4. *Kautilya Arthashastra*, (Ed.) Karunakar Das, Kitab Mahal, Cuttack.
5. *Yājñavalkyasmṛti*, (Ed.) M.N. Dutta, Parimal Publications, New Delhi

DISCIPLINE SPECIFIC ELECTIVE (DSE)-2

DSE-2 ETHICAL LITERATURE IN SANSKRIT

80+20 = 100 Marks

1. *Cāṇakyanīti (Chaps- I, II, III and IV from Cāṇakyanītidarpaṇa)* **40 marks**
2. *Nīśataka of Bhartrhari (Verses 1-50)* **40 marks**

1. Cāṇakyanīti

40 Marks

- Unit-I & II Long Question -2 (About 150 words each)
Short Questions – 4 (About 50 words each)

12x2= 24 Marks
3 ×2= 06 Marks
4x4=16 Marks

2. Nitisataka

40Marks

- Unit-III & IV Long Question -2 (About 150 words each)

12x2= 24 Marks
10 Marks

Short Questions – 4 (About 50 words each)

3 × 2 = 06 Marks
4 × 4 = 16 Marks

Core Readings:

3. *Cāṅkyaṅītidarpaṇa* (Ed.) Gunjeswar Choudhury, Choukhamba SurabharatiPrakashan, Varanasi
4. *Nītiśataka* (Ed.) M.R. Kale, MLBD, New Delhi(Text)

Suggested Readings:

4. *Sampurna Canakyaniti* (Ed.), Dr. N.S. Mishra, A.K. Mishra Agencies, Cuttack
5. *Nītiśataka* (Ed.) Naresh Jha, Choukhamba Prakashan, New Delhi
1. *Bhartrhari Sataktrayam*, B. S. Mishra, Vidyapuri, Cuttack.

SEMESTER-VI

CC-13 AYURVEDA & VRKSAYURVEDA 80+20 = 100
Marks

1. Ayurveda (Carakasamhita- Sutrasthana, dhirgham jivitiyadhyaya) 60 Marks

2 Vrksayurveda (Vrksayurvedadhyaya of Brhatsamhita) 20 Marks

Unit I, II & III Ayurveda (Carakasamhita) 60 Marks

Long Questions – 2 (About 150 words each) 12 x 2 =24 Marks

Short Questions - 4 (About 50 words each) 6x 4 = 24 Marks
Explanation – 1 (About 150 words) 12 Marks

Unit-IV Vrksayurveda (Vrksayurvedadhyaya of Brhatsamhita) 20 Marks

Long Question -1 (About 150 words) 12 Marks

Short Questions - 2 (About 50 words each) 4x2 = 8 Marks

Core Readings :

1. *Carakasamhita, Brahmananda Tripathy, Chawkhamba Surabharati Prakasan, Varanasi.*
2. *Brhatsamhita of Barahmihira, Ed. Sudhakar Dwivedi, Sampurnanda Samskrita Viswavidyalaya, Varanasi*

Suggested Readings:

1. *Samskrita Vanmayaka brhata itihās* (Vol.17) Ayurved ka itihās Uttarpradesh Samskrit Sansthan, Lukhnow, 2006
2. *Ayurved ka Brhat Itihās*, Atridev Vidyalkar, Chawkhamba, Delhi
3. *Carakachintanam*, Priyabrata Sharma, Chawkhamba, Delhi
4. *Vrksayurveda*, Ed. Dr. Narayana Prasad Dash, Vidyapuri, Cuttack.

CC – 14 TECHNICAL LITERATURE IN SANSKRIT (JYOTISA & VASTU) 80+20 = 100 Marks

1. Jyotisa (Jyotih-sara-ratnavali, Chap I) 40 Marks
(Graha-naksatra-paricaya-prakaranam)

2. Vastu (Vasturatnakara, Chap-I) 40 Marks
(Bhuparigraha-prakaranam)

1. Jyotisa 40 Marks

Unit-I & II

Long Question -2 (About 150 words each) 12 x 2 = 24Marks

Short Questions - 4 (About 50 words each) 4x4 = 16 Marks

2. Vastu 40 Marks

Unit-III & IV

Long Question -2 (About 150 words each) 12x2=24Marks

Short Questions - 4 (About 50 words each) 4x4 = 16 Marks

Core Readings :

3. *Jyotih-sara-ratnavali*(Part-I) (Ed.) Pandit Baikoli Mahapatra, Radhakrishna Pustakalaya, Satyanarayan Temple Road, Berhampur, Ganjam, Odisha

4. *Vasturatnakara* (Ed.) Vindhyaeshwari Prasad Dwivedi, Chowkhamba Krishnadas Academy, Varanasi

Suggested Readings:

1. *Grahanaksatra paricaya prakaranam*, Dr. N.S. Mishra, Kalyani Publishers, Ludhiana.

2. *Bhuparagraha – prakaranam*, Dr. N.S. Mishra, Kalyani Publishers, Ludhiana.

3. *Jyotih-avisvakosa*, Haridutta Sharma, Subodh Publication, New Delhi

4. *Vaidika jyotisa*, Dr.G.S.Shastrri, Chaukhamba Samskriti bhabana, Varanasi

5. *Bharatiya jyotisa*, Dr.Nemichandra Shastrri, Bharatiya Jnanapitha, New Delhi-110003

6. *Jyotisa- tattvanka*, Gitapress, Gorakhpur (2014)

7. *RajaballavamVastusatram*, Ed. Dr Srhrikrishna Jugnu, Parimal Publication, Delhi, 2005

8. *Vastu, Astrology & Architecture*, (Copmilation of Research Paper of ANational Conference on Vastu & Jyotisa), Ed.by Gayatri Dev Vasudev, MLBD, New Delhi, (4th reprint-2015)

DSE-3

TRANSLATION, EDITING AND WRITING SKILL

80+20 = 100 Marks

2. Anuvada Kala-

2. Precises Writing-

3. Proof Correction and Transliteration

4. Essay

20

20

20

20

Page 51 of

Unit-I Anuvada Kala-**20 Marks**

Translation of one Odia/ English Paragraph in to Sanskrit

Unit-II Precises Writing-**20 Marks**

One Sanskrit Paragraph is to be precised in 1/3rd words and a suitable title is to be suggested.

Unit-III Proof Correction and Transliteration**20 Marks**

i. Proof Correction of **two** *wrongly printed* Sanskrit Verses from the Prescribed text are to set for necessary Proof Correction- 5x2=10Marks

ii. Transliteration of **two** Sanskrit Verses from Prescribed text are to be written in Roman/ Italic script with diacritical marks. 5x2=10Marks

Unit- IV Essay**20 Marks**

One Essay in Sanskrit (About 300 words)

20Marks**Core Readings:**

1. Samskrta Vyakaranadarpana, Odisha Text Book Bureau, Bhubaneswar
2. Samskrta Nibandha Satakam, Kapildev Dwivedi, Chawkhamba Publication, Banaras

Suggested Readings:

1. Brht Anuvada Shiksa, Chakradhara Hansa Nautiyal, MLBD, New Delhi
2. Samskrta- nibandhadarsah, Rammurti Sharma, Sahitya Niketan, Kanpur

DSE – 4 INDIAN PHILOSOPHIES: GENERAL IDEAS**1. Astika****60 Marks****2. Nastika****20 Marks****1. Astika****Unit – I Samkhya and Yoga****20 Marks**

Twenty – five elements of Samkhya, Satkaryavada and Astangayoga of Yogadarsana.

Long question – 1 (About 150 words)

12 Marks

Short Questions – 2 (About 50 words each)

4x2= 8 Marks

Unit – II Nayavaisesika**20 Marks**

Asatkaryavada, Saptapadarthas, Armbhavada, Paramanuvada

Long question – 1 (About 150 words)

12 Marks

Short Questions – 2 (About 50 words each)

4x2= 8 Marks

Unit – III Vedanta Mimamsa**20 Marks**

Saktidvaya of Maya in vedanta, Vivartavada, Netivada and karma in Mimamsa,
Svatapramanyavada.

Long question – 1 (About 150 words)

12 Marks

Short Questions – 2 (About 50 words each)

4x2= 8 Marks

Unit IV *Nastikas Carvak Jaina & Bouddha*

20 Marks

Svabhavavada, Adibhautikasukhavada of Carvak, Ratnatryam, Sapta-bhanga-naya/
Syadvada

of Jaina, Aryasatyas, Ksanikavada, Nairatmyavada & Moksa of Bouddha.

Long question – 1 (About 150 words)

12 Marks

Short Questions – 2 (About 50 words each)

4x2= 8

Marks

Core Reading :

1. Bharatiya Darsana (Odia), Gouranga Charana Nayak, The Odisha State Bureau of Text Book Preparation and Production, Bhubaneswar.

Suggested Readings :

1. History of Indian Philosophy, S.N. Dasgupta, MLBD, New Delhi.
2. Indian Philosophy, S. Radhakrishnan, George Allen and Unwin Ltd., New York.
3. A Critical Survey of Indian Philosophy, C. D. Sharma, MLBD, New Delhi.
4. Outlines of Indian Philosophy, M. Hiriyana, MLBD, New Delhi.

OR

DSE-04 PREPARATION AND PRESENTATION OF PROJECT

80+20 = 100

Marks

Project- 80 Marks

Presentation- 20 Marks

**(The Project work should be done preferably on Creative writings and Translation
works of Sanskrit Language.)**

DETAILS OF M.I.L. (SANSKRIT)

+3 M.I.L. (If Sanskrit)
Paper-1

(For Hons. Students as AECC-2) M.I.L.-1

Full Marks- 80 + 20 = 100Marks

- | | |
|--------------------|----------|
| 1. SANSKRIT PROSE | 40 Marks |
| 2. SANSKRIT POETRY | 40 Marks |

Unit- I & II SANSKRIT PROSE 40 Marks

1. Aparīksitakāram
2. Pitbhaktih
3. Jimutavahanakatha

Unit- I	Two Long Questions – (About 150 words each)	12x2= 24Marks
Unit-II	Four Short Questions - (About 50 words each)	4x4 = 16Marks

Unit- III & IV SANSKRIT POETRY 40 Marks

1. Mahabharata Santi Parva (Ch. 70 on Qualities of Ruler)
2. Mahabharata Santi Parva (Ch. 107 on Democracy)
3. Mahabharata, Santiparva, (Ch. 120 on Duties of Ruler)

Unit- III	Two Long Questions (About 150 words each)	12x2= 24 Marks
Unit- IV	Four Short Questions - (About 50 words each)	4x4 = 16 Marks

Core Reading:

1. *Samskrta-pravesa*, Utkal University, Vanivihar, Bhubaneswar
2. *Mahabharata Santi Parva*, Gita Press, Gorakhpur

Suggested Reading:

1. *Mahabharata Santi Parva*, Rastriya Sanskrit Sansthan, New Delhi

SOCIOLOGY UNDERGRADUATE SYLLABUS FOR HONOURS

SL.No	Semester	Number	Title of the Course	Marks	Credit
1	1st	DSC.H.SOC.1	Introduction to Sociology-1	80+20	6
2		DSC.H.SOC.2	Introduction to Sociology-2	80+20	6
3		GE.H.SOC.1	Introduction to Sociology-1	80+20	6
4		AECC.H.SOC.1		80+20	4
5	2nd	DSC.H.SOC.3	Indian Society	80+20	6
6		DSC.H.SOC.4	Sociology of Environment	80+20	6
7		GE.H.SOC.2	Indian Society	80+20	6
8		AECC.H.SOC.2		80+20	4
9	3rd	DSC.H.SOC.5	Classical Sociological Thinkers	80+20	6
10		DSC.H.SOC.6	Social Change & Development	80+20	6
11		DSC.H.SOC.7	Sociology of Gender	80+20	6
12		GE.H.SOC.3	Social Change and Development	80+20	6
13		SEC SOC.1	Political Sociology	80+20	4
14	4th	DSC.H.SOC.8	Rural Sociology	80+20	6
15		DSC.H.SOC.9	Globalization & Society	80+20	6
16		DSC.H.SOC.10	Marriage, Family and Kinship	80+20	6
17		GE.H.SOC.4	Rural Sociology	80+20	6
18		SEC SOC.2	Industrial Sociology	80+20	4
19	5th	DSC.H.SOC.11	Research Methodology	80+20	6
20		DSC.H.SOC.12	Social Movements in India	80+20	6
21		DSE.H.SOC.1	Sociology of Health	80+20	6
22		DSE.H.SOC.2	Sociology of Education	80+20	6
23	6th	DSC.H.SOC.13	Population & Society	80+20	6
24		DSC.H.SOC.14	Social Disorganization & Deviance	80+20	6
25		DSE.H.SOC.3	Urban Sociology	80+20	6
26		DSE.H.SOC.4	Field Work & Dissertation / Tribes of India	80+20	6
	TOTAL			2600	0

HONOURS PAPERS:

Core Paper – 14 papers

Discipline Specific Elective – 4 papers

Generic Elective for non Sociology students – 4 papers. In case University offers 2 subjects as GE, then papers 1 and 2 will be the GE paper.

Marks per paper - Midterm: 20 marks, End term : 80 marks, Total – 100 marks

Credit per paper – 6

Teaching hours per paper – 50 hours + 10 hours tutorial

CORE PAPER I INTRODUCTION TO SOCIOLOGY-I

This introductory paper intends to acquaint the students with Sociology as a social science and the basic concepts used in the discipline. It also focuses on the social processes and the social institutions that man encounters as a member of the society.

Objectives: After studying this paper the student can

-] Can get to know the convergence and divergence of Sociology with other social science disciplines in terms of the subject matter, nature and scope of the discipline and its approach. Develop knowledge about its historicity.
-] Can get acquainted with the basic concepts used in the subject.
-] Can generate ideas about the social processes and social institutions man encounters as a member of the society.

Learning Outcomes: This paper is expected to clarify and broaden the student's notion about the subject, the basic concepts used and some universal societal processes. This will provide a wholesome picture about what the subject is all about.

Unit-1: Discipline and Perspective

Meaning, Definition and Subject Matter

Emergence of Sociology

Nature and Scope of Sociology

Importance of Sociology

Unit-2: Sociology and other Social Sciences

Sociology, Anthropology and History

Sociology and Psychology

Sociology and Political Science

Sociology and Economics

Unit-3: Basic Concepts

Society and Community, Associations and Institutions

Social Groups and Culture

Role and Status.

Power and Social Norms

Unit-4: Social Stratification

Meaning, Definition, Characteristics
Forms of Stratification-Caste, class & gender
Theories of stratification: Functional, Marxian
& Weberian Theories of stratification
Elite Theory: Pareto, C Wright Mills.

Suggested Text Book:

1. Haralambos, M. & Holborn, J., Sociology: Themes and Perspectives, Harper Collins; Eighth edition, 2014

Reference Readings:

1. C.N.Shankar Rao, Principles of Sociology: With an Introduction to Social Thought, S.Chand & Co. Pvt. Ltd.(Revised ed.), 2006
2. Inkeles, A., What is Sociology? An Introduction to the Discipline and Profession, Englewood Cliffs, New Jersey: Prentice Hall, 1964.
3. Mills, C.W., The Power Elite, Oxford:Oxford University Press, 1954.
4. Bottomore, T. B. Sociology: A Guide to Problems and Literature, New Delhi: S. Chand, 2008
5. Paul B. Horton, Chester L. Hunt.. Sociology, McGraw-Hill., 1984
6. Giddens, Anthony., Introduction to Sociology, Polity Press 1991

CORE PAPER II INTRODUCTION TO SOCIOLOGY-II

This part two introductory paper intends to provide some additional knowledge on the interrelationship between individual and society, the types of societies and the various social processes that contribute to sustain the society over a period of time.

Objectives: After studying these two papers, the student can

-] Develop knowledge about the subject matter, nature and scope of the key topics and its approach.
-] Develop knowledge about individual and society.
-] Can get acquainted with the basic concepts used in the subject.
-] Can generate ideas about the social processes and social institutions.

Learning Outcomes: This paper is expected to clarify and broaden the student's notion about the subject, the basic concepts used and some universal societal processes. This will provide a wholesome picture about what the subject is all about.

Unit-1: Individual, Society and Culture:

Social Structure
Types of Society – Primitive, Agrarian and Industrial
Relationship between individual and society
Culture and Personality, Theories of Self: Cooley and Mead

Unit-2: Socialization

Meaning, Definitions & types
Stages of Socialization Process

Agencies of Socialization
Theories of Socialization- G H Mead, C.H Cooley

Unit-3: Social Control

Meaning, Definitions & Nature
Importance of social Control
Types of Social Control: Formal and Informal
Agencies of Social Control

Unit-4: Social Processes

Meaning and Definition
Associative Social Processes- Cooperation, Accommodation, Assimilation
Dissociative Social Processes- Competition and Conflict
Cooperation, Conflict and Competition: Interrelations and relevance

Suggested Text Books:

1. Rao ,C.N.Shankar, Principles of Sociology: With an Introduction to Social Thought, S.Chand& Co. Pvt. Ltd.(Revised edt.), 2006
2. Haralambos & Holborn , Sociology: Themes and Perspectives Harper Collins; Eighth edition, 2014

Reference Readings:

1. Mills, C.W.,*The Sociological Imagination*, Oxford: Oxford University Press, 1959.
2. Giddens ,Anthony, Introduction to Sociology, 1991
3. Rawat, H.K. Contemporary Sociology, Rawat Publication, Jaipur, 2013
4. Johnson, Harry M. Sociology: A Systematic Introduction, New Delhi, Allied Publishers, 1995
5. Smelser Neil J. *Hand Book of Sociology*, Sage Publications, Inc. 1998
6. Dasgupta,Samir and Saha,Paulomi An Introduction to Sociology,Pearson,2014

CORE PAPER III INDIAN SOCIETY

Every society has its own peculiar structure and there are some institutions universal to every society, but with their unique manifestations in each society. There are some change agents and initiatives that enable the society to change with the passage of time. This paper focuses on the structure of the Indian society and the changing aspects with the processes operating change agents and initiatives.

Objectives: After studying these two papers on Indian society, the student can

-] Get an impression about the basic composition of Indian society, its historical moorings, basic philosophical foundations of the society and the institutions.
-] Learn about the changing institutions, the processes, the agents and the **Page 521 of** that bring about change in the Indian society.

Learning Outcomes: This paper is expected to bring familiarity in a student about Indian society. It will present a comprehensive, integrated and empirically –based profile of Indian society. It is hoped that the structure and processes operative in the society, the change agents operating in Indian society presented in this course will also enable students to gain a better understanding of their own situation and region.

Unit-1: Composition of Indian Society and Approaches to the study of Indian Society:

Religious composition, Linguistic composition & Racial composition

Unity in diversity

National Integration—Meaning, Threats (Communalism, Linguism, Regionalism)

Approaches to the study of Indian society: Structural-Functional, Marxian and Subaltern

Unit-2: Historical Moorings and Bases of Hindu Social Organization

Varna Vyavastha and relevance

Ashrama and relevance

Purusartha and relationship with Ashramas

Doctrine of Karma

Unit-3: Marriage and Family in India

Hindu Marriage as Sacrament, Aims of Hindu marriage, Forms of Hindu Marriage.

Hindu Joint Family-Meaning & disintegration

Marriage among the Muslims & Tribes

Changes in Marriage and Family in India

Unit-4: The Caste System in India

Meaning, Definitions & features of Caste

Functions & Dysfunctions of Caste

Factors affecting caste system

Recent Changes in Caste System

Suggested Text Book:

1. Rao ,C.N.Shankar, Sociology of Indian Society, S.Chand& Co. Pvt. Ltd.(Revised ed.), 2004

Reference Readings:

1. Shah, A.M., *The Household Dimension of the Family in India: A Field Study in a Gujarat Village and a Review of Other Studies*, Delhi: Orient Longman, 1973.
2. Uberoi, P. (ed.), *Family, Kinship and Marriage in India*, New Delhi: Oxford University Press, 1993.
- 3.. Y. Singh , *Modernisation of Indian Tradition*, Jaipur: Rawat Publications, 1986
- 4..Ram Ahuja, *Indian Social System*, Rawat Publications, 1993
5. Sharma, KL. *Indian Social Structure and Change*, Rawat Publication, 2008
6. Srinivas, M.N. *India: Social Structure*. New Delhi: Hindustan Publishing Corporation, 1980

CORE PAPER- IV SOCIOLOGY OF ENVIRONMENT

Environment and society are in constant interaction with each other. It is the environment which sustains life in society and it is the society that is responsible for the preservation and the degradation of the environment. In the recent years environmental challenges have posed a threat to the lives on the planet. Keeping this in view, the present paper tries to create awareness among the students about the major environmental issues and the efforts geared to tackle them.

Objectives: After going through this paper, the student can

-] Derive knowledge about the close interaction between society and environment.
-] Gain substantial idea about the environmental issues and their repercussions on humanity.
-] Accumulate ideas about the ideological currents, issues that drive environment movements.
-] Get aware about the global and national efforts to conserve environment.

Learning Outcomes: The very aim of this paper is to disseminate knowledge about the significance of environment for society, to change the practices that can protect and preserve the environment and to make the students participate in the mission to preserve, protect and promote the cause of environment.

Unit-1: Conceptual Issues of Sociology of Environment

Sociology of Environment: Meaning, emergence and scope

Environment and Society – their inter-relations, Ecology and Environment.

Eco-system.

Sustainable Development

Unit-2: Environmental Movements

2.1 Narmada Bachao Andolan

2.2 Ganga Bachao Abhiyan

Silent valley movements

Eco-feminist movement

Unit-3: Major Environmental Issues:

Global Warming & Climate Change.

Loss of Biodiversity

Deforestation.

Urban Wastes, Industrial wastes

Unit-4: Environmental Protection:

Environment protection efforts at the global level

Efforts at national level

Role of Civil Society Organizations

Role of Corporate Social Responsibility in environmental protection

Suggested Text Books:

1. Biswas, Anupama Environment & Society, Wisdom Press (ISBN) (CBCS).
2. Giddens, Anthony “Global Problems and Ecological Crisis”: 2nd edition New York. W.W.Norton and Co.,1996

Reference Readings:

1. Baviskar, A., In the Belly of the River: Tribal Conflicts Over Development in the Narmada Vally, New Delhi: Oxford University Press, 2005.
2. DharamGhai, (ed) Development and Environment: Sustaining People and Nature UNRISD Blackwell Publication,1994.
3. Schumacher, E. F., Small is Beautiful: A Study of Economics as if People Mattered,London: Blond and Briggs, 1973.
4. Prasad, A., Against the Ecological Romanticism: Verrier Elwin and the Making of an Anti-modern Tribal Identity, Delhi: Three Essays Collective, 2011.
5. Maria Mies&Vandana Shiva, Ecofeminism, Fernwood Pub. Halifax, Nova Scotia, Canada, 1993
6. Gadgil Madhav& Ram Ch. Guha, Ecology & Equity: The use and abuse of Nature in contemporary India, New Delhi, OUP, 1996.

CORE PAPER V CLASSICAL SOCIOLOGICAL THINKERS

Sociology originated as an intellectual response to the crisis confronting the mid nineteenth century European society. Its development over two centuries has been influenced by a variety of socio-economic and political conditions. It is now established as a multi-paradigmatic academic discipline, with its body of theoretical knowledge enriched and its methodological techniques and procedures systemized. This paper is intended to familiarize the students with the social, political, economic and intellectual contexts in which sociology emerged as a distinctive discipline. It deals with the contributions of the forerunners of the discipline and with the contributions of the founders who gave a systematic shape to the subject.

Objectives: After going through these two papers, the student can

-] Gain an understanding of some of the classical contributions in Sociology, and their contemporary relevance.
-] Learn about the methodological shift in the discipline over the years.

Learning Outcomes: This paper is expected to clarify and broaden the student’s knowledge about the theoretical and methodological contributions of the classical contributors to the subject and the contemporary relevance of these theories.

Unit-1: Auguste Comte

Law of the Three Stages
Hierarchy of Sciences & Positivism
Organismic Analogy
Theory of Social Evolution

Unit-2: Karl Marx

- 2.1 Historical and Dialectical Materialism
- 2.2 Class struggle
- 2.3 Alienation
- 2.4 Theory of Capitalism

Unit-3: Emile Durkheim

- Division of Labour in Society
- Rules of Sociological Method
- Theory of Suicide
- Theory of Religion

Unit-4: Max Weber

- Social Action
- Protestant ethic and the spirit of capitalism
- 4.3 Ideal type
- 4.4 Bureaucracy, Authority

Suggested Text Books:

1. Morrison, Ken, Marx, Durkheim, Weber: Formation of Modern Social Thought, London, Sage, 1995
2. Lewis A. Coser, Masters of Sociological Thought, New York, Harcourt Brace Jovanovich (Text Book), 1977

Reference Readings :

1. F. Abraham & J.H. Morgan, Sociological Thought, Wyndham Hall Press, 1989.
2. Kenneth, A., *The Social Lens: An Invitation to Social and Sociological Theory*, London: Sage. 2011.
3. Ramond Aron, Main Currents in Sociological thoughts Vol. I & Vol. II Harmondsworth, Middlesex: Penguin Books, 1967 (1982 reprint).
4. Ritzer, George, Sociological Theory, New Delhi, Tata-McGraw Hill, 1996
5. Waters, M., *Modern Sociological Theory*, London: Sage, 2000
6. Fletcher, R. *The Making of Sociology: A Study of Sociological Theory*, Volume 1 and 2, Thomas Nelson & Sons Ltd, 1972

CORE PAPER VI SOCIAL CHANGE AND DEVELOPMENT

Change is the law of nature and every society is subject to change. Social change has always been a central concern of Sociological study. Change takes different forms. Change has its pattern which is spelt out by various theories. Change is often propelled by various factors. This paper is designed to provide some ideas to the student about such process, theories and factors.

-] Derive knowledge about the meaning, nature, forms and patterns of change.
- Get an idea about the theories that explain change and their adequacy in explaining so.
-] Get an impression about the factors that propel change in the society.

Learning Outcomes: This paper is expected to provide a wholesome idea to the students about the process of social change. They can relate their experience with the theoretical explanations.

Unit-1: Social Change:

Meaning and Nature

Social Evolution & Social Progress: Meaning and features

Social Development: Meaning and Features

Factors of Change: Cultural, Technological, Demographic

Unit-2: Theories of Social Change:

Evolutionary theory

Functionalist theory

Conflict Theory

Cyclical Theory

Unit-3: Models of development:

Indicators of Social Development

Capitalist

Socialist

Gandhian

Unit-4: Processes of Social Change in Indian Context:

Sanskritisation

Westernisation

Modernisation

Secularisation

Suggested Text Books

1. Steven, Vago, Social Change, Pearson Prentice Hall, 2003 5th Rev. Edt

Reference Readings:

1. Jairam Kansal , Social Change & Development, Wisdom Press (ISBN) (CBCS), 2004
2. Singh, Y., Modernization of Indian Tradition: A Systematic Study of Social Change, Faridabad: Thompson Press Limited, 1973.

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3. Rudolf, L and Rudolf, S. H., Modernity of Tradition: Political Development in India,

Chicago: University of Chicago Press, 1984.

4. Moore, W.E Social Change, Prentice Hall of India, New Delhi, 1965.

5. Mishra, B Capitalism, Socialism and Planning, South Asia Books, 1998

6. Escobar, A., Encountering Development, London: Zed Books, 2012

CORE PAPER VII SOCIOLOGY OF GENDER

The biological basis to the differences between the sexes does not explain the inequalities faced by the sex groups in the society. In the society variations are marked in the roles, responsibilities, rights of and relations between sex groups depending on the social prescriptions relating to sex affiliations. The differences, inequalities and the division of labour between men and women are often simply treated as consequences of ‘natural’ differences between male and female humans. But, in reality the social norms, institutions, societal expectations play a significant role in deciding and dictating the behaviour of each sex group. This is the fundamental of the study of Gender and Society.

Objectives: After studying this paper, the student can

-] Conceptualize what is “Gender” and what is “Sex” and draw a line of distinction between the two.
-] Note the difference in gender roles, responsibilities, rights and relations.
-] Trace out the evolution and institutionalization of the institution of “Patriarchy”.
-] Get to know the theories of Feminism that brought women issues and demands to the forefront.
-] Assess the initiatives undertaken for gender development with the paradigm shift from time to time.

Learning Outcomes: This paper is expected to generate ideas and sensitivity about gender in a student which he/she can put into practice in daily life. This will lead to change the prevalent biases and gender practices and create a gender neutral social world where both men and women can enjoy their basic rights and cherish to achieve their dreams.

Unit-1: Social Construction of Gender

Gender as a Social Construct

Gender Vs. Sex

Gender Stereotyping and Socialization

Gender Role

Unit-2: Feminism

Meaning and Definitions

Origin , Growth of Feminism, Waves of Feminism

Patriarchy

Theories of Feminism-Liberal, Radical, Socialist, Marxist, Post Modernism

Unit-3: Gender and Development

Approaches -WAD, WID and GAD.

Gender Mainstreaming: Meaning, Policies and Programmes

Women Empowerment: Meaning and Dimensions: Political, Economic and Social.

Unit-4: Women in India through ages

Status of Women in Ancient Period

Medieval Period

Women in Pre- independence India

Women in Contemporary Indian Society

Suggested Text Book:

1. Bhasin, Kamla, Understanding Gender, Kali for Women, 2003

Reference Readings:

1. Prabhakar, Vani Gender and Society, Wisdom Press (ISBN) (CBCS), 2012
2. Choudhury, Maitry *Feminism in India: Issues in Contemporary Indian Feminism*, Kali for Women, New Delhi, 2004.
3. Walby, S., *Theorizing Patriarchy*, John Wiley and Sons, 1990.
4. John, M. E. (ed.), *Women's Studies: A Reader*, New Delhi: Penguin India, 2008.
5. Pilcher, J and Whelehan, I., *Fifty Key Concepts in Gender Studies*. London: Sage, 2004.
6. Forbes, G. *Women in Modern India*, Cambridge: Cambridge University Press, 1996.

CORE PAPER VIII RURAL SOCIOLOGY

Rural Sociology is a specialized branch of Sociology describing the society of villages and rural areas. As the rural areas or the villages mark the beginning of human civilization, this paper is designed to bring out the distinct features of the rural society with their typologies and typicalities. In the present paper an attempt is made to introduce the student with the development of this branch overtime with its focus on the typicality of Indian villages, their structures, changing features and social problems faced by the rural people.

Objectives: After studying this paper, the student can

-] Get an impression about the emergence of the sub discipline Rural Sociology and the forces contributing for its origin.
-] Learn about the nature of this branch of knowledge, its subject matter and significance.
-] Collect information and knowledge about the mooring of the sub discipline in the Indian context.
-] Generate an idea about the typicality of the rural society and the institutions operating therein and their dynamics.
-] Derive ideas about rural social problems of the country.

Learning Outcomes: India thrives in her villages. By going through this paper, the student can have a grip on the grass roots of Indian society. This will enable the student to understand the society in a better manner, to note the heterogeneities in culture, institutions and their functions, changes, the contrasts found between the rural urban societies and the problems faced by the people.

Unit- 1: Introduction to Rural Sociology

1.1 Meaning, Definition & Nature

Origin & Subject Matter of Rural Sociology

Importance of Rural Sociology

Evolution and Growth of Village Community

Unit- 2: Rural Social Structure

Village Community-Meaning & Types

Rural-Urban Contrast & Continuum

Agrarian Economy

Dominant Caste, Emerging class structure in rural India

Unit- 3: Rural Social Problems

Poverty

Unemployment

Indebtedness

Rural factionalism

Unit- 4: Rural Development Programmes

Community development Programmmes, Cooperative Movements and Panchayati Raj System

Swarnajayanti Gram SwarozgarYojana (SGSY), Mahatma Gandhi National Rural Employment Guarantee Scheme (MGNREGS)

National Rural Livelihood Mission (NRLM)

National Rural Health Mission (NRHM)

Suggested Text Books:

1. Sharma, R.N. Rural Sociology,Media Promoters and Publishers. Pvt. Ltd. 1983
2. Singh , Kartar Rural Development: Principle Policies and Management, Sage, New Delhi,1995

Reference Readings:

1. Choudhury, Anjana Rural Sciology, Wisdom Press ,2004
2. S.L. Doshi, S.L &P.C.Jain , Rural Sociology, Jajpur, Rawat,2002.
- 3.Maheswari, S.R Rural Development in India, Sage Publication, New Delhi,1985.
4. Ahuja, Ram Rural Sociology,Popular Prakashan Ltd; New edition 2011
- 5.Desai, A.R .Rural Sociology in India, Popular Prakashn, Bombay, 1997
6. Ray E. Pahl "The Rural-Urban Continuum." *Sociologia Ruralis* 6(3-4):299-327. Reprinted in R. E. Pahl, ed. *Readings in Urban Sociology*. Oxford: Pergamon, 1970

CORE PAPER- IX GLOBALISATION & SOCIETY

Globalization is the dominant process of social change in the contemporary world. It has resulted in the sinking of time and space and collapse of borders. It is a new coinage for an old process. It has its own dimensions, distinct features and impacts on society. It has given birth to new ~~places~~ ~~places~~. All these are the focal points of discussion of this paper.

Objectives: By going through this paper, the student can

-] Collect information about the meaning and nature of this process, its historical mooring.
-] Amass knowledge about its dimensions and impacts, both positive and negative.
-] Get introduced to the agencies that manage the process.

Learning Outcomes:

This paper is expected to acquaint the student with an ongoing social process; which can bring tremendous changes in the nations.

Unit-1: Globalisation

1.1 Meaning, characteristics of Globalisation

Emergence of Globalisation

Liberalisation- Meaning & characteristics

Privatisation- Meaning & characteristics

Unit-2: Dimensions of Globalisation

Economic

Technological

Political

Cultural

Unit-3: Consequences of Globalisation

Rising Inequality

Environmental Degradation

Consumerism

Health and Security

Unit-4: Impact of Globalisation in Indian Context:

Cultural Impacts

Impact on Education

Impact on Religion

Impact on Women

Suggested Text Books:

1. Biswas, Anupama Globalization and Society, Wisdom Press (ISBN) (CBCS)
2. Bhagwati, Jagdis, In Defence of Globalization, Oxford Univ. Press, Delhi 2004.

Reference Readings:

1. Pathak, A., Modernity, Globalization and Identity: A Reflexive Quest, Delhi: Aakar Books, 2006
2. Singh, Y. Culture Change in India: Identity and Globalization. Jaipur: Rawat, 2006.
3. Sengupta, A., Reforms, Equity and the IMF: An Economist's World, Delhi: Har-Anand Publications PVT limited, 2001
4. Jha, Avinash, Background to Globalisation, Centre for education and documentation. Mumbai, 2000
5. Arjun Appadurai, Modernity at large: Cultural Dimensions of Globalization, Delhi, 1997.
6. Joseph E. Stiglitz, Globalization & its Discontents, W.W. Norton & Company, 2002

CORE PAPER- X MARRIAGE, FAMILY & KINSHIP

This course provides a brief account of the classical approaches to the study of family and kinship. It exposes the students to the distinct aspects of these three interrelated institutions in the Indian context. Finally, it discusses some contemporary issues that pose a challenge to the normative model of these institutions.

Objectives: By going through this paper, the student can

-] Understand the three institutions that are the foundations of the society.
-] Comprehend the theoretical perspectives on these institutions.
-] Get to know the rules governing these institutions.
-] Estimate the changes coming over these institutions with the process of social change.

Learning Outcomes:

This paper is expected to instill knowledge about the foundational institutions, their governing principles and the continuity and change features of these institutions.

Unit-1: Marriage

Marriage as a social institution
Functions of marriage
Rules of marriage, Types of marriage
Changes in the institution of marriage

Unit-2: Family

Family as a social institution

Rules of Marriage and Types of family
Functions of family
Contemporary Changes in family

Unit-3: Kinship System

Meaning, Definition & Types
Kinship Terminologies & usages
Kinship system in North India & South India
Clan, Lineage

Unit-4: Contemporary Issues

Migration and its impact on family
Domestic Violence
Dowry
Divorce

Suggested Text Books:

1. Kapadia , K.M. Marriage and family in India : London, Oxford Univ. Press, 1966

Reference Readings:

1. Maya Majumdar, Maya Marriage, Family & Kinship, Wisdom Press (ISBN), (CBCS), 2005
2. Shankar Rao, C.N. Principles of Sociology: With an Introduction to Social Thought, S.Chand & Co. Pvt. Ltd.(Revised ed.), 2006
- 3 Karve, Irawati Kinship Organisation in India, Poona, Deccan college, 1953
5. Robin Fox , Kinship and Marriage: An Anthropological Perspective, Pelican,1967
6. Patricia Uberoi, Family, Kinship & Marriage in India, Oxford University Press, Delhi, 1993

CORE PAPER- XI RESEARCH METHODOLOGY

Since the days of August Comte, a debate and a deliberate attempt has been initiated to provide a scientific character to social sciences. In this attempt empirical research has been introduced as an integral part of observing social reality and generalizing it objectively without any subjective predisposition. Gradually, research methods have been developed and introduced in social sciences to bring it in par with scientific observations. The essence of this paper lies in introducing the students with these methods of research to ensure objectivity as far as practicable in social research.

Objectives: By going through this paper, the student can

- Get an understanding of the nature of scientific methods, nature of social Phenomena and the way of attaining value neutrality.
- Have a grip over the basic steps involved in social research and the types of social research with their applicability
- Develop an insight into the need and types of research design and the use of sampling method for attending objectivity and scientific study.

Learning Outcomes: This paper is designed and incorporated to acquaint the students with the scientific ways of studying social phenomena. This provides them with a research insight that will enable them to capture the most relevant data in an objective manner. The market demand of this paper will be very high as the students well versed with this paper will be highly demanded in academics, fundamental research, and policy research undertaken both by Government and Non- Government agencies.

Unit-1: Meaning & Significance of Social Research

Meaning ,Definitions & Utility of Social Research
Major Steps in Social Research
Scientific Method-Characteristics
Applicability of Scientific Method

Unit-: 2 Hypothesis & Sampling

Meaning, definitions and Characteristics of Hypothesis
Types of and sources of Hypothesis
Sampling-Meaning & Characteristics
Types of sampling-probability & non-probability

Unit -3: Tools and Techniques of Data Collection

Qualitative methods and Quantitative methods
Observation
Interview Schedule, Questionnaire
Case study

Unit-:4 Data Analysis & Report Writing

Significance of Measures of Central Tendency
Mean, Median, Mode
Tabulation and Data Analysis
Report Writing

Suggested Text Books:

1. Goode William J and Paul K. Hatt. Methods in Social Research. New York: McGraw-Hill Book Co, 1952
2. Wilkinson T.S& P.L. Bhandarkar, Methodology & Techniques of Social Research, Himalaya Publishing House, 2010

Reference Readings:

1. Bajpayee, . S.R. Methods of Social Survey and Research, KitabGhar, 1960.
2. Seale, C. (ed), *Researching Society and Culture*, London: Sage, 2014.
3. Young , P.V. Scientific Social Survey and Research, Prentice Hall, New Delhi, (Ref.Book) 1939
4. Kothari, C.R Research Methodology: Methods and Techniques, Bangalore ,Wiley Eastern, 1985
5. Bryman, Alan Quality and Quantity in Social Research, Unwin Hyman, London, 1988.
6. Jayram , N. Sociology: Methods and Theory, Madras, Macmillan Madras, 1989.

CORE PAPER- XII SOCIAL MOVEMENTS IN INDIA

Movements reflect the voices raised against the prevailing practices of a society. Every society witnesses social movement in some form or the other. Movements bring social change and transformation. It is a collective effort that is driven by particular issues and brings forth changes. The present paper tries to provide a rudimentary impression to the students about the concept, nature and types of movements with a thrust on the movements witnessed by Indian society.

Objectives:

-] To introduce to the students with the concept of social movements and their dynamics.
-] To introduce the students to the role of social movements in social transformation.
-] To help them understand the various approaches to the study of social movements.

Learning Outcomes: The very aim of this paper is to disseminate knowledge about the concept of social movements and its process and change making role in the society.

Unit-1: Social Movement

1.1 Meaning, definitions

Nature and Characteristics of Social Movement

Causes of Social Movement

Types of Social Movement- Revolutionary, Reforms, Revival

Unit-2: Peasant Movements in India

Champan Satyagraha
The Bardoli Movement in Gujarat
The Peasant Revolt in Telengana
The Tebhaga Movement in Bengal

Unit-3: Backward Castes & Tribal Movement in India

Mahar Movement in Maharashtra
Dalit & Non-Brahmin Movement in Tamilnadu, SNDP movement in Kerala
Santhal Insurrection
Jharkhand Movement

Unit-4: Women's Movement in India

The Social Reform Movement and Women
Women in the Indian National Movement
Women in Chipko Movement
Contemporary Women's Movement

Suggested Text Books:

1. Shah, Ghanashyam Social Movements in India, Sage Publication, New Delhi, 1990
2. Rao, M.S.A.edt. ,Social Movements in India 1920-1950, OUP Delhi, 1983

Reference Readings:

1. Kumar, R.,History of Doing: An illustrated Account of Movements for Women's Rights and Feminism in India , New Delhi: Zubban, 1997.
2. Agnihotri, I. and Mazumdar, V., Changing Terms of Political Discourse: Women's Movement in India, in T. K. Oomen (ed.), Social Movements II: Concerns of Equity and Security, New Delhi: OUP,2010.
3. Geetha, V and Rajadurai, S. V., Towards a Non-Brahmin Millennium: From Iyothee Thass to Periyar. Delhi: Popular Prakashan, 1998.
4. Dhanagare D. N. Peasants Movements in India, Oxford University Press, 1983
5. Omvelt, Gail Social Movements in India, Rowman& Littlefield, INC, Oxford, 1993
- 6.Singh, K.S. Tribal Movements in India, Foundation Pub. New Delhi, 1982

CORE PAPER- XIII POPULATION & SOCIETY

Demography is both an index and instrument of development and change. India as a country is plagued by population explosion which retards, the economy and blocks social progress. Irrespective of several positive attempts undertaken by the government, India has failed to control its population problem. This paper is designed to provide an idea to the students about population dynamics and its impact on society.

Objectives: After going through this paper, the student can

- 1] Understand the various facets of population studies and the theories that depict population change.

-] Develop specific idea on Indian population structure, policies adopted and programmes launched in the country to check population.
-] Assess the role of various agencies in population control.

Learning Outcomes: The very aim of this paper is to acquaint the students with a perennial problem of the Indian society that is population growth and the measures introduced to control it.

Unit: 1 Population Studies

1.1 Meaning & Scope of Population Studies

Population & Society-Relationship

Importance of Population Studies

Causes and effects of Population Growth

Unit: 2 Population Theories

Malthusian Theory

Optimum Theory of Population

2.4 The Theory of Demographic Transition

2.4 Applicability of Population Theories in Contemporary Scenario

Unit: 3 Determinants of Population Growth

Fertility

Migration

Mortality

Measures to control population growth

Unit: 4 Population Compositions in India

Sex Composition

Age Compositions

Literacy Composition

Rural & Urban Composition

Suggested Text Book:

1. Hans, Raj Population Studies with special reference to India, Sujeet Publication, New Delhi, 1978

Reference Readings:

1. S.N. Agarwal, Population studies with Special Reference to India, New Delhi: Lok Surjeet Publication, 1989
2. Bose, Ashish Demographic Diversity in India, Delhi: B.R. Publishing Corporation, 1991
3. Dubey, Surendra Nath Population of India, Delhi: Authors Press, 2001
4. Chandrasekhar S. (ed) Infant Mortality, Population growth and Family Planning in India, London, George Allen and Unwin Ltd., 1974
5. Srivastava, O.S. Demography and Population Studies, Vikas Pub. House, New Delhi, 1998
6. Jain, R.K A Textbook of Population Studies, Neha Publishers & Distributors, 2013

No society is fully organized in character. Disorganization is apt to occur from time to time.

Disorganization is a manifestation of the deviant behavior found among some individuals. This deviance occurs when the individuals feel that the normative order of the society and its institutions are not need fulfilling in character. This present paper makes an attempt to provide an impression about the scenario of disorganization, its forms, causes and consequences with the theories explaining the situation.

Objectives: After going through this paper, the student can

-] Understand the meaning, causes, consequences and forms of social disorganization.
-] Learn about the theories explaining the disorganization situations.
-] Comprehend the concept of crime and the existing theories of punishment.

Learning Outcomes: This paper is designed with an expectation to impress upon a student on the concept of deviant behavior leading to social disorganization, forms, theoretical foundations and criminal activities which he encounters in real life situations.

Unit-1 : Social Disorganization

1.1 Meaning and Nature

Causes and Consequences of Social Disorganization

Family Disorganization - Causes and Consequences

Personality Disorganization- Causes and Consequences

Unit- 2: Theories of Deviant Behaviour

Durkheim's Theory

Merton's Theory

Differential Association theory

Delinquent Sub-Culture theory

Unit- 3 : Crime and Punishment :

Crime-Definitions and types

Causes & Consequences of Crime

Juvenile Delinquency-Causes and consequences

Theories of Punishment: Retributive, Deterrant, Reformative

Unit-4: Social Problems:

Alcoholism

Terrorism

Human Trafficking

Drug Addiction

Suggested Text Book

1. Memoria, C.B.Social Problems and Social Disorganization in India, Kitab Mahal, Allahabad, 1980.

Reference Readings:

1. Prabhakar , Vani Social Disorganization & Deviance, Wisdom Press (ISBN) (CBSE) Page 536 of 536
2 Ahuja, Ram Social Problems in India, Rawat, 2014

3. Sharma, R.N.Criminology & Penology, Surjit Publication, New Delhi,2008
4. Ahuja, Ram Criminology, Rawat, 2001
5. Shankar Rao , C.N.Indian Social Problems, S.Chand& Co. Pvt. Ltd.(Revised edt.), 2015
6. Sharma, P.D.Criminal Justice Administration, Rawat, 1998

DISCIPLINE SPECIFIC ELECTIVE, PAPER-1 SOCIOLOGY OF

HEALTH

Objectives: After studying this paper, the student can

-] Gain knowledge on the sociology of health and medicine.
-] Can get an insight on socio-cultural dimensions in the construction of illness and medical knowledge.
-] Can gain understanding on health sector reforms of Government of India.
-] Gain knowledge on medical pluralism for treatment of disease.

Learning Outcome: Students are expected to know the concept of health from different perspectives. They can also learn about the contemporary trend of Sociology of Health in India. By knowing various health policies and programs in India student can expand the information base and disseminate the same to others.

Unit – 1: Sociology of Health

Meaning & Definition
Emergence of Health Sociology
Scope of Sociology of Health
Social Determinants of Health

Unit – 2: Sociological Perspectives of Health

Functionalist
Marxist
Post structuralist
Feminist

Unit-3: Health Programs in India

Pradhan Mantri Swasthya Suraksha Yojana (PMSSY)
Janani Suraksha Yojana (JSY)
National Urban Health Mission
National AIDS Control Programme

Unit-4: Health Sector Reforms of the Government of India:

Health Policies of the Government of India
Role of ICDS
Protective & Preventive measures
Promotive measures (modern & indigenous)

Suggested Text Book:

1. Cockerham, William C. Medical Sociology Englewood, Cliffs, Prentice Hall 1978.

Reference Readings:

1. Dak, T.M. Sociology of Health in India, Kaveri Printers, New Delhi, 1991.
2. Blaxter, M., Health, Cambridge: Polity Press, 2004.
3. White, K., An Introduction to Sociology of Health and Illness, London: Sage, 2016, third edition
4. Prasad, Purendra and Amar Jesani ed. Equity and Access Health Care Studies, Oxford University Press, 2018

DISCIPLINE SPECIFIC ELECTIVES, PAPER-2 SOCIOLOGY OF EDUCATION

Objectives: After going through this paper, the student can

-] Get to know the meaning and theoretical perspectives on sociology of education
-] Get familiar with the relationship between education and society.
-] Get insights on role of education in Nation building.
-] Get an understanding on inequality in education that persists at various levels.
-] Gain knowledge on constitutional provisions and various education policies

Learning Outcomes: The students are expected to learn various perspectives on education through the contributions of both Indian and western thinkers. Knowledge on education policies and constitution provisions can prepare the students for the development of their own higher education. Students can develop academic interest by knowing the contribution of education in nation building as well as the educational inequalities which persist in the society.

Unit-1: Sociology of Education

Meaning & Concept of Sociology of Education
Interrelationship between Education and Society
Literacy & Education
Education as Social Construct

Unit-2: Perspectives on Sociology of Education

Dominant Perspectives on Sociology of Education
Functionalist
Conflict Critical Perspectives

Unit-3: Education, Social Process

- 3.1 Education and Socialization
- Education and Social Change
 - Education and Social Mobility
 - Education and Development

Unit-4: Educational Programs, Policies & Issues in India

Educational Policies in India
Universalisation of Primary Education
Privatisation of Education
Right to Education in Contemporary India

Suggested Text Book:

- 1 Jayram, N., Sociology of Education in India. Rawat. Jaipur., 2015

Reference Readings:

1. Morish, I. The Sociology of Education. An Introduction. London. Unwin Publication, 1972.
2. Freire, P., *Pedagogy of the Oppressed*, New York: Seabury Press, 1970.
3. Hooks, B. *Teaching to Transgress*, New York: Routledge, 1994
4. Aggarwal, J.C Yearbook of Indian Education. New Delhi, 1992
5. Dwivedi, Ramnath. Education and Society, Kalyani Publisher, New Delhi 2016.
6. Kilpatrick, M.O. Philosophy of Education. McMillan Company 1963

DISCIPLINE SPECIFIC ELECTIVES, PAPER-3 URBAN SOCIOLOGY

Urbanisation is an important social process that changed the face of human civilization. It was initiated with the process of modernization, transport revolution, coming up of river valley civilizations, establishment of trade links and industrial revolution. Urbanisation has brought both prosperity and problems. It is one of the earnest tasks of Sociology to trace out the evolution of the process, social; problems associated with it and policy planning and measures undertaken to overcome these challenges. This paper Urban Sociology concentrates upon these tasks.

Objectives: After going through this paper, the student can

-] Understand the specific traits of urban areas, its historical patterns of growth.
-] Develop knowledge about urban social institutions and problems
-] Gain insight into urban development plans, programmes and efforts.

Learning Outcomes: By going through this paper, the students can get an insight into the basic features of an urban area, the way cities grow, the major problem that encounter urban population and the various urban development programmes designed by the Government of India, their implementations, achievements and limitations.

Unit-1: Introduction to Urban Sociology

Meaning, and Subject matter of Urban Sociology
Importance of Urban Sociology
Specific traits of Urban Community
Urbanism as a way of life

Unit-2: Theories of patterns of city growth:

Concentric zone theory
Sector model
Multiple nuclei theory
Exploitative Model & symbolic approach theory

Unit-3: Urban Social Problems

Urban Crime
Problem of Slums
Problem in Urban Basic Services
Urban Pollution

Unit –4: Urban Development Programmes in India

Smart City Mission (SCM)
Jawaharlal Nehru National Urban Renewal Mission (JNNURM)
Atal Mission for Rejuvenation and Urban Transformation (AMRUT)
National Urban Livelihoods Mission (NULM)

Suggested Text Book:

1.Sharma,R.N.Urban Sociology, Atlantic Publishers & Distributors Pvt Ltd,2014

Reference Readings:

1. Rao M. S. A. Urban Sociology in India: Reader and Sourcebook ,Sangam Books Limited; New edition ,1992Satish Sharma, Urban Sociology, Wisdom Press (ISBN) (CBCS)
2. Jayapalan, N . Urban Sociology, Atlantic Publishers,2002,
3. Dhandeva, M.S. Sociology & Slum, Archives Books, New Delhi, 1989.
4. Sandhu, R.S Urbanization in India: Sociological Contributions, Sage Publication, New Delhi, 2003.
5. William G. Flanagan, William G. Urban Sociology: Images and structure, Allyn & Bacon, Boston. 1999.
6. Ramachandran, R Urbanization and Urban system in India, Oxford Univ. Press, New Delhi, 1989

DISCIPLINE SPECIFIC ELECTIVES, PAPER-4

FIELD WORK AND DISSERTATION

(College can give this choice only for students with above 60% aggregate marks)

Objectives: This paper is designed

-] To provide a basic exposure to the student to the fields and to acquaint him/her with the research process.
-] To equip them with the capacity to browse secondary literature from right sources and with a process of reviewing relevant literature.
-] To promote in them an ability to capture the right type of data and put them into documentation format.

(Dissertation: 80 marks and Viva-voce: 20 marks)

-] Dissertation may be written on any social institution, problem or may be an evaluative study.
-] It should be based on empirical study.
-] Size of the dissertation should be around 5000 words.
-] Dissertation paper will be examined jointly by one Internal and one External Examiner to be appointed by the University. Marks will be awarded jointly by the

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Internal and External Examiners on the basis of the written and Viva-

voce.

OR TRIBES OF INDIA

Objectives: The present paper aims

-] To provide a fair stock of knowledge to the students on the tribes and tribal life.
-] To enable the students to understand the problems faced by the tribes
-] To give impression and knowledge on the tribal development plans, policies and programmes.

Learning outcomes: After going through this paper it is expected that the students will gain fair idea about the Indian tribes, their demography and distribution. They will be sensitized about tribal situations and the challenges faced by them today. Finally, they can get an account of the safeguards created for them through the Constitution, legislations and programmes and the changes noted in the tribal society of the country today.

Unit-1: Tribes: Their Distribution and Demography

1.1 Tribe: definitions, characteristics and demography

Geographic distribution of the tribes

N.K.Guha's Classification on Tribes

Caste and Tribe

Unit-2: Social Organisation of the Tribes

Tribal economic system

Tribal political system

Tribal religion

Women in Tribal Society

Unit-3: Challenges Faced by the Tribes

Land alienation, Migration

Alcoholism and Indebtedness

Tribal Displacement

Tribal health and Sanitation

Unit-4: Changes and Upliftment of the Tribes

Constitutional safeguards for the tribes

Legal provisions for tribes

Flagship programmes of the Government for the tribes

Recent Changes in Tribal Life

Suggested Text Books:

1. Hasnain, Nadeem, Indian Anthropology, New Royal Book Co 2011
2. Majumdar, D.N. and T.N.Madan, An Introduction To Social Anthropology, Asia Pub. House, 2010

Reference Readings:

1. Hasnain Nadeem Tribal India, New Royal Book Company, 2017 edition
2. Joshi Vidyut and Chandrakant Upadhyaya (eds), Tribal Situation in India: Issues and Development ,Rawat Publications,2017
3. Rath Govind Chandra,edt. Tribal Development in India:The Contemporary Debate,Sage Publications,2006
4. Paul Mitra, Kakali Development Programmes And Tribals Some Emerging Issues, Kalpaz Publications,2004
5. Munshi, Indra The Adivasi Question, Orient Blackswan Private Limited,2018
6. Mohanty,P.K. Development of Primitive Tribal Groups in India, Kalpaz Publications,2003

GENERIC ELECTIVE PAPER I INTRODUCTION TO SOCIOLOGY

This introductory paper intends to acquaint the students with Sociology as a Social Science and the basic concepts used in the discipline. It also focuses on the social processes and the social institutions that man encounters as a member of the society.

Objectives: After studying these two papers, the student can

-] Get to know the convergence and divergence of Sociology with other social science disciplines in terms of the subject matter, nature and scope of the discipline and its approach.
-] Develop knowledge about its historicity.
-] Can get acquainted with the basic concepts used in the subject.
-] Can generate ideas about the social processes and social institutions man encounters as a member of the society.

Learning Outcomes: This paper is expected to clarify and broaden the student's notion about the subject, the basic concepts used and some universal societal processes. This will provide a wholesome picture about what the subject is all about.

Unit-1: Discipline and Perspective

Meaning, Emergence of Sociology

Definition, Subject Matter

Nature and Scope of Sociology

Relationship of Sociology with Anthropology, Political Science, History and Economics

Unit-2: Basic Concepts

Society and Community

Associations and Institutions

Social Groups and Culture

Role and Status

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Unit-3: Social Stratification

Meaning, Definition, Characteristics
Forms of Stratification-Caste, class & gender
Functionalist Theorists of stratification (Parsons, Davis & Moore)
Marxian & Weberian Theories of stratification

Unit-4: Socialization and Social Control

- 4.1 Meaning, Definitions, Stages of Socialization Process.
4.2. Agencies of Socialization
Social Control: Meaning, Definitions, importance of social control
Agencies of Social Control: Formal and Informal

Suggested Text Books:

1. Rao ,C.N.Shankar, Principles of Sociology: With an Introduction to Social Thought, S.Chand & Co. Pvt. Ltd.(Revised ed.), 2006
2. Haralambos & Holborn , Sociology: Themes and Perspectives Harper Collins; Eighth edition, 2014

Reference Readings:

1. Mills, C.W., *The Sociological Imagination*, Oxford: Oxford University Press, 1959.
2. Giddens ,Anthony, Introduction to Sociology, 1991
3. Rawat, H.K. Contemporary Sociology, Rawat Publication, Jaipur, 2013
- 4 Johnson, Harry M. Sociology: A Systematic Introduction, New Delhi, Allied Publishers, 1995
5. Smelser Neil J. *Hand Book of Sociology*, Sage Publications, Inc. 1998
6. Dasgupta, Samir and Saha, Paulomi An Introduction to Sociology, Pearson, 2014

GENERIC ELECTIVE PAPER II INDIAN SOCIETY

Every society has its own peculiar structure and there are some institutions universal to every society, but with their unique manifestations in each society. There are some change agents and initiatives that enable the society to change with the passage of time. This paper focuses on the structure of the Indian society and the changing aspects with the processes operating, change agents and initiatives.

Objectives: After studying these two papers on Indian society, the student can

-] Get an impression about the basic composition of Indian society, its historical moorings, basic philosophical foundations of the society and the institutions.
-] Learn about the changing institutions, the processes, the agents and the interventions that bring about change in the Indian society.

Learning Outcomes: This paper is expected to bring familiarity in a student about Indian society. It will present a comprehensive, integrated and empirically –based profile of Indian society. It is hoped that the structure and processes operative in the society, the change agents operating in Indian society presented in this course will also enable students to gain a better understanding of their own situation and region.

Unit-1: Composition of Indian Society and Approaches to the study of Indian society:

Composition of Indian Society: Religious, Linguistic and Racial
Unity in diversity
National Integration--Meaning & Threats (Communalism, linguism, regionalism)
Approaches to the study of Indian society: Structural-Functional, Marxian and Subaltern

Unit-2: Historical Moorings and Bases of Hindu Social Organization

Varna Vyavastha and relevance
Ashrama and relevance
Purusartha and relationship with Ashramas
Doctrine of Karma

Unit-3: Marriage and Family in India

Hindu Marriage as Sacrament, Aims of Hindu marriage, Forms of Hindu Marriage
Hindu Joint Family-Meaning & disintegration
Marriage among the Muslims & Tribes
Changes in Marriage and Family in India

Unit-4: The Caste System in India

Meaning, Definitions & features of Caste
Functions & Dysfunctions of Caste
Factors affecting caste system
Recent Changes in Caste System

Suggested Text Book:

1. Rao ,C.N.Shankar, Sociology of Indian Society, S.Chand & Co. Pvt. Ltd.(Revised ed.), 2004

Reference Readings:

1. Shah, A.M., The Household Dimension of the Family in India: A Field Study in a Gujarat Village and a Review of Other Studies, Delhi: Orient Longman, 1973.
2. Uberoi, P. (ed.), Family, Kinship and Marriage in India, New Delhi: Oxford University Press, 1993.
- 3.. Y. Singh , Modernisation of Indian Tradition, Jaipur: Rawat Publications, 1986
- 4..Ram Ahuja, Indian Social System, Rawat Publications, 1993
5. Sharma, KL. Indian Social Structure and Change, Rawat Publication, 2008
6. Srinivas, M.N. India: Social Structure. New Delhi: Hindustan Publishing Corporation, 1980

GENERIC ELECTIVE PAPER III

SOCIAL CHANGE AND DEVELOPMENT

Change is the law of nature and every society is subject to change. Social change has always been a central concern of Sociological study. Change takes different forms. Change has its pattern which is spelt out by various theories. Change is often propelled by various factors. This paper is designed to provide some ideas to the student about such process, theories and factors.

Objectives: After going through this paper, the student can

-] Derive knowledge about the meaning, nature, forms and patterns of change.
- Get an idea about the theories that explain change and their adequacy in explaining so.
-] Get an impression about the factors that propel change in the society.

Learning Outcomes: This paper is expected to provide a wholesome idea to the students about the process of social change. They can relate their experience with the theoretical explanations.

Unit-1: Social Change:

Meaning and Nature.

Social Evolution & Social Progress: Meaning and features

Social Development: Meaning and Features

Factors of Change: Cultural, Technological, Demographic

Unit-2: Theories of Social Change:

Evolutionary theory

Functionalist theory

Conflict Theory

Cyclical Theory

Unit-3: Models of development:

Indicators of Social Development

Capitalist

Socialist

Gandhian

Unit-4: Processes of Social Change in Indian Context:

Sanskritisation

Westernisation

Modernisation

1.5 Secularisation

Suggested Text Books:

1. Steven, Vago, Social Change, Pearson Prentice Hall, 2003 5thRev.Edt

Reference Readings:

1. Jairam Kansal , Social Change & Development, Wisdom Press (ISBN) (CBCS), 2004
2. Singh, Y., *Modernization of Indian Tradition: A Systematic Study of Social Change*, Faridabad: Thompson Press Limited, 1973.
3. Rudolf, L and Rudolf, S. H., *Modernity of Tradition: Political Development in India*, Chicago: University of Chicago Press, 1984.
4. Moore, W.E Social Change, Prentice Hall of India, New Delhi, 1965.
5. Mishra, B Capitalism, Socialism and Planning, South Asia Books, 1998
6. Escobar, A., *Encountering Development*, London: Zed Books, 2012

GENERIC ELECTIVE PAPER IV RURAL SOCIOLOGY

Rural Sociology is a specialized branch of Sociology describing the society of villages and rural areas. As the rural areas or the villages mark the beginning of human civilization, this paper is designed to bring out the distinct features of the rural society with their typologies and typicalities. In the present paper an attempt is made to introduce the student with the development of this branch overtime with its focus on the typicality of Indian villages, their structures, changing features and social problems faced by the rural people.

Objectives: After studying this paper, the student can

-] Get an impression about the emergence of the sub discipline Rural Sociology and the forces contributing for its origin.
-] Learn about the nature of this branch of knowledge, its subject matter and significance.
-] Collect information and knowledge about the mooring of the sub discipline in the Indian context.
-] Generate an idea about the typicality's of the rural society and the institutions operating therein and their dynamics.
-] Derive ideas about rural social problems of the country.

Learning Outcomes: India thrives in her villages. By going through this paper, the student can have a grip on the grass roots of Indian society. This will enable the student to understand the society in a better manner, to note the heterogeneities in culture, institutions and their functions, changes, the contrasts found between the rural urban societies and the problems faced by the people.

Unit- 1: Introduction to Rural Sociology

1.1 Meaning, Definition & Nature

Origin & Subject Matter of Rural Sociology

Importance of Rural Sociology

Evolution and Growth of Village Community

Unit- 2: Rural Social Structure

Village Community-Meaning & Types

Rural-Urban Contrast & Continuum

Agrarian Economy

Dominant Caste, Emerging class structure in rural India

Unit- 3: Rural Social Problems

Poverty

Unemployment

3.4 Indebtedness

3.4 Rural factionalism

Unit- 4: Rural Development Programmes

Community development Programmes, Cooperative Movements and Panchayati Raj System

Swarnajayanti Gram Swarozgar Yojana (SGSY), Mahatma Gandhi National Rural Employment Guarantee Scheme (MGNREGS)

National Rural Livelihood Mission (NRLM)

National Rural Health Mission (NRHM)

Suggested Text Books:

1. Sharma, R.N. Rural Sociology, Media Promoters and Publishers. Pvt. Ltd. 1983
2. Singh, Kartar Rural Development: Principle Policies and Management, Sage, New Delhi, 1995

Reference Readings :

1. Choudhury, Anjana Rural Sociology, Wisdom Press, 2004
2. S.L. Doshi, S.L. & P.C. Jain, Rural Sociology, Jajpur, Rawat, 2002.
3. Maheswari, S.R Rural Development in India, Sage Publication, New Delhi, 1985.
4. Ahuja, Ram Rural Sociology, Popular Prakashan Ltd; New edition 2011
5. Desai, A.R. Rural Sociology in India, Popular Prakashan, Bombay, 1997
6. Ray E. Pahl "The Rural-Urban Continuum." *Sociologia Ruralis* 6(3-4):299-327. Reprinted in R. E. Pahl, ed. *Readings in Urban Sociology*. Oxford: Pergamon, 1970

Areas of Training

Sl. No.	Name of the Paper	Units needing a coverage under training	Days required	Total no. of training sessions needed
1.	Sociology of Environment	4 units	4 days	16
2.	Research Methodology	2 units	2 days	8
3.	Social Movements in India	4 units	4 days	16
4.	Population & Society	2 units	2 days	8
5.	Sociology of Health	4 units	4 days	16
6.	Sociology of Education	4 units	4 days	16
Total	06 Papers	20 Units	20 Days	80 sessions

STATE MODEL SYLLABUS FOR UNDERGRADUATE COURSES IN SCIENCE (2019-2020)

UNDER CHOICE BASED CREDIT SYSTEM

	Skill Development
	Employability
	Entrepreneurship
	All the three
	Skill Development and Employability
	Skill Development and Entrepreneurship
	Employability and Entrepreneurship

Course Structure of U.G. Botany Honours				
Semester	Course	Course Name	Credit	Total marks
Semester-I	AECC-I		4	100
	C-1 (Theory)	Microbiology and Phycology	4	75
	C-1 (Practical)	Microbiology and Phycology	2	25
	C-2 (Theory)	Biomolecules and Cell Biology	4	75
	C-2 (Practical)	Biomolecules and Cell Biology	2	25
	GE -1A (Theory)	Biodiversity (Microbes, Algae, Fungi & Archegoniate)	4	75
	GE -1A(Practical)	Biodiversity (Microbes, Algae, Fungi & Archegoniate)	2	25
	AECC-II		4	100
	C-3 (Theory)	Mycology and Phytopathology	4	75

Semester-II	C-3 (Practical)	Mycology and Phytopathology	2	25
	C-4 (Theory)	Archegoniate	4	75
	C-4 (Practical)	Archegoniate	2	25
	GE -2A (Theory)	Plant Physiology & Metabolism	4	75
	GE -2A(Practical)	Plant Physiology & Metabolism	2	25
Semester-III	C-5 (Theory)	Anatomy of Angiosperms	4	75
	C-5 (Practical)	Anatomy of Angiosperms	2	25
	C-6 (Theory)	Economic Botany	4	75
	C-6 (Practical)	Economic Botany	2	25
	C-7 (Theory)	Genetics	4	75
	C-7 (Practical)	Genetics	2	25
	SEC-1		4	100
	GE -1B (Theory)	Plant Ecology & Taxonomy	4	75
	GE -1B (Practical)	Plant Ecology & Taxonomy	2	25
Semester-IV	C-8 (Theory)	Molecular Biology	4	75
	C-8 (Practical)	Molecular Biology	2	25
	C-9 (Theory)	Plant Ecology & Phytogeography	4	75
	C-9 (Practical)	Plant Ecology & Phytogeography	2	25

	C-10 (Theory)	Plant Systematics	4	75
	C-10 (Practical)	Plant Systematics	2	25
	SEC II		4	100
	GE-2B (Theory)	Plant Anatomy , Embryology & Biotechnology	4	75
	GE-2B(Practical)	Plant Anatomy , Embryology & Biotechnology	2	25
Semester-V	C-11 (Theory)	Reproductive Biology of Angiosperms	4	75
	C-11 (Practical)	Reproductive Biology of Angiosperms	2	25
	C-12 (Theory)	Plant Physiology	4	75
	C-12 (Practical)	Plant Physiology	2	25
	DSE - 1 (Theory)	Analytical Techniques in Plants Sciences	4	75
	DSE - 1 (Practical)	Analytical Techniques in Plants Sciences	2	25
	DSE - 2 (Theory)	Natural Resource Management	4	75
	DSE - 2 (Practical)	Natural Resource Management	2	25
Semester- VI	C-13 (Theory)	Plant Metabolism	4	75
	C-13 (Practical)	Plant Metabolism	2	25
	C-14 (Theory)	Plant Biotechnology	4	75
	C-14 (Practical)	Plant Biotechnology	2	25
	DSE - 3 (Theory)	Horticulture Practices & Post Harvest Technology	4	75
	DSE-3 (Practical)	Horticulture Practices & Post Harvest Technology	2	25
	DSE – 4 Project work	Project Work	6	100
Total			148	2600

BOTANY

HONOURS PAPERS:

Core course – 14 papers

Discipline Specific Elective – 4 papers

Generic Elective for non-Botany students – 4 papers. In case University offers 2 subjects as GE, then papers 1 and 2 will be the GE paper. The students have the option of taking any two.

Marks per paper – Mid term: 15 marks, End term: 60 marks (Theory) + 25 marks (Practical),
Total – 100 marks

Credit per paper – 6

Teaching hours per paper – 40 hours (theory) + 10 hours (practical)

Core Paper I

MICROBIOLOGY AND PHYCOLOGY

Unit-I

Introduction to microbial world, microbial nutrition, growth and metabolism. **Viruses:-** Discovery, physicochemical and biological characteristics; classification (Baltimore), general structure with special reference to viroids and prions; replication (general account), DNA virus (T-phage), lytic and lysogenic cycle; RNA virus (TMV). Economic importance of viruses with reference to vaccine production, role in research, medicine and diagnostics, as causal organisms of plant diseases.

Unit-II

- (i) **Bacteria:** - Discovery, general characteristics, types- archaeobacteria, eubacteria, wall-less forms (mycoplasma and spheroplasts), cell structure, nutritional types, reproduction-vegetative, asexual and recombination (conjugation, transformation and transduction). Economic importance of bacteria with reference to their role in agriculture and industry (fermentation and medicine).
- (ii) **Cyanobacteria:-** Ecology and occurrence, cell structure, heterocyst, reproduction, economic importance; role in biotechnology. Morphology and life-cycle of *Nostoc*. General characteristics of prochlorophyceae, Evolutionary significance of Prochloron.

Unit-III

- (i) **Algae:-** General characteristics; Ecology and distribution; range of thallus organization; Cell structure and components; cell wall, pigment system, reserve food (of only groups represented in the syllabus), flagella and methods of reproduction, classification; criteria, system of Fritsch, and evolutionary classification of Lee (only upto groups); Role of algae in the environment, agriculture, biotechnology and industry.

(i) **Chlorophyta**:- General characteristics, occurrence, range of thallus organization, cell structure and reproduction. Morphology and life-cycles of *Chlamydomonas*, *Volvox*, *Oedogonium* and *Coleochaete*.

Unit-IV

- (i) **Charophyta:-** General characteristics; occurrence, morphology, cell structure and life-cycle of *Chara*; evolutionary significance.
- (ii) **Xanthophyta:-** General characteristics; Occurrence, morphology and life- cycle of *Vaucheria*.
- (iii) **Phaeophyta:-**Characteristics, occurrence, cell structure and reproduction. Morphology and life-cycles of *Ectocarpus* and *Fucus*.
- (iv) **Rhodophyta:-**General characteristics, occurrence, cell structure and reproduction. Morphology and life-cycle of *Polysiphonia*.

PRACTICAL

Microbiology

- (i) Electron micrographs/Models of viruses –T-Phage and TMV, Line drawings/ Photographs of Lytic and Lysogenic Cycle.
- (ii) Types of Bacteria to be observed from temporary/permanent slides/photographs.
- (iii) Examination of bacteria from bacterial culture by Gram's staining method.
- (iv) Electron micrographs of bacteria, binary fission, endospore, conjugation, root Nodule (live materials and photographs).

Phycology

Study of vegetative and reproductive structures of Nostoc, Chlamydomonas (electron micrographs), Volvox, Oedogonium, Coleochaete, Chara, Vaucheria, Ectocarpus, Fucus and Polysiphonia, Prochloron, Diatoms through, temporary preparations and permanent slides.

Text Books:

1. Singh, V., Pandey, P.C., and Jain, D.K. (2017). Microbiology and Phycology, Rastogi Publication, Meerut.

Reference Books:

1. Lee, R.E. (2008). Phycology, Cambridge University Press, Cambridge. 4th edition.
2. Prescott, L.M., Harley J.P., Klein D. A. (2010). Microbiology, McGraw-Hill, India. 8th edition.
3. Kumar, H.D. (1999). Introductory Phycology. Affiliated East-West Press, Delhi.
4. Campbell, N.A., Reece J.B., Urry L.A., Cain M.L., Wasserman S.A. Minorsky P.V., Jackson R.B. (2008). Biology, Pearson Benjamin Cummings, USA. 8th edition.
5. Pelczar, M.J., Chan, E.C.S., Krieg, N.R. (2011) Microbiology, 8th edition, Tata McGraw-Hill Co, New Delhi.
6. Willey, Sherwood and Christopher. Laboratory exercises in Microbiology. McGraw-Hill, India. 9th edition.
7. Vasistha B.R. (2017) Botany for Degree student, Algae, S. Chand Publication, New Delhi.
8. Mishra B. K. (2018) Microbiology and Phycology, Kalyani Publishers, New Delhi.

**Core Paper II BIOMOLECULES
AND CELL BIOLOGY**

Unit-I

- (i) Biomolecules and Bioenergetics: Types and significance of chemical bonds; Structure and properties of water; pH and buffers. Laws of thermodynamics, concept of free energy, endergonic and exergonic reactions, coupled reactions, redox reactions.
- (ii) Enzymes: Structure of enzyme: holoenzyme, apoenzyme, cofactors, coenzymes and prosthetic group; Classification of enzymes; Features of active site, substrate specificity, properties of enzymes, mechanism of action (activation energy, lock and key hypothesis, induced - fit theory), Michaelis – Menten equation, enzyme inhibition and factors affecting enzyme activity.
- (iii) Carbohydrates: Nomenclature, classification, structure and function of Monosaccharides, Disaccharides, Oligosaccharides and polysaccharides

Unit –II

- (i) Lipids: Definition and major classes of storage and structural lipids. Fatty acids structure and functions. Essential fatty acids. Triacyl glycerols structure, functions and properties.
- (ii) Proteins: Structure and classification of amino acids; Peptide bonds; Levels of protein structure-primary, secondary, tertiary and quaternary; Isoelectric point; Protein denaturation and biological roles of proteins.
- (iii) Nucleic acids: Structure of nitrogenous bases; Structure and function of nucleotides; Types of nucleic acids; Structure of A, B, Z types of DNA; Types of RNA; Structure of tRNA.

Unit –III

- (i) The Cell: Cell as a unit of structure and function; Characteristics of prokaryotic and eukaryotic cells; Origin of eukaryotic cell (Endosymbiotic theory).
- (ii) Cell wall and plasma membrane: Chemistry, structure and function of Plant Cell Wall. Overview of membrane function; fluid mosaic model; Chemical composition of membranes; Membrane transport – Passive, active and facilitated transport, endocytosis and exocytosis.
- (i) Cell organelles: Nucleus; Structure-nuclear envelope, nuclear pore complex, nuclear lamina, molecular organization of chromatin; nucleolus.

Unit-IV

- (i) Cytoskeleton: Role and structure of microtubules, microfilaments and intermediary filament.
- (ii) Chloroplast, mitochondria and peroxisomes: Structural organization; Function; Semiautonomous nature of mitochondria and chloroplast. Endoplasmic Reticulum, Golgi Apparatus, Lysosomes.
- (iii) Cell division: Eukaryotic cell cycle, different stages of mitosis and meiosis. Cell cycle,

Regulation of cell cycle.

PRACTICAL

- (i) Qualitative tests for carbohydrates, reducing sugars, non-reducing sugars, lipids and proteins.
- (ii) Study of plant cell structure with the help of epidermal peel mount of Onion/*Rhoeo*
- (iii) Demonstration of the phenomenon of protoplasmic streaming in *Hydrilla* leaf.
- (iv) Counting the cells per unit volume with the help of haemocytometer. (Yeast/pollen grains).
- (v) Study the phenomenon of plasmolysis and deplasmolysis.
- (vi) Study of different stages of mitosis and meiosis using aceto carmine and aceto orcin method from Onion root tip and bud respectively.

Text Books:

1. Rastogi, V. B. (2016). Introductory Cytology, Kedar Nath & Ram Nath, Meerut
2. Gupta, P. K. (2017). Biomolecules and Cell Biology, Rastogi Publication, Meerut.

Reference Books:

1. Sahoo, K. (2017) Biomolecules and Cell Biology, Kalyani Publishers, New Delhi.
2. Tymoczko, J.L., Berg, J.M. and Stryer, L. (2012) Biochemistry: A short course, 2nd ed., W.H. Freeman
3. Nelson, D.L. and Cox, M.M. (2008) Lehninger Principles of Biochemistry, 5th Edition, W.H. Freeman and Company.
4. Cooper, G.M. and Hausman, R.E. 2009 The Cell: A Molecular Approach. 5th edition. ASM Press & Sunderland, Washington, D.C.; Sinauer Associates, MA.
5. Becker, W.M., Kleinsmith, L.J., Hardin. J. and Bertoni, G. P. 2009 The World of the Cell. 7th edition. Pearson Benjamin Cummings Publishing, San Francisco

Core Paper III

MYCOLOGY AND PHYTOPATHOLOGY

Unit-I

- (i) Introduction to true fungi: Definition, General characteristics; Affinities with plants and animals; Thallus organization; Cell wall composition; Nutrition; Classification.
- (i) Zygomycota: General characteristics; Ecology; Thallus organisation; Life cycle with reference to *Rhizopus*.
- (ii) Ascomycota: General characteristics (asexual and sexual fruiting bodies); Ecology; Life cycle, Heterokaryosis and parasexuality; life cycle and classification with reference to *Saccharomyces*, *Aspergillus*, *Penicillium*, and *Neurospora*.
- (iv) Basidiomycota: General characteristics; Ecology and Classification; Life cycle of *Puccinia* and *Agaricus*.

Unit-II

- (i) Allied Fungi: General characteristics; Status of Slime molds, Classification;

Occurrence; Types of plasmodia; Types of fruiting bodies.

- (ii) Oomycota: General characteristic; Ecology; Life cycle and classification with reference to *Phytophthora*, and *Albugo*.
- (iii) Symbiotic associations: Lichen – Occurrence; General characteristics; Growth forms and range of thallus organization; Nature of associations of algal and fungal partners; Reproduction. Mycorrhiza-Ectomycorrhiza, Endomycorrhiza and their significance. Economic importance of Lichens.

Unit-III

Applied Mycology: Role of fungi in biotechnology, Mushroom cultivation, Application of fungi in food industry (Flavour & texture, Fermentation, Baking, Organic acids, Enzymes, Mycoproteins); Secondary metabolites (Pharmaceutical preparations); Agriculture (Biofertilizers); Mycotoxins; Biological control (Mycofungicides, Mycoherbicides, Mycoinsecticides, Myconematicides); Medical mycology.

Unit-IV

Phytopathology: Terms and concepts; General symptoms; Geographical distribution of diseases; etiology; symptomology; Host- Pathogen relationships; disease cycle and environmental relation; prevention and control of plant diseases, and role of quarantine. Bacterial diseases – Citrus canker and angular leaf spot disease of Cotton. Viral diseases – Tobacco Mosaic, Vein Clearing. Fungal diseases – Early blight of potato, Loose and covered smut.

PRACTICAL

- (i) Introduction to the world of fungi (Unicellular, coenocytic/ septate mycelium, ascocarps & basidiocarps).
- (ii) *Rhizopus*: study of asexual stage from temporary mounts and sexual structures through permanent slides.
- (iii) *Aspergillus*, *Penicillium* and *Saccharomyces* : study of asexual stage from temporary mounts. Study of Sexual stage from permanent slides/photographs.
- (iv) *Puccinia* : Study of different stages from temporary mounts and permanent slides.
- (v) *Agaricus*: Specimens of button stage and full grown mushroom; sectioning of gills of *Agaricus*, and fairy rings are to be shown.
- (vi) *Albugo*: Study of symptoms of plants infected with *Albugo*; asexual phase study through section/ temporary mounts and sexual structures through permanent slides.
- (vii) *Phytopathology*: Herbarium specimens of bacterial diseases; Citrus Canker; Viral diseases: Mosaic disease of ladies finger, papaya, cucurbits, moong, black gram, Fungal diseases: Blast of rice, Tikka disease of ground nut, powdery mildew of locally available plants and White rust of crucifers.

Text Books:

1. Mishra, B. K. (2017), Mycology and Phytopathology, Kalynai Publishers, New Delhi.

Reference Books:

1. Sharma, P. D. (2017). Mycology and Phytopathology Rastogi Publication, Meerut.
2. Agrios, G.N. (1997) Plant Pathology, 4th edition, Academic Press, U.K.
3. Alexopoulos, C.J., Mims, C.W., Blackwell, M. (1996). Introductory Mycology, John Wiley & Sons (Asia) Singapore. 4th edition.
4. Webster, J. and Weber, R. (2007). Introduction to Fungi, Cambridge University Press, Cambridge. 3rd edition.
5. Sethi, I.K. and Walia, S.K. (2011). Text book of Fungi and Their Allies, Macmillan Publishers India Ltd.
6. Mehrotra, R. S.(2011). Plant Pathology. Tata Mc Graw-Hill Publishing Company Limited, New Delhi

Core Paper IV

ARCHEGONIATAE

Unit-I

- (i) Introduction: Unifying features of archegoniates; Transition to land habit; Alternation of generations. General characteristics; Origin of land plants and Adaptations to land habit;
- (ii) Bryophytes : Origin and Classification; Range of thallus organization. Classification (up to family). Structure, Reproduction and evolutionary trends in *Riccia*, *Marchantia*, *Anthoceros* and *Funaria* (developmental stages not included). Ecological and economic importance of bryophytes.

Unit-II

Pteridophytes: General characteristics, classification. Classification (up to family), morphology, anatomy and reproduction of *Psilotum*, *Selaginella*, *Equisetum*, *Pteris* and *Marsilea*. Apogamy, and apospory, heterospory and seed habit, telome theory, stellar evolution and economic importance.

Unit-III

Gymnosperms: General characteristics, classification (up to family), morphology, anatomy and reproduction of *Cycas*, *Pinus*, *Ginkgo* and *Gnetum*. (Developmental details not to be included). Ecological and economic importance.

Unit-IV

Palaeobotany: Geological time scale, fossils and fossilization process. Morphology, anatomy and affinities of Rhynia, Calamites, Lepidodendron, Lyginopteris, Cycadeoidea and Williamsonia.

PRACTICAL

- (i) Morphology, anatomy and reproductive structures of *Riccia*, *Marchantia*, *Anthoceros*, *Funaria*.
- (ii) *Psilotum*- Study of specimen, transverse section of synangium (permanent slide).
- (iii) *Selaginella*- Morphology, whole mount of leaf with ligule, transverse section of stem, whole mount of strobilus, whole mount of microsporophyll and megasporophyll (temporary slides), longitudinal section of strobilus (permanent slide).
- (iv) *Equisetum*- Morphology, transverse section of internode, longitudinal section of strobilus, transverse section of strobilus, whole mount of sporangiophore, whole mount of spores (wet and dry) (temporary slide), transverse section of rhizome (permanent slide).
- (v) Study of temporary preparations and permanent slides of *Marsilea*.
- (vi) *Pteris*- Morphology, transverse section of rachis, vertical section of sporophyll, whole mount of sporangium, whole mount of spores (temporary slides), transverse section of rhizome, whole mount of prothallus with sex organs and young sporophyte (permanent slide).
- (vii) *Cycas*- Morphology (coralloid roots, bulbil, leaf), whole mount of microsporophyll and megaspore, T.S root, leaflet, rachis
- (viii) *Pinus*- Morphology (long and dwarf shoots, whole mount of dwarf shoot, male and female cones), T.S. Needle, stem, L.S. male cone, whole mount of microsporophyll, whole mount of Microspores (temporary slides), L.S.of female cone.
- (ix) *Gnetum*- Morphology (stem, male & female cones), transverse section of stem, vertical section of ovule (permanent slide).
- (x) Study of some fossil slides / photographs as per theory.

Text Books:

1. Vasistha, B. R. (2017) Botany for Degree student, Bryophyta, S. Chand Publication, New Delhi.
2. Singh, V., Pandey, P.C. and Jain, D.K. (2017). Archegoniate, Rastogi Publication, Meerut.

Reference Books:

1. Acharya, B. S. (2017), Archegoniate, Kalyani Publishers, New Delhi.
2. Vashistha, P.C., Sinha, A.K., Kumar, A. (2010). Pteridophyta. S. Chand. New Delhi, India.
3. Bhatnagar, S.P. & Moitra, A. (1996). Gymnosperms. New Age International (P) Ltd Publishers, New Delhi, India.
4. Raven, P.H., Johnson, G.B., Losos, J.B., Singer, S.R. (2005). Biology. Tata McGraw Hill, Delhi.

Core Paper V
ANATOMY OF ANGIOSPERMS

Unit-I

- (i) Introduction and scope of Plant Anatomy: Applications in systematics, forensics and pharmacognosy.
- (ii) Tissues: Classification of tissues; Simple and complex tissues (no phylogeny); cyto-differentiation of tracheary elements and sieve elements; Pits and plasmodesmata; Cell wall ingrowths and transfer cells, adcrustation and incrustation, Ergastic substances.

Unit-II

- (i) Stem: Organization of shoot apex (Apical cell theory, Histogen theory, Tunica Corpus theory, continuing meristematic residue, cyto-histological zonation); Types of vascular bundles; Anatomy of dicot and monocot stem. Vascular Cambium: Structure, function and seasonal activity of cambium; secondary growth in stem (normal and anomalous). Root Stem transition.
- (ii) Leaf: Anatomy of dicot and monocot leaf, Kranz anatomy.

Unit-III

- (i) Root: Organization of root apex (Apical cell theory, Histogen theory, Korper-Kappe theory); Quiescent centre; Root cap; Anatomy of dicot and monocot root; Endodermis, exodermis and origin of lateral root. Secondary growth in roots.
- (ii) Wood: Axially and radially oriented elements; Types of rays and axial parenchyma; Cyclic aspects and reaction wood; Sapwood and heartwood; Ring and diffuse porous wood; Early and late wood, tyloses; Dendrochronology.
- (iii) Periderm: Development and composition of periderm, rhytidome and lenticels.

Unit –IV

- (i) Adaptive and Protective Systems Epidermal tissue system, cuticle, epicuticular waxes, trichomes (uni- and multicellular, glandular and nonglandular: two examples of each), stomata (classification); Anatomical adaptations of xerophytes and hydrophytes.
- (ii) Secretory System: Hydathodes, cavities, lithocysts and laticifers.
- (iii) Mechanical tissue system.

PRACTICAL

1. Study of distribution and types of parenchyma, collenchyma and sclerenchyma, Xylem: Tracheary elements-tracheids, vessel elements; thickenings; perforation plates; xylem fibres, Phloem: Sieve tubes-sieve plates; companion cells; phloem fibres.
2. Wood: ring porous; diffuse porous; tyloses; heart- and sapwood.
3. Epidermal system: cell types, stomata types; trichomes: non-glandular and glandular.
4. Root: monocot, dicot, secondary growth.
5. Stem: monocot, dicot - primary and secondary growth (normal and anomalous); periderm; lenticels.

6. Leaf: isobilateral, dorsiventral, C₄ leaves (Kranz anatomy).
7. Ecological anatomy.

Text Books:

1. Singh, V., Pandey, P.C. and Jain, D.K. (2017). Anatomy of Angiosperms, Rastogi Publication, Meerut.

Reference Books:

1. Eames, A.J. and Mc Daniels, L.H., (1953). An introduction to plant anatomy, Tata Mc Grow Hills, New Delhi
2. Esau, K. (1977). Anatomy of Seed Plants. John Wiley & Sons, Inc., Delhi.
3. Tayal, M. S. (2012) Plant Anatomy Rajpal and Sons, New Delhi
4. Mishra, B. K. (2017). Anatomy of Angiosperms, Kalyani Publishers, New Delhi.
5. Pandey, B. P. (2017) Plant Anatomy, S. Chand Publication, New Delhi.

Core Paper VI

ECONOMIC BOTANY

Unit-I

- (i) Origin of Cultivated Plants: Concept of Centres of Origin, their importance with reference to Vavilov's work. Examples of major plant introductions; Crop domestication and loss of genetic diversity; evolution of new crops/varieties, importance of germplasm diversity.
- (ii) Cereals: Cultivation and brief account of Wheat, Rice and millets.
- (iii) Legumes: General account, importance to man and ecosystem.
- (iv) Sugars & Starches: Morphology, cultivation and processing of sugarcane, products and by-products of sugarcane industry. Potato – morphology, cultivation, propagation & uses.

Unit-II

- (i) Spices: Listing of important spices, their family and part used, economic importance with special reference to fennel, saffron, clove and black pepper Beverages: Tea, Coffee (morphology, processing & uses)
- (ii) Drug-yielding plants: Therapeutic and habit-forming drugs with special reference to Cinchona, Digitalis, Papaver and Cannabis.
- (iii) Tobacco: Tobacco (Morphology, processing, uses and health hazards)

Unit-III

- (i) Oils & Fats: General description, classification, extraction, their uses and health implications groundnut, coconut, linseed and *Brassica* (Botanical name, family & uses)
- (i) Essential Oils: General account, extraction methods, comparison with fatty oils &

their uses.

Unit-IV

- (i) Natural Rubber: Para-rubber: tapping, processing and uses.
- (ii) Timber plants: General account with special reference to teak and pine. Fibers: Classification based on the origin of fibers, Cotton and Jute (morphology, extraction and uses).

PRACTICAL

- (i) Cereals: Rice (habit sketch, study of paddy and grain, starch grains).
- (ii) Legumes: Soya bean/moong bean/black gram, Groundnut, (habit, fruit, seed structure, micro-chemical tests).
- (iii) Sugars & Starches: Sugarcane (habit sketch; cane juice- micro-chemical tests), Potato (habit sketch, tuber morphology, T.S. tuber to show localization of starch grains, starch grains, micro-chemical tests).
- (iv) Spice and Beverages: clove, black pepper, Tea (plant specimen, tea leaves), Coffee (plant specimen, beans).
- (v) Oils & Fats: Groundnut, Mustard—plant specimen, seeds; tests for fats in crushed seeds.
- (vi) Drug-yielding plants: Specimens of *Digitalis*, *Papaver* and *Cannabis*.
- (vii) Woods: *Tectona*, *Pinus*/Sal: Specimen, Section of young stem.
- (viii) Fiber-yielding plants: Cotton (specimen, whole mount of seed to show lint and fuzz; whole mount of fiber and test for cellulose), Jute (specimen, transverse section of stem, test for lignin on transverse section of stem and fiber).

Text Books:

1. B. P. Pandey, (2017) Economic Botany. S. Chand Publication, New Delhi.

Reference Books:

1. Kochhar, S.L. (2012). Economic Botany in Tropics, MacMillan & Co. New Delhi, India.
2. Samba Murty, A.V.S.S. and Subrahmanyam, N.S. (2011). Text Book of Modern Economic Botany, CBS Publishers and Distributors, New Delhi.
3. Hill, Albert F. Economic Botany, Tata Mc Grow Hill Publishing Company, Ltd. New Delhi.
4. Wickens, G.E. (2001). Economic Botany: Principles & Practices. Kluwer Academic Publishers, The Netherlands.
5. Singh, V., Pandey, P.C. and Jain, D.K. (2017). Economic Botany, Rastogi Publication, Meerut.
6. Baruah, B. (2017). Economic Botany, Kalyani Publishers, New Delhi.

Core Paper VII

GENETICS

Unit-I

- (i) Mendelian genetics and its extension Mendelism: History; Principles of inheritance; Chromosome theory of inheritance; Autosomes and sex chromosomes; Incomplete dominance and codominance; Multiple alleles, Lethal alleles, Interaction of genes, Pleiotropy, Recessive and Dominant traits, Polygenic inheritance.
- (ii) Extrachromosomal Inheritance: Chloroplast mutation: Variegation in Four o'clock plant; Mitochondrial mutations in yeast; cytoplasmic male sterility; Maternal effects-shell coiling in snail; Infective heredity- Kappa particles in Paramecium.

Unit-II

Linkage, crossing over and chromosome mapping: Linkage and crossing over-Cytological basis of crossing over; Recombination frequency, two factor and three factor crosses; Interference and coincidence; Numericals based on gene mapping; Sex Linkage.

Unit-III

- (i) Variation in chromosome number and structure: Deletion, Duplication, Inversion, Translocation, Position effect, Euploidy and Aneuploidy
- (ii) Gene mutations: Types of mutations; Molecular basis of Mutations; Mutagens – physical and chemical (Base analogs, deaminating, alkylating and intercalating agents); Detection of mutations: CIB method. Role of Transposons in mutation. DNA repair mechanisms.

Unit-IV

- (i) Fine structure of gene: Classical vs. molecular concepts of gene; Cis-Trans complementation test for functional allelism; Structure of Phage T4, rII Locus.
- (i) Population and Evolutionary Genetics: Gene pool, Allele frequencies, Genotype frequencies, Hardy-Weinberg Law, role of natural selection, mutation, genetic drift. Genetic variation and Speciation.

PRACTICAL

1. Analysis of allelic and genotypic frequencies.
2. Mendel's laws through seed ratios. Laboratory exercises in probability and chi-square analysis.
3. Chromosome mapping using test cross data.
4. Pedigree analysis for dominant and recessive autosomal and sex linked traits.
5. Incomplete dominance and gene interaction through seed ratios (9:7, 9:6:1, 13:3, 15:1, 12:3:1, 9:3:4).
6. Blood Typing: ABO groups & Rh factor.

7. Chromosome anomaly : Translocation Ring, Laggards and Inversion Bridge, break etc (through photographs).

Text Books:

1. Singh B. D. (2017). Fundamental of Genetics, Kalyani Publishers, New Delhi.
2. Gupta P. K. (2017). Genetics, Rastogi Publication, Meerut.

Reference Books:

1. Gardner, E.J., Simmons, M.J., Snustad, D.P. (1991). Principles of Genetics, John Wiley & Sons, India. 8th edition.
2. Sinnot, E.W., Dunn, L.C. and Dobzhansky, T. (1985) Principles of Genetics, Tata Mc Grow Hill, New Delhi
3. Klug, W.S., Cummings, M.R., Spencer, C.A. (2012). Concepts of Genetics. Benjamin Cummings, U.S.A. 10th edition.
4. Griffiths, A.J.F., Wessler, S.R., Carroll, S.B., Doebley, J. (2010). Introduction to Genetic Analysis. W.H. Freeman and Co., U.S.A. 10th edition.
5. Strickberger, M.W. Genetics, Pearson Publishers, 3rd Edition
6. Rastogi V. B. (2017). Genetics, Kedar Nath & Ram Nath, Meerut

Core Paper VIII

MOLECULAR BIOLOGY

Unit-I

Nucleic acids: Carriers of genetic information: Historical perspective; DNA as the carrier of genetic information (Griffith's, Hershey & Chase, Avery, McLeod & McCarty), Types of genetic material, denaturation and renaturation, cot curves. Organization of DNA and structure of RNA- Prokaryotes, Viruses, Eukaryotes, Fraenkel-Conrat's experiment. Organelle DNA - mitochondria and chloroplast DNA. The Nucleosome -Chromatin structure- Euchromatin, Heterochromatin- Constitutive and Facultative heterochromatin.

Unit-II

- (i) The replication of DNA: Chemistry of DNA synthesis (Kornberg's discovery); General principles – bidirectional, semi-conservative and semi discontinuous replication, RNA priming; Various models of DNA replication, including rolling circle, θ (theta) mode of replication, replication of linear ds-DNA, replication of the 5' end of linear chromosome; Enzymes involved in DNA replication.
- (ii) Central dogma and genetic code: Key experiments establishing-The Central Dogma (Adaptor hypothesis and discovery of mRNA template), Genetic code (deciphering & salient features)
- (iii) Processing and modification of RNA: Split genes-concept of introns and exons, removal of introns, spliceosome machinery, splicing pathways, group I & group II intron splicing, alternative splicing eukaryotic mRNA processing (5' cap, 3'

polyA tail); Ribozymes, exon shuffling; RNA editing and mRNA transport.

Unit-III

Mechanism of Transcription: Transcription in prokaryotes and eukaryotes; Regulation of transcription in prokaryotes and eukaryotes: Principles of transcriptional regulation; Prokaryotes: Operon concept- Regulation of lactose metabolism and tryptophan synthesis in *E.coli*. Eukaryotes: transcription factors, heat shock proteins, steroids and peptide hormones; Gene silencing

Unit-IV

Translation (Prokaryotes and eukaryotes): Ribosome structure and assembly; Charging of tRNA, aminoacyl tRNA synthetases; Various steps in protein synthesis, proteins involved in initiation, elongation and termination of polypeptides; Fidelity of translation; Inhibitors of protein synthesis; Post-translational modifications of proteins.

PRACTICAL

1. Preparation of LB medium and raising *E. coli*.
2. Isolation of genomic DNA from suitable plant material.
3. RNA estimation by orcinol method.
4. DNA estimation by diphenylamine reagent/UV Spectrophotometry.
5. Photographs establishing nucleic acid as genetic material (Messelson and Stahl's, Avery et al, Griffith's, Hershey & Chase's and Fraenkel & Conrat's experiments)
6. Study of Barr body from buccal smear preparation.

Text Books:

1. Gupta P. K. (2017). Molecular Biology, Rastogi Publication, Meerut.

Reference Books:

1. Watson, J.D., Baker, T.A., Bell, S.P., Gann, A., Levine, M., Losick, R. (2007). Molecular Biology of the Gene, Pearson Benjamin Cummings, CSHL Press, New York, U.S.A. 6th edition.
2. Snustad, D.P. and Simmons, M.J. (2010). Principles of Genetics. John Wiley and Sons Inc., U.S.A. 5th edition.
3. Klug, W.S., Cummings, M.R., Spencer, C.A. (2009). Concepts of Genetics. Benjamin Cummings. U.S.A. 9th edition.
4. Sheeler, P. and Bianchi, D.E. (2009) Molecular Biology of the Cell, Willey Publisher, New Delhi
5. Griffiths, A.J.F., Wessler, S.R., Carroll, S.B., Doebley, J. (2010). Introduction to Genetic Analysis. W.H. Freeman and Co., U.S.A. 10th edition.
6. Alberts, B. et al. 2014. Molecular Biology of the cell Garland Science. 6th Edition
7. Power, C. B. (2017) Cell Biology, Himalaya Publishing House, New Delhi

8. Sahu, A.C. (2017). Essentials of Molecular Biology, Kalynai Publishers, New Delhi.

Core Paper IX

PLANT ECOLOGY & PHYTOGEOGRAPHY

Unit-I

- (i) Introduction Concept of ecology, Autoecology, Synecology, system ecology, Levels of organization. Inter-relationships between the living world and the environment, the components of environment, concept of hydrosphere and lithosphere and dynamism, homeostasis.
- (ii) Light, temperature, wind and fire: Variations; adaptations of plants to their variation.

Unit-II

- (i) Soil: Formation; Composition; Physical; Chemical and Biological components; Soil profile; Role of climate in soil development.
- (ii) Water: Importance: States of water in the environment; Atmospheric moisture; Precipitation types (rain, fog, snow, hail, dew); Hydrological Cycle; Water in soil; Water table.

Unit-III

Biotic interactions and Population ecology: Characteristics and Dynamics.

Plant communities: Concept of ecological amplitude; Habitat and niche; Characters: analytical and synthetic; Ecotone and edge effect; Dynamics: succession – processes, types; climax concepts.

Unit-IV

- (i) Ecosystems: Structure; Processes; Trophic organisation; Food chains and Food webs; Ecological pyramids.
- (ii) Functional aspects of ecosystem: Principles and models of energy flow; Production and productivity; Ecological efficiencies; Biogeochemical cycles; Cycling of Carbon, Nitrogen and Phosphorus.
- (iii) Phytogeography: Principles; Continental drift; Theory of tolerance; Endemism; Phytogeographical division of India; Vegetation of Odisha.

PRACTICAL

1. Determination of pH of various soil and water samples (pH meter, universal indicator/Lovibond comparator and pH paper)
2. Analysis for carbonates, chlorides, nitrates, sulphates, organic matter and base deficiency from two soil samples by rapid field tests.
3. Determination of dissolved oxygen of water samples from polluted and unpolluted sources.
4. Study of morphological adaptations of hydrophytes, xerophytes, halophytes (two

- each).
5. Determination of minimal quadrat size for the study of herbaceous vegetation in the college campus, by species area curve method (species to be listed).
 6. Quantitative analysis of herbaceous vegetation for frequency, density and abundance in the college campus.
 7. Field visit to familiarize students with ecology of different sites.

Text Books:

1. Sharma, P.D. (2017). Fundamentals of Ecology. Rastogi Publications, Meerut, India.

Reference Books:

1. Odum, E.P. (2005). Fundamentals of ecology. Cengage Learning India Pvt. Ltd., New Delhi. 5th edition.
2. Singh, J.S., Singh, S.P., Gupta, S. (2006). Ecology Environment and Resource Conservation. Anamaya Publications, New Delhi, India.
3. Wilkinson, D.M. (2007). Fundamental Processes in Ecology: An Earth Systems Approach. Oxford University Press. U.S.A.
4. Kormondy, E.J. (1996). Concepts of ecology. PHI Learning Pvt. Ltd., Delhi, India. 4th edition.
5. Santra, S. C. (2015) Environmental Science. New Central Book Agency (P) Ltd. Kolkata.
6. Das M. C. and Das S. P. (2009). Fundamental of Ecology. Tata McGraw Hill, New Delhi.
7. Shukla R.S. and Chandel P.S. (2016). A Text Book of Plant Ecology. S Chand Publication, New Delhi

Core Paper X PLANT

SYSTEMATICS

Unit-I

Plant identification, Classification, Nomenclature; Biosystematics. Identification: Field inventory; Functions of Herbarium; Important herbaria and botanical gardens of the world and India; Virtual herbarium; E-flora; Documentation: Flora, Monographs, Journals; Keys: Single access and Multi-access

Unit-II

Taxonomic hierarchy: Concept of taxa (family, genus, species); Categories and taxonomic hierarchy; Species concept (taxonomic, biological, evolutionary).

Botanical nomenclature: Principles and rules (ICN); Ranks and names; Typification, author citation, valid publication, rejection of names, principle of priority and its limitations; Names of hybrids.

Unit-III

- (i) Systematics- an interdisciplinary science: Evidence from palynology, cytology, phytochemistry and molecular data.
- (ii) Systems of classification: Major contributions of Theophrastus, Bauhin, Tournefort, Linnaeus, Adanson, de Candolle, Bessey, Hutchinson, Takhtajan and Cronquist; Classification systems of Bentham and Hooker (up to series) and Hutchinson (up to series); Brief reference of Angiosperm Phylogeny Group (APG III) classification.

Unit-IV

Phylogeny of Angiosperms: Terms and concepts (primitive and advanced, homology and analogy, parallelism and convergence, monophyly, Paraphyly, polyphyly and clades). Origin & evolution of angiosperms; co- evolution of angiosperms and animals; methods of illustrating evolutionary relationship (phylogenetic tree, cladogram).

Families of Angiosperms : Descriptive studies of Magnoliaceae, Rosaceae, Rubiaceae, Poaceae, Orchidaceae, Musaceae, Acanthaceae, Apocynaceae, Asclepiadaceae, Lamiaceae.

PRACTICAL

- (i) Study of vegetative and floral characters of available materials of the families included in theory syllabus (Description, V.S. flower, section of ovary, floral diagram/s, floral formula/e and systematic position according to Bentham & Hooker's system of classification).
- (ii) Field visit, plant collection and herbarium preparation and submission. Mounting of properly dried and pressed specimen of at least fifteen wild plants with herbarium label (to be submitted in the record book)

Text Books:

1. Sharma O. P. (2009) Plant Taxonomy, Tata Mc Grow Hill, New Delhi

Reference Books:

1. Singh, G. (2012). *Plant Systematics: Theory and Practice*. Oxford & IBH Pvt. Ltd., New Delhi. 3rd edition.
2. Jeffrey, C. (1982). *An Introduction to Plant Taxonomy*. Cambridge University Press, Cambridge.
3. Judd, W.S., Campbell, C.S., Kellogg, E.A., Stevens, P.F. (2002). *Plant Systematics-A Phylogenetic Approach*. Sinauer Associates Inc., U.S.A. 2nd edition.
4. Saxena, H. O. and Brahman, M.. *The Flora of Orissa*, CSIR Publication.
5. Bose T. K. (2009). *Trees of the World*, Regional Plant Resource Centre, Bhubaneswar, Odisha, India
6. Radford, A.E. (1986). *Fundamentals of Plant Systematics*. Harper and Row, New York.
7. Hanes, H. H. (2009). *Botany of Bihar and Orissa*,

8. Mohanty, C. R. (2017). Text Book of Plant Systematics, Kalynai Publisher, New Delhi.
9. Subrahmainayam, M. S. (2011) Modern Plant Taxonomy, Vikash Publishing House, New Delhi
10. Pandey, B. P., (2017). Taxonomy of Angiosperm. S. Chand Publication.

Core Paper XI REPRODUCTIVE

BIOLOGY OF ANGIOSPERMS

Unit-I

- (i) Introduction: History and scope.
- (ii) Anther: Anther wall: Structure and functions, micro-sporogenesis, callose deposition and its significance.
- (iii) Pollen biology: Micro-gametogenesis; Pollen wall structure, MGU (male germ unit) structure, NPC system; Palynology and scope (a brief account); Pollen wall proteins; Pollen viability, storage and germination; Abnormal features: Pseudomonads, polyads, massulae, pollinia.

Unit-II

Ovule: Structure; Types; Special structures—endothelium, obturator, aril, caruncle and hypostase; Female gametophyte— mega-sporogenesis and mega-gametogenesis; Types and ultrastructure of different mature embryo sacs (Details of *Polygonum* type), Developmental pattern of mono-, bi- and tetrasporic embryo sacs.

Unit-III

- (i) Pollination and fertilization: Pollination types and significance; adaptations; structure of stigma and style; path of pollen tube in pistil; double fertilization.
- (ii) Self incompatibility: Basic concepts; Methods to overcome self- incompatibility: mixed pollination, bud pollination, stub pollination; Intraovarian and *in vitro* pollination; Modification of stigma surface.

Unit-IV

- (i) Endosperm: development, structure and functions
- (ii) Embryo: Types of embryogeny; General pattern of development of dicot and monocot embryo; Suspensor: structure and functions; Embryo- endosperm relationship; Nutrition of embryo; Embryo development in *Paeonia*.
- (iii) Seed: Structure, importance and dispersal mechanisms
- (iv) Polyembryony and apomixes: Introduction; Classification; Causes and applications.

PRACTICAL

- (i) Anther: Wall and its ontogeny; Tapetum (amoeboid and glandular); MMC, spore tetrads, uninucleate, bicelled and dehisced anther stages through slides/micrographs, male germ unit (MGU) through photographs and schematic

representation.

- (ii) Pollen grains: Fresh and acetolyzed showing ornamentation and aperture, psuedomonads, polyads, pollinia (slides/photographs, fresh material), ultrastructure of pollen wall (micrograph); Pollen viability: Tetrazolium test, Germination: Calculation of percentage germination in different media using hanging drop method.
- (iii) Ovule: Types-anatropous, orthotropous, amphitropous/ campylotropous, circinotropous, unitegmic, bitegmic; Tenuinucellate and crassinucellate; Special structures: Endothelium, obturator, hypostase, caruncle and aril (permanent slides/specimens/photographs). Female gametophyte through permanent slides/photographs: Types, ultrastructure of mature egg apparatus.
- (iv) Embryogenesis: Study of development of dicot embryo through permanent slides/photographs; dissection of developing seeds for embryos at various developmental stages; Study of suspensor through electron micrographs.
- (v) Tracing the path of pollen tube.
- (vi) Study of haustorial endosperm.

Text Books:

1. Singh, V., Pandey, P.C, and Jain, D.K. (2017). Reproductive Biology of Angiosperms, Rastogi Publications, Meerut

Reference Books:

1. Maheswari, P. (2009). Embryology of Angiosperms.
2. Shivanna, K.R. (2003). Pollen Biology and Biotechnology. Oxford and IBH Publishing Co. Pvt. Ltd. Delhi.
3. Raghavan, V. (2000). Developmental Biology of Flowering plants, Springer, Netherlands.
4. Johri, B.M. I (1984). Embryology of Angiosperms, Springer-Verlag, Netherlands.
5. Bhojwani, S.S. and Bhatnagar, S.P. (2011). The Embryology of Angiosperms, Vikas Publishing House. Delhi. 5th edition.
6. Mishra, B. K. (2017). Reproductive Biology of Angiosperms, Kalyani Publishers, New Delhi.

Core Paper XII

PLANT PHYSIOLOGY

Unit-I

- (i) Plant water relationship: Water Potential and its components, plasmolysis and imbibitions, water absorption by roots, aquaporins, pathway of water movement, symplast, apoplast, trans-membrane pathways, root pressure, guttation. Ascent of sap—cohesion-tension theory. Transpiration and factors affecting transpiration, anti-transpirants, mechanism of stomatal movement.

- (ii) Translocation in the phloem: Experimental evidence in support of phloem as the site of sugar translocation. Pressure–Flow Model; Phloem loading and unloading; Source–sink relationship.

Unit-II

- (i) Mineral nutrition: Essential and beneficial elements, macro and micronutrients, methods of study and use of nutrient solutions, criteria for essentiality, mineral deficiency symptoms, roles of essential elements, chelating agents.
- (ii) Nutrient Uptake: Soil as a nutrient reservoir, transport of ions across cell membrane, passive absorption, electrochemical gradient, facilitated diffusion, active absorption, role of ATP, carrier systems, proton ATPase pump and ion flux, uniport, co-transport, symport, and antiport.

Unit-III

Plant growth regulators: Discovery, chemical nature (basic structure), bioassay and physiological roles of Auxin, Gibberellins, Cytokinin, Absciscic acid, Ethylene. Brassinosteroids and Jasmonic acid.

Unit-IV

- (i) Physiology of flowering: Photoperiodism, flowering stimulus, florigen concept, vernalization, seed dormancy. Senescence: Types and causes.
- (ii) Phytochrome: Discovery, chemical nature, role of phytochrome in photomorphogenesis, low energy responses (LER) and high irradiance responses (HIR), mode of action.

PRACTICAL

1. Determination of osmotic potential of plant cell sap by plasmolytic method.
2. Determination of water potential of given tissue (potato tuber) by weight method.
3. Study of the effect of wind velocity and light on the rate of transpiration in excised twig/leaf.
4. Calculation of stomatal index and stomatal frequency from the two surfaces of leaves of a mesophyte and xerophyte.
5. To calculate the area of an open stoma and percentage of leaf area open through stomata in a mesophyte and xerophyte (both surfaces).
6. To study the phenomenon of seed germination (effect of light).
7. To study the induction of amylase activity in germinating barley grains
8. To demonstrate suction due to transpiration.
9. Measurement of relation between transpiration and transpiring surface.
10. Measurement of cuticular resistance to transpiration.

Text Books:

1. Sinha, R. K. (2015). Modern Plant Physiology, Narosa Publishing House, New

Delhi.

Reference Books:

1. Hopkins, W.G. and Huner, A. (2008). Introduction to Plant Physiology. John Wiley and Sons. U.S.A. 4th edition.
2. Taiz, L., Zeiger, E., MØller, I.M. and Murphy, A (2015). Plant Physiology and Development. Sinauer Associates Inc. USA. 6th edition.
3. Bajracharya D. (1999). Experiments in Plant Physiology-A Laboratory Manual. Narosa Publishing House, New Delhi.
4. Salisbury, F. B. and Ross, C. W. Plant Physiology Wadsworth Publishing Company, California
5. Sahoo, A. C. (2018). Outlines of Plant Physiology Kalynai Publishers, New Delhi.
6. Srivastava, N. K.. (2017). Plant Physiology, Rastogi Publications, Meerut.
7. Pandey and Sinha (2011). Plant Physiology, Vikash Publishing House, New Delhi

Core Paper XIII

PLANT METABOLISM

Unit-I

- (i) Concept of metabolism: Introduction, anabolic and catabolic pathways, regulation of metabolism, role of regulatory enzymes (allosteric ,covalent modulation and Isozymes).
- (ii) Mechanisms of signal transduction: Calcium, phospholipids, cGMP, NO.

Unit-II

Carbon assimilation: Historical background, photosynthetic pigments, role of photosynthetic pigments, Red drop and Emerson Enhancement Effect, antenna molecules and reaction centres, photochemical reactions, photosynthetic electron transport, PSI, PSII, Q cycle, C₃, C₄ pathways; Crassulacean acid metabolism; Factors affecting CO₂ reduction. Photorespiration.

Unit-III

- (i) Carbon Oxidation: Glycolysis, fate of pyruvate, regulation of glycolysis, oxidative pentose phosphate pathway, oxidative decarboxylation of pyruvate, regulation of PDH, NADH shuttle; TCA cycle, amphibolic role, anaplerotic reactions, regulation of the cycle, mitochondrial electron transport, oxidative phosphorylation, cyanide-resistant respiration, factors affecting respiration.
- (i) ATP-Synthesis: Mechanism of ATP synthesis, substrate level phosphorylation, chemiosmotic mechanism (oxidative and photo- phosphorylation), ATP synthase, Boyers conformational model, Racker's experiment, Jagendorf's experiment; role of uncouplers.

Unit-IV

- (i) Lipid metabolism: Synthesis and breakdown of triglycerides, β -oxidation, glyoxylate cycle, gluco-neogenesis and its role in mobilisation of lipids during seed germination, α oxidation.
- (ii) Nitrogen metabolism: Nitrate assimilation, free living and symbiotic biological nitrogen fixation (examples of legumes and non-legumes); Nitrification, Physiology and biochemistry of nitrogen fixation; Ammonia assimilation and trans-amination.

PRACTICAL

1. Isolation and quantization of photosynthetic pigments.
2. Experimental demonstration of Hill's reaction.
3. To study the effect of light intensity on the rate of photosynthesis.
4. Effect of carbon dioxide on the rate of photosynthesis.
5. To compare the rate of respiration in different parts of a plant.
6. Demonstration of absorption spectrum of photosynthetic pigments.
7. Assay of the enzyme Catalase.
8. Photoreduction of dye by isolated chloroplasts.

Text Books:

1. Gupta, S, K. (2017). Plant Metabolism, Rastogi Publication, Meerut.

Reference Books:

1. Hopkins, W.G. and Huner, A. (2008). Introduction to Plant Physiology. John Wiley and Sons. U.S.A. 4th edition.
2. Taiz, L., Zeiger, E., Møller, I.M. and Murphy, A (2015). Plant Physiology and Development. Sinauer Associates Inc. USA. 6th edition.
3. Harborne, J.B. (1973). Phytochemical Methods. John Wiley & Sons. New York.
4. Sahoo, A. C. (2018). Outlines of Plant Metabolism, Kalynai Publishers, New Delhi.

Core Paper XIV PLANT

BIOTECHNOLOGY

Unit-I

Plant Tissue Culture: Historical perspective; Aseptic tissue culture techniques, Composition of media; Nutrient and hormone requirements (role of vitamins and hormones). Totipotency; Organogenesis; Embryogenesis (somatic and zygotic); Protoplast isolation, culture and fusion; Tissue culture applications (micropropagation, androgenesis, virus elimination, secondary metabolite production, haploids, triploids and hybrids; Cryopreservation; Germplasm Conservation).

Unit-II

Recombinant DNA technology-I: Restriction Endonucleases (History, Types I-IV, biological role and application); Restriction Mapping (Linear and Circular); Cloning Vectors: Prokaryotic (pUC 18 and pUC19, pBR322, Ti plasmid, BAC); Lambda phage, M13 phagemid, Cosmid, Shuttle vector; Eukaryotic Vectors (YAC and briefly PAC, MAC, HAC). Gene Cloning (Recombinant DNA, Bacterial Transformation and selection of recombinant clones, PCR-mediated gene cloning).

Unit-III

Recombinant DNA technology-II: Gene Construct; construction of genomic and cDNA libraries, screening DNA libraries to obtain gene of interest by genetic selection; complementation, colony hybridization; Probes-oligonucleotide, heterologous, Methods of gene transfer- *Agrobacterium*-mediated, Direct gene transfer by Electroporation, Microinjection, Microprojectile bombardment; Selection of transgenics– selectable marker and reporter genes (Luciferase, GUS, GFP).

Unit-IV

Applications of Biotechnology: Pest resistant (Bt-cotton); herbicide resistant plants (RoundUp Ready soybean); Transgenic crops with improved quality traits (Flavr Savr tomato, Golden rice); Improved horticultural varieties (Moondust carnations); Role of transgenics in bioremediation (Superbug); edible vaccines; Industrial enzymes (Aspergillase, Protease, Lipase); Genetically Engineered Products–Human Growth Hormone; Humulin; Biosafety concerns.

PRACTICAL

1. a) Preparation of tissue culture (MS) medium.
(b) Demonstration of *in vitro* sterilization and inoculation methods using leaf and nodal explants of tobacco, *Datura*, *Brassica* etc.
2. Study of another culture through photographs.
3. Preparation of artificial seeds.
4. Study of Bt cotton through photographs.
5. Isolation of plasmid DNA.
6. Gel electrophoresis (demonstration).

Text Books:

1. Chawla, H. S. (2010). Introduction to Plant Biotechnology. Oxford & IBH Publishing Co. Pvt. Ltd., New Delhi.

Reference Books:

1. Bhojwani, S.S. and Razdan, M.K., (1996). Plant Tissue Culture: Theory and Practice. Elsevier Science Amsterdam. The Netherlands.
2. Glick, B.R., Pasternak, J.J. (2003). Molecular Biotechnology- Principles and Applications of recombinant DNA. ASM Press, Washington.

3. Stewart, C.N. Jr. (2008). Plant Biotechnology & Genetics: Principles, Techniques and Applications. John Wiley & Sons Inc. U.S.A.
4. Singh, B. D. (2018). Plant Biotechnology Kalynai Publishers, New Delhi.
5. Gupta, P. K. (2017). Plant Biotechnology, Rastogi Publication, Meerut.
6. Dubey, R. C. (2017). Advanced Biotechnology, S, Chand Publication, New Delhi

Discipline Specific Elective Paper-I

ANALYTICAL TECHNIQUES IN PLANT SCIENCES

Unit-I

Imaging and related techniques: Principles of microscopy; Light microscopy; Fluorescence microscopy; Flow cytometry (FACS); Transmission and Scanning electron microscopy – sample preparation for electron microscopy, cryofixation, negative staining, shadow casting, freeze fracture, freeze etching.

Unit-II

Cell fractionation: Centrifugation: Differential and density gradient centrifugation, sucrose density gradient, CsCl₂ gradient, analytical centrifugation, ultracentrifugation. Radioisotopes: Use in biological research, auto-radiography, pulse chase experiment. Spectrophotometry: Principle and its application in biological research.

Unit-III

Chromatography: Principle; Paper chromatography; Column chromatography, TLC, GLC, HPLC, Ion-exchange chromatography; Molecular sieve chromatography; Affinity chromatography. Characterization of proteins and nucleic acids: Mass spectrometry; X-ray diffraction; X-ray crystallography; Characterization of proteins and nucleic acids; Electrophoresis: AGE, PAGE, SDS-PAGE

Unit-IV

Biostatistics: Statistics, data, population, samples, variables, parameters; Representation of Data: Tabular, Graphical; Measures of frequency and central tendency: Arithmetic mean, mode, median; Measures of dispersion: Range, mean deviation, variance, standard deviation; Chi-square test for goodness of fit. Test of significance: comparison of large, small and paired samples (T-Test) and correlation.

PRACTICAL

1. Study of different microscopic techniques for chromosome study
2. Study of PCR Demonstration.
3. To separate pigments by paper chromatography.
4. To separate phytochemicals by thin layer chromatography.
5. To estimate protein through Lowry's methods.
6. To separate proteins using PAGE.

7. To separate DNA (marker) using AGE.
8. Spectrometric estimation of total sugar by Anthrone method.
9. Chi-square analysis of Mendelian ratio.
10. T-Test.

Text Books:

1. Patil, C. S. (2017). Advanced Analytical Techniques, ABE Books, New Delhi.

Reference Books:

1. Plummer, D.T. (1996). An Introduction to Practical Biochemistry. Tata McGraw-Hill Publishing Co. Ltd. New Delhi. 3rd edition.
2. Ruzin, S.E. (1999). Plant Micro technique and Microscopy, Oxford University Press, New York. U.S.A.
3. Ausubel, F., Brent, R., Kingston, R. E., Moore, D.D., Seidman, J.G., Smith, J.A., Struhl, K. (1995). Short Protocols in Molecular Biology. John Wiley & Sons. 3rd edition.
4. Zar, J.H. (2012). Biostatistical Analysis. Pearson Publication. U.S.A. 4th edition.
5. Aneja, K. R. (2014). Laboratory manual of microbiology and biotechnology, Medtech, New Delhi

Discipline Specific Elective Paper-II**NATURAL RESOURCE MANAGEMENT****Unit-I**

- (i) Natural resources: Definition and types.
- (ii) Sustainable utilization :Concept, approaches (economic, ecological and socio-cultural).
- (iii) Land: Utilization (agricultural, horticultural, silvicultural); Soil degradation and management.
- (iv) Water: Fresh water (rivers, lakes, groundwater, water harvesting technology, rain water storage and utilization).

Unit-II

Biological Resources: Biodiversity-definition and types; Significance; Threats; Management strategies; Bioprospecting; IPR; CBD; National Biodiversity Action Plan).

Forests: Definition, Cover and its significance (with special reference to India); Major and minor forest products; Depletion; Management.

Unit-III

- (i) Energy: Renewable and non-renewable sources of energy-solar, wind, tidal, geothermal and bioenergy resources.
- (ii) Contemporary practices in resource management: EIA, GIS, Participatory Resource Appraisal, Ecological Footprint with emphasis on carbon footprint.

Unit-IV

Resource Accounting; Waste management. National and international efforts in resource management and conservation

PRACTICAL

- i. Estimation of solid waste generated by a domestic system (biodegradable and non-biodegradable) and its impact on land degradation.
- ii. Collections of data on forest cover of specific area.
- iii. Measurement of dominance of woody species by DBH (diameter at breast height) method.
- iv. Calculation and analysis of ecological footprint.
- v. Ecological modeling.
- vi. Estimation of soil moisture content and soil texture.
- vii. Estimation of soil porosity
- viii. Estimation of soil water-holding capacity.
- ix. Estimation of soil organic matter and soil carbon

Text Books:

1. Pandey, B. W. 2005. Natural Resource Management. Mittal Publication, New Delhi

Reference Books:

1. Vasudevan, N. (2006). Essentials of Environmental Science. Narosa Publishing House, New Delhi.
2. Singh, J. S., Singh, S.P. and Gupta, S. (2006). Ecology, Environment and Resource Conservation. Anamaya Publications, New Delhi.
3. Rogers, P.P., Jalal, K.F. and Boyd, J.A. (2008). An Introduction to Sustainable Development. Prentice Hall of India Private Limited, New Delhi.

Discipline Specific Elective Paper-III

HORTICULTURAL PRACTICES AND POST-HARVEST TECHNOLOGY

Unit-I

- (i) Introduction: Scope and importance, Branches of horticulture; Role in rural economy and employment generation; Importance in food and nutritional security; Urban horticulture and ecotourism.
- (ii) Ornamental plants: Types, classification (annuals, perennials, climbers and trees); Identification and salient features of some ornamental plants [rose, marigold, gladiolus, carnations, orchids, poppies, gerberas, tuberose, sages, cacti and succulents (*Opuntia*, *Agave* and spurge)]

Unit-II

- (i) Fruit and vegetable crops: Production, origin and distribution; Description of plants and their economic products; Management and marketing of vegetable and fruit crops.

- (i) Horticultural techniques: Application of manure, fertilizers, nutrients and PGRs; Weed control; Biofertilizers, biopesticides; Irrigation methods (drip irrigation, surface irrigation, furrow and border irrigation); Hydroponics; Propagation Methods: asexual (grafting, cutting, layering, budding), sexual (seed propagation), Scope and limitations.
- (ii) Landscaping and garden design :Planning and layout (parks and avenues); gardening traditions - Ancient Indian, European, Mughal and Japanese Gardens; Urban forestry; policies and practices.

Unit-III

- (i) Post-harvest technology: Importance of post harvest technology in horticultural crops; Evaluation of quality traits; Harvesting and handling of fruits, vegetables and cut flowers; Principles, methods of preservation and processing; Methods of minimizing losses during storage and transportation;
- (ii) Disease control and management : Field and post-harvest diseases; Identification of deficiency symptoms; remedial measures and nutritional management practices; Crop sanitation; IPM strategies (genetic, biological and chemical methods for pest control); Quarantine practices;

Unit-IV

Horticultural crops - conservation and management: Documentation and conservation of germplasm; Role of micropropagation and tissue culture techniques; Varieties and cultivars of various horticultural crops; IPR issues; National, international and professional societies and sources of information on horticulture.

PRACTICAL

- i. Identification and description of salient features of ornamental plants included in the syllabus.
- ii. Horticultural techniques (Drip irrigation, surface irrigation, furrow and border irrigation).
- iii. Study of practice of asexual propagation methods (grafting, cutting, layering, budding)
- iv. Planning and layout of parks and avenues
- v. Handling of harvested fruits, vegetables and cut flowers
- vi. Methods of fruit preservation
- vii. Basic tissue cultures technique

Text Books:

1. Peter, K. V. (2009). Basics of Horticulture, Kalyani Publishers, New Delhi.

Reference Books:

1. Singh, D. & Manivannan, S. (2009). Genetic Resources of Horticultural Crops. Ridhi International, Delhi, India.
2. Swaminathan, M.S. and Kochhar, S.L. (2007). Groves of Beauty and Plenty: An Atlas

- of Major Flowering Trees in India. Macmillan Publishers, India.
3. NIIR Board (2005). Cultivation of Fruits, Vegetables and Floriculture. National Institute of Industrial Research Board, Delhi.
 4. Kader, A.A. (2002). Post-Harvest Technology of Horticultural Crops. UCANR Publications, USA.
 5. Capon, B. (2010). Botany for Gardeners. 3rd Edition. Timber Press, Portland, Oregon.
 6. Pandey, P. H. (2007). Principles and Practices of Post Harvest Technology, Kalyani Publishers, New Delhi.

Discipline Specific Elective Paper-IV

INDUSTRIAL AND ENVIRONMENTAL MICROBIOLOGY

Unit-I

- (i) Scope of microbes in industry and environment: Bioreactors/Fermenters and fermentation processes: Solid-state and liquid-state (stationary and submerged) fermentations; Batch and continuous fermentations. Components of a typical bioreactor, Types of bioreactors- laboratory.
- (ii) Microbial production of industrial products: Microorganisms involved, media, fermentation conditions, downstream processing and uses; Filtration, centrifugation, cell disruption, solvent extraction, precipitation and ultrafiltration, lyophilization, spray drying.

Unit-II

Microbial enzymes of industrial interest and enzyme immobilization: Microorganisms for industrial applications and hands on screening microorganisms for casein hydrolysis; starch hydrolysis; cellulose hydrolysis. Methods of immobilization, advantages and applications of immobilization, large scale applications of immobilized enzymes (glucose isomerase and penicillin acylase).

Unit-III

Microbes and quality of environment: Distribution of microbes in air; Isolation of microorganisms from soil, air and water.

Microbial flora of water: Water pollution, role of microbes in sewage and domestic waste water treatment systems. Determination of BOD, COD, TDS and TOC of water samples; Microorganisms as indicators of water quality.

Unit-IV

Microbes in agriculture and remediation of contaminated soils: Biological fixation; Mycorrhizae; Bioremediation of contaminated soils. Isolation of root nodulating bacteria, arbuscular mycorrhizal colonization in plant roots.

PRACTICAL

- 1.Principles and functioning of instruments in microbiology laboratory
- 2.Hands on sterilization techniques and preparation of culture media
3. Screening microorganisms for industrial use.
4. Mycorrhiza, arbuscular mycorrhizal colonization in plant roots
5. Determination of BOD, COD, TDS and TOC of water samples;
6. Microorganisms as indicators of water quality

Text Books:

1. P. D. Sharma. (2017) Environmental Microbiology. Rastogi Publications, Meerut.

Suggested Readings

1. Pelzar, M.J. Jr., Chen E.C. S., Krieg, N.R. (2010). Microbiology: An application based approach. Tata McGraw Hill Education Pvt. Ltd., Delhi.
2. Tortora, G.J., Funke, B.R., Case. C.L. (2007). Microbiology. Pearson Benjamin Cummings, San Francisco, U.S.A. 9th edition.
3. Pradipta K. Mohapatra (2008). Text Book of Environmental Microbiology, I. K. International Publishing House, New Delhi
4. A. K. Rath (2018). Industrial and Environmental Microbiology, Kalyani Publishers, New Delhi.

OR

Discipline Specific Elective Paper-IV

DISSERTATION / PROJECT WORK

Identification of problem	Review of Literature	Methodology	Findings	Analysis	Viva-Voce	Total
10	10	10	25	25	20	100

** = Students who score more than $\geq 60\%$ in aggregate are eligible for project work

Generic Elective Paper I A

BIODIVERSITY (MICROBES, ALGAE, FUNGI AND ARCHEGONIATES)

Unit-I

Microbes :Viruses – Discovery, general structure, replication (general account), DNA virus (T-phage); Lytic and lysogenic **cycle**, RNA virus (TMV); Economic importance; Bacteria – Discovery, General characteristics and cell structure; Reproduction – vegetative, asexual and recombination (conjugation, transformation and transduction); Economic importance.

Unit-II

- (i) Algae: General characteristics; Ecology and distribution; Range of thallus organization and reproduction; Morphology and life- cycles of the following: *Chlamydomonas*, *Oedogonium*, *Nostoc* and *Fucus*, *Vaucheria*, *Polysiphonia*, Economic importance of algae.
- (ii) Fungi : Introduction- General characteristics, ecology and significance, range of thallus organization, cell wall composition , nutrition, reproduction and classification; True Fungi- General characteristics, ecology and significance, life cycle of *Rhizopus* (Zygomycota) *Penicillium* (Ascomycota), *Puccinia*, *Agaricus* Basidiomycota); Symbiotic Associations- Lichens:

Unit-III

- (i) **Bryophytes:** General characteristics, adaptations to land habit, Classification, Range of thallus organization, Classification (up to family), morphology, anatomy and reproduction of *Marchantia* and *Funaria* (Developmental details not to be included).
- (ii) **Pteridophytes:** General characteristics, classification, early land plants (*Rhynia*). Classification (up to family), morphology, anatomy and reproduction of *Selaginella*, *Equisetum* and *Pteris* (Developmental details not to be included).Heterospory and seed habit, stellar evolution. Ecological and economical importance of Pteridophytes.

Unit-IV

Gymnosperms: General characteristics, classification. Classification (up to family), morphology, anatomy and reproduction of *Cycas*, *Pinus* and *Gnetum*. (Developmental details not to be included).Ecological and economical importance.

PRACTICAL

1. Gram staining
2. Study of vegetative and reproductive structures of *Nostoc*, *Chlamydomonas*, *Oedogonium*, *Vaucheria*, *Fucus* and *Polysiphonia* through temporary preparations and permanent slides.
3. *Rhizopus* and *Penicillium*: Asexual stage from temporary mounts and sexual structures through permanent slides.

4. *Puccinia* and *Agaricus*: Specimens of button stage and full grown mushroom;

Sectioning of gills of *Agaricus*.

5. *Marchantia and Funaria*- morphology of thallus, w.m. rhizoids and scales, v.s. thallus through gemma cup, w.m. gemmae (all temporary slides), v.s. antheridiophore, archegoniophore, l.s. sporophyte (all permanent slides).
6. *Selaginella*- morphology, w.m. leaf with ligule, t.s. stem, w.m. strobilus, w.m. microsporophyll and megasporophyll (temporary slides), l.s. strobilus (permanent slide).
7. *Equisetum*- morphology, t.s. internode, l.s. strobilus, t.s. strobilus, w.m. sporangiophore, w.m. spores (wet and dry)(temporary slides); t.s. rhizome (permanent slide).
8. *Cycas*- morphology (coralloid roots, bulbil, leaf), t.s. coralloid root, t.s. rachis, v.s. leaflet, v.s. microsporophyll, w.m. spores (temporary slides), l.s. ovule, t.s. root (permanent slide).
9. *Pinus*- morphology (long and dwarf shoots, w.m. dwarf shoot, male and female), w.m. dwarf shoot, t.s. needle, t.s. stem, , l.s./t.s. male cone, w.m. microsporophyll, w.m. microspores (temporary slides), l.s. female cone, t.l.s. & r.l.s. stem (permanent slide).

Text Books:

1. Mitra, J.N., Mitra, D. and Choudhury, S.K. Studies in Botany Volume 1. Moulik Publisher, Kolkata. Ninth Revised Edition

Reference Books:

1. Kumar, H.D. (1999). Introductory Phycology. Affiliated East-West. Press Pvt. Ltd. Delhi. 2nd edition.
2. Tortora, G.J., Funke, B.R., Case, C.L. (2010). Microbiology: An Introduction, Pearson Benjamin Cummings, U.S.A. 10th edition.
3. Sethi, I.K. and Walia, S.K. (2011). Text book of Fungi & Their Allies, Mac Millan Publishers Pvt. Ltd., Delhi.
4. Alexopoulos, C.J., Mims, C.W., Blackwell, M. (1996). Introductory Mycology, John Wiley and Sons (Asia), Singapore. 4th edition.
5. Raven, P.H., Johnson, G.B., Losos, J.B., Singer, S.R., (2005). Biology. Tata McGraw Hill, Delhi, India.
6. Vashishta, P.C., Sinha, A.K., Kumar, A., (2010). Pteridophyta, S. Chand. Delhi, India.
7. Bhatnagar, S.P. and Moitra, A. (1996). Gymnosperms. New Age International (P) Ltd Publishers, New Delhi, India.
8. Parihar, N.S. (1991). An introduction to Embryophyta. Vol. I. Bryophyta. Central Book Depot, Allahabad.
9. Pandey, B. P. (2017), Botany for degree studies (as per CBCS). S. Chand
10. Acharya, B. S. and Mishra, B. K. (2018). Plant Biodiversity, Kalyani Publishers, New Delhi.

Generic Elective Paper IIA

PLANT PHYSIOLOGY AND METABOLISM

Unit-I

- (i) Plant-water relations: Importance of water, water potential and its components; Transpiration and its significance; Factors affecting transpiration; Root pressure and guttation.
- (ii) Mineral nutrition: Essential elements, macro and micronutrients; Criteria of essentiality of elements; Role of essential elements; Transport of ions across cell membrane, active and passive transport, carriers, channels and pumps.
- (iii) Translocation in phloem.: Composition of phloem sap, girdling experiment; Pressure flow model; Phloem loading and unloading

Unit-II

- (i) Photosynthesis: Photosynthetic Pigments (*Chl a*, *b*, xanthophylls, carotene); Photosystem I and II, reaction center, antenna molecules; Electron transport and mechanism of ATP synthesis; C_3 , C_4 and CAM pathways of carbon fixation.
- (ii) Respiration: Glycolysis, anaerobic respiration, TCA cycle; Oxidative Phosphorylation.

Unit-III

- (i) Enzymes: Structure and properties; Mechanism of enzyme catalysis and enzyme inhibition.
- (ii) Nitrogen metabolism: Biological nitrogen fixation; Nitrate and ammonia assimilation.

Unit-IV

- (i) Plant growth regulators: Discovery and physiological roles of auxins, gibberellins, cytokinins, ABA, ethylene.
- (ii) Plant response to light and temperature: Photoperiodism (SDP, LDP, Day neutral plants); Phytochrome (discovery and structure), red and far red light responses on homomorphogenesis; Vernalization.

PRACTICAL

1. Determination of osmotic potential of plant cell sap by plasmolytic method.
2. To study the effect of two environmental factors (light and wind) on transpiration by excised twig.
3. Calculation of stomatal index and stomatal frequency of a mesophyte and a xerophyte.
4. Demonstration of Hill reaction.
5. Demonstrate the activity of catalase and study the effect of pH and enzyme concentration.
6. To study the effect of light intensity and bicarbonate concentration on O_2 evolution in photosynthesis.
7. Comparison of the rate of respiration in any two parts of a plant.

Text Books:

1. A. C. Sahu (2018). Plant Physiology and Metabolism. Kalyani Publishers, New Delhi.

Reference Books:

1. Taiz, L., Zeiger, E., MØller, I.M. and Murphy, A (2015). Plant Physiology and Development. Sinauer Associates Inc. USA. 6th edition.
2. Hopkins, W.G., Huner, N.P., (2009). Introduction to Plant Physiology. John Wiley & Sons, U.S.A. 4th Edition.
3. Bajracharya, D., (1999). Experiments in Plant Physiology- A Laboratory Manual. Narosa Publishing House, New Delhi.
4. H. S. Srivatava. Plant Physiology, Rastogi Publications, New Delhi

Generic Elective Paper IB PLANT**ECOLOGY AND TAXONOMY****Unit-I**

- (i) Ecological factors: Soil: Origin, formation, composition, soil profile. Water: States of water in the environment, precipitation types. Light and temperature: Variation Optimal and limiting factors; Shelford law of tolerance. Adaptation of hydrophytes and xerophytes
- (ii) Plant communities : Characters; Ecotone and edge effect; Succession; Processes and types

Unit-II

- (i) Ecosystem : Structure; Biotic and abiotic components, energy flow trophic organisation; Food chains and food webs, Ecological pyramids production and productivity; Biogeochemical cycling; Cycling of carbon, nitrogen and Phosphorous
- (ii) Phytogeography: Principal biogeographical zones, Endemism.

Unit-III

- (i) Introduction to plant taxonomy: Identification, Classification, Nomenclature.
- (ii) Identification : Functions of Herbarium, important herbaria and botanical gardens of the world and India; Documentation: Flora, Keys: single access and multi-access

Unit-IV

- (i) Taxonomic hierarchy: Ranks, categories and taxonomic groups
- (ii) Botanical nomenclature: Principles and rules (ICN); ranks and names; binominal system, typification, author citation, valid publication, rejection of names, principle of priority and its limitations.
- (iii) Classification: Types of classification-artificial, natural and phylogenetic. Bentham and Hooker (upto series), Hutchinson (upto series).
- (iv) Taxonomic description of the families : Malvaceae, Fabaceae, Asteraceae and Poaceae, Apocynaceae, Lamiaceae and Musaceae.

PRACTICAL

1. Study of instruments used to measure microclimatic variables: Soil thermometer, maximum and minimum thermometer, anemometer, psychrometer/hygrometer, rain gauge and lux meter.
2. Determination of pH, and analysis of two soil samples for carbonates, chlorides, nitrates, sulphates, organic matter and base deficiency by rapid field test.
3. Comparison of bulk density, porosity and rate of infiltration of water in soil of three habitats.
4. (a) Study of morphological adaptations of hydrophytes and xerophytes (four each).
(b) Study of biotic interactions of the following: Stem parasite (*Cuscuta*), Root parasite (*Orobanche*), Epiphytes, Predation (Insectivorous plants)
6. Determination of minimal quadrat size for the study of herbaceous vegetation in the college campus by species area curve method. (species to be listed)
7. Quantitative analysis of herbaceous vegetation in the college campus for frequency and comparison with Raunkiaer's frequency distribution law .
8. Study of vegetative and floral characters of the families as in theory syllabus (Description, V.S. flower, section of ovary, floral diagram/s, floral formula/e and systematic position according to Bentham & Hooker's system of classification).
9. Mounting of properly dried and pressed specimen of any ten wild plant's with herbarium label (to be submitted in the record book).

Text Books:

1. Sharma, P.D. (2017). Fundamentals of Ecology. Rastogi Publications, Meerut, India.

Reference Books:

1. Kormondy, E.J. (1996). Concepts of Ecology. Prentice Hall, U.S.A. 4th edition.
2. Sharma, P.D. (2010) Ecology and Environment. Rastogi Publications, Meerut, India. 8th edition.
3. Simpson, M.G. (2006). *Plant Systematics*. Elsevier Academic Press, San Diego, CA, U.S.A.
4. Singh, G. (2012). *Plant Systematics: Theory and Practice*. Oxford & IBH Pvt. Ltd., New Delhi. 3rd edition.
5. Sahu, A. C. (2017). Plant Ecology and Phytogeography, Kalyani Publishers, New Delhi.
6. Das, M. C. and Das, S. P. (2009). Fundamental of Ecology. Tata McGraw Hill, New Delhi.
7. Shukla, R.S. and Chandel, P.S. (2016). A text book of Plant Ecology. S Chand Publication, New Delhi
8. Mohanty, C. R. (2017). Text Book of Plant Systematics, Kalynai Publisher, New Delhi.

Generic Elective Paper IIB

PLANT ANATOMY AND EMBRYOLOGY

Unit-I

- (i) Meristematic and permanent tissues : Root and shoot apical meristems; Simple and complex tissues
- (ii) Organs :Anatomy of dicot and monocot root stem and leaf.

Unit-II

- (i) Secondary Growth: Vascular cambium – structure and function, seasonal activity. Secondary growth in and stem, Wood (heartwood and sapwood)
- (ii) Adaptive and protective systems: Epidermis, cuticle, stomata; General account of adaptations in xerophytes and hydrophytes.

Unit-III

- (i) Structural organization of flower: Structure of anther and pollen; Structure and types of ovules; Types of embryo sacs, organization and ultrastructure of mature embryo sac.
- (ii) Pollination and fertilization : Pollination mechanisms and adaptations; Double fertilization;

Unit-IV

- (i) Endosperm: Endosperm types, structure and functions.
- (ii) Embryo: Dicot and monocot embryo; Structure and development, Embryo endosperm relationship.
- (iii) Seed-structure and development, appendages and dispersal mechanisms.

PRACTICAL

1. Study of meristems through permanent slides and photographs.
2. Tissues (parenchyma, collenchyma and sclerenchyma); Macerated xylary elements, Phloem (Permanent slides, photographs)
3. Stem: Monocot: *Zea mays*; Dicot: *Helianthus*; Secondary: *Helianthus* (only Permanent slides).
4. Root: Monocot: *Zea mays*; Dicot: *Helianthus*; Secondary: *Helianthus* (only Permanent slides).
5. Leaf: Dicot and Monocot leaf (only Permanent slides).
6. Adaptive anatomy: Xerophyte (*Nerium* leaf); Hydrophyte (*Hydrilla* stem).
7. Structure of anther (young and mature), tapetum (amoeboid and secretory) (Permanent slides).
8. Types of ovules: anatropous, orthotropous, circinotropous, amphitropous/campylotropous.

Text Books:

1. Singh, Pandey and Jain (2017). Anatomy of Angiosperms, Rastogi Publication, Meerut.

Reference Books:

1. Bhojwani, S.S. & Bhatnagar, S.P. (2011). Embryology of Angiosperms. Vikas Publication House Pvt. Ltd. New Delhi. 5th edition.
2. Mauseth, J.D. (1988). Plant Anatomy. The Benjamin/Cummings Publisher, USA.
3. C. R. Mohanty (2018). Plant Anatomy and Embryology. Kalyani Publishers, New Delhi.

CAPACITY BUILDING OF FACULTY

Following modules have been proposed for training of faculties:

- Isolation and quantification of nucleic acids following spectrophotometric and gel electrophoresis techniques
- Techniques of Chromatography
- Micrometry and Haemocytometry
- Tissue Culture Techniques
- PCR techniques
- Chromosome techniques

The above module may be of 3-4 weeks duration with 30 participants.

LIST OF EQUIPMENTS

Sl. No.	List of Equipments	Quantity
01	Dissecting Microscope (Indian Make)	2 no.
02	Compound Microscope (Indian Make) with photographic attachment	2 no.
03	Ocular and Stage Micrometer (Indian Make)	1 no.
04	Uv Spectrophotometer (Indian Make)	1 no.
05	Cold Centrifuge (Indian Make)	1 no.
06	Refrigerator (Indian Make)	1 no.
07	Soil Thermometer (Indian Make)	1 no.
08	Anemometer (Indian Make)	1 no.
09	Psychrometer (Indian Make)	1 no.
10	Rain gauge (Indian Make)	1 no.

11	pH meter (Indian Make)	1 no.
12	Herbarium Press (Indian Make)	1 set
13	Hot air Oven (Indian Make)	1 no.
14	Electronic Balance (Indian Make)	1no.
15	Gel Electrophoresis (Indian Make) Vertical and submarine	1 no.
16.	Power Pack for electrophoresis	1 no.
17	Blood Testing Kit (Indian Make)	1 no.
18	Laminar Flow (Indian Make)	1 no.
19	BOD Incubator (Indian Make)	1 no.
20	Autoclave (Indian Make)	1 no.

Course structure of UG Chemistry Honours

Semester	Course	Course Name	Credits	Total marks
I	AECC-I	AECC-I	04	100
	C-I	Inorganic Chemistry-I	04	75
	C-I Practical	Inorganic Chemistry-I Lab	02	25
	C-II	Physical Chemistry-I	04	75
	C-II Practical	Physical Chemistry-I Lab	02	25
	GE-I	GE-I	04	75
	GE-I Practical	GE-I Lab	02	25
			22	400
II	AECC-II	AECC-II	04	100
	C-III	Organic Chemistry-I	04	75
	C-III Practical	Organic Chemistry-I Lab	02	25
	C-IV	Physical Chemistry-II	04	75
	C-IV Practical	Physical Chemistry-II	02	25
	GE-II	GE-II	04	75
	GE-II Practical	GE-II Lab	02	25
			22	400
III	C-V	Inorganic Chemistry-II	04	75
	C-V Practical	Inorganic Chemistry-II Lab	02	25
	C-VI	Organic Chemistry-II	04	75
	C-VI Practical	Organic Chemistry-II Lab	02	25
	C-VII	Physical Chemistry-III	04	75
	C-VII Practical	Physical Chemistry-III Lab	02	25
	GE-III	GE-III	04	75
	GE-III Practical	GE-III Lab	02	25
	SECC-I	SECC-I	04	100
			28	500
IV	C-VIII	Inorganic Chemistry-III	04	75
	C-VIII Practical	Inorganic Chemistry-III Lab	02	25

	C-IX	Organic Chemistry-III	04	75
	C-IX Practical	Organic Chemistry-III Lab	02	25
	C-X	Physical Chemistry-IV	04	75
	C-X Practical	Physical Chemistry-IV Lab	02	25
	GE-IV	GE-IV (Theory)	04	75
	GE-IV Practical	GE-IV (Practical)	02	25
	SECC-II	SECC-II	04	100
			28	500
V	C-XI	Organic Chemistry-IV	04	75
	C-XI Practical	Organic Chemistry-IV	02	25
	C-XII	Physical Chemistry-V	04	75
	C-XII Practical	Physical Chemistry-V	02	25
	DSE-I	DSE-I	04	75
	DSE-I Practical	DSE-I Lab	02	25
	DSE-II	DSE-II	04	75
	DSE-II Practical	DSE-II Lab	02	25
			24	400
VI	C-XIII	Inorganic Chemistry- IV	04	75
	C-XIII Practical	Inorganic Chemistry-IV	02	25
	C-XIV	Organic Chemistry-V	04	75
	C-XIV Practical	Organic Chemistry-V	02	25
	DSE-III	DSE-III	04	75
	DSE-III Practical	DSE-III Lab	02	25
	DSE-IV	DSE-IV	04	75
	DSE-IV Practical	DSE-IV Lab	02	25
	OR			
	DSE-IV	Dissertation	06	100*
			24	400
		TOTAL	148	2600

Discipline Specific Elective Papers: (Credit: 06 each)

(4 papers to be selected by students of Chemistry Honours): DSE (1-IV)

1. Polymer Chemistry
2. Green Chemistry
3. Industrial Chemicals & Environment
4. Inorganic Materials of Industrial Importance
5. *Dissertation (can be opted as alternative of DSE-IV only and of 6 credits. **Dissertation content: 60, Seminar cum Viva: 20**)
6. Analytical Methods in Chemistry (Alternative)

CHEMISTRY

HONOURS PAPERS:

Core course – 14 papers

Discipline Specific Elective – 4 papers (out of the 6 papers suggested)

Generic Elective for non-Chemistry students – 4 papers. In case the University offers 2 subjects as GE, then papers 1 and 2 will be the GE paper.

Marks per paper - Midterm : 15 marks, End term : 60 marks, Practical- 25 marks

Total – 100 marks Credit per paper – 6

Teaching hours per paper – 40 hours Theory classes + 20 hours Practical classes

CORE PAPER 1

INORGANIC CHEMISTRY-I

Unit-I

Atomic structure

Bohr's theory, its limitations and atomic spectrum of hydrogen atom, Sommerfeld's modification. Wave mechanics: de Broglie equation, Heisenberg's Uncertainty Principle, Schrödinger's wave equation (time independent) and its significance, Derivation of Schrödinger's wave equation (for hydrogen atom) in Cartesian coordinate, significance of ψ and ψ^2 . Normalized and orthogonal wave functions. Sign of wave functions; Setting of Schrödinger's equation in polar coordinates (derivation not required), radial and angular wave functions for hydrogen atom. Radial and angular distribution curves; Shapes of s, p, d and f orbitals; Quantum numbers and their significance. Pauli's Exclusion principle, Hund's rule of maximum

multiplicity, Aufbau's principle and its limitations.

Unit-II

Periodicity of elements

Periodicity of Elements: s, p, d, f block elements, the long form of periodic table. Detailed discussion of the following properties of the elements, with reference to s & p-blocks. (a) Effective nuclear charge, shielding or screening effect, Slater rules, variation of effective nuclear charge in periodic table. (b) Atomic radii (van der Waals) (c) Ionic and crystal radii. (d) Covalent radii (octahedral and tetrahedral) (e) Ionization enthalpy, Successive ionization enthalpies and factors affecting ionization energy. Applications of ionization enthalpy. (f) Electron gain enthalpy, trends of electron gain enthalpy. (g) Electronegativity, Pauling's/ Mulliken's electronegativity scales. Variation of electronegativity with bond order, partial charge, hybridization. Sanderson's electron density ratio.

Unit-III

Chemical bonding-I

(i) Ionic bond: General characteristics, types of ions, size effects, radius ratio rule and its limitations. Packing of ions in crystals. Born-Landé equation with derivation. Madelung constant, Born-Haber cycle and its application, Solvation energy.

(i) Covalent bond: Valence Bond theory (Heitler-London approach). Hybridization with suitable examples of linear, trigonal planar, square planar, tetrahedral, trigonal bipyramidal and octahedral arrangements, equivalent and non-equivalent hybrid orbitals, Resonance and resonance energy.

Molecular orbital theory. Molecular orbital diagrams of diatomic and simple polyatomic molecules N_2 , O_2 , C_2 , B_2 , F_2 , CO , NO , and their ions (CO^+ , NO^+ , NO^-).

Unit-IV

Chemical bonding-II

VSEPR theory, shapes of simple molecules and ions containing lone and bond pairs of electrons, multiple bonding (σ and π bond approach) and bond lengths. Covalent character in ionic compounds, polarizing power and polarizability. Fajan's rules and consequences of polarization. Ionic character in covalent compounds: Bond moment and dipole moment. Percentage ionic

character from dipole moment and electronegativity difference.

(i) *Metallic Bond*: Qualitative idea of valence bond and band theories. Semiconductors and insulators.

(ii) *Weak Chemical Forces*: van der Waals forces, ion-dipole forces, dipole-dipole interactions, induced dipole interactions, Instantaneous dipole-induced dipole interactions. Repulsive forces, Hydrogen bonding (theories of hydrogen bonding, valence bond treatment) Effects of chemical force, melting and boiling points, solubility energetics of dissolution process.

Oxidation-reduction: Redox equations, standard electrode potential and its applications to inorganic reactions. Principles involved in some volumetric analyses (iron and copper).

Recommended Text Books:

1. Lee J. D., Concise Inorganic Chemistry Wiley India, 5th Edn., 2008.
2. Huheey J. E., Keiter E. A. and Keiter R. L., Inorganic Chemistry – Principles of structure and reactivity, , Pearson Education, 4th Ed. 2002.
3. Puri, Sharma, Kalia, Principles of Inorganic Chemistry, Vishal Pub. Co., 33rd ed., 2017
4. Malik, Tuli, Madan Selected Topic in Inorganic Chemistry, S. Chand, New Delhi, 17th Ed., 2010.

Reference books

1. Das Asim K., Fundamentals of Inorganic Chemistry, Vol. I, CBS Publications, 2nd Ed. 2010.
2. Pradeep's Inorganic Chemistry, Vol. I & II, Universal Book seller, 14th Ed. 2017.

CORE PAPER I LAB

Students are required to learn the followings:

- i. Calibration and use of apparatus
- ii. Preparation of solutions of different Molarity/Normality of titrants.

List of experiments

(A) Acid-Base Titrations

- i Estimation of carbonate and hydroxide present together in mixture.
- ii Estimation of carbonate and bicarbonate present together in a mixture.
- iii Estimation of free alkali present in different soaps/detergents

(B) Oxidation-Reduction Titrimetry

- i Standardization of KMnO_4 with standard sodium oxalate and estimation of Fe (II) using standardized KMnO_4 solution.
- ii Estimation of percentage of oxalic acid and sodium oxalate in a given mixture.
- iii Estimation of Fe (II) and Fe (III) in a mixture by standard $\text{K}_2\text{Cr}_2\text{O}_7$ solution.

Reference text Books:

1. J. Mendham, A. I. Vogel's Quantitative Chemical Analysis 6th Ed., Pearson, 2009.
2. Gulati Shikha , Sharma Gulati JL and Manocha, Shagun, Practical Inorganic Chemistry, 1stEdn., CBS Publishers & Distributors Pvt Ltd., (2017).

CORE PAPER II PHYSICAL

CHEMISTRY- I

Unit- I

Gaseous state-I

Kinetic molecular model of a gas: postulates and derivation of the kinetic gas equation; collision frequency; collision diameter; mean free path and viscosity of gases, including their temperature and pressure dependence, relation between mean free path and coefficient of viscosity, calculation of σ from η ; variation of viscosity with temperature and pressure.

Maxwell distribution and its use in evaluating molecular velocities (average, root mean square and most probable) and average kinetic energy, law of equipartition of energy, degrees of freedom and molecular basis of heat capacities.

Behaviour of real gases: Deviations from ideal gas behaviour, compressibility factor, Z, and its variation with pressure for different gases. Causes of deviation from ideal behaviour. van der Waal's equation of state, its derivation and application in explaining real gas behaviour. Isotherms of real gases and their comparison with van der Waals isotherms, continuity of states, critical state, relation between critical constants and van der Waals constants, law of corresponding states.

Unit-II Liquid

state

Qualitative treatment of the structure of the liquid state; physical properties of liquids; vapour pressure, surface tension and coefficient of viscosity, and their determination. Effect of addition of various solutes on surface tension and viscosity. Explanation of cleansing action of detergents. Temperature variation of viscosity of liquids and comparison with that of gases. Qualitative discussion of structure of water.

Ionic equilibria- I

Strong, moderate and weak electrolytes, degree of ionization, factors affecting degree of ionization, ionization constant and ionic product of water. Ionization of weak acids and bases, pH scale, common ion effect; dissociation constants of mono- and diprotic acids.

Unit- III: Solid state

Nature of the solid state, law of constancy of interfacial angles, law of rational indices, Miller indices, elementary ideas of symmetry, symmetry elements and symmetry operations, seven crystal systems and fourteen Bravais lattices; X-ray diffraction, Bragg's law, a simple account of rotating crystal method and powder pattern method. Analyses of powder diffraction patterns of NaCl, CsCl and KCl. Defects in crystals (stoichiometric and non- stoichiometric). Glasses and liquid crystals.

Unit-IV

Ionic equilibria - II

Salt hydrolysis-calculation of hydrolysis constant, degree of hydrolysis and pH for different salts. Buffer solutions; derivation of Henderson equation and its applications; buffer capacity, buffer

range, buffer action and applications of buffers in analytical chemistry and biochemical processes in the human body. Solubility and solubility product of sparingly soluble salts – applications of solubility product principle. Qualitative treatment of acid – base titration curves (calculation of pH at various stages). Theory of acid–base indicators; selection of indicators and their limitations.

Multistage equilibria in polyelectrolyte systems; hydrolysis and hydrolysis constants.

Recommended Text Books:

1. Atkins P. W. & Paula, J. de, Elements of Physical Chemistry, Oxford University Press, 6th Ed., (2006).
2. Puri, Sharma & Pathania, Principles of Physical Chemistry, Vishal Publishing Co, 47th Edn. 2017.
3. Kapoor K. L., Text Book of Physical Chemistry, McGraw Hill, 3rd Edn. 2017
4. Castellan G. W. Physical Chemistry 4thEdn. Narosa (2004).

Reference Books:

1. Kheterpal S.C., Pradeep's Physical Chemistry, Vol. I & II, Pradeep Publications
2. Mortimer R. G., Physical Chemistry, Elsevier (Academic Press), 3rd Ed (2008).
3. Ball D. W. Physical Chemistry Thomson Press, India (2007).
4. Engel T. & Reid P., Physical Chemistry, 3rd Ed. Pearson (2013)

CORE PAPER II LAB

Surface tension measurements.

- a. Determine the surface tension by (i) drop number (ii) drop weight method.
- b. Study the variation of surface tension of detergent solutions with concentration.

Viscosity measurement using Ostwald's viscometer.

- a. Determination of viscosity of aqueous solutions of (i) polymer (ii) ethanol and (iii) sugar at room temperature.
- b. Study the variation of viscosity of sucrose solution with the concentration of solute.

pH- metry

- a. Study the effect on pH of addition of HCl/NaOH to solutions of acetic acid, sodium acetate and their mixtures.
- b. Preparation of buffer solutions of different pH (i) Sodium acetate-acetic acid (ii) Ammonium chloride-ammonium hydroxide.
- c. pH metric titration of (i) strong acid vs. strong base, (ii) weak acid vs. strong base.
- d. Determination of dissociation constant of a weak acid.

Ionic equilibria

- a. Determination of solubility product of PbI_2 by titrimetric method.

Reference Books

1. Khosla, B. D. Garg, V. C. & Gulati, A. Senior Practical Physical Chemistry, R. Chand & Co., New Delhi (2011).
2. Garland, C. W., Nibler, J. W. & Shoemaker, D. P. Experiments in Physical Chemistry, 8th Ed.; McGraw-Hill, New York (2003).
3. Viswanathan, B., Raghavan, P.S. Practical Physical Chemistry, Viva Books (2009).
4. Halpern, A. M. & McBane, G. C. Experimental Physical Chemistry 3rd Ed.; W.H. Freeman & Co., New York (2003).

CORE PAPER – III

ORGANIC CHEMISTRY I

Unit –I:

Basics of organic chemistry

Electronic Displacements: Inductive, electromeric, resonance and mesomeric effects, hyperconjugation and their applications; Dipole moment; Organic acids and bases; their relative strength.

Homolytic and heterolytic fission with suitable examples. Curly arrow rules; Electrophiles and Nucleophiles; Nucleophilicity and basicity; Types, shape and relative stability of carbocations, carbanions, free radicals and carbenes.

Introduction to types of organic reactions and their mechanism: Addition, Elimination and Substitution reactions.

Carbon-carbon sigma bonds

Chemistry of alkanes: Formation of alkanes, Wurtz Reaction, Wurtz-Fittig Reactions, Free radical

substitutions: Halogenation -relative reactivity and selectivity.

Unit – II:

Stereochemistry

Fischer Projection, Newmann and Sawhorse Projection formulae; Geometrical isomerism: cis–trans and, syn-anti isomerism, E/Z notations with C.I.P rules.

Optical Isomerism: Optical Activity, Specific Rotation, Chirality/Asymmetry, Enantiomers, Molecules with one and two chiral-centres, Distereoisomers, meso-structures, Racemic mixture and resolution, inversion. Relative and absolute configuration: D/L and R/S designations.

Unit – III:

Chemistry of aliphatic hydrocarbons

Carbon-Carbon pi bonds:

Formation of alkenes and alkynes by elimination reactions, Mechanism of E1, E2, E1cb reactions. Saytzeff and Hofmann eliminations.

Reactions of alkenes: Electrophilic additions their mechanisms (Markownikoff/ Anti Markownikoff addition), mechanism of oxymercuration- demercuration, hydroboration oxidation, ozonolysis, reduction (catalytic and chemical), syn and anti-hydroxylation (oxidation). 1,2- and 1,4-addition reactions in conjugated dienes and, Diels-Alder reaction; Reactions of alkynes: Acidity, Electrophilic and Nucleophilic additions. Hydration to form carbonyl compounds, Alkylation of terminal alkynes.

Cycloalkanes and Conformational Analysis

Types of cycloalkanes and their relative stability, Baeyer strain theory, Conformational analysis of alkanes (ethane and n-butane): Relative stability with energy diagrams. Energy diagrams of cyclohexane: Chair, Boat and Twist boat forms.

Unit – IV:

Aromatic hydrocarbons

Aromaticity: Hückel's rule, aromatic character of arenes, cyclic carbocations/ carbanions and heterocyclic compounds with suitable examples. Electrophilic aromatic substitution: halogenation, nitration, sulphonation and Friedel-Craft's alkylation/acylation with their mechanism. Directing effects of the groups

Recommended Text Books:

1. Morrison, R. N. & Boyd, R. N., Organic Chemistry, Dorling Kindersley (India) Pvt. Ltd. (Pearson Education).
2. Bhal and Bhal, Advanced Organic Chemistry, 2nd Edition, S. Chand Publisher, 2012.
3. Kalsi, P. S., Stereochemistry Conformation and Mechanism; 8thEdn, New Age

International, 2015.

Reference Books:

1. Graham Solomons T. W., Fryhle, Craig B., Snyder Scott A, Organic Chemistry, Wiley Student Ed, 11th Edition (2013)
2. Jonathan Clayden, Nick Greeves, Stuart Warren, Organic Chemistry, 2nd Edition, Oxford Publisher, 2014.
3. Dhawan, S.N., Pradeep's Organic Chemistry, (Vol. I and II), Pradeep Publications

CORE PAPER III LAB

Students are required to learn the followings:

- Checking the calibration of the thermometer
- Determination of melting point, effect of impurities on the melting point – mixed melting point of two unknown organic compounds
- Determination of boiling point of liquid compounds [boiling point lower than and more than 100°C (up to 160°C) by distillation and capillary method respectively](e.g., ethanol, cyclohexane, ethyl methyl ketone, cyclohexanone, acetylacetone, anisole, crotonaldehyde, mesityl oxide etc.).

List of experiments

1. Functional group tests for alcohols, phenols, carbonyl and carboxylic acid groups and identification of unknown organic compounds of CHO system (without element detection).
2. Separation and purification of any one component of following binary solid mixture based on the solubility in common laboratory reagents like water (cold, hot), dil. HCl, dil. NaOH, dil. NaHCO₃, etc. and determination of melting point.
Benzoic acid/p-Toluidine; p-Nitrobenzoic acid/p-Aminobenzoic acid; p-Nitrotoluene/p-Anisidine etc.
3. Chromatography
 - Separation of a mixture of two amino acids by ascending and horizontal paper chromatography
 - Separation of a mixture of two sugars by ascending paper chromatography
 - Separation of a mixture of o-and p-nitrophenol or o-and p-aminophenol by thin layer chromatography (TLC)

Reference Books:

1. Mann, F.G. & Saunders, B.C. Practical Organic Chemistry, Pearson Education (2009)
2. Furniss, B.S.; Hannaford, A.J.; Smith, P.W.G.; Tatchell, A.R. Practical Organic Chemistry, 5th Ed., Pearson (2012)

CORE PAPER IV

PHYSICAL CHEMISTRY II

Unit –I

Chemical Thermodynamics

Intensive and extensive variables; state and path functions; isolated, closed and open systems; zeroth law of thermodynamics.

First law: Concept of heat(q), work(w), internal energy(U) and statement of first law; enthalpy(H), relation between heat capacities, calculations of q , w , U and H for reversible, irreversible and free expansion of gases (ideal and van der Waals) under isothermal and adiabatic conditions.

Thermochemistry: Heats of reactions: standard states; enthalpy of formation of molecules and ions and enthalpy of combustion and its applications; calculation of bond energy, bond dissociation energy and resonance energy from thermochemical data, effect of temperature (Kirchhoff's equations) and pressure on enthalpy of reactions.

Unit-II

Carnot cycle, efficiency of heat engine, Carnot theorem

Second Law: Concept of entropy; thermodynamic scale of temperature, statement of the second law of thermodynamics; molecular and statistical interpretation of entropy. Calculation of entropy change for reversible and irreversible processes.

Third Law: Statement of third law, concept of residual entropy, calculation of absolute entropy of molecules.

Free Energy Functions: Gibbs and Helmholtz energy; variation of S , G , A with T , V , P ; Free energy change and spontaneity. Relation between Joule-Thomson coefficient and other thermodynamic parameters, inversion temperature, Gibbs-Helmholtz equation, Maxwell relations, thermodynamic equation of state.

Unit-III

Systems of variable composition

Partial molar quantities, dependence of thermodynamic parameters on composition; Gibbs Duhem equation, chemical potential of ideal mixtures, change in thermodynamic functions in mixing of ideal gases.

Chemical equilibrium

Criteria of thermodynamic equilibrium, degree of advancement of reaction, chemical equilibria in ideal gases, concept of fugacity. Thermodynamic derivation of relation between Gibbs free energy of reaction and reaction quotient (Vant Hoff's reaction). Equilibrium constants and their quantitative dependence on temperature, pressure and concentration. Free energy of mixing and spontaneity; thermodynamic derivation of relations between the various equilibrium constants K_p , K_c and K_x . Le Chatelier principle (quantitative treatment) and its applications.

Unit-IV

Solutions and Colligative Properties

Dilute solutions; lowering of vapour pressure, Raoult's and Henry's Laws and their applications. Thermodynamic derivation using chemical potential to derive relations between the four colligative properties: (i) relative lowering of vapour pressure, (ii) elevation of boiling point, (iii) Depression of freezing point, (iv) osmotic pressure and amount of solute. Applications in calculating molar masses of normal, dissociated and associated solutes in solution.

Recommended Text Books:

1. Atkins P. W. & Paula, J. de, Elements of Physical Chemistry, Oxford University Press, 6th Ed., (2006).
2. Puri, Sharma & Pathania, Principles of Physical Chemistry, Vishal Publishing Co, 47th Edn., 2017.
3. K. L. Kapoor, Text Book of Physical Chemistry, Mac Grow Hill, 3rdEdn. 2017
4. Castellan G. W. Physical Chemistry 4th Ed. Narosa (2004).

Reference Books:

1. Engel T. & Reid P., Physical Chemistry 3rd Ed. Pearson (2013).
2. McQuarrie, D. A. & Simon, J. D. Molecular Thermodynamics Viva Books Pvt. Ltd.: New Delhi (2004).
3. Kheterpal S.C., Pradeep's Physical Chemistry, Vol. I & II, Pradeep Publications.

CORE PAPER IV LAB

THERMOCHEMISTRY

- a) Determination of heat capacity of a calorimeter for different volumes using change of enthalpy data of a known system (method of back calculation of heat capacity of calorimeter from known enthalpy of solution or enthalpy of neutralization).
- b) Determination of heat capacity of the calorimeter and enthalpy of neutralization of hydrochloric acid with sodium hydroxide.
- c) Calculation of the enthalpy of ionization of ethanoic acid.
- d) Determination of heat capacity of the calorimeter and integral enthalpy (endothermic and exothermic) solution of salts.
- e) Determination of basicity/ proticity of a polyprotic acid by the thermochemical method in terms of the changes of temperatures observed in the graph of temperature versus time for different additions of a base. Also calculate the enthalpy of neutralization of the first step.
- f) Determination of enthalpy of hydration of copper sulphate.
- g) Determination of heat of solution (ΔH) of oxalic acid/benzoic acid from solubility measurement.

Reference Books

1. Khosla, B. D.; Garg, V. C. & Gulati, A., Senior Practical Physical Chemistry, R. Chand & Co.: New Delhi (2011).
2. Athawale, V. D. & Mathur, P. Experimental Physical Chemistry, New Age International: New Delhi (2001).
3. Viswanathan, B., Raghavan, P.S. Practical Physical Chemistry, Viva Books (2009)

CORE PAPER V
INORGANIC CHEMISTRY II

Unit - I

General Principles of Metallurgy

Chief modes of occurrence of metals based on standard electrode potentials. Ellingham diagrams for reduction of metal oxides using carbon and carbon monoxide as reducing agent. Electrolytic Reduction, Hydrometallurgy. Methods of purification of metals: Electrolytic process, Parting process, van Arkel-de Boer process and Mond's process, Zone refining.

Acids and Bases

Brönsted-Lowry concept of acid-base reactions, solvated proton, relative strength of acids, types of acid-base reactions, Lewis acid-base concept, Classification of Lewis acids, Hard and Soft Acids and Bases (HSAB) application of HSAB principle.

Unit-II

Chemistry of *s* and *p* Block Elements - I

Inert pair effect, Relative stability of different oxidation states, diagonal relationship and anomalous behaviour of first member of each group. Allotropy and catenation. Complex formation tendency of *s* and *p* block elements.

Hydrides and their classification ionic, covalent and interstitial.

Basic beryllium acetate and nitrate.

Unit-III

Chemistry of *s* and *p* Block Elements - II

Study of the following compounds with emphasis on structure, bonding, preparation, properties and uses.

Boric acid and borates, boron nitrides, borohydrides (diborane) carboranes and graphitic compounds, silanes. Oxides and oxoacids of nitrogen, Phosphorus and chlorine. Peroxo acids of sulphur, interhalogen compounds, polyhalide ions, pseudohalogens and basic properties of halogens.

Unit-IV

Noble Gases

Occurrence and uses, rationalization of inertness of noble gases, clathrates; preparation and

properties of XeF_2 , XeF_4 and XeF_6 ; Nature of bonding in noble gas compounds (Valence bond treatment and MO treatment for XeF_2). Molecular shapes of noble gas compounds (VSEPR theory).

Inorganic Polymers:

Types of inorganic polymers, comparison with organic polymers, synthesis, structural aspects and applications of silicones and siloxanes. Borazines, silicates and phosphazenes, and polysulphates.

Recommended Text Books:

1. Lee J. D., Concise Inorganic Chemistry Wiley India, 5th Edn., 2008.
2. Huheey J. E., Keiter E. A. and Keiter R. L., Inorganic Chemistry – Principles of structure and reactivity, , Pearson Education, 4th Ed. 2002.
3. Puri, Sharma, Kalia, Principles of Inorganic Chemistry, Vishal Pub. Co., 33rd ed., 2017.
4. Shriver D.E., Atkins P. W., Inorganic Chemistry, Oxford University Press , 5th Edn.(2010).

Reference books

1. Das Asim K., Fundamentals of Inorganic Chemistry, Vol. I, CBS Publications, 2nd Ed. 2010.
2. Pradeep's Inorganic Chemistry, Vol. I & II, Universal Book seller, 14th Ed. 2017.

CORE PAPER V LAB

Iodometric / Iodimetric titrations

- (i) Standardization of sodium thiosulphate solution by standard of $\text{K}_2\text{Cr}_2\text{O}_7$ solution.
- (ii) Estimation of Cu(II) using standard sodium thiosulphate solution (Iodimetrically).
- (iii) Estimation of available chlorine in bleaching powder iodometrically.

Inorganic preparations

- (i) Cuprous oxide (Cu_2O)
- (ii) Cuprous chloride(Cu_2Cl_2)
- (iii) Manganese(III) phosphate($\text{MnPO}_4 \cdot \text{H}_2\text{O}$)
- (iv) Aluminium potassium sulphate ($\text{K}_2\text{SO}_4 \cdot \text{Al}_2(\text{SO}_4)_3 \cdot 24\text{H}_2\text{O}$ - Potash alum).
- (v) Lead chromate (PbCrO_4)

Reference Books:

1. Mendham, J., A. I. Vogel's Quantitative Chemical Analysis, 6th Ed., Pearson, 2009.

2. Ahluwalia, V.K., Dhingra, S. and Gulati A, College Practical Chemistry, University Press (2005).
3. Gulati Shikha , Sharma Gulati JL and Manocha, Shagun, Practical Inorganic Chemistry, 1stEdn., CBS Publishers & Distributors Pvt. Ltd., (2017).

CORE PAPER VI
ORGANIC CHEMISTRY-II

Unit - I

Chemistry of Halogenated Hydrocarbons

Alkyl halides: Methods of preparation, nucleophilic substitution reactions – SN₁, SN₂ and SN_i; mechanisms with stereochemical aspects and effect of solvent etc.; nucleophilic substitution vs. elimination.

Aryl halides: Preparation, including preparation from diazonium salts, nucleophilic aromatic substitution; S_NAr, Benzyne mechanism.

Relative reactivity of alkyl, allyl/benzyl, vinyl and aryl halides towards nucleophilic substitution reactions.

Organometallic compounds of Mg and Li – Use in synthesis of organic compounds.

Unit-II

Alcohols, Phenols, Ethers and Epoxides

Alcohols: preparation, properties and relative reactivity of 1°, 2°, 3° alcohols, Bouvaelt-Blanc Reduction; Preparation and properties of glycols: Oxidation by periodic acid and lead tetraacetate, Pinacol-Pinacolone rearrangement;

Phenols: Preparation and properties; Acidity and factors effecting it, Ring substitution reactions, Reimer–Tiemann and Kolbe’s–Schmidt Reactions, Fries and Claisen rearrangements with mechanism;

Ethers and Epoxides: Preparation and reactions with acids. Reactions of epoxides with alcohols, Ammonia derivatives and LiAlH₄.

Unit-III

Carbonyl Compounds

Structure, reactivity and preparation:

Nucleophilic additions, Nucleophilic addition-elimination reactions with ammonia derivatives with mechanism; Mechanisms of Aldol and Benzoin condensation, Knoevenagel condensation, Perkin, Cannizzaro and Wittig reaction, Beckmann rearrangements, α halo form reaction and

Baeyer Villiger oxidation, - substitution reactions, oxidations and reductions (Clemmensen, Wolff-Kishner, LiAlH_4 , NaBH_4 , MPV.); Addition reactions of unsaturated carbonyl compounds: Michael addition.

Active methylene compounds: Keto-enol tautomerism. Preparation and synthetic applications of diethyl malonate and ethyl acetoacetate.

Unit-IV

Carboxylic Acids and their Derivatives

Preparation, physical properties and reactions of monocarboxylic acids: Typical reactions of dicarboxylic acids, hydroxy acids and unsaturated acids: succinic, lactic, malic, tartaric, citric, maleic and fumaric acids;

Preparation and reactions of acid chlorides, anhydrides, esters and amides; Comparative study of nucleophilic substitution at acyl group -Mechanism of acidic and alkaline hydrolysis of esters, Claisen condensation, Dieckmann and Reformatsky reactions, Hofmann-bromamide degradation and Curtius rearrangement.

Sulphur containing compounds: Preparation and reactions of thiols and thioethers.

Recommended Text Books:

1. Morrison, R. N. & Boyd, R. N., Organic Chemistry, Dorling Kindersley (India) Pvt. Ltd. (Pearson Education).
2. Bhal and Bhal, Advanced Organic Chemistry, 2nd Edition, S. Chand Publisher, 2012.
3. Mendham, J., et al, A. I. Vogel's Quantitative Chemical Analysis, 6th Ed., Pearson, 2009.

Reference Books:

1. Graham Solomons T. W., Fryhle, Craig B., Snyder Scott A, Organic Chemistry, Wiley Student Ed, 11th Edition (2013)
2. Jonathan Clayden, Nick Greeves, Stuart Warren, Organic Chemistry, 2nd Edition, Oxford Publisher, 2014.
3. Dhawan, S.N., Pradeep's Organic Chemistry, (Vol. I and II), Pradeep Publications

CORE PAPER VI LAB

Organic preparations:

- i. Acetylation of one of the following compounds: amines (aniline, *o*-, *m*-, *p*-toluidines and *o*-, *m*-, *p*-anisidine) and phenols (β -naphthol, vanillin, salicylic acid) by any one method:
 - a. Using conventional method.
 - b. Using green approach
- ii. Benzoylation of one of the following amines (aniline, *o*-, *m*-, *p*-toluidines and *o*-, *m*-, *p*-anisidine) and one of the following phenols (β -naphthol, resorcinol, *p*-cresol) by Schotten-Baumann reaction.
- iii. Bromination of any one of the following:
 - a. Acetanilide by conventional methods
 - b. Acetanilide using green approach (Bromate-bromide method)
- iv. Nitration of any one of the following:
 - a. Acetanilide/nitrobenzene by conventional method
 - b. Salicylic acid by green approach (using ceric ammonium nitrate).

The above derivatives should be prepared using 0.5-1g of the organic compound.

Calculate percentage yield, based upon isolated yield (crude) and theoretical yield.

Purification of the crude product by recrystallisation from water/alcohol, or sublimation, whichever is applicable and determination of melting point.

Reference Books

1. Vogel, A. I. Elementary Practical Organic Chemistry, Part 1: Small scale Preparations, Pearson (2011)
2. Mann, F.G. & Saunders, B.C. *Practical Organic Chemistry*, Pearson Education (2009)
3. Furniss, B.S.; Hannaford, A.J.; Smith, P.W.G.; Tatchell, A.R. *Practical Organic Chemistry, 5th Ed.*, Pearson (2012)
4. Ahluwalia, V.K. & Aggarwal, R. *Comprehensive Practical Organic Chemistry: Preparation and Quantitative Analysis*, University Press (2000).
5. Ahluwalia, V.K. & Dhingra, S. *Comprehensive Practical Organic Chemistry: Qualitative Analysis*, University Press (2000).

CORE PAPER VII PHYSICAL
CHEMISTRY-III

Unit-I

Phase Equilibria-I

Concept of phases, components and degrees of freedom, derivation of Gibbs Phase Rule for nonreactive and reactive systems, Clausius- Clapeyron equation and its applications to solid-liquid, liquid-vapour and solid-vapour equilibria, phase diagram for one component systems, with applications (H₂O and sulphur system).

Phase diagrams for systems of solid-liquid equilibria involving eutectic (Pb-Ag system, desilverisation of lead), congruent (ferric chloride-water) and incongruent (sodium sulphate-water) melting points, completely miscible solid solutions (intermediate, medium, maximum freezing points).

Unit-II

Phase Equilibria-II

Three component systems, water-chloroform-acetic acid system, triangular plots.

Binary solutions: Gibbs-Duhem-Margules equation, its derivation and applications to fractional distillation of binary miscible liquids (ideal and non-ideal), azeotropes, partial miscibility of liquids, CST, miscible pairs, steam distillation.

Nernst distribution law: its derivation and applications.

Unit-III

Chemical Kinetics

Order and molecularity of a reaction, rate laws in terms of the advancement of a reaction, differential and integrated form of rate expressions up to second order reactions, experimental methods of the determination of orders.

Kinetics of complex reactions (integrated rate expressions up to first order only): (i) Opposing reactions (ii) parallel reactions (iii) consecutive reactions and their differential rate equations (steady-state approximation in reaction mechanisms) (iv) chain reactions.

Temperature dependence of reaction rates; Arrhenius equation; activation energy. Collision theory of reaction rates, qualitative treatment of the theory of absolute reaction rates.

Unit-IV

Catalysis

Types of catalyst, specificity and selectivity, mechanisms of catalyzed reactions at solid surfaces; effect of particle size and efficiency of nanoparticles as catalysts. Enzyme catalysis, Michaelis-Menten mechanism, acid-base catalysis.

Surface chemistry:

Physical adsorption, chemisorption, adsorption isotherms (Langmuir, Freundlich and Gibb's isotherms), nature of adsorbed state.

Recommended Text Books:

1. Atkins P. W. & Paula, J. de, Elements of Physical Chemistry, Oxford University Press, 6th Ed., (2006).
2. Puri, Sharma & Pathania, Principles of Physical Chemistry, Vishal Publishing Co, 47th Edn., 2017.
3. Kapoor K. L., Text Book of Physical Chemistry, McGraw Hill, 3rd Edn. 2017
4. Castellan G. W. Physical Chemistry 4th Edn. Narosa (2004).

Reference Books:

1. Kheterpal S.C., Pradeep's Physical Chemistry, Vol. I & II, Pradeep Publications.
2. Levine, I. N. *Physical Chemistry 6thEd.*, Tata McGraw-Hill (2011).
3. Ball D. W. Physical Chemistry Thomson Press, India (2007).
4. Engel T. & Reid P., Physical Chemistry 3rd Ed. Pearson (2013)

CORE PAPER VII LAB

1. Determination of distribution coefficients of:
 - (a) Iodine between water and carbon tetrachloride.
 - (b) Acetic/ benzoic acid between water and cyclohexane.
2. Study the equilibrium of at least one of the following reactions by the distribution method:
 - $\square \text{I}_2(\text{aq}) + \text{I}^- \rightarrow \text{I}_3^-(\text{aq})$
 - $\square \text{Cu}^{2+}(\text{aq}) + n\text{NH}_3 \rightarrow \text{Cu}(\text{NH}_3)_n$
3. Study the kinetics of the following reactions.
 - (i) Integrated rate method:
 - a) Acid hydrolysis of methyl acetate with hydrochloric acid.

- b) Saponification of ethyl acetate.
- (ii) Compare the strengths of HCl and H₂SO₄ by studying kinetics of hydrolysis of methyl acetate.
4. Verify the Freundlich and Langmuir isotherms for adsorption of acetic acid on activated charcoal.

Reference Books:

1. Khosla, B. D.; Garg, V. C. & Gulati, A. *Senior Practical Physical Chemistry*, R. Chand & Co.: New Delhi (2011).
2. Garland, C. W., Nibler, J. W. & Shoemaker, D. P. *Experiments in Physical Chemistry 8th Ed.*; McGraw-Hill: New York (2003).
3. Halpern, A. M. & McBane, G. C. *Experimental Physical Chemistry 3rd Ed.*; W.H. Freeman & Co.: New York (2003).

CORE PAPER VIII

INORGANIC CHEMISTRY-III

Unit-I

Coordination Chemistry

Werner's theory, valence bond theory (inner and outer orbital complexes), electroneutrality principle and back bonding.

IUPAC nomenclature of coordination compounds, isomerism in coordination compounds. Stereochemistry of complexes with 4 and 6 coordination numbers. Chelate effect, Labile and inert complexes.

Crystal field theory, measurement of CFSE weak and strong fields, pairing energies, factors affecting the magnitude of 10 Dq in octahedral vs. tetrahedral coordination, tetragonal distortions from octahedral geometry, Jahn-Teller theorem, square planar geometry. Qualitative aspect of ligand field and MO Theory.

Unit-II

Transition Elements-I

General group trends with special reference to electronic configuration, colour, variable valency, magnetic and catalytic properties, and ability to form complexes. Stability of various oxidation states and e.m.f. (Latimer & Ebsworth diagrams). Difference between the first, second and third transition series.

Unit-III

Transition Elements-II

Chemistry of Ti, V, Cr, Mn, Fe and Co in various oxidation states (excluding their metallurgy).

Lanthanoids and Actinoids

Electronic configuration, oxidation states, colour, spectral and magnetic properties, lanthanide contraction, separation of lanthanides (ion-exchange method only).

General features of actinoids, separation of Np, Pm, Am from U.

Unit-IV

Bioinorganic Chemistry

Metal ions present in biological systems, classification of elements according to their action in biological system. Na/K-pump, carbonic anhydrase and carboxypeptidase. Excess and deficiency of some trace metals. Toxicity of metal ions (Hg, Pb, Cd and As), reasons for toxicity, Use of chelating agents in medicine.

Iron and its application in bio-systems, Haemoglobin and myoglobin.

Recommended Text Books:

1. Lee J. D., Concise Inorganic Chemistry, Wiley India, 5th Edn., 2008.
2. Huheey J. E., Keiter E. A. and Keiter R. L., Inorganic Chemistry – Principles of structure and reactivity, , Pearson Education, 4th Ed. 2002.
3. Puri, Sharma, Kalia, Principles of Inorganic Chemistry, Vishal Pub. Co., 33rd ed., 2017.
4. Shriver D. E. Atkins P. W., Inorganic Chemistry, Oxford University Pres, 5th Edn..

Reference books

1. Das Asim K., Fundamentals of Inorganic Chemistry, Vol. II, CBS Publications, 2nd Ed. 2010.
2. Bioinorganic Chemistry, Asim Kumar Das, Books & Allied (P) Ltd. 1st Ed. 2015.
3. Selected Topic in Inorganic Chemistry, Mallick, Madan and Tuli, S. Chand Publisher. 17th Ed. 2010.

4. Pradeep's Inorganic Chemistry, Vol. I & II, Universal Book seller, 14th Ed. 2017.

CORE PAPER VIII LAB

Inorganic preparations

Preparation of complexes:

- i. Hexamine nickel(II), $[\text{Ni}(\text{NH}_3)_6]\text{Cl}_2$
- ii. Potassium trioxalatoferrate (III) trihydrate
- iii. Tetraamminecopper (II) sulphate, $[\text{Cu}(\text{NH}_3)_4]\text{SO}_4 \cdot \text{H}_2\text{O}$
- iv. Tetraamminecarbonatocobalt (III) nitrate

Complexometric titration

- i. Estimation of Ca by EDTA
- ii. Estimation of Mg by EDTA

Gravimetric Analysis:

- i. Estimation of nickel (II) using dimethylglyoxime (DMG).
- ii. Estimation of copper as CuSCN
- iii. Estimation of iron as Fe_2O_3 by precipitating iron as $\text{Fe}(\text{OH})_3$.
- iv. Estimation of Al(III) by precipitating with oxine and weighing as $\text{Al}(\text{oxine})_3$ (Aluminium Oxinate).

Chromatography of metal ions

Principles involved in chromatographic separations. Paper chromatographic separation of following metal ions:

- i. Ni(II) and Co(II)
- ii. Fe(III) and Al(III)

Reference Books:

1. Vogel, A.I. A Textbook of Quantitative Inorganic Analysis, ELBS (1978).
2. Ahluwalia, V.K., Dhingra, S. and Gulati A, College Practical Chemistry, University Press (2005).
3. Gulati Shikha , Sharma Gulati JL and Manocha, Shagun, Practical Inorganic Chemistry, 1stEdn., CBS Publishers & Distributors Pvt Ltd., (2017).

CORE PAPER IX
ORGANIC CHEMISTRY-III

Unit-I

Nitrogen Containing Functional Groups

Preparation and important reactions of nitro and compounds, nitriles.

Amines: Effect of substituent and solvent on basicity; Preparation and properties: Gabriel phthalimide synthesis, Carbylamine reaction, Mannich reaction, Hoffmann's exhaustive methylation, Hofmann-elimination reaction; Distinction between 1°, 2° and 3° amines with Hinsberg reagent and nitrous acid.

Unit-II

Diazonium

Salts

Preparation and their synthetic applications.

Polynuclear Hydrocarbons

Reactions of naphthalene and anthracene Structure, Preparation and structure elucidation and important derivatives of naphthalene and anthracene. Polynuclear hydrocarbons.

Unit-III

Heterocyclic Compounds

Classification and nomenclature, Structure, aromaticity in 5-numbered and 6-membered rings containing one heteroatom; Synthesis, reactions and mechanism of substitution reactions of: Furan, Pyrrole (Paal-Knorr synthesis, Knorr pyrrole synthesis, Hantzsch synthesis), Thiophene, Pyridine (Hantzsch synthesis), Pyrimidine. Fischer indole synthesis and Madelung synthesis, Derivatives of furan: Furfural and furoic acid (preparation only).

Unit-IV

Alkaloids

Natural occurrence, General structural features, Isolation and their physiological action.

Hoffmann's exhaustive methylation, Emde's modification, Structure elucidation and synthesis of Hygrine and Nicotine. Medicinal importance of Nicotine, Hygrine, Quinine, Morphine, Cocaine, and Reserpine.

Terpenes

Occurrence, classification, isoprene rule; Elucidation of structure and synthesis of Citral, Neral and α -terpineol.

Recommended Text Books:

1. Morrison, R. N. & Boyd, R. N., Organic Chemistry, Dorling Kindersley (India) Pvt. Ltd. (Pearson Education).
2. Advanced Organic Chemistry, 2nd Edition, Arun Bahl & B S Bahl, S. Chand Publisher, 2012.

Reference Books:

1. Graham Solomons T. W., Fryhle, Craig B., Snyder Scott A, Organic Chemistry, Wiley Student Ed, 11th Edition (2013)
2. Jonathan Clayden, Nick Greeves, Stuart Warren, Organic Chemistry, 2nd Edition, Oxford Publisher, 2014.
3. Dhawan, S.N., Pradeep's Organic Chemistry, (Vol. I and II), Pradeep Publications

CORE PAPER IX LAB

Qualitative organic analysis of organic compounds

1. Detection of extra elements (N, X, S) in organic compounds by Lassaigne's test.
2. Qualitative analysis of unknown organic compounds containing simple functional groups under CHN system (amine, nitro, amide and imide), determination of melting/ boiling point, and preparation of their derivative.

Reference Books

1. Mann, F.G. & Saunders, B.C. Practical Organic Chemistry, Pearson Education (2009).
2. Furniss, B.S.; Hannaford, A.J.; Smith, P.W.G.; Tatchell, A.R. Practical Organic Chemistry, 5th Ed., Pearson (2012)
3. Ahluwalia, V.K. & Dhingra, S. Comprehensive Practical Organic Chemistry: Qualitative Analysis, University Press (2000).
4. Ghoshal, A., Mahapatra, B., Nad, A. K. An Advanced Course in Practical Chemistry, New Central Book Agency (2007).

CORE PAPER X

PHYSICAL CHEMISTRY-IV

Unit-I

Conductance-I

Arrhenius theory of electrolytic dissociation. Conductivity, equivalent and molar conductivity and their variation with dilution for weak and strong electrolytes. Molar conductivity at infinite dilution. Kohlrausch law of independent migration of ions. Debye-Hückel-Onsager equation, Wien effect, Debye-Falkenhagen effect, Walden's rules.

UNIT-II

Conductance-II

Ionic velocities, mobilities and their determinations, transference numbers and their relation to ionic mobilities, determination of transference numbers using Hittorf and Moving Boundary methods. Applications of conductance measurement: (i) degree of dissociation of weak electrolytes, (ii) ionic product of water (iii) solubility and solubility product of sparingly soluble salts, (iv) conductometric titrations, and (v) hydrolysis constants of salts.

Unit-III

Electrochemistry-I

Quantitative aspects of Faraday's laws of electrolysis, rules of oxidation/reduction of ions based on half-cell potentials, applications of electrolysis in metallurgy and industry.

Chemical cells, reversible and irreversible cells with examples. Electromotive force of a cell and its measurement, Nernst equation; Standard electrode (reduction) potential and its application to different kinds of half-cells. Application of EMF measurements in determining free energy, enthalpy and entropy of a cell reaction, (ii) equilibrium constants, and (iii) pH values, using hydrogen, quinone-hydroquinone, glass electrodes.

Unit-IV

Electrochemistry-II

Concentration cells with and without transference, liquid junction potential; determination of activity coefficients and transference numbers. Qualitative discussion of potentiometric titrations (acid-base, redox, precipitation).

Electrical properties of atoms and molecules

Basic ideas of electrostatics, Electrostatics of dielectric media. Clausius-Mosotti equation and Lorenz-Laurentz equation (no derivation), Dipole moment and molecular polarizabilities and their measurements.

Recommended Text Books:

1. Atkins P. W. & Paula, J. de, Elements of Physical Chemistry, Oxford University Press, 6th Ed., (2006).
2. Puri, Sharma & Pathania, Principles of Physical Chemistry, Vishal Publishing Co, 47th Edn., 2017.
3. Kapoor, K. L., Text Book of Physical Chemistry, Mac Grow Hill, 3rdEdn., 2017
4. Castellan G. W. Physical Chemistry 4th Ed. Narosa (2004).

Reference Books:

1. Engel T. & Reid P., Physical Chemistry 3rd Ed. Pearson (2013).
2. Levine, I. N. Physical Chemistry 6th Ed., Tata McGraw-Hill (2011).
3. McQuarrie, D. A. & Simon, J. D. Molecular Thermodynamics Viva Books Pvt. Ltd.: New Delhi (2004).
4. Kheterpal S.C., Pradeep's Physical Chemistry, Vol. I & II, Pradeep Publications.

CORE PAPER X LAB

Conductometry

- I. Determination of cell constant.
- II. Determination of equivalent conductance, degree of dissociation and dissociation constant of a weak acid.
- III. Perform the following conductometric titrations:
 - i. Strong acid vs. strong base
 - ii. Weak acid vs. strong base
 - iii. Strong acid vs. weak base

Potentiometry

- I Perform the following potentiometric titrations:

- i. Strong acid vs. strong base
- ii. Weak acid vs. strong base
- iii. Dibasic acid vs. strong base

Reference Books:

1. Khosla, B. D., Garg, V. C. & Gulati, A., Senior Practical Physical Chemistry, R. Chand & Co., New Delhi (2011).
2. Garland, C. W. Nibler, J. W. & Shoemaker, D. P., Experiments in Physical Chemistry 8th Ed.; McGraw-Hill: New York (2003).
3. Halpern, A. M. & McBane, G. C., Experimental Physical Chemistry 3rd Ed.; W.H. Freeman & Co., New York (2003).
4. Viswanathan, B., Raghavan, P.S., Practical Physical Chemistry, Viva Books (2009).

CORE PAPER XI

ORGANIC CHEMISTRY-IV

Unit-I

Organic Spectroscopy-I

UV Spectroscopy: Types of electronic transitions, λ_{\max} , Lambert-Beer's law and its limitations, Chromophores and Auxochromes, Bathochromic and Hypsochromic shifts, Intensity of absorption; Application of Woodward rules for calculation of λ_{\max} for the following systems: α , β the unsaturated aldehydes: ketones, carboxylic acids and esters; Conjugated dienes: alicyclic, homoannular and heteroannular; Extended conjugated systems (aldehydes, ketones and dienes); distinction between cis and trans isomers.

Unit-II

Organic Spectroscopy-II

IR Spectroscopy: Fundamental and non-fundamental molecular vibrations; IR absorption positions of O and N containing functional groups; Effect of H-bonding, conjugation, resonance and ring size on IR absorptions; Fingerprint region and its significance; application in simple functional group analysis.

Unit-III

Organic Spectroscopy-III

NMR Spectroscopy: Basic principles of Proton Magnetic Resonance, chemical shift and factors influencing it; Spin-spin coupling and coupling constant; Anisotropic effects in alkene, alkyne, aldehydes and aromatics; Interpretation of NMR spectra of simple compounds.

Mass Spectroscopy- Basic principle, Fragmentation pattern, instrumentation, determination of m/e ratio. Application of mass spectroscopy on CH₄, C₂H₆, *n*-butane and *neo*-pentane.

Applications of IR, UV & NMR for identification of simple organic molecules.

Unit-IV

Carbohydrates

tes

Occurrence, classification and their biological importance.

Monosaccharides: Constitution and absolute configuration of glucose and fructose, epimers and anomers, mutarotation, determination of ring size of glucose and fructose, Haworth projections and conformational structures; Interconversions of aldoses and ketoses; Killiani-Fischer synthesis and Ruff degradation;

Disaccharides – Structure elucidation of maltose; Polysaccharides – Elementary treatment of starch, cellulose.

Recommended Text Books:

1. Kemp William, Organic Spectroscopy, 3rd Edition, Palgrave Publisher, 1991.
2. Davis, B. G., Fairbanks, A. J., Carbohydrate Chemistry, Oxford Chemistry Primer, Oxford University Press.
3. J Kalsi P. S., Spectroscopy of Organic Compounds, 5th Edition, New Age International Publishers, 2016.
4. Advanced Organic Chemistry, 2nd Edition, Arun Bahl & B S Bahl, S. Chand Publisher, 2012.

Reference Books:

1. Y R Sharma, Elementary Organic Spectroscopy, 5th Edition, S. Chand & Company, 2013.
2. Jag Mohan, Organic Spectroscopy and Applications, Narosa Publishers, 2012.
3. Graham Solomons T. W., Fryhle, Craig B., Snyder Scott A, Organic Chemistry, Wiley Student Ed, 11th Edition (2013).

- Jonathan Clayden, Nick Greeves, Stuart Warren, Organic Chemistry, 2nd Edition, Oxford Publisher, 2014.
- Dhawan, S.N., Pradeep's Organic Chemistry, (Vol. I and II), Pradeep Publications

CORE PAPER XI LAB

- Qualitative analysis of carbohydrate: aldoses and ketoses, reducing and non-reducing sugars.
- Qualitative analysis of unknown organic compounds containing simple bifunctional groups, for e.g. salicylic acid, cinnamic acid, nitrophenols etc.
- Quantitative estimation of sugars:
 - Estimation glucose by titration with Fehling's solution.
 - Estimation of sucrose by titration with Fehling's solution.
 - Estimation glucose and sucrose in a given mixture.
- Identification of labelled peaks in the ^1H NMR spectra of the known organic compounds explaining the relative δ -values and splitting pattern.
- Identification of labelled peaks in the IR spectrum of the same compound explaining the relative frequencies of the absorptions (CORE PAPERH, O-H, N-H, CORE PAPER O, CORE PAPER N, CORE PAPER X, C=C, C=O, N=O, C=C, C \equiv N stretching frequencies; characteristic bending vibrations are included).

Reference Books:

- Vogel, A.I. *Quantitative Organic Analysis*, Part 3, Pearson (2012).
- Mann, F.G. & Saunders, B.C. *Practical Organic Chemistry*, Pearson Education (2009)
- Furniss, B.S.; Hannaford, A.J.; Smith, P.W.G.; Tatchell, A.R. *Practical Organic Chemistry*, 5th Ed., Pearson (2012)
- Ahluwalia, V.K. & Aggarwal, R. *Comprehensive Practical Organic Chemistry: Preparation and Quantitative Analysis*, University Press (2000).
- Ahluwalia, V.K. & Dhingra, S. *Comprehensive Practical Organic Chemistry: Qualitative Analysis*, University Press (2000).

CORE PAPER XII PHYSICAL

CHEMISTRY V

Unit-I

Quantum Chemistry-I

Quantum mechanical operators, Postulates of quantum mechanics, Schrödinger equation and its application to particle in one-dimensional box (complete solution) - quantization of energy levels, zero-point energy, normalization of wave functions, probability distribution functions, nodal properties. Extension to three-dimensional boxes, separation of variables, degeneracy.

Qualitative treatment of simple harmonic oscillator model of vibrational motion: Setting up of Schrödinger equation and discussion of solution and wave functions. Vibrational energy of diatomic molecules and zero-point energy.

Angular momentum: Commutation rules, quantization of square of total angular momentum and z-component.

Rigid rotator model of rotation of diatomic molecule: Schrödinger equation, transformation to spherical polar coordinates. Separation of variables (Preliminary treatment).

Unit-II

Chemical Bonding

Chemical bonding: Covalent bonding, valence bond and molecular orbital approaches, LCAO-MO treatment of H_2^+ . Bonding and antibonding orbitals. Qualitative extension to H_2 . Comparison of LCAO-MO and VB treatments of H_2 (only wave functions, detailed solution not required) and their limitations. Localized and non-localized molecular orbitals treatment of triatomic (BeH_2 , H_2O) molecules. Qualitative MO theory and its application to AH_2 type molecules.

Unit-III

Molecular Spectroscopy-I

Interaction of electromagnetic radiation with molecules and various types of spectra; Born-Oppenheimer approximation.

Rotation spectroscopy: Selection rules, intensities of spectral lines, determination of bond lengths of diatomic and linear triatomic molecules, isotopic substitution.

Vibrational spectroscopy: Classical equation of vibration, computation of force constant, amplitude of diatomic molecular vibrations, anharmonicity, Morse potential, dissociation energies, fundamental frequencies, overtones, hot bands, degrees of freedom for polyatomic

molecules, modes of vibration. Vibration-rotation spectroscopy: diatomic vibrating rotator, P, Q, R branches.

Unit-IV

Molecular Spectroscopy-II

Raman spectroscopy: Qualitative treatment of Rotational Raman effect; Effect of nuclear spin, Vibrational Raman spectra, Stokes and anti-Stokes lines; their intensity difference, rule of mutual exclusion.

Electronic spectroscopy: Franck-Condon principle, electronic transitions, singlet and triplet states, fluorescence and phosphorescence, dissociation and predissociation.

Photochemistry

Characteristics of electromagnetic radiation, physical significance of absorption coefficients. Laws of photochemistry, quantum yield, actinometry, examples of low and high quantum yields, photochemical equilibrium and the differential rate of photochemical reactions, photosensitised reactions, quenching, chemiluminescence.

Recommended Text Books:

1. McQuarie D., Quantum Chemistry, University Science Publishers, 2007
2. Chandra, A. K. Introductory Quantum Chemistry Tata McGraw-Hill (2001).
3. Banwell, C. N. & McCash, E. M. Fundamentals of Molecular Spectroscopy 4th Ed. Tata McGraw-Hill: New Delhi (2010).
4. Prasad R K., Quantum Chemistry, New Age International Publishers, 4th Edn, 2010.
5. Rohatagi Mukherjee K K., Fundamentals of Photochemistry, Wiley Eastern Ltd., 1992.

Reference Books:

1. Puri, Sharma & Pathania, Principles of Physical Chemistry, Vishal Publishing Co, 47th Edn., 2017.
2. Kapoor, K. L., Text Book of Physical Chemistry, McGraw Hill, Vol. II, IV.
3. Levine, I. N. Quantum Chemistry, PHI.

CORE PAPER XII LAB

Spectroscopy/Colorimetry

1. Study of absorption spectra (visible range) of KMnO_4 and determine the λ_{max}

value. Calculate the energies of the transitions in kJ mol^{-1} , cm^{-1} , and eV.

2. Verify Lambert-Beer's law and determine the concentration of CuSO_4 / KMnO_4 / $\text{K}_2\text{Cr}_2\text{O}_7$ in a solution of unknown concentration.
3. Determine the dissociation constant of an indicator (phenolphthalein).

Spectrophotometric titration

1. Determine the concentration of HCl against 0.1 N NaOH spectrophotometrically.
2. To find the strength of given ferric ammonium sulfate solution of (0.05 M) by using EDTA spectrophotometrically.
3. To find out the strength of CuSO_4 solution by titrating with EDTA spectrophotometrically.
4. To determine the concentration of Cu(II) and Fe(III) solution photometrically by titrating with EDTA.

Reference Books

1. Khosla, B. D.; Garg, V. C. & Gulati, A., *Senior Practical Physical Chemistry*, R. Chand & Co.: New Delhi (2011).
2. Garland, C. W., Nibler, J. W. & Shoemaker, D. P. *Experiments in Physical Chemistry 8th Ed.*; McGraw-Hill: New York (2003).
3. Halpern, A. M. & McBane, G. C. *Experimental Physical Chemistry 3rd Ed.*; W.H. Freeman & Co.: New York (2003).
4. J. N. Gurtu, R. Kapoor, *Experimental Physical Chemistry*.

CORE PAPER XIII INORGANIC CHEMISTRY-IV

Unit-I

Organometallic Compounds-I

Definition and classification of organometallic compounds on the basis of bond type. Concept of hapticity of organic ligands.

Metal carbonyls: 18 electron rule, electron count of mononuclear, polynuclear and substituted metal carbonyls of 3d series. General methods of preparation (direct combination, reductive carbonylation, thermal and photochemical decomposition) of mono and binuclear carbonyls of

3d series. Structures of mononuclear and binuclear carbonyls of Cr, Mn, Fe, Co and Ni using VBT. π -acceptor behaviour of CO (MO diagram of CO to be discussed), synergic effect and use of IR data to explain extent of back bonding.

Zeise's salt: Preparation and structure, evidences of synergic effect and comparison of synergic effect with that in carbonyls.

Unit-II

Organometallic Compounds-II

Metal Alkyls: Important structural features of methyl lithium (tetramer) and trialkyl aluminium (dimer), concept of multicentre bonding in these compounds. Role of triethyl aluminium in polymerisation of ethene (Ziegler – Natta Catalyst). Species present in ether solution of Grignard reagent and their structures.

Ferrocene: Preparation and reactions (acetylation, alkylation, metallation, Mannich Condensation), structure and aromaticity, comparison of aromaticity and reactivity with that of benzene.

Unit-III

Catalysis by Organometallic Compounds

Study of the following industrial processes and their mechanism:

1. Alkene hydrogenation (Wilkinson's Catalyst)
2. Hydroformylation (Co salts)
3. Wacker Process
4. Synthetic gasoline (Fischer Tropsch reaction)

Theoretical Principles in Qualitative Analysis (H₂S Scheme)

Basic principles involved in analysis of cations and anions and solubility products, common ion effect. Principles involved in separation of cations into groups and choice of group reagents. Interfering anions (fluoride and phosphate) and need to remove them after Group II.

Unit-IV

Thermodynamic & kinetic aspects and reaction mechanism of metal complexes

Thermodynamic and kinetic stability, Stepwise and overall formation constants and their relationship, factors affecting stability. Introduction to inorganic reaction mechanisms-types of reaction and classification of substitution reaction. Substitution reaction of square planar complexes, Trans effect and its applications, theories of trans-effect (electrostatic polarization and Static π -Bonding Theory). Kinetics of octahedral substitution (classification of metal ions based on water exchange rate), General mechanism of ligand substitution reactions in octahedral complexes (D, I, I_d, I_a).

Recommended Text Books:

1. Huheey J. E., Keiter E. A. and Keiter R. L., Inorganic Chemistry – Principles of structure and reactivity, , Pearson Education, 4th Ed. 2002.
2. Puri, Sharma, Kalia, Principles of Inorganic Chemistry, Vishal Pub. Co., 33rd Ed., 2017.
3. Shriver D.E. Atkins P. W., Inorganic Chemistry, Oxford University Press , 5th Edn.
4. Svehla, G. *Vogel's Qualitative Inorganic Analysis*, 7th Edition, Prentice Hall, 1996-0307.

Reference books

1. Das Asim K., Fundamentals of Inorganic Chemistry, Vol. II, CBS Publications, 2nd Ed. 2010.
2. Selected Topic in Inorganic Chemistry, Mallick, Madan and Tuli, S. Chand Publisher. 17th Ed. 2010.
3. Mehrotra R.C. and Singh, A. *Organometallic Chemistry*, New Age International Publishers, 2nd Edn, 2000.
4. Gupta B. D. and Elias A. J., Basic Organometallic Chemistry, 2nd Edn., University Press (2013).

CORE PAPER XIII LAB

- Qualitative analysis of mixtures containing 4 radicals (2 anions and 2 cations). Emphasis should be given to the understanding of the chemistry of different reactions. The following radicals are suggested:
- CO_3^{2-} , NO_2^- , S^{2-} , SO_3^{2-} , F^- , Cl^- , Br^- , I^- , NO_3^- , PO_4^{3-} , NH_4^+ , K^+ , Pb^{2+} , Cu^{2+} , Cd^{2+} , Bi^{3+} , Sn^{2+} , Fe^{3+} , Al^{3+} , Cr^{3+} , Zn^{2+} , Mn^{2+} , Co^{2+} , Ni^{2+} , Ba^{2+} , Sr^{2+} , Ca^{2+} , Mg^{2+} .
- Mixtures may contain one insoluble component (BaSO_4 , SrSO_4 , PbSO_4 , CaF_2 or Al_2O_3) σ

combination of interfering anions e.g. CO_3^{2-} and SO_3^{2-} , NO_2^- and NO_3^- , Cl^- and Br^- , Cl^- and I^- , Br^- and I^- , NO_3^- and Br^- , NO_3^- and I^- .

Spot tests should be done whenever possible.

Reference Books:

1. Vogel's Qualitative Inorganic Analysis, 7th Ed, Revised by G. Svehela, 4th Ed., Person (2007).
2. Gulati Shikha, Sharma Gulati JL and Manocha, Shagun, Practical Inorganic Chemistry, 1st Edn., CBS Publishers & Distributors Pvt Ltd., (2017).

CORE PAPER XIV ORGANIC

CHEMISTRY-V

Unit-I

Amino Acids, Peptides and Proteins

Amino acids: Classification; α -Amino acids - Synthesis, ionic properties and reactions.

Zwitterions, pK_a values, isoelectric point and electrophoresis.

Peptides: Classification, Determination of their primary structures-end group analysis, methods of peptide synthesis. Synthesis of peptides using N-protecting, CORE PAPER protecting and CORE PAPER activating groups - Solid-phase synthesis.

Proteins: Structure of proteins, protein denaturation and renaturation

Unit-II Enzymes

Introduction, classification and characteristics of enzymes. Salient features of active site of enzymes. Mechanism of enzyme action (taking trypsin as example), factors affecting enzyme action, coenzymes and cofactors and their role in biological reactions, specificity of enzyme action (including stereo specificity), enzyme inhibitors and their importance, phenomenon of inhibition (competitive, uncompetitive and non-competitive inhibition including allosteric inhibition).

Nucleic Acids

Components of nucleic acids, Nucleosides and nucleotides;

Structure, synthesis and reactions of: Adenine, Guanine, Cytosine, Uracil and Thymine;

Structure of polynucleotides.

Unit-III Lipids

Introduction to oils and fats; common fatty acids present in oils and fats, Hydrogenation of fats and oils, Saponification value, acid value, iodine number. Reversion and rancidity.

Concept of Energy in Biosystems

Cells obtain energy by the oxidation of foodstuff (organic molecules). Introduction to metabolism (catabolism and anabolism).

Overview of catabolic pathways of fat and protein.

Interrelationship in the metabolic pathways of protein, fat and carbohydrate. Caloric value of food, standard caloric content of food types.

Unit-IV

Pharmaceutical Compounds: Structure and Importance

Classification, structure and therapeutic uses of antipyretics: Paracetamol (with synthesis), Analgesics: Ibuprofen (with synthesis), Antimalarials: Chloroquine (with synthesis). An elementary treatment of Antibiotics and detailed study of chloramphenicol, Medicinal values of curcumin (haldi), azadirachtin (neem), vitamin C and antacid (ranitidine).

Dyes

Classification, colour and constitution; Mordant and Vat dyes; Chemistry of dyeing. Synthesis and applications of: *Azo dyes* – Methyl orange and Congo red (mechanism of Diazo Coupling); *Triphenylmethane dyes* - Malachite Green, and crystal violet; *Phthalein dyes* – Phenolphthalein and Fluorescein.

Recommended Text books

1. Nelson, D.L., Cox, M.M. and Lehninger, A.L. Principles of Biochemistry. 6th Edn. W.H. Freeman and Co. (2013).
2. Kar Ashutosh, Medicinal chemistry, New Age International (P) Ltd., (2007)
3. Debojyoti Das, Biochemistry, (Part-I) Academic Publishers (1979)

Reference Books:

1. Talwar, G.P. & Srivastava, M. Textbook of Biochemistry and Human Biology, 3rd Ed. PHI Learning.

2. Berg, J.M., Tymoczko, J.L. & Stryer, L. Biochemistry, W.H. Freeman, 2002.
4. Murray, R.K., Granner, D.K., Mayes, P.A. and Rodwell, V.W. (2009) Harper's Illustrated Biochemistry. XXVIII edition. Lange Medical Books/ McGraw-Hill.
5. Berg, J.M., Tymoczko, J.L. and Stryer, L. (2006) Biochemistry, 6th Edition. W.H. Freeman and Co. (2002).
6. Wilson, K. & Walker, J. Practical Biochemistry. Cambridge University Press (2009).
7. The Tools of Biochemistry (1977; Reprint 2011) Cooper, T.G., Wiley India Pvt. Ltd. (New Delhi), ISBN: 978-81-265-3016-8.

CORE PAPER XIV LAB

1. Preparations of the following compounds
 - i. Aspirin
 - ii. Methyl orange
2. Estimation of phenol and aniline by bromination method.
3. Saponification value of an oil/ fat/ ester.
4. Estimation of glycine by Sorenson's formalin method.
5. Estimation formaldehyde (formalin).
6. Estimation of ascorbic acid in fruit juices/Vitamin C tablet (Iodometric method)
7. Determination of Iodine number of an oil/ fat.

Reference Books:

1. Arthur, I. Vogel, Elementary Practical Organic Chemistry, Part-1 Small scale preparations, Indian Edition, Pearson (2011).
2. Manual of Biochemistry Workshop, 2012, Department of Chemistry, University of Delhi.
3. Arthur, I. Vogel, *Quantitative Organic Analysis*, Pearson.
4. Wilson, K. & Walker, J. Practical Biochemistry. Cambridge University Press (2009).

Discipline Specific Elective Paper-1

POLYMER CHEMISTRY

Unit-I

Introduction and history of polymeric materials:

Different schemes of classification of polymers, Polymer nomenclature, Molecular forces and chemical bonding in polymers, Texture of Polymers.

Functionality and its importance:

Criteria for synthetic polymer formation, classification of polymerization processes, Relationships between functionality, extent of reaction and degree of polymerization. Bi- functional systems, Poly-functional systems.

Unit-II

Mechanism & Kinetics of Polymerization:

Polymerization reactions – addition and condensation, mechanism and kinetics of step growth, radical chain growth, ionic chain (both cationic and anionic) and coordination polymerizations, Mechanism and kinetics of copolymerization, polymerization techniques.

Crystallization and crystallinity:

Determination of crystalline melting point and degree of crystallinity, Morphology of crystalline polymers, Factors affecting crystalline melting point.

Unit-III

Molecular weight of polymers and their determination (M_n , M_w , M_v , M_z) by end group analysis, viscometry and osmotic pressure methods. Molecular weight distribution and its significance. Polydispersity index.

Glass transition temperature (T_g) and its determination: WLF equation, Outlines of factors affecting glass transition temperature (T_g).

Unit-IV

Properties of polymers (physical, thermal and mechanical properties)

Preparation, structure, properties and applications of the following polymers: polyolefins (polyethylene, polypropylene), polystyrene, polyvinyl chloride, polyvinyl acetate, polyacrylamide, fluoro polymers (Teflon), polyamides (nylon-6 and nylon 6, 6). Thermosetting polymers - phenol formaldehyde resins (Bakelite, Novalac), polyurethanes, conducting polymers (polyacetylene, polyaniline). Brief outline of biodegradable polymers.

Recommended Text Books:

1. V. R. Gowarikar, Jayadev Sreedhar, N. V. Viswanathan, Polymer Science 1st Edition, New Age International Publishers, 1986.

2. Premamoy Ghosh, Polymer Science and Technology: Plastics, Rubber, Blends and Composites, 3rd Edition, McGraw Hill Education, 2010.
3. P. Bahadur & N.V.Sastry, Principles of polymer science, Narosa Publishing house, New Delhi 2002.
4. Fred W. Billmeyer, Textbook of Polymer Science, 3rd ed. Wiley- Interscience (1984)

Reference books

1. L.H. Sperling, Introduction to Physical Polymer Science, 4th ed. John Wiley & Sons (2005)
2. Malcolm P. Stevens, Polymer Chemistry: An Introduction, 3rd ed. Oxford University Press (2005)
3. Seymour/ Carraher's Polymer Chemistry, 9th ed. by Charles E. Carraher, Jr. (2013).
4. Nayak P.L., Polymer Chemistry, Kalyani Publisher (2017).

Discipline Specific Elective Paper I LAB

Polymer synthesis (At least three experiments)

1. Preparation of nylon-6,6 / Polyaniline.
2. Preparations of phenol-formaldehyde resin-novalac/ phenol-formaldehyde resin resold.
3. Preparation of urea-formaldehyde resin.
4. Free radical solution polymerization of styrene (St) / Methyl Methacrylate (MMA) / Methyl Acrylate (MA) / Acrylic acid (AA).
 - a. Purification of monomer.
 - b. Polymerization using benzoyl peroxide (BPO) / 2,2'-azo-bis-isobutyronitrile (AIBN).
5. Redox polymerization of acrylamide.
6. Precipitation polymerization of acrylonitrile.

Polymer characterization/analysis (At least two different experiments)

1. Determination of molecular weight by viscometry:
 - a. Polyacrylamide / Polystyrene
 - b. Polyvinyl pyrrolidone (PVP)
2. Determination of acid value/ saponification value of a resin.

3. Determination of hydroxyl number of a polymer using colorimetric method.
4. Estimation of the amount of HCHO in the given solution by sodium sulphite method
5. Analysis of some IR spectra of polymers – Identification of labelled peaks in IR spectra of known polymer.

Reference Books:

1. Hundiwale G.D., Athawale V.D., Kapadi U.R. and Gite V. V., Experiments in Polymer Science, New Age Publications (2009).
2. Malcolm P. Stevens, Polymer Chemistry: An Introduction, 3rd Ed.
3. Joel R. Fried, Polymer Science and Technology, 2nd Ed. Prentice-Hall (2003).
4. Petr Munk and Tejraj M. Aminabhavi, Introduction to Macromolecular Science, 2nd Ed. John Wiley & Sons (2002).
5. Malcolm P. Stevens, Polymer Chemistry: An Introduction, 3rd ed. Oxford University Press (2005).

Discipline Specific Elective Paper-II

GREEN CHEMISTRY

Unit-I

Introduction to Green Chemistry

What is Green Chemistry? Need for Green Chemistry. Goals of Green Chemistry. Limitations/Obstacles in the pursuit of the goals of Green Chemistry.

Principles of Green Chemistry and Designing a Chemical synthesis- I

Twelve principles of Green Chemistry. Explanations of principle with special emphasis on - Designing green synthesis processes: Prevention of Waste/ by-products; maximize the incorporation of the materials used in the process into the final products (Atom Economy) with reference to rearrangement, addition, substitution and elimination reactions; Prevention/minimization of hazardous/ toxic products; Designing safer chemicals; Use of safer solvents and auxiliaries (e.g. separating agent) - green solvents (supercritical CO₂, water, ionic liquids), solvent less processes, immobilized solvents.

Unit-II

Principles of Green Chemistry and Designing a Chemical synthesis-II

Explanation of green chemistry principles with special emphasis on:

Energy efficient processes for synthesis - use of microwaves and ultrasonic energy. Selection of starting materials (use of renewable feedstock); avoidance of unnecessary derivatization (e.g. blocking group, protection groups, deprotection); Use of catalytic reagents (wherever possible) in preference to stoichiometric reagents; designing of biodegradable products use of chemically safer substances for prevention of chemical accidents, inherent safer design greener - alternative to Bhopal Gas Tragedy (safer route to carcarbaryl) and Flixiborough accident (safer route to cyclohexanol); real-time, in-process monitoring and control to prevent the formation of hazardous substances; development of green analytical techniques to prevent and minimize the generation of hazardous substances in chemical processes.

Unit-III

Examples of Green Synthesis/ Reactions and some real world cases-I

Green Synthesis of the following compounds: adipic acid, catechol, methyl methacrylate, urethane, disodium iminodiacetate (alternative to Strecker synthesis), paracetamol, furfural.

Microwave assisted reactions: Applications to reactions (i) in water: Hofmann Elimination, hydrolysis (of benzyl chloride, methyl benzoate to benzoic acid), Oxidation (of toluene, alcohols); (ii) reactions in organic solvents: Diels-Alder reaction and Decarboxylation reaction.

Ultrasound assisted reactions: Applications to esterification, saponification, Simmons-Smith Reaction (Ultrasonic alternative to Iodine).

Unit-IV

Examples of Green Synthesis/ Reactions and some real world cases- II

Surfactants for carbon dioxide – replacing smog producing and ozone depleting solvents with CO₂ for precision cleaning and dry cleaning of garments; Designing of Environmentally safe marine antifoulant; Right fit pigment: synthetic azopigments to replace toxic organic and inorganic pigments; Synthesis of a compostable and widely applicable plastic (poly lactic acid) from corn; Development of Fully Recyclable Carpet: Cradle to Cradle Carpeting

Future Trends in Green Chemistry

Oxidizing and reducing reagents and catalysts; multifunctional reagents; Combinatorial green

chemistry; Proliferation of solvent less reactions; Green chemistry in sustainable development. (Bio-diesel, bio-ethanol and biogas).

Recommended Text Books:

1. Anastas P.T. & Warner J.K.: Green Chemistry- Theory and Practical, Oxford University Press (2000).
2. Ahluwalia V.K. & Kidwai M.: New Trends in Green Chemistry, Anamalaya Publishers, New Delhi (2004).
3. Kumar V., An Introduction to Green Chemistry, Vishal Publishing Co., (2015).

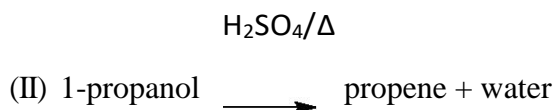
Reference Books:

1. Matlack A.S. Introduction to Green Chemistry, Marcel Dekker (2001).
2. Das Asim K. and Das Mahua, Environment Chemistry with Green Chemistry, Books and Allied (P) Ltd. (2010)

Discipline Specific Elective Paper II LAB

At least five experiments should be done:

1. Acetylation of primary amine (Aniline to N-phenylacetamide) using Zn dust.
2. Nitration of salicylic acid by green method (Using calcium nitrate and acetic acid).
3. Bromination of acetanilide using ceric ammonium nitrate/KBr.
4. Microwave assisted nitration of Phenols using $\text{Cu}(\text{NO}_3)_2$.
5. Detection of elements in organic compounds by green method (Sodium carbonate fusion).
6. Base catalyzed Aldol condensation (Synthesis of dibenzalpropanone).
7. Vitamin C clock reaction using vitamin C tablets, tincture of iodine, hydrogen peroxide and liquid laundry starch. Effect of concentration on clock reaction.
8. Photoreduction of benzophenone to benzopinacol in the presence of sunlight.
9. Diels Alder reaction in water: Reaction between furan and maleic acid in water and at room temperature rather than in benzene and reflux.
10. Preparation and characterization of nanoparticles (Cu, Ag) using plant extract.
11. Preparation of propene by following two methods or any other reactions like addition, elimination, substitution showing atomic economy can be studied
(I) $\text{Triethylamine ion} + \text{OH}^- \rightarrow \text{Propene} + \text{Trimethylpropene} + \text{water}$



Reference Books:

1. Monograph on Green Chemistry Laboratory Experiments, edited and published by Green Chemistry Task Force Committee, DST Govt. of India, p. 1-79.
2. Kirchoff, M. & Ryan, M.A. *Greener approaches to undergraduate chemistry experiment*. American Chemical Society, Washington DC (2002).
3. Sharma, R.K.; Sidhwani, I.T. & Chaudhari, M.K. I.K. *Green Chemistry Experiment: A monograph International Publishing House Pvt Ltd. New Delhi. Bangalore* CISBN978-93-81141-55-7 (2013).

Discipline Specific Elective Paper-III

INDUSTRIAL CHEMICALS AND ENVIRONMENT

Unit-I

Industrial Gases and Inorganic Chemicals

Industrial Gases: Large scale production uses storage and hazards in handling of the following gases: oxygen, nitrogen, argon, hydrogen, acetylene, carbon monoxide, chlorine, sulphur dioxide.

Inorganic Chemicals: Manufacture, application and hazards in handling the following chemicals: hydrochloric acid, nitric acid, sulphuric acid, caustic soda, common salt, bleaching powder, sodium thiosulphate, hydrogen peroxide, potash alum, potassium dichromate and potassium permanganate.

Industrial Metallurgy

Preparation of metals (ferrous and nonferrous) and ultrapure metals for semiconductor technology.

Unit-II

Environment and its segments

Ecosystems. Biogeochemical cycles of carbon, nitrogen and sulphur.

Air Pollution: Major regions of atmosphere. Chemical and photochemical reactions in atmosphere. Air pollutants: types, sources, particle size and chemical nature; Photochemical smog: its constituents and photochemistry. Environmental effects of ozone. Major sources of air pollution.

Pollution by SO₂, CO₂, CO, NO_x, and H₂S and control procedures.

Effects of air pollution on living organisms and vegetation. Greenhouse effect and global warming, Ozone depletion by oxides of nitrogen, chlorofluorocarbons and halogens, removal of sulphur from coal.

Unit-III

Water Pollution: Hydrological cycle, water resources, aquatic ecosystems, Sources and nature of water pollutants, Techniques for measuring water pollution, Impacts of water pollution on hydrological and ecosystems.

Water purification methods. Effluent treatment plants (primary, secondary and tertiary treatment). Industrial effluents from the following industries and their treatment: electroplating, textile, tannery, dairy, petroleum and petrochemicals, fertilizer. Sludge disposal.

Industrial waste management: incineration of waste. Water treatment and purification (reverse osmosis, ion exchange). Water quality parameters for wastewater, industrial water and domestic water.

Unit-IV

Energy and Environment

Sources of energy: Coal, petrol and natural gas. Nuclear fusion/fission, solar energy, hydrogen, geothermal, tidal and hydel.

Nuclear Pollution: Disposal of nuclear waste, nuclear disaster and its management.

Biocatalysis

Introduction to biocatalysis: Importance in green chemistry and chemical industry.

Recommended Text Books:

1. De, A. K. *Environmental Chemistry*: New Age International Pvt., Ltd, New Delhi, 2010.
2. Stocchi E., *Industrial Chemistry*, Vol-I, Ellis Horwood Ltd. UK.
3. Sharma, B.K. & Gaur, H. *Industrial Chemistry*, Goel Publishing House, Meerut (1996).

Reference Books:

1. Felder R.M. and Rousseau R.W., *Elementary Principles of Chemical Processes*, Wiley Publishers, New Delhi.
2. Dara S. S., *A Textbook of Engineering Chemistry*, S. Chand & Company Ltd. New Delhi.
3. Miller G.T., *Environmental Science*, 11th edition. Brooks/ Cole (2006).
4. Mishra, *Environmental Studies*, Selective and Scientific Books, New Delhi (2005).

Discipline Specific Elective Paper III LAB

1. Determination of Dissolved Oxygen (DO) in water.
2. Determination of Chemical Oxygen Demand (COD)
3. Determination of Biological Oxygen Demand (BOD)
4. Percentage of available chlorine in bleaching powder.
5. Measurement of chloride, sulphate and salinity of water samples by simple titration method (AgNO₃ and potassium chromate).
6. Estimation of total alkalinity of water samples (CO²⁻, HCO⁻) using double titration method.
7. Measurement of dissolved CO₂.
8. Study of some of the common bio-indicators of pollution.
9. Estimation of SPM in air samples.
10. Preparation of borax/ boric acid.

Reference Books:

1. Dara S. S., *A Textbook on Experiments and Calculations in Engineering Chemistry S* Chand & Company; 9th revised edition (2015).
2. E. Stocchi: *Industrial Chemistry*, Vol-I, Ellis Horwood Ltd. UK.
3. R.M. Felder, R.W. Rousseau: *Elementary Principles of Chemical Processes*, Wiley Publishers, New Delhi.
4. A. Kent: *Riegel's Handbook of Industrial Chemistry*, CBS Publishers, New Delhi.
5. S. M. Khopkar, *Environmental Pollution Analysis*: Wiley Eastern Ltd, New Delhi.

Discipline Specific Elective Paper-IV

INORGANIC MATERIALS OF INDUSTRIAL IMPORTANCE

Unit I

Silicate Industries

Glass: Glassy state and its properties, classification (silicate and nonsilicate glasses). Manufacturing and processing of glass. Composition and properties of the following types of glasses: Soda lime glass, lead glass, armoured glass, safety glass, borosilicate glass, fluorosilicate, coloured glass, photosensitive glass.

Ceramics: Important clays and feldspar, ceramic, their types and manufacture. High technology ceramics and their applications, superconducting and semiconducting oxides, fullerenes carbon nanotubes and carbon fibre.

Cements: Classification of cement, ingredients and their role, Manufacture of cement and the setting process, quick setting cements.

Unit II

Fertilizers: Different types of fertilizers. Manufacture of the following fertilizers: Urea, ammonium nitrate, calcium ammonium nitrate, ammonium phosphates; polyphosphate, superphosphate, compound and mixed fertilizers, potassium chloride, potassium sulphate.

Batteries: Primary and secondary batteries, battery components and their role, Characteristics of Battery. Working of following batteries: Pb acid, Li-Battery, Solid state electrolyte battery. Fuel cells, Solar cell and polymer cell.

Unit III

Surface Coatings:

Objectives of coatings surfaces, preliminary treatment of surface, classification of surface coatings. Paints and pigments-formulation, composition and related properties. Oil paint, Vehicle, modified oils, Pigments, toners and lakes pigments, Fillers, Thinners, Enamels, emulsifying agents. Special paints (Heat retardant, Fire retardant, Eco-friendly paint, Plastic paint), Dyes, Wax polishing, Water and Oil paints, additives, Metallic coatings, metal spraying and anodizing.

Unit IV

Alloys: Classification of alloys, ferrous and non-ferrous alloys, Specific properties of elements in alloys. Manufacture of Steel (removal of silicon, decarbonization, demanganization, desulphurization, dephosphorisation) and surface treatment (argon treatment, heat treatment nitriding, carburizing). Composition and properties of different types of steels.

Chemical explosives: Origin of explosive properties in organic compounds, preparation and explosive properties of lead azide, PETN, cyclonite (RDX). Introduction to rocket propellants.

Recommended Text Books:

1. Stocchi E., *Industrial Chemistry*, Vol-I, Ellis Horwood Ltd. UK.
2. Sharma, B.K. & Gaur, H. *Industrial Chemistry*, Goel Publishing House, Meerut (1996).
3. P. C. Jain, M. Jain: *Engineering Chemistry*, Dhanpat Rai & Sons, Delhi.

Reference Books:

1. Felder R.M. and Rousseau R.W., *Elementary Principles of Chemical Processes*, Wiley Publishers, New Delhi.
2. Dara S. S., *A Textbook of Engineering Chemistry*, S. Chand & Company Ltd. New Delhi.
3. A. Kent: *Riegel's Handbook of Industrial Chemistry*, CBS Publishers, New Delhi.
4. R. Gopalan, D. Venkappayya, S. Nagarajan: *Engineering Chemistry*, Vikas Publications, New Delhi.

Discipline Specific Elective Paper-IV LAB

List of Practicals

1. Determination of free acidity in ammonium sulphate fertilizer.
2. Estimation of Calcium in Calcium ammonium nitrate fertilizer.
3. Estimation of phosphoric acid in superphosphate fertilizer.
4. Determination of composition of dolomite (by complexometric titration).
5. Analysis of (Cu, Ni); (Cu, Zn) in alloy or synthetic samples.
6. Analysis of Cement.
7. Estimation of Iron from Cement Volumetrically
8. Preparation of pigment (zinc oxide).

Reference Books

1. Dara S. S., *A Textbook on Experiments and Calculations in Engineering Chemistry S Chand & Company; 9th revised edition (2015).*
2. E. Stocchi: *Industrial Chemistry*, Vol-I, Ellis Horwood Ltd. UK.
3. R. M. Felder, R. W. Rousseau: *Elementary Principles of Chemical Processes*, Wiley

Publishers, New Delhi.

4. W. D. Kingery, H. K. Bowen, D. R. Uhlmann: Introduction to Ceramics, Wiley Publishers, New Delhi.
5. J. A. Kent: Riegel's Handbook of Industrial Chemistry, CBS Publishers, New Delhi.
6. P. C. Jain, M. Jain: Engineering Chemistry, Dhanpat Rai & Sons, Delhi.
7. R. Gopalan, D. Venkappayya, S. Nagarajan: Engineering Chemistry, Vikas Publications, New Delhi.

Alternative to DSC CORE PAPER IV

Discipline Specific Elective Paper- V

DISSERTATION

A project work is to be carried out by the student in consultation with the teachers of the department. The report of work (dissertation) in a standard format is to be submitted and presented for evaluation.

Distribution of marks

- (a) Project Report/Dissertation (Proper documentation of literature, data, discussion etc. and logical flow of work undertaken): 50 Marks
- (b) Seminar/Presentation: 30 marks
- (c) Viva voce: 20 marks

Brief Guidelines to Project Work:

1. Students shall undertake the project work (experimental/theoretical) related to any branch of chemistry/Chemical science under the guidance of teacher(s) from the department or jointly with teachers/research personnel of other institutes.
2. The following activities have been outlined as guidelines (not exhaustive):
 - Physiochemical studies (pH, conductivity, turbidity, etc.) of different wetlands (ponds, lakes, river etc.)
 - Analysis of iron in pond / tube well / river water.
 - Analysis of Hardness of water samples.
 - Adulteration detection activities in food stuff and other edible items.
 - Extraction and preliminary characterization of useful chemicals (as far as possible) from plants.
 - Solubility, surface tension, and viscosity measurements of some solution of practical

- relevance, (cough syrup, soap solution, pesticides, fertilizers.. etc.)
- Pollution related activities (Industrial/Agricultural/Municipal etc.)
 - Nutrition related activities, (essential metal detection in food, cereals, pulses, fruits etc.).
 - Small synthetic work (inorganic/Organic/Polymeric compounds)
2. The UG level project work is a group activity, maximum number of students being limited to three. HOD to notify the name of teacher(s) for supervising the project work of each group. A teacher can guide more than one group, if necessary.
 4. No two groups in the same institution are permitted to do project work on the same problem.
 5. Each student shall prepare and submit the project report separately for evaluation. Two copies of project report are required to be submitted in bound form (spiral/paperback).
 6. The project report shall be divided as:
 - Chapter I: Introduction (Introduction on the topic, review of literature, objective and scope of the work)
 - Chapter II: Materials and methods
 - Chapter II: Results and discussion
 - Chapter IV: Conclusions and Scope of future studies
 - Chapter V: References

Reference Books:

1. M. A. Malati, An Investigative, Integrated Approach to Practical Project Work; Mid-Kent College of Higher/Further Education, UK (October 1999); Imprint: Woodhead Publishing; ISBN: 978-1-898563-47-1.
2. Dean, J. R., Jones, A. M., Holmes, D., Reed, R., Weyers, J. & Jones, A. (2011) Practical skills in chemistry. 2nd Ed., Prentice-Hall, Harlow.

Alternative for Discipline Specific Elective (DSE) Papers Discipline

Specific Elective Paper-VI

ANALYTICAL METHODS IN CHEMISTRY

Unit I

UV-Visible and IR Spectrometry

Origin of spectra, interaction of radiation with matter, fundamental laws of spectroscopy and selection rules, validity of Beer-Lambert's law.

UV-Visible Spectrometry: Basic principles, instrumentation (choice of source, monochromator and detector) for single and double beam instrument; Basic principles of quantitative analysis:

estimation of metal ions from aqueous solution, geometrical isomers, keto-enol tautomers. Determination of composition of metal complexes using Job's method of continuous variation and mole ratio method.

Infrared Spectrometry: Basic principles of instrumentation (choice of source, monochromator & detector) for single and double beam instrument; sampling techniques. Structural illustration through interpretation of data, Effect and importance of isotope substitution.

Unit II

Qualitative and quantitative aspects of analysis

Sampling, evaluation of analytical data, errors, accuracy and precision, methods of their expression, normal law of distribution if indeterminate errors, statistical test of data; F, Q and t test, rejection of data, and confidence intervals.

Flame Atomic Absorption Spectrometry

Basic principles of instrumentation (choice of source, monochromator, detector, choice of flame and Burner designs. Techniques of atomization and sample introduction; Method of background correction, sources of chemical interferences and their method of removal. Techniques for the quantitative estimation of trace level of metal ions from water samples.

Unit III

Thermal and electro-analytical methods of analysis

Theory of thermo-gravimetry (TG), basic principle of instrumentation. Techniques for quantitative estimation of Ca and Mg from their mixture.

Classification of electro-analytical methods, basic principle of pH metric, potentiometric and conductometric titrations. Techniques used for the determination of equivalence points.

Unit IV

Separation techniques

Solvent extraction: Classification, principle and efficiency of the technique. Mechanism of extraction: extraction by solvation and chelation. Technique of extraction: batch, continuous and counter current extractions.

Chromatography: Classification, principle and efficiency of the technique. Mechanism of separation: adsorption, partition & ion exchange. Development of chromatograms: frontal, elution and displacement methods. Qualitative and quantitative aspects of chromatographic methods of analysis: TLC and HPLC.

Recommended text books:

1. Vogel, Arthur I: A Test book of Quantitative Inorganic Analysis (Rev. by G.H. Jeffery and others) 5th Ed., The English Language Book Society of Longman.
2. Skoog, Holler and Crouch, Principles of Instrumental Analysis, Cengage Learning, 6th Indian Reprint (2017).
3. Christian, Gary D; Analytical Chemistry, 6th Ed., John Wiley & Sons, New York, 2004.

Reference books

1. Harris, Daniel C: Exploring Chemical Analysis, Ed. New York, W. H. Freeman, 2001.
2. Willard, Hobert H. et al.: Instrumental Methods of Analysis, 7th Ed., Wardsworth Publishing Company, Belmont, California, USA, 1988.
3. Mikes, O. & Chalmes, R.A. Laboratory Hand Book of Chromatographic & Allied Methods, Elles Harwood Ltd. London.
4. Pavia, Lamman, Kriz and Vyvyan, Introduction to Spectroscopy, Cengage Learning, 3rd Indian Reprint (2017).
5. Dash U N , Analytical Chemistry.

Discipline Specific Elective Paper -VI LAB

1. Paper chromatographic separation of Fe^{3+} , Al^{3+} , and Cr^{3+} .
2. Separation and identification of the monosaccharides present in the given mixture (glucose & fructose) by paper chromatography. Reporting the R_f values.
3. Separate a mixture of Sudan yellow and Sudan Red by TLC technique and identify them on the basis of their R_f values.
4. Chromatographic separation of the active ingredients of plants, flowers and juices by TLC.
5. Determine the pH of the given aerated drinks fruit juices, shampoos and soaps.
6. Determination of Na, Ca, Li in cola drinks and fruit juices using flame photometric techniques.
7. Analysis of soil: determination of pH of soil, total soluble salt, estimation of calcium, magnesium, phosphate, nitrate.
8. Separation of metal ions from their binary mixture.
9. Separation of amino acids from organic acids by ion exchange chromatography.
10. Determination of dissolved oxygen in water.
11. Determination of chemical oxygen demand (COD).

Reference Books:

1. Vogel, Arthur I: A Test book of Quantitative Inorganic Analysis (Rev. by G. H. Jeffery and others) 5th Ed., The English Language Book Society of Longman.
2. Willard, Hobert H. et al.: Instrumental Methods of Analysis, 7th Ed., Wardsworth Publishing Company, Belmont, California, USA, 1988.
3. Khopkar, S.M. Basic Concepts of Analytical Chemistry. New Age, International Publisher, 2009.

GENERIC ELECTIVE (GE)

Generic Elective Paper I (Theory)

ATOMIC STRUCTURE, BONDING, GENERAL ORGANIC CHEMISTRY & ALIPHATIC HYDROCARBONS

Section A: Inorganic Chemistry-I

Unit-I

Atomic Structure

Review of: Bohr's theory and its limitations, dual behaviour of matter and radiation, de-Broglie's relation, Heisenberg Uncertainty principle. Hydrogen atom spectra.

Quantum mechanics: Time independent Schrodinger equation and meaning of various terms in it. Significance of ψ and ψ^2 , Schrödinger equation for hydrogen atom. Radial and angular parts of the hydrogenic wave functions (atomic orbitals) and their variations for 1s, 2s, 2p, 3s, 3p and 3d orbitals (Only graphical representation). Quantum numbers and their significance, shapes of s, p and d atomic orbitals, nodal planes.

Rules for filling electrons in various orbitals, Electronic configurations of the atoms. Stability of half-filled and completely filled orbitals, concept of exchange energy. Relative energies of atomic orbital, Anomalous electronic configurations.

Unit-II

Chemical Bonding and Molecular Structure

Ionic Bonding: General characteristics, energy considerations. Lattice energy and solvation energy and their importance in the context of stability and solubility of ionic compounds. Statement of Born-Landé equation for calculation of lattice energy, Born-Haber cycle and its applications, polarizing power and polarizability. Fajan's rules and its applications.

Covalent bonding: VB Approach: Shapes of some inorganic molecules and ions on the basis of VSEPR and hybridization with suitable examples of linear, trigonal planar, square planar, tetrahedral, trigonal bipyramidal and octahedral arrangements.

Concept of resonance and resonating structures in various inorganic and organic compounds.

MO Approach: Rules for the LCAO method, bonding and antibonding MOs and their characteristics for *s-s*, *s-p* and *p-p* combinations of atomic orbitals, nonbonding combination of orbitals, MO treatment of homonuclear diatomic molecules (N₂, O₂) and heteronuclear diatomic molecules (CO, NO). Comparison of VB and MO approaches.

Section B: Organic Chemistry-I

Unit- III

Fundamentals of Organic Chemistry

Physical Effects, Electronic Displacements: Inductive effect, Electrometric effect, Resonance and hyperconjugation. Cleavage of bonds: Homolysis and heterolysis.

Structure, shape and reactivity of organic molecules: Nucleophiles and electrophiles. Reactive Intermediates: Carbocations, Carbanions and free radicals.

Strength of organic acids and bases: Comparative study with emphasis on factors affecting pK values. Aromaticity: Hückel's rule.

Stereochemistry

Conformations with respect to ethane, butane and cyclohexane. Interconversion of Wedge Formula, Newmann, Sawhorse and Fischer representations. Concept of chirality (up to two carbon atoms). Configuration: Geometrical and Optical isomerism; Enantiomerism, Diastereomerism and Meso compounds). D and L; cis-trans nomenclature; CIP Rules: R/ S (for one chiral carbon atoms) and E / Z Nomenclature (for up to two C=C systems).

Unit-IV

Aliphatic Hydrocarbons

Functional group approach for the following reactions (preparations & reactions) to be studied in context to their structure.

Alkanes: (Up to 5 Carbons) *Preparation:* Catalytic hydrogenation, Wurtz reaction, Kolbe's synthesis, from Grignard reagent. *Reactions:* Free radical Substitution: Halogenation.

Alkenes: (Up to 5 Carbons) *Preparation:* Elimination reactions: Dehydration of alkenes and dehydrohalogenation of alkyl halides (Saytzeff's rule); cis-alkenes (Partial catalytic hydrogenation) and trans-alkenes (Birch reduction). *Reactions:* cis-addition (alk. KMnO₄) and trans-addition (bromine), Addition of HX (Markownikoff's and anti- Markownikoff's addition),

Hydration, Ozonolysis.

Alkynes: (Up to 5 Carbons) *Preparation:* Acetylene from CaC_2 and conversion into higher alkynes; by dehalogenation of tetra halides and dehydrohalogenation of vicinal-dihalides.

Reactions: formation of metal acetylides, addition of bromine and alkaline KMnO_4 , ozonolysis.

Recommended Text Books:

1. Lee J. D., Concise Inorganic Chemistry, Wiley India, 5thEdn., 2008.
2. Puri, Sharma, Kalia, Principles of Inorganic Chemistry, Vishal Pub. Co., 33rd Ed., 2017.
3. Shriver D.E., Atkins P. W., Inorganic Chemistry, Oxford University Press, 5th Edn.
4. Huheey J. E., Keiter E. A. and Keiter R. L., Inorganic Chemistry – Principles of structure and reactivity, Pearson Education, 4th Ed. 2002.
5. Morrison, R. N. & Boyd, R. N., Organic Chemistry, Dorling Kindersley (India) Pvt. Ltd. (Pearson Education).
6. Bhal Arun & Bhal B S, Advanced Organic Chemistry, 2nd Edition, S. Chand Publisher, 2012.
7. Kalsi, P. S. Stereochemistry Conformation and Mechanism; 8th Edn, New Age International, 2015.

Reference books

1. Das Asim K., Fundamentals of Inorganic Chemistry, Vol. II, CBS Publications, 2nd Ed. 2010.
2. Pradeep's Inorganic Chemistry, Vol. I & II, Universal Book seller, 14th Ed. 2017.
3. Mallick, Madan and Tuli, S. Chand Selected Topic in Inorganic Chemistry, 17thEdn. 2010.
4. Dhawan, S.N., Pradeep's Organic Chemistry, (Vol. I and II), Pradeep Publications.

Generic Elective Paper I LAB

Section A: Inorganic Chemistry

Volumetric Analysis

1. Estimation of sodium carbonate and sodium hydrogen carbonate present in a mixture.
2. Estimation of oxalic acid by titrating it with KMnO_4 .
3. Estimation of water of crystallization in Mohr's salt by titrating with KMnO_4 .
4. Estimation of Fe(II) ions by titrating it with $\text{K}_2\text{Cr}_2\text{O}_7$ using internal indicator.
5. Estimation of Cu(II) ions iodometrically using $\text{Na}_2\text{S}_2\text{O}_3$.

Section B: Organic Chemistry

1. Detection of extra elements (N, S, Cl) in organic compounds (containing up to two extra elements)
2. Separation of mixtures by Chromatography: Measure the R_f value in each case (combination of two compounds to be given)
 - (a) Identify and separate the components of a given mixture of 2 amino acids (glycine, aspartic acid, glutamic acid, tyrosine or any other amino acid) by paper chromatography.
 - (b) Identify and separate the sugars present in the given mixture by paper chromatography.

Reference Books:

1. Mendham, J., A. I. Vogel's Quantitative Chemical Analysis 6th Ed., Pearson, 2009.
2. Mann, F.G. & Saunders, B.C. Practical Organic Chemistry, Pearson Education (2009)
3. Ahluwalia, V.K., Dhingra, S. and Gulati A, College Practical Chemistry, University Press (2005).

Generic Elective Paper II (Theory)

CHEMICAL ENERGETICS, EQUILIBRIA & FUNCTIONAL ORGANIC CHEMISTRY

Section A: Physical Chemistry-I

Unit-I

Chemical Energetics

Review of thermodynamics and the Laws of Thermodynamics.

Important principles and definitions of thermochemistry. Concept of standard state and standard enthalpies of formations, integral and differential enthalpies of solution and dilution. Calculation of bond energy, bond dissociation energy and resonance energy from thermochemical data. Variation of enthalpy of a reaction with temperature – Kirchhoff's equation.

Statement of Third Law of thermodynamics.

Chemical Equilibrium

Free energy change in a chemical reaction. Thermodynamic derivation of the law of chemical equilibrium. Distinction between ΔG and ΔG° , Le Chatelier's principle. Relationships between K_p , K_c and K_x for reactions involving ideal gases.

Unit- II

Ionic Equilibria

Strong, moderate and weak electrolytes, degree of ionization, factors affecting degree of ionization, ionization constant and ionic product of water. Ionization of weak acids and bases, pH scale, common ion effect. Salt hydrolysis-calculation of hydrolysis constant, degree of hydrolysis and pH for different salts. Buffer solutions. Solubility and solubility product of sparingly soluble salts – applications of solubility product principle.

Section B: Organic Chemistry-II

Unit- III

Functional group approach for the following reactions (preparations & reactions) to be studied in context to their structure.

Aromatic hydrocarbons

Preparation (Case benzene): from phenol, by decarboxylation, from acetylene, from benzene sulphonic acid. Reactions: (Case benzene): Electrophilic substitution: nitration, halogenation and sulphonation. Friedel-Craft's reaction (alkylation and acylation) (up to 4 carbons on benzene). Side chain oxidation of alkyl benzenes (up to 4 carbons on benzene).

Alkyl and Aryl Halides

Alkyl Halides (Up to 5 Carbons) Types of Nucleophilic Substitution (SN_1 , SN_2 and SN_i) reactions.

Preparation: from alkenes and alcohols. Reactions: hydrolysis, nitrite & nitro formation, nitrile & isonitrile formation. Williamson's ether synthesis: Elimination vs substitution.

Aryl Halides Preparation: (Chloro, bromo and iodo-benzene case): from phenol, Sandmeyer & Gattermann reactions.

Reactions (Chlorobenzene): Aromatic nucleophilic substitution (replacement by $-OH$ group) and effect of nitro substituent. Benzyne Mechanism: KNH_2/NH_3 (or $NaNH_2/NH_3$).

Unit- IV

Alcohols, Phenols and Ethers (Up to 5 Carbons)

Alcohols: Preparation: Preparation of 1° , 2° and 3° alcohols: using Grignard reagent, Ester hydrolysis, Reduction of aldehydes and ketones, carboxylic acid and esters.

Reactions: With sodium, HX (Lucas test), esterification, oxidation (with PCC, Alk. $KMnO_4$, acidic dichromate, conc. HNO_3). Oppeneauer oxidation Diols: (Up to 6 Carbons) oxidation of diols. Pinacol-Pinacolone rearrangement.

Phenols: (Phenol case) Preparation: Cumene hydroperoxide method, from diazonium salts.
Reactions: Electrophilic substitution: Nitration, halogenation and sulphonation. Reimer Tiemann Reaction, Gattermann -Koch Reaction,

Ethers (aliphatic and aromatic): Cleavage of ethers with HI.

Aldehydes and ketones (aliphatic and aromatic): Formaldehyde, acetaldehyde, acetone and benzaldehyde

Preparation: from acid chlorides and from nitriles.

Reactions – Reaction with HCN, ROH, NaHSO₃, NH₂-G derivatives. Iodoform test. Aldol Condensation, Cannizzaro's reaction, Benzoin condensation. Clemensen reduction and Wolff Kishner reduction.

Recommended Text Books:

1. Atkins P. W. & Paula, J. de, Elements of Physical Chemistry, Oxford University Press, 6th Ed., (2006).
2. Principles of Physical Chemistry, Puri, Sharma & Pathania, Vishal Publishing Co, 47th Edn., 2017.
3. K. L. Kapoor, Text Book of Physical Chemistry, Mac Grow Hill, 3rdEdn. 2017.
4. Morrison, R. N. & Boyd, R. N., Organic Chemistry, Dorling Kindersley (India) Pvt. Ltd. (Pearson Education).
5. Arun Bahl & B S Bahl, Advanced Organic Chemistry, 2nd Edition, S. Chand Publisher, 2012.

Reference Books:

1. Kheterpal S.C., Pradeep's Physical Chemistry, Vol. I & II, Pradeep Publications.
2. Dhawan, S.N., Pradeep's Organic Chemistry, (Vol. I and II), Pradeep Publications

Generic Elective Paper II LAB Section

A: Physical Chemistry

Thermochemistry (any three)

1. Determination of heat capacity of calorimeter for different volumes.
2. Determination of enthalpy of neutralization of hydrochloric acid with sodium hydroxide.
3. Determination of enthalpy of ionization of acetic acid.
4. Determination of integral enthalpy of solution of salts (KNO₃, NH₄Cl).
5. Determination of enthalpy of hydration of copper sulphate.

6. Study of the solubility of benzoic acid in water and determination of ΔH .

Ionic equilibria

pH measurements

- a) Measurement of pH of different solutions like aerated drinks, fruit juices, shampoos and soaps (use dilute solutions of soaps and shampoos to prevent damage to the glass electrode) using pH-meter.
- b) Preparation of buffer solutions:
 - Sodium acetate-acetic acid
 - Ammonium chloride-ammonium hydroxide

Measurement of the pH of buffer solutions and comparison of the values with theoretical values.

Section B: Organic Chemistry

1. Purification of organic compounds by crystallization (from water) and determination of melting.
2. Preparations, recrystallisation, determination of melting point and calculation of quantitative yields of the followings:
 - (a) Bromination of Phenol/Aniline
 - (b) Benzoylation of amines/phenols
 - (c) Oxime and 2,4 dinitrophenylhydrazone of aldehyde/ketone

Reference Books

1. A.I. Vogel: Textbook of Practical Organic Chemistry, 5th edition, Prentice-Hall.
2. Mann, F.G. & Saunders, B.C. Practical Organic Chemistry, Pearson Education (2009).
3. Khosla, B. D.; Garg, V. C. & Gulati, A. Senior Practical Physical Chemistry, R. Chand & Co., New Delhi (2011).
4. Ahluwalia, V.K., Dhingra, S. and Gulati A, College Practical Chemistry, University Press (2005).

Generic Elective Paper III (Theory)

**CHEMISTRY OF S- AND P-BLOCK ELEMENTS, STATES OF MATTER & CHEMICAL
KINETICS**

Section A: Inorganic Chemistry-II

Unit-I

General Principles of Metallurgy

Chief modes of occurrence of metals based on standard electrode potentials. Ellingham diagrams for reduction of metal oxides using carbon as reducing agent.

Hydrometallurgy, Methods of purification of metals (Al, Pb, Fe, Cu, Ni): electrolytic, oxidative refining, Parting process, van Arkel-de Boer process and Mond's process.

s- and p-Block Elements

Periodicity in s- and p-block elements with respect to electronic configuration, atomic and ionic size, ionization enthalpy, electronegativity (Pauling & Mulliken scales). Allotropy in C, S, and P.

Oxidation states with reference to elements in unusual and rare oxidation states like carbides and nitrides), inert pair effect, diagonal relationship and anomalous behaviour of first member of each group.

Unit-II

Compounds of s- and p-Block Elements

Hydrides and their classification (ionic, covalent and interstitial), structure and properties with respect to stability of hydrides of p- block elements.

Concept of multicentre bonding (diborane).

Structure, bonding and their important properties like oxidation/reduction, acidic/basic nature of the following compounds and their applications in industrial, organic and environmental chemistry.

Hydrides of nitrogen (NH_3 , N_2H_4 , N_3H , NH_2OH); Oxoacids of P, S and Cl; Halides and oxohalides: PCl_3 , PCl_5 , SOCl_2 .

Section B: Physical Chemistry- II

Unit-III

Kinetic Theory of Gases

Postulates of Kinetic Theory of Gases and derivation of the kinetic gas equation.

Deviation of real gases from ideal behaviour, compressibility factor, causes of deviation. van der Waals equation of state for real gases. Boyle temperature (derivation not required). Critical phenomena, critical constants and their calculation from van der Waals equation.

Maxwell Boltzmann distribution laws of molecular velocities and molecular energies (graphic representation – derivation not required) and their importance.

Temperature dependence of these distributions. Most probable, average and root mean square velocities (no derivation). Collision cross section, collision number, collision frequency, collision diameter and mean free path of molecules. Viscosity of gases and effect of temperature and pressure on coefficient of viscosity (qualitative treatment only).

Liquids

Surface tension and its determination using stalagmometer. Viscosity of a liquid and determination of coefficient of viscosity using Ostwald viscometer. Effect of temperature on surface tension and coefficient of viscosity of a liquid (qualitative treatment only).

Unit-IV

Solids

Forms of solids. Symmetry elements, unit cells, crystal systems, Bravais lattice types and identification of lattice planes. Laws of Crystallography - Law of constancy of interfacial angles, Law of rational indices. Miller indices. X-Ray diffraction by crystals, Bragg's law. Structures of NaCl, and CsCl (qualitative treatment only). Defects in crystals.

Chemical Kinetics

The concept of reaction rates. Effect of temperature, pressure, catalyst and other factors on reaction rates. Order and molecularity of a reaction. Derivation of integrated rate equations for zero, first and second order reactions (both for equal and unequal concentrations of reactants). Half-life of a reaction. General methods for determination of order of a reaction. Concept of activation energy and its calculation from Arrhenius equation.

Theories of Reaction Rates: Collision theory and Activated Complex theory of bimolecular reactions. Comparison of the two theories (qualitative treatment only).

Recommended Text Books:

1. Lee J. D., Concise Inorganic Chemistry, Wiley India, 5th Edn., 2008.
2. Puri, Sharma, Kalia, Principles of Inorganic Chemistry, Vishal Pub. Co., 33rd ed., 2017.
3. Shriver D.E., Atkins P. W., Inorganic Chemistry, Oxford University Press, 5th Edn.
4. Principles of Physical Chemistry, Puri, Sharma & Pathania, Vishal Publishing Co, 47th Edn., 2017.
5. K. L. Kapoor, Text Book of Physical Chemistry, Mac Grow Hill, 3rd Edn. 2017.

Reference Books:

1. Kheterpal S.C., Pradeep's Physical Chemistry, Vol. I & II, Pradeep Publications.
2. Pradeep's Inorganic Chemistry, Vol. I & II, Universal Book seller, 14th Ed. 2017.

Generic Elective Paper -III LAB

Section A: Inorganic Chemistry

Qualitative analysis of inorganic salt mixture using H₂S: not more than four ionic species (two anions and two cations and excluding insoluble salts) out of the following:

Cations : NH₄⁺, Pb²⁺, Ag⁺, Bi³⁺, Cu²⁺, Cd²⁺, Sn²⁺, Fe³⁺, Al³⁺, Co²⁺, Cr³⁺, Ni²⁺, Mn²⁺,
Zn²⁺, Ba²⁺, Sr²⁺, Ca²⁺, K⁺

Anions: CO₃²⁻, S²⁻, SO₄²⁻, NO₃⁻, Cl⁻, Br⁻, I⁻, NO₂⁻, SO₃²⁻, PO₄³⁻, F⁻

(Spot tests should be carried out wherever feasible)

Section B: Physical Chemistry

Chemical Kinetics

Study the kinetics of the following reactions.

1. Initial rate method: Iodide-persulphate reaction
2. Integrated rate method:
 - a. Acid hydrolysis of methyl acetate with hydrochloric acid.
 - b. Saponification of ethyl acetate.
 - c. Compare the strengths of HCl and H₂SO₄ by studying kinetics of hydrolysis of methyl acetate

Reference Books:

1. Svehla, G, Vogel's Qualitative Inorganic Analysis, 7th Ed, 4th Ed., Pearson Education (2007).
2. Khosla, B. D.; Garg, V. C. & Gulati, A. Senior Practical Physical Chemistry, R. Chand & Co., New Delhi (2011).
3. Gulati Shikha, Sharma Gulati JL and Manocha, Shagun, Practical Inorganic Chemistry, 1stEdn., CBS Publishers & Distributors Pvt Ltd., (2017).

Generic Elective Paper- IV (Theory)

ORGANOMETALLICS, BIOINORGANIC CHEMISTRY, POLYNUCLEAR

HYDROCARBONS AND UV, IR SPECTROSCOPY

Section A: Inorganic Chemistry- III

Unit-I

Chemistry of 3d metals

Oxidation states displayed by Cr, Fe, Co, Ni and Cu.

A study of the following compounds (including preparation and important properties);

Peroxo compounds of Cr, $K_2Cr_2O_7$, $KMnO_4$, $K_4[Fe(CN)_6]$, sodium nitroprusside, $[Co(NH_3)_6]Cl_3$, $Na_3[Co(NO_2)_6]$.

Organometallic Compounds

Definition and Classification with appropriate examples based on nature of metal-carbon bond (ionic, s, p and multicentre bonds). Structures of methyl lithium, Zeiss salt and ferrocene. EAN rule as applied to carbonyls. Preparation, structure, bonding and properties of mononuclear and polynuclear carbonyls of 3d metals. π -acceptor behaviour of carbon monoxide. Synergic effects (VB approach).

Unit-II

Bio-Inorganic Chemistry

A brief introduction to bio-inorganic chemistry. Role of metal ions present in biological systems with special reference to Na^+ , K^+ and Mg^{2+} ions: Na/K pump; Role of Mg^{2+} ions in energy production and chlorophyll. Role of Ca^{2+} in blood clotting, and structural role (bones).

Section B: Organic Chemistry- III

Unit-III

Polynuclear and heteronuclear aromatic compounds

Properties of the following compounds with reference to electrophilic and nucleophilic substitution: Naphthalene, Anthracene, Furan, Pyrrole, Thiophene, and Pyridine.

Active methylene compounds

Preparation: Claisen ester condensation. Keto-enol tautomerism.

Reactions: Synthetic uses of ethylacetoacetate (preparation of non-heteromolecules having up to 6 carbon).

Unit-IV

Application of Spectroscopy (UV-Visible, IR) to Simple Organic Molecules

Electromagnetic radiations, electronic transitions, λ_{\max} & ϵ_{\max} , chromophore, auxochrome, bathochromic and hypsochromic shifts. Application of electronic spectroscopy and Woodward rules for calculating λ_{\max} of conjugated dienes and α , β – unsaturated compounds.

Infrared radiation and types of molecular vibrations, functional group and fingerprint region. IR spectra of alkanes, alkenes and simple alcohols (inter and intramolecular hydrogen bonding), aldehydes, ketones, carboxylic acids and their derivatives (effect of substitution on $>C=O$ stretching absorptions).

Recommended Text Books:

1. Puri, Sharma, Kalia, Principles of Inorganic Chemistry, Vishal Pub. Co., 33rd ed., 2017.
2. Shriver D.E., Atkins P. W., Inorganic Chemistry, Oxford University Press, 5th Edn.
3. Huheey J. E., Keiter E. A. and Keiter R. L., Inorganic Chemistry – Principles of structure and reactivity, Pearson Education, 4th Ed. 2002.
4. Morrison, R. N. & Boyd, R. N., Organic Chemistry, Dorling Kindersley (India) Pvt. Ltd. (Pearson Education).
5. Arun Bahl & B S Bahl, Advanced Organic Chemistry, 2nd Edition, S. Chand Publisher, 2012.

Reference books

1. Das Asim K., Fundamentals of Inorganic Chemistry, Vol. II, CBS Publications, 2nd Ed. 2010.
2. Das Asim K., Bioinorganic Chemistry, Books & Allied (P) Ltd. 1st ed. 2015.
3. Pradeep's Inorganic Chemistry, Vol. I & II, Universal Book seller, 14th Ed. 2017.
4. Dhawan, S.N., Pradeep's Organic Chemistry, (Vol. I and II), Pradeep Publications

Generic Elective Paper IV LAB

Section A: Inorganic Chemistry

1. Preparation of following compounds (Any two)
 - a. Cuprous oxide (Cu_2O)
 - b. Cuprous chloride, Cu_2Cl_2
 - c. Manganese(III) phosphate, $\text{MnPO}_4 \cdot \text{H}_2\text{O}$
 - d. Lead chromate (PbCrO_4)
2. Separation of mixtures by chromatography: Measure the R_f value in each case. (Combination of two ions to be given)
 - Paper chromatographic separation of Fe^{3+} , Al^{3+} and Cr^{3+} or
 - Paper chromatographic separation of Ni^{2+} , Co^{2+} , Mn^{2+} and Zn^{2+}

Section B: Organic Chemistry

Systematic qualitative organic analysis of organic compounds possessing mono-functional groups (-COOH, phenolic, aldehyde, ketone, amide, nitro, amines) and preparation of one derivative.

Reference Books

1. Mendham, J., A. I. Vogel's Quantitative Chemical Analysis 6th Edn, Pearson, 2009.
2. Mann, F.G. & Saunders, B.C. Practical Organic Chemistry, Pearson Education (2009).
3. Ahluwalia, V.K., Dhingra, S. and Gulati A, College Practical Chemistry, University Press (2005).
4. Gulati Shikha, Sharma Gulati JL and Manocha, Shagun, Practical Inorganic Chemistry, 1st Edn., CBS Publishers & Distributors Pvt. Ltd., (2017).

List of minimum instrument required for undertaking practical classes of UG-CBCS in

Chemistry (Core and DSC Practicals)

Sl.	Name of the instrument	Numbers
1.	Ostwald's viscometer	02
2.	Tensiometer (Surface tension measurements)	01
3.	Digital pH-meter with accessories	02
4.	Digital Conductivity meter with accessories	02

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5.	Potentiometer with accessories	01
6.	Colorimeter	01
7.	Calorimeter with accessories (precision thermometer)	01
8.	Visible spectrophotometer (single beam)	01
9.	Magnetic stirrer (with/without hot plate)	02
10.	Heating mantle	01
11.	Melting point apparatus	02
12.	Vacuum pump for filtration	01
13.	Single distillation units (All glass) 2lit/hr capacity	02
14.	Single pan digital balance with precision 0.01 gm and 0.001 gm	02
15.	Water bath (Electrical)	01
16.	Fume hood	01
17.	Kipp's apparatus (PP)	02
18.	Fire extinguishers	02
19.	Aspirator for chromatographic developer	01
20.	Air oven (up to 300°C)	01
21.	Microwave oven (kitchen quality)	01

22.	Small lab accessories like glassware, plastic wares, laboratory wires and other small accessories as per requirement.	
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COMMON SYLLABUS FOR BSc COMPUTER SCIENCE

B. Sc. (Honours) Computer Science (CBCS)

Preamble

Information and Communication Technology (ICT) has today become integral part of all industry domains as well as fields of academics and research. The industry requirements and technologies have been steadily and rapidly advancing. Organizations are increasingly opting for open source systems. The students too these days are thinking beyond career in the industry and aiming for research opportunities. A genuine attempt has been made while designing the new syllabus for this 3- year B. Sc. Computer Science (H) course. Not only does it prepare the students for a career in Software industry, it also motivates them towards further studies and research opportunities. The core philosophy of overall syllabus is to:

- a. Form strong foundation of Computer science,
- b. Introduce emerging trends to the students in gradual way,
- c. Groom the students for the challenges of ICT industry

The Government of Odisha has initiated several measures to bring equity, efficiency and excellence in the Higher Education System of the State of Odisha in line with the University Grants Commission (UGC). The important measures taken to enhance academic standards and quality in higher education include innovation and improvements in curriculum, teaching-learning process, examination and evaluation systems, besides governance and other matters.

The Government of Odisha has formulated various regulations and guidelines from time to time to improve the higher education system and maintain minimum standards and quality across the Universities & Colleges in Odisha in line with UGC. The academic reforms recommended by the UGC in the recent past have led to overall improvement in the higher education system. However, due to lot of diversity in the system of higher education, there are multiple approaches followed by universities towards examination, evaluation and grading system. While the Universities and Colleges must have the flexibility and freedom in designing the examination and evaluation methods that best fits the curriculum, syllabi and teaching-learning methods, there is a need to devise a sensible system for awarding the grades based on the performance of students. Presently the performance of the students is reported using the conventional system of marks secured in the examinations or grades or both. The conversion from marks to letter grades and the letter grades used vary widely across the Universities and Colleges in the states as well as the country. This creates difficulty for the academia and the employers to understand and infer the performance of the students graduating from different universities and colleges based on grades.

The grading system is considered to be better than the conventional marks system and hence it uniform grading system. This will facilitate student mobility across institutions within and

has been followed in the top institutions in India and abroad. So, it is desirable to introduce

uniform grading system. This will facilitate student mobility across institutions within and

across countries and also enable potential employers to assess the performance of students. To bring in the desired uniformity, in grading system and method for computing the cumulative grade point average (CGPA) based on the performance of students in the examinations, the UGC has formulated these guidelines, which is being adopted by the state of Odisha.

CHOICE BASED CREDIT SYSTEM (CBCS): The CBCS provides an opportunity for the students to choose courses from the prescribed courses comprising core, elective/minor or skill based courses. The courses can be evaluated following the grading system, which is considered to be better than the conventional marks system. Therefore, it is necessary to introduce uniform grading system in the entire higher education in Odisha. This will benefit the students to move across institutions within Odisha to begin with and across states and countries. The uniform grading system will also enable potential employers in assessing the performance of the candidates. In order to bring uniformity in evaluation system and computation of the Cumulative Grade Point Average (CGPA) based on student's performance in examinations, the UGC has formulated the guidelines to be followed.

Outline of Choice Based Credit System:

1. **Core Course:** A course, which should compulsorily be studied by a candidate as a core requirement is termed as a Core course.

2. **Elective Course:** Generally, a course which can be chosen from a pool of courses and which may be very specific or specialized or advanced or supportive to the discipline/ subject of study or which provides an extended scope or which enables an exposure to some other discipline/subject/domain or nurtures the candidate's proficiency/skill is called an Elective Course.

Discipline Specific Elective (DSE) Course: Elective courses may be offered by the main discipline/subject of study is referred to as Discipline Specific Elective. The University/Institute may also offer discipline related Elective courses of interdisciplinary nature (to be offered by main discipline/subject of study).

Dissertation/Project: An elective course designed to acquire special/advanced knowledge, such as supplement study/support study to a project work, and a candidate studies such a course on his own with an advisory support by a teacher/faculty member is called dissertation/project.

Generic Elective (GE) Course: An elective course chosen generally from an unrelated discipline/subject, with an intention to seek exposure is called a Generic Elective.

P.S.: A core course offered in a discipline/subject may be treated as an elective by other discipline/subject and vice versa and such electives may also be referred to as Generic Elective.

3. **Ability Enhancement Courses (AEC)/Competency Improvement Courses/Skill Development Courses/Foundation Course:** They ((i) Environmental Science, (ii) English/MIL Communication) are mandatory for all disciplines. AEC courses are value-based and/or skill-based and are aimed at providing hands-on-training, competencies, skills, etc.

Project work/Dissertation is considered as a special course involving application of knowledge

in solving / analyzing /exploring a real life situation / difficult problem. A Project/Dissertation work would be of 6 credits. A Project/Dissertation work may be given in lieu of a discipline specific elective paper.

GUIDELINES FOR PROJECT FORMULATION

As the project work constitutes a major component in most of the professional programs and it is to be carried out with due care and should be executed with seriousness by the candidates.

TYPE OF PROJECT

As majority of the students are expected to work out a real-life project in some industry/research and development laboratories/educational institutions/software companies, it is suggested that the project is to be chosen which should have some direct relevance in day-to-day activities of the candidates in his/her institution. It is not mandatory for a student to work on a real-life project. The student can formulate a project problem with the help of Guide.

PROJECT PROPOSAL (SYNOPSIS)

The project proposal should be prepared in consultation with the guide. The project proposal should clearly state the project objectives and the environment of the proposed project to be undertaken. The project work should compulsorily include the software development. The project proposal should contain complete details in the following form:

1. Title of the Project
2. Introduction and Objectives of the Project
3. Project Category (RDBMS/OOPS/Networking/Multimedia/Artificial Intelligence/Expert Systems etc.)
4. Analysis (DFDs at least up to second level, ER Diagrams/ Class Diagrams/ Database Design etc. as per the project requirements).
5. A complete structure which includes: Number of modules and their description to provide an estimation of the student's effort on the project. Data Structures as per the project requirements for all the modules. Process Logic of each module. Testing process to be used. Reports generation
6. Tools / Platform, Hardware and Software Requirement specifications
7. Future scope and further enhancement of the project.

SEME STER	COURSE OPTED	COURSE NAME	CREDITS
I	Ability Enhancement Course-1	AEC-1 (Environmental Science)	2
	Core Course-1	Programming using C	4
	Core Course-1 Practical	Programming using C LAB	2
	Core Course-2	Digital Logic	4
	Core Course-2 Practical	Digital Logic Lab	2
	Generic Elective-1	GE-1	4
	Generic Elective-1 Practical	GE-1 Tutorial/ LAB	2
II	Ability Enhancement Course-2	AEC-2 (English Communication/MIL)	2
	Core Course-3	Programming using C++	4
	Core Course-3 Practical	Programming using C++ LAB	2
	Core Course-4	Data Structures	4
	Core Course-4 Practical	Data Structures LAB	2
	Generic Elective-2	GE-2	4
	Generic Elective-2 Practical	GE-2 Tutorial/ LAB	2
III	Core Course-5	JAVA Programming	4
	Core Course-5 Practical	JAVA Programming LAB	2
	Core Course-6	Database Systems	4
	Core Course-6 Practical	Database Systems LAB	2
	Core Course-7	Discrete Mathematical Structures	4
	Core Course-7 Practical	Discrete Mathematical Structures LAB	2
	Skill Enhancement Course-1	SEC-1	2
	Generic Elective-3	GE-3	4
General Elective-3 Practical	GE-3 Tutorial/ LAB	2	
IV	Core Course-8	Operating Systems	4
	Core Course-8 Practical	Operating Systems LAB	2
	Core Course-9	Computer Networks	4
	Core Course-9 Practical	Computer Networks LAB	2
	Core Course-10	Computer Graphics	4
	Core Course-10 Practical	Computer Graphics LAB	2
	Skill Enhancement Course-2	SEC-2	2
	Generic Elective-4	GE-4	4
General Elective-4 Practical	GE-4 Tutorial/ LAB	2	
V	Core Course-11	Web Technology	4
	Core Course-11 Practical	Web Technology LAB	2
	Core Course-12	Software Engineering	4
	Core Course-12 Practical	Software Engineering Lab	2
	Discipline Specific Elective-1	DSE-1	4
	Discipline Specific Elective-1 Practical	DSE-1 LAB/ Tutorial	2
	Discipline Specific Elective-2	DSE-2	4
	Discipline Specific Elective-2 Practical	DSE-2 LAB/ Tutorial	2
VI	Core Course-13	Artificial Intelligence	4
	Core Course-13 Practical	Artificial Intelligence LAB	2
	Core Course-14	Algorithm Design Techniques	4
	Core Course-14 Practical	Algorithm Design Techniques LAB	2
	Discipline Specific Elective-3	DSE-3	4
	Discipline Specific Elective-3 Practical	DSE-3 LAB/ Tutorial	2

	Discipline Specific Elective-4	DSE-4	4
	Discipline Specific Elective-4 Practical	DSE-4 LAB/ Tutorial	2

CORE Papers: (Credit: 06 each)

CORE – 1: Programming Using C

CORE – 2: Digital Logic

CORE – 3: Programming Using C++

CORE – 4: Data Structure

CORE – 5: Java Programming

CORE – 6: Database Systems

CORE – 7: Discrete Mathematical Structures CORE –

8: Operating System

CORE – 9: Computer Network CORE

– 10: Computer Graphics CORE –

11: Web Technologies CORE – 12:

Software Engineering CORE – 13:

Artificial Intelligence

CORE – 14: Algorithm Design Techniques

Discipline Specific Electives (DSE) Papers:

DSE–1: Numerical Techniques

DSE–2: Unix Shell Programming

DSE–3: Data Science

DSE–4: Project Work / Dissertation

OR

Data Mining

Skill Enhancement Courses (SEC):

SEC – 1: Python Programming. SEC

– 2: Android Programming.

Ability Enhancement Courses (AEC): AEC –

1: Environmental Science.

AEC – 2: English Communication/MIL.

Generic Elective (GE): (Credit: 06 each) papers offered by Computer Science/IT Departments for other disciplines. It is recommended that the other departments must offer the following papers as GE.

GE – 1: Computer Fundamentals

GE – 2: C and Data Structures

GE – 3: Programming in Python

GE – 4: Web Technology

However the students from **Computer Science/IT** discipline shall choose **four papers of any one discipline** as their GE papers from the following list.

GE-1:

- a) Mathematics–1
- b) Physics–1
- c) Statistics–1
- d) Electronics –1

GE-2:

- a) Mathematics–2
- b) Physics–2
- c) Statistics–2
- d) Electronics –2

GE-3:

- a) Mathematics–3
- b) Physics–3
- c) Statistics–3
- d) Electronics –3

GE-4:

- a) Mathematics–4
- b) Physics–4
- c) Statistics–4
- d) Electronics –4

Detailed Syllabus

CORE – 1: Programming Using

C OBJECTIVES:

-] To learn basics of C programming language.
 -] To be able to develop logics to create programs/ applications in C.
-

Unit-1

Introduction: Introduction to Programming Language, Introduction to C Programming, Keywords & Identifiers, Constants, Variables, Input and Output Operations, Compilation and pre-processing, **Data types:** Different data types, Data types qualifier, modifiers, Memory representation, size and range, **Operators:** Operators (Arithmetic, Relational, Logical, Bitwise, Assignment & compound assignment, Increment & Decrement, Conditional), Operator types (unary, binary, ternary). Expressions, Order of expression (Precedence and associativity) **Control structures:** Decision Making and Branching (Simple IF Statement, IF...ELSE Statement, Nesting IF... ELSE Statement, ELSE IF Ladder), Selection control structure (Switch Statement).

Unit-2

Loops: The WHILE Statement, The DO...WHILE Statement, The FOR Statement, Jumps in Loops, **Array:** Concept of Array, Array Declaration, types of array (one and multiple dimension), Character Arrays and Strings, Subscript and pointer representation of array, Array of Pointers, Limitation of array, **Pointers:** Concept of Pointer (null pointer, wild pointer, dangling pointer, generic pointer), Pointer Expressions, Accessing the Address of a Variable, Declaring Pointer Variables, Initializations of Pointer Variable, Accessing a Variable through its Pointer, Pointer arithmetic.

Unit-3

Storage class: Types (auto, register, static, extern), scope rules, declaration and definition. **Function:** Function & types (User defined function, library function) Function Definition, Declaration, Function Calls, Header file and library, Function Arguments, string handling function (strlen, strcmp, strcpy, strncpy, strcat, strstr), Function recursion, Functions Returning Pointers, Pointers to Functions, Command line arguments, Application of pointer (dynamic memory allocation).

Unit-4

Structure and Union: Defining, Declaring, Accessing, Initialization Structure, nested structure, self-referential structure, bit-field, Arrays of Structures, Structures and Functions, Unions, difference between structure and union, active data member, structure within union, Self-referential Structure, **File:** File Management in C, Defining and Opening a File, File opening modes (read, write, append), Closing a File, File operations, file and stream, Error Handling During I/O Operations, sequential and random access file, low level and high level file.

Text Books:

1. E. Balagurusamy, "Programming in ANSI C", 4/e, (TMH)

Reference Books:

1. B. Kernighan & Dennis Ritchie, "The C Programming Language", 2/e PHI
2. Paul Deitel, Harvey Deitel, "C: How to Program", 8/e, Prentice Hall.
3. P.C. Sethi, P.K. Behera, "Programming using C", Kalyani Publisher, Ludhiana

Core-1 Practical: Programming Fundamentals using C Lab

1. Write a Program to find greatest among three numbers.
2. Write a Program to all arithmetic operation using switch case.
3. Write a Program to print the sum and product of digits of an integer.
4. Write a Program to reverse a number.
5. Write a Program to compute the sum of the first n terms of the following series

$$S = 1 + 1/2 + 1/3 + 1/4 + \dots$$
6. Write a Program to compute the sum of the first n terms of the following series

$$S = 1 - 2 + 3 - 4 + 5 - \dots$$
7. Write a function that checks whether a given string is Palindrome or not. Use this function to find whether the string entered by user is Palindrome or not.
8. Write a function to find whether a given no. is prime or not. Use the same to generate the prime numbers less than 100.
9. Write a Program to compute the factors of a given number.
10. Write a program to swap two numbers using macro.
11. Write a Program to print a triangle of stars as follows (take number of lines from user):

```

*
***
*****
*****

```

12. Write a Program to perform following actions on an array entered by the user:
 - a) Print the even-valued elements
 - b) Print the odd-valued elements
 - c) Calculate and print the sum and average of the elements of array
 - d) Print the maximum and minimum element of array
 - e) Remove the duplicates from the array
 - f) Print the array in reverse order

The program should present a menu to the user and ask for one of the options. The menu should also include options to re-enter array and to quit the program.
13. Write a Program that prints a table indicating the number of occurrences of each alphabet in the text entered as command line arguments.
14. Write a program that swaps two numbers using pointers.
15. Write a program in which a function is passed address of two variables and then alter its contents.
16. Write a program which takes the radius of a circle as input from the user, passes it to another function that computes the area and the circumference of the circle and displays the value of area and circumference from the main() function.
17. Write a program to find sum and average of n elements entered by the user. To write this program, allocate memory dynamically using malloc() / calloc() functions.
18. Write a menu driven program to perform following operations on strings:
 - a) Show address of each character in string
 - b) Concatenate two strings without using strcat function.
 - c) Concatenate two strings using strcat function.
 - d) Compare two strings
 - e) Calculate length of the string (use pointers)
 - f) Convert all lowercase characters to uppercase
 - g) Convert all uppercase characters to lowercase
 - h) Calculate number of vowels
 - i) Reverse the string
19. Given two ordered arrays of integers, write a program to merge the two-arrays to get an ordered array.
20. Write a program to copy the content of one file to other.

CORE-2: DIGITAL LOGIC

OBJECTIVES

-] To understand different methods used for the simplification of Boolean functions and binary arithmetic.
-] To design and implement combinational circuits, synchronous & asynchronous sequential circuits.
-] To study in detail about Semiconductor Memory Systems.

Unit-1

Character Codes, Decimal System, Binary System, Decimal to Binary Conversion, Hexadecimal Notation, Boolean Algebra, Basic Logic Functions: Electronic Logic Gates, Synthesis of Logic Functions, Minimization of Logic Expressions, Minimization using Karnaugh Maps, Synthesis with NAND and NOR Gates, Tri-State Buffers

Unit-2

Arithmetic: Addition and Subtraction of Signed Numbers, Addition/ Subtraction Logic Unit, Design of Fast Adders: Carry-Lookahead Addition, Multiplication of Positive Numbers, Signed-Operand Multiplication: Booth Algorithm, Fast Multiplication: Bit-Pair Recoding Multipliers, Carry-Save Addition of Summands, Integer Division, Floating-Point Numbers and Operations: IEEE Standard for Floating-Point Numbers, Arithmetic Operations on Floating-Point Numbers, Guard Bits and Truncation, Implementing Floating-Point Operations.

Unit-3

Flip-Flops, Gated Latches, Master-Slave Flip-Flops, Edge-Triggering, T Flip-Flops, JK Flip-Flops. Registers and Shift Registers, Counters, Decoders, Multiplexers, Programmable Logic Devices (PLDs), Programmable Array Logic (PAL), Complex Programmable Logic Devices (CPLDs), Field-Programmable Gate Array (FPGA), Sequential Circuits, UP/ DOWN Counters, Timing Diagrams, The Finite State Machine Model, Synthesis of Finite State Machines.

Unit-4

Memory System: Semiconductor RAM Memories, Internal Organization of Memory Chips, Static Memories, Asynchronous DRAMS, Synchronous DRAMS, Structure of Large Memories, Memory System Considerations, RAMBUS Memory. Read-Only Memories: ROM, PROM, EPROM, EEPROM, Flash Memory, Speed, Size, and Cost of Memory. Secondary Storage: Magnetic Hard Disks, Optical Disks, Magnetic Tape Systems.

Text Books:

1. Carl Hamacher, Z. Vranesic, S. Zaky: Computer Organization, 5/e (TMH)

Reference Books:

1. M. Morris Mano: Digital Logic and Computer Design, Pearson

CORE–2 Practical: Digital Logic Lab

1. Introduction to Xilinx software (VHDL)

Write the VHDL code for

2. Realizing all logic gates.

3. Combination Circuit.

4. ADDER.

5. SUBTRACTOR.

6. MUX.

7. DE-MUX.

8. Encoder.

9. Decoder.

10. PAL.

11. PLA.

Write the VHDL program for the following Sequential Logic Circuits

12. Flip Flops.

13. Shift Registers.

14. Counters.

15. Memory Elements.

CORE–3: Programming Using C++

OBJECTIVES

- To know about the Object Oriented Programming concepts.
- To learn basics of C++ programming language.
- To be able to develop logics to create programs/ applications in C++.

Unit-1

Principles of Object-Oriented Programming: Object-Oriented Programming (OOP) Paradigm, Basic Concepts of OOP, Benefits of OOP, Characteristics of OOPS, Object Oriented Languages, Applications of OOP.

C++ Program, C++ statements, Expressions and Control Structures.

Introduction to C++, Difference between C & C++, Tokens, Data types, Operators, Structure of

C++ Program, C++ statements, Expressions and Control Structures.

Functions in C++: Argument passing in function, Inline Functions, Default Arguments, Const. Arguments, Friend function.

Unit-2

Classes and Objects: Defining Member Functions, Making an outside Function Inline, Nested Member Functions, Private Member Functions, Arrays within a Class, Memory Allocation for Objects, Static Data Members, Static Member Functions, Arrays of Objects, Objects as Function Arguments, Friend Functions.

Constructors & Destructors: Constructors, Parameterized Constructors, Constructors with Default Arguments, Dynamic Initialization of Objects, Copy Constructor, Dynamic Constructors, Destructors.

Unit-3

Inheritance: Basics of Inheritance, Type of Inheritance, Virtual Base Classes, Abstract Classes, Member Classes, Nesting of Classes. Polymorphism: Pointers, Pointers to Objects, this Pointer, Pointers to Derived Classes, Virtual Functions, Pure Virtual Functions, Function Overloading, Operator Overloading.

Unit-4

Managing Console I/O Operations: C++ Streams, C++ Stream Classes, Unformatted I/O Operations, Formatted Console I/O Operations, Managing Output with Manipulators. Files: Classes for File Stream Operations, Opening and Closing a File, Detecting end-of-file, File Modes, File Pointers and their Manipulations, Sequential Input and Output Operations, Updating a File: Random Access, Error Handling during File Operations, Command-line Arguments.

Text Books

1. E. Balgurusawmy, Object Oriented Programming with C++, 4/e (TMH).
2. Paul Deitel, Harvey Deitel, "C++: How to Program", 9/e. Prentice Hall.

Reference Books:

1. Bjarne Stroustrup, Programming - Principles and Practice using C++, 2/e, Addison-Wesley 2014
2. Herbtz Schildt, C++: The Complete reference, MGH, 4/ed.
3. P. C. Sethi, P. K. Behera, "Programming in C++"- Kalyani Publisher, Ludhiana

CORE–3 Practical: Programming using C++ Lab

1. Write a Program to find greatest among three numbers using nested if...else statement.
2. Write a Program to check a number is prime or not.
3. Write a Program to find the GCD and LCM of two numbers.
4. Write a program to print the result for following series: $1! + 2! + 3! + \dots$
5. Write a program to print multiplication table from 1 to 10.
6. Write a Program for Swapping of two numbers using pass by value.
7. Write a Program for Swapping of two numbers using pass by address.
8. Write a Program for Swapping of two numbers using pass by reference.
9. Write a Program to find sum of four numbers using default argument passing.
10. Write a Program to find square and cube of a number using inline function.
11. Write a Program to find the factorial of a number.
12. Write a Program to find reverse of a number.
13. Write a program to find sum of four numbers using default argument passing in member

function.

14. Write a Program to find area of circle, triangle and rectangle using function overloading.
15. Write a program to distinguish the properties of static and non-static ata members.
16. Write a program to show the method of accessing static private member function.
17. Write a program to show the ways of calling constructors and destructors.
18. Write a program to perform ++ operator overloading using member function.
19. Write a program to perform ++ operator overloading using friend function.
20. Write a program to perform + operator overloading for two complex number addition.
21. Write a program to perform + operator overloading for string concatenation.
22. Write a program to perform single inheritance.
23. Write a program to perform multiple inheritance.
24. Write a program to create an integer array using new operator and find the sum and average of array elements.
25. Write a program to implement virtual destructor.
26. Create the Person class. Create some objects of this class (by taking information from the user). Inherit the class Person to create two classes Teacher and Student class. Maintain the respective information in the classes and create, display and delete objects of these two classes (Use Runtime Polymorphism).
27. Write a program to Copy the contents of one file to other.

CORE–4: Data Structure

OBJECTIVES

- To learn how the choice of data structures impacts the performance of programs.
- To study specific data structures such as arrays, linear lists, stacks, queues, hash tables, binary trees, binary search trees, heaps and AVL trees.
- To learn efficient searching and sorting techniques.

Unit-1

Introduction: Basic Terminology, Data structure, Time and space complexity, Review of Array, Structures, Pointers.

Linked Lists: Dynamic memory allocation, representation, Linked list insertion and deletion, Searching, Traversing in a list, Doubly linked list, Sparse matrices.

Unit-2

Stack: Definition, Representation, Stack operations, Applications (Infix–Prefix–Postfix Conversion & Evaluation, Recursion).

Queues: Definition, Representation, Types of queue, Queue operations, Applications.

Unit-3

Trees: Tree Terminologies, General Tree, Binary Tree, Representations, Traversing, BST, Operations on BST, Heap tree, AVL Search Trees, M-way search tree, Applications of all trees.

Unit-4

Sorting: Exchange sorts, Selection Sort, Bubble sort, Insertion Sorts, Merge Sort, Quick Sort, Radix Sort, Heap sort.

Searching: Linear search, Binary search.

Text book

1. Classic Data Structure , D. Samanta , PHI , 2/ed.

REFERENCES

1. Ellis Horowitz, Sartaj Sahni, “Fundamentals of Data Structures”, Galgotia Publications, 2000.
2. Sastry C.V., Nayak R, Ch. Rajaramesh, Data Structure & Algorithms, I. K. International Publishing House Pvt. Ltd, New Delhi.

CORE – 4 Practical: Data Structure Lab

Write a C/ C++ Program for the followings

1. To insert and delete elements from appropriate position in an array.
2. To search an element and print the total time of occurrence in the array.
3. To delete all occurrence of an element in an array.
4. Array implementation of Stack.
5. Array implementation of Linear Queue.
6. Array implementation of Circular Queue.
7. To implement linear linked list and perform different operation such as node insert and delete, search of an item, reverse the list.
8. To implement circular linked list and perform different operation such as node insert and delete.
9. To implement double linked list and perform different operation such as node insert and delete.
10. Linked list implementation of Stack.
11. Linked list implementation of Queue.
12. Polynomial representation using linked list.
13. To implement a Binary Search Tree.
14. To represent a Sparse Matrix.
15. To perform binary search operation.
16. To perform Bubble sort.
17. To perform Selection sort.
18. To perform Insertion sort.
19. To perform Quick sort.

20. To perform Merge sort.

CORE – 5: Java Programming

OBJECTIVES

-] To learn the fundamentals of Object Oriented Programming in Java environment.
-] To learn the use of Java language and the Java Virtual Machine.
-] To write simple Java programming applications.

Unit-1

Introduction to Java: Java History, Architecture and Features, Understanding the semantic and syntax differences between C++ and Java, Compiling and Executing a Java Program, Variables, Constants, Keywords (super, this, final, abstract, static, extends, implements, interface) , Data Types, Wrapper class, Operators (Arithmetic, Logical and Bitwise) and Expressions, Comments, Doing Basic Program Output, Decision Making Constructs (conditional statements and loops) and Nesting, Java Methods (Defining, Scope, Passing and Returning Arguments, Type Conversion and Type and Checking, Built-in Java Class Methods). Input through keyboard using Command line Argument, the Scanner class, BufferedReader class.

Unit-2

Object-Oriented Programming Overview: Principles of Object-Oriented Programming, Defining & Using Classes, Class Variables & Methods, Objects, Object reference, Objects as parameters, final classes, Garbage Collection.

Constructor- types of constructor, this keyword, super keyword. Method overloading and Constructor overloading. Aggregation vs Inheritance, Inheritance: extends vs implements, types of Inheritance, Interface, Up-Casting, Down-Casting, Auto-Boxing, Enumerations, Polymorphism, Method Overriding and restrictions. Package: Pre-defined packages and Custom packages.

Unit-3

Arrays: Creating & Using Arrays (1D, 2D, 3D and Jagged Array), Array of Object, Referencing Arrays Dynamically. Strings and I/O: Java Strings: The Java String class, Creating & Using String Objects, Manipulating Strings, String Immutability& Equality, Passing Strings To & From Methods, StringBuffer Classes and StringBuilder Classes. IO package: Understanding StreamsFile class and its methods, Creating, Reading, Writing using classes: Byte and Character streams, FileOutputStream, FileInputStream, FileWriter, FileReader, InputStreamReader, PrintStream, PrintWriter. Compressing and Uncompressing File.

Unit-4

Exception Handling, Threading, Networking and Database Connectivity: Exception types, uncaught exceptions, throw, built-in exceptions, Creating your own exceptions; Multi-threading: The Thread class and Runnable interface, creating single and multiple threads, Thread prioritization, synchronization and communication, suspending/resuming threads. Using java.net package, Overview of TCP/IP and Datagram programming. Accessing and manipulating databases using JDBC.

Text Books:

1. E. Balagurusamy, “Programming with Java”, TMH, 4/Ed,

Reference books:

1. Herbert Schildt, “The Complete Reference to Java”, TMH, 10/Ed.

CORE – 5 Practical: Java Programming Lab

1. To find the sum of any number of integers entered as command line arguments.
2. To find the factorial of a given number.
3. To convert a decimal to binary number.
4. To check if a number is prime or not, by taking the number as input from the keyboard.
5. To find the sum of any number of integers interactively, i.e., entering every number from the keyboard, whereas the total number of integers is given as a command line argument
6. Write a program that show working of different functions of String and StringBufferclass like setCharAt(), setLength(), append(), insert(), concat()and equals().
7. Write a program to create a – “distance” class with methods where distance is computed in terms of feet and inches, how to create objects of a class and to see the use of this pointer
8. Modify the – “distance” class by creating constructor for assigning values (feetandinches) to the distance object. Create another object and assign second object as reference variable to another object reference variable. Further create a third object which is a clone of the first object.
9. Write a program to show that during function overloading, if no matching argument is found, then Java will apply automatic type conversions (from lower to higher data type)
10. Write a program to show the difference between public and private access specifiers. The program should also show that primitive data types are passed by value and objects are passed by reference and to learn use of final keyword.
11. Write a program to show the use of static functions and to pass variable length arguments in a function.
14. Write a program to demonstrate the concept of boxing and unboxing.
15. Create a multi-file program where in one file a string message is taken as input from the user and the function to display the message on the screen is given in another file (make use of Scanner package in this program).
16. Write a program to create a multilevel package and also creates a reusable class to generate Fibonacci series, where the function to generate Fibonacci series is given in a different file belonging to the same package.
17. Write a program that creates illustrates different levels of protection in classes/subclasses belonging to same package or different packages
18. Write a program – “DivideByZero” that takes two numbers a and b as input, computes a/b, and invokes Arithmetic Exception to generate a message when the denominator is zero.
19. Write a program to show the use of nested try statements that emphasizes the sequence of checking for catch handler statements.
20. Write a program to create your own exception types to handle situation specific to your application (Hint: Define a subclass of Exception which itself is a subclass of Throwable).
21. Write a program to demonstrate priorities among multiple threads.
22. Write a program to demonstrate different mouse handling events like mouseClicked(), mouseEntered(), mouseExited(), mousePressed(), mouseReleased() & mouseDragged().
23. Write a program to demonstrate different keyboard handling events.

CORE-6: Database Systems

OBJECTIVES

- To learn the fundamental elements of database system.

- To learn the basic concepts of relational database management systems.
- To learn various SQL commands.

Unit-1

Introduction to Database and Database Users, Database System Concepts and Architecture: data Models, schema, and instances, Conceptual Modeling and Database Design: Entity Relationship (ER) Model: Entity Types, Entity Sets, Attributes, Keys, Relationship Types, Relationship Sets, Roles and Structural Constraints, Weak Entity Types, ER Naming Conventions. Enhanced Entity-Relationship (EER) Model.

Unit-2

Database Design Theory and Normalization: Functional Dependencies, Normal Forms based on Primary Keys, Second and third Normal Forms, Boyce-Codd Normal Form, Multivalued Dependency and Fourth Normal Form, Join Dependencies and Fifth Normal Form.

Unit-3

Relational data Model and SQL: Relational Model Concepts, Basic SQLs, SQL Data Definition and Data types, Constraints in SQL, Retrieval Queries in SQL, INSERT, DELETE, UPDATE Statements in SQL, Relational Algebra and Relational Calculus: Unary Relational Operations: SELECT and PROJECT, Binary Relation: JOIN and DIVISION.

Unit-4

Introduction to Transaction Processing Concepts and Theory: Introduction to Transaction Processing, Transaction and System Concepts, Properties of Transactions, Recoverability, Serializability, Concurrency Control Techniques, Locking techniques for Concurrency Control, Concurrency Control based on Time-Stamp Ordering.

Text Book:

1. Fundamentals of Database Systems, 6th edition, Ramez Elmasri, Shamkant B. Navathe, Pearson Education

Reference Book:

1. An Introduction to Database System, Date C. J. - Pearson Education, New Delhi - 2005

CORE-6 Practical: Database Systems Labs

Create and use the following database schema to answer the given queries.

EMPLOYEE Schema

Field	Type	NULL	KEY	DEFAULT
Eno	Char(3)	NO	PRI	NIL
Ename	Varchar(50)	NO		NIL
Job_type	Varchar(50)	NO		NIL
Manager	Char(3)	Yes	FK	NIL
Hire_date	Date	NO		NIL
Dno	Integer	YES	FK	NIL
Commission	Decimal(10,2)	YES		NIL
Salary	Decimal(7,2)	NO		NIL

DEPARTMENT Schema

Field	Type	NULL	KEY	DEFAULT
Dno	Integer	No	PRI	NULL
Dname	Varchar(50)	Yes		NULL
Location	Varchar(50)	Yes		New Delhi

Query List

1. Query to display Employee Name, Job, Hire Date, Employee Number; for each employee with the Employee Number appearing first.
2. Query to display unique Jobs from the Employee Table.
3. Query to display the Employee Name concatenated by a Job separated by a comma.
4. Query to display all the data from the Employee Table. Separate each Column by a comma and name the said column as THE_OUTPUT.
5. Query to display the Employee Name and Salary of all the employees earning more than \$2850.
6. Query to display Employee Name and Department Number for the Employee No= 7900.
7. Query to display Employee Name and Salary for all employees whose salary is not in the range of \$1500 and \$2850.
8. Query to display Employee Name and Department No. of all the employees in Dept 10 and Dept 30 in the alphabetical order by name.
9. Query to display Name and Hire Date of every Employee who was hired in 1981.
10. Query to display Name and Job of all employees who don't have a current Manager.
11. Query to display the Name, Salary and Commission for all the employees who earn commission.
12. Sort the data in descending order of Salary and Commission.
13. Query to display Name of all the employees where the third letter of their name is 'A'.
14. Query to display Name of all employees either have two 'R's or have two 'A's in their name and are either in Dept No = 30 or their Mangers Employee No = 7788.
15. Query to display Name, Salary and Commission for all employees whose Commission Amount is 14 greater than their Salary increased by 5%.
16. Query to display the Current Date.
17. Query to display Name, Hire Date and Salary Review Date which is the 1st Monday after six months of employment.

employee was hired.

18. Query to display Name and calculate the number of months between today and the date each

19. Query to display the following for each employee <E-Name> earns < Salary> monthly but wants <3*Current Salary>. Label the Column as Dream Salary.
20. Query to display Name with the 1st letter capitalized and all other letter lower case and length of their name of all the employees whose name starts with 'J', 'A' and 'M'.
21. Query to display Name, Hire Date and Day of the week on which the employee started.
22. Query to display Name, Department Name and Department No for all the employees.
23. Query to display Unique Listing of all Jobs that are in Department # 30.
24. Query to display Name, Department Name of all employees who have an 'A' in their name.
25. Query to display Name, Job, Department No. and Department Name for all the employees working at the Dallas location.
26. Query to display Name and Employee no. Along with their Manger's Name and the Manager's employee no; along with the Employees Name who do not have a Manager.
27. Query to display Name, Department No. And Salary of any employee whose department No. and salary matches both the department no. And the salary of any employee who earns a commission.
28. Query to display Name and Salaries represented by asterisks, where each asterisk (*) signifies \$100.
29. Query to display the Highest, Lowest, Sum and Average Salaries of all the employees.
30. Query to display the number of employees performing the same Job type functions.
31. Query to display the no. of managers without listing their names.
32. Query to display the Department Name, Location Name, No. of Employees and the average salary for all employees in that department.
33. Query to display Name and Hire Date for all employees in the same dept. as Blake.
34. Query to display the Employee No. And Name for all employees who earn more than the average salary.
35. Query to display Employee Number and Name for all employees who work in a department with any employee whose name contains a 'T'.
36. Query to display the names and salaries of all employees who report to King.
37. Query to display the department no, name and job for all employees in the Sales department.

CORE – 7: Discrete Mathematical

Structure OBJECTIVES

-] To learn the mathematical foundations for Computer Science.
-] Topics covered essential for understanding various courses.

Unit-1

Logics and Proof: Propositional Logic, Propositional Equivalences, Predicates and Quantifiers Nested Quantifiers, Rules inference, Mathematical Induction.

Sets and Functions: Sets, Relations, Functions, Closures of Equivalence Relations, Partial ordering well ordering, Lattice, Sum of products and product of sums principle of Inclusions and Exclusions

Unit-2

Combinatory: Permutations, Combinations, Pigeonhole principle

Recurrence Relation: Linear and Non-linear Recurrence Relations, Solving Recurrence Relation using Generating Functions.

Unit-3

Graphs: Introduction to graphs, graphs terminologies, Representation of graphs, Isomorphism, **Connectivity & Paths:** Connectivity, Euler and Hamiltonian Paths, Introduction to tree, tree traversals, spanning tree and tree search: Breadth first search, Depth first search, cut-set, cut-vertex.

Unit-4

Modeling Computation: Finite State Machine, Deterministic Finite Automata (DFA), Non-Deterministic Finite Automata (NFA), Grammars and Language, Application of Pumping Lemma for Regular Language.

Text Books:

1. “Discrete Mathematics and its Applications with Combinatory and Graph Theory” 7th edition by Kenneth H. Rosen.

Reference Books:

1. Elements of Discrete Mathematics by C. L. Liu and D.P. Mohapatra, TMH, 2012
2. J. P Tremblay, R. Manohar, “Discrete Mathematical Structures with Applications to Computer Science”, TMH, 1997.
3. A Modern Approach to Discrete Mathematics and Structure by J. K. Mantri & T. K Tripathy ,Laxmi Publication
- 4.

CORE – 7 Practical: Discrete Mathematical Structure Lab

Write the following programs using C/ C++

1. Tower of Hanoi
2. Graph representation using Adjacency List.
3. Graph representation using Adjacency Matrix.
4. String Matching using finite state machine.
5. Detecting whether a number is even or odd using Finite State Machine.
6. To identify keywords such as char, const, continue using Finite State Machine.
7. To find the power set for a given set.
8. To find GCD of two numbers using recursion.
9. To find Binomial coefficients.
10. To find Permutation and Combination result for a given pair of values n and r.
11. To check a number is prime or not.
12. To calculate the Euclidean distance between two points.
13. To find the Roots of polynomials.
14. Find the shortest path pair in a plane.

CORE–8: Operating System

OBJECTIVES

- To understand Operating system structure and services.
- To understand the concept of a Process, memory, storage and I/O management.

Unit–1

Introduction to Operating System, System Structures: Operating system services, system calls, system programs, Operating system design and implementation, Operating system structure.

Unit-2

Process Management: Process Concept, Operations on processes, Process scheduling and algorithms, Inter-process Communication, Concepts on Thread and Process, Deadlocks: Deadlock detection, deadlock prevention, and deadlock avoidance fundamentals.

Unit-3

Memory Management Strategies: Swapping, Contiguous Memory Allocation, Paging, Segmentation, Virtual Memory Management: Concepts, implementation (Demand Paging), Page Replacement, Thrashing.

Unit-4

Storage Management: File System concept, Access Methods, File System Mounting, File Sharing and File Protection, Implementing File Systems, Kernel I/O Systems.

Text book – Operating System Concepts, Abraham Silberschatz, Peter B. Galvin, and Greg Gagne, Eighth Edition, Wiley Student Edition 2009.

Reference book:

1. Morden Operating System , Tanenbaum ,Pearson , 4/ed. 2014
2. Richard F Ashley, Linux with Operating System Concepts, Chapman andHall/CRC
Published August 26, 2014
3. Richard Blum, Linux Command Line and Shell Scripting Bible, O’ Reilly

CORE-8 Practical: Operating System Lab

1. Write a program (using *fork()* and/or *exec()* commands) where parent and child execute:
 - a) same program, same code.
 - b) same program, different code.
 - c) before terminating, the parent waits for the child to finish its task.
2. Write a program to report behavior of Linux kernel including kernel version, CPU type and model. (CPU information)
3. Write a program to report behavior of Linux kernel including information on configured memory, amount of free and used memory. (memory information)
4. Write a program to print file details including owner access permissions, file access time, where file name is given as argument.
5. Write a program to copy files using system calls.
6. Write a program using C to implement FCFS scheduling algorithm.
7. Write a program using C to implement Round Robin scheduling algorithm.
8. Write a program using C to implement SJF scheduling algorithm.
9. Write a program using C to implement non-preemptive priority based scheduling algorithm.
10. Write a program using C to implement preemptive priority based scheduling algorithm.
11. Write a program using C to implement SRTF scheduling algorithm.

12. Write a program using C to implement first-fit, best-fit and worst-fit allocation strategies.

CORE – 9: Computer Networks OBJECTIVES

-] To learn how do computers and terminals actually communicate with each other.
-] To understand the parts of a communication network and how they work together.

Unit-1

Introduction to Data Communications and Network Models: Protocols and Standards, Layers in OSI Models, Analog and Digital Signals, Transmission Modes, Transmission Impairment, Data Rate Limits, Performance, Digital Transmission, Network Devices & Drivers: Router, Modem, Repeater, Hub, Switch, Bridge (fundamental concepts only).

Unit-2

Signal Conversion: Digital-to-Digital Conversion, Analog-to-Digital Conversion, Digital-to-analog Conversion, Analog-to-analog Conversion.
Transmission Media: Guided Media, Unguided Media, Switching Techniques: Packet Switching, Circuit Switching, Datagram Networks, Virtual-Circuit Networks, and Structure of a Switch.

Unit-3

Error Detection and Correction: Checksum, CRC, Data Link Control: Framing, Flow and Error Control, Noiseless Channels, Noisy channels, (Stop and Wait ARQ, Sliding Window Protocol , Go Back N, Selective Repeat) HDLC, Point-to-Point Protocol. Access Control: TDM, CSMA/CD, and Channelization (FDMA, TDMA, and CDMA).

Unit-4

Network Layer: Logical Addressing, IPv4 Addresses, IPv6 Addresses, Virtual-Circuit Networks: Frame Relay and ATM, Transport Layer: Process-Process Delivery: UDP, TCP. Application layers: DNS, SMTP, POP, FTP, HTTP, Basics of WiFi (Fundamental concepts only), Network Security: Authentication, Basics of Public Key and Private Key, Digital Signatures and Certificates (Fundamental concepts only).

Text Books:

1. Data Communications and Networking, Fourth Edition by Behrouza A. Forouzan, TMH.

Reference Books:

1. Computer Networks, A. S. Tanenbaum, 4th edition, Pearson Education.

CORE – 9 Practical: Computer Networks Lab

Use C/C++/ any Network Simulator

1. Simulate Even Parity generator and checker.
2. Simulate two dimensional Parity generator and checker.
3. Simulate checksum generator and checker.

4. Simulate Hamming code method.
5. Simulate Cyclic Redundancy Check (CRC) error detection algorithm for noisy channel.
6. Simulate and implement stop and wait protocol for noisy channel.
7. Simulate and implement go back n sliding window protocol.
8. Simulate and implement selective repeat sliding window protocol.
9. Simulate and implement distance vector routing algorithm.

CORE – 10: Computer Graphics OBJECTIVES

-] To be able to learn the core concepts of Computer Graphics.
-] To be able to create effective programs for solving graphics problems.

Unit-1

Computer Graphics: A Survey of Computer graphics, Overview of Graphics System: Video Display Devices, Raster-Scan Systems, Input Devices, Hard-Copy Devices, Graphics Software.

Unit-2

Graphics Output Primitives: Point and Lines, Algorithms for line, circle & ellipse generation, Filled-Area Primitives. Attributes of Graphics Primitives: Point, line, curve attributes, fill area attributes, Fill methods for areas with irregular boundaries.

Unit-3

Geometric Transformations (both 2-D & 3-D): Basic Geometric Transformations, Transformation Matrix, Types of transformation in 2-D and 3-D Graphics: Scaling, Reflection, shear transformation, rotation, translation. 2-D, 3-D transformation using homogeneous coordinates.

Unit-4

Two Dimensional Viewing: Introduction to viewing and clipping, Viewing transformation in 2-D, Viewing pipeline, Clipping Window, Clipping Algorithms: Point clipping, Line clipping and Polygon clipping.

Text books

1. Mathematical Elements for Computer Graphics, D. F. Rogers & J. A. Adams, MGH, 2/ed.
2. Donald Hearn & M. Pauline Baker, “Computer Graphics with OpenGL”, Pearson Education.

Reference books

1. D. Hearn and M. Baker, “Computer Graphics with Open GL”, Pearson, 2/ed.
2. D. F. Rogers, “Procedural Elements for Computer Graphics”, MGH

CORE – 10 Practical: Computer Graphics Lab

Develop the programs using C/C++ or Java

1. Write a program to implement Bresenham’s line drawing algorithm.
2. Write a program to implement mid-point circle drawing algorithm.
3. Write a program to clip a line using Cohen and Sutherland line clipping algorithm.

4. Write a program to clip a polygon using Sutherland Hodgeman algorithm.
5. Write a program to fill a polygon using Scan line fill algorithm.
6. Write a program to apply various 2D transformations on a 2D object (use homogenous coordinates).
7. Write a program to apply various 3D transformations on a 3D object and then apply parallel and perspective projection on it.

CORE – 11: Web Technologies

OBJECTIVES

-] To learn the fundamentals of web designing.
-] To design and develop standard and interactive web pages.
-] To learn some popular web scripting languages.

Unit-1

Web Essentials: Clients, Servers and Communication:

The Internet – Basic Internet protocols – The WWW, HTTP request message – response message, web clients web servers – case study.

Introduction to HTML: HTML, HTML domains, basic structure of an HTML document – creating an HTML document, mark up tags, heading, paragraphs, line breaks, HTML tags. Elements of HTML, working with text, lists, tables and frames, working with hyperlink, images and multimedia, forms and controls

Unit-2

Introduction to cascading style sheets: Concepts of CSS, creating style sheet, CSS properties, CSS styling (background, text format, controlling fonts), working with the block elements and objects. Working with lists and tables, CSS ID and class. Box model (introduction, border properties, padding properties, margin properties), CSS colour, grouping, Dimensions, display, positioning, floating, align, pseudo class, Navigation bar, image sprites.

Unit-3

Java scripts: Client side scripting, what is java script, simple java script, variables, functions, conditions, loops and repetitions. Java scripts and objects, java script own objects, the DOM and web browser environment, forms and validations.

DHTML: Combining HTML, CSS, java scripts, events and buttons, controlling your browser.

Unit-4

PHP: Starting to script on server side, PHP basics, variables, data types, operators, expressions, constants, decisions and loop making decisions. Strings – creating, accessing strings, searching, replacing and formatting strings. Arrays: Creation, accessing array, multidimensional arrays, PHP with Database.

Text Book:

1. Web Technologies – Black Book – DreamTech Press

2. Matt Doyle, Beginning PHP 5.3 (wrox-Willey publishing)
3. John Duckett, Beginning HTML, XHTML, CSS and Java script.

Reference Book:

1. HTML, XHTML and CSS Bible, 5ed, Willey India-Steven M. Schafer.

CORE – 11 Practical: Web Technology Lab

1. Acquaintance with elements, tags and basic structure of HTML files.
2. Practicing basic and advanced text for formatting.
3. Practice use of image, video and sound in HTML documents.
4. Designing of web pages- Document layout, list, tables.
5. Practicing Hyperlink of web pages, working with frames.
6. Working with forms and controls.
7. Acquaintance with creating style sheet, CSS properties and styling.
8. Working with background, text, font, list properties.
9. Working with HTML elements box properties in CSS.
10. Develop simple calculator for addition, subtraction, multiplication and division operation using java script.
11. Create HTML page with java script which takes integer number as a input and tells whether the number is odd or even.
12. Create HTML page that contains form with fields name, Email, mobile number, gender, favorite colour and button; now write a java script code to validate each entry. Also write a code to combine and display the information in text box when button is clicked.
13. Write a PHP program to check if number is prime or not.
14. Write a PHP program to print first ten Fibonacci numbers.
15. Create a MySQL data base and connect with PHP.
16. Write PHP script for string and retrieving user information from my SQL table.
 - a. Write a HTML page which takes Name, Address, Email and Mobile number from user (register PHP).
 - b. Store this data in MySQL data base.
 - c. Next page display all user in HTML table using PHP (display .PHP).
17. Using HTML, CSS, Javascript, PHP, MySQL, design a authentication module of a web page.

CORE – 12: Software Engineering

OBJECTIVES:

-] To learn the way of developing software with high quality and the relevant techniques.
-] To introduce software engineering principles for industry standard.
-] To focus on Project management domain and Software risks management.

Unit-1

Introduction: Evolution of Software to an Engineering Discipline, Software Development Projects, Exploratory Style of Software Development, Emergence of Software Engineering, Changes in Software Development Practices, Computer Systems Engineering.

Software Lifecycle Models: Waterfall Model and its Extensions, Rapid Application Development (RAD), Agile Development Models, Spiral Model.

Unit-2

Software Project Management: Software Project Management Complexities, Responsibilities of a Software Project Manager, Project Planning, Metrics for Project Size Estimation, Project Estimation Techniques, Empirical Estimation Techniques, COCOMO, Halstead's Software Science, Staffing Level Estimation, Scheduling, Organization and Team Structures, Staffing, Risk Management, Software Configuration Management.

Unit-3

Requirement Analysis and Specification: Requirements Gathering and Analysis, Software Requirement Specifications, Formal System Specification Axiomatic Specification, Algebraic Specification, Executable Specification and 4GL.

Software Design: Design Process, Characterize a Good Software Design, Cohesion and Coupling, Layered Arrangements of Modules, Approaches to Software Design (Function Oriented & Object-Oriented).

Unit-4

Coding and Testing: Coding: Code Review, Software Documentation, Testing, Unit Testing, Black Box and White Box Testing, Debugging, Program Analysis Tools, Integration Testing, System Testing, Software Maintenance.

Text Book:

1. Fundamental of Software Engineering, Rajib Mall, Fifth Edition, PHI Publication, India.

Reference Books:

1. Software Engineering– Ian Sommerville, 10/Ed, Pearson.
2. Software Engineering Concepts and Practice – Ugrasen Suman, Cengage Learning India Pvt, Ltd.
3. R. Misra, C. Panigrahi, B. Panda: Principles of Software Engineering & System Design, YesDee Publication

CORE – 12 Practical: Software Engineering Lab

S. No. Practical Title

1. • Problem Statement,
 • Process Model
2. Requirement Analysis:

- Creating a Data Flow
 - Data Dictionary, Use Cases
3. Project Management:
 - Computing FP
 - Effort
 - Schedule, Risk Table, Timeline chart
 4. Design Engineering:
 - Architectural Design
 - Data Design, Component Level Design
 5. Testing:
 - Basis Path Testing

Sample Projects:

1. **Criminal Record Management:** Implement a criminal record management system for jailers, police officers and CBI officers.
2. **Route Information:** Online information about the bus routes and their frequency and fares
3. **Car Pooling:** To maintain a web based intranet application that enables the corporate employees within an organization to avail the facility of carpooling effectively.
4. Patient Appointment and Prescription Management System
5. Organized Retail Shopping Management Software
6. Online Hotel Reservation Service System
7. Examination and Result computation system
8. Automatic Internal Assessment System
9. Parking Allocation System
10. Wholesale Management System

CORE–13: Artificial Intelligence

OBJECTIVES:

- To learn the basic concepts of AI principles and approaches.
- To develop the basic understanding of the building blocks of AI.

Unit-1

Introduction to Artificial Intelligence, Background and Applications, Turing Test and Rational Agent approaches to AI, Introduction to Intelligent Agents, their structure, behavior and environment.

Unit-2

Problem Solving and Searching Techniques: Problem Characteristics, Production Systems, Control Strategies, Breadth First Search, Depth First Search, Hill climbing and its Variations,

Heuristics Search Techniques: Best First Search, A* algorithm, Constraint Satisfaction Problem, Introduction to Game Playing, Min-Max and Alpha-Beta pruning algorithms.

Unit-3

Knowledge Representation : Introduction to First Order Predicate Logic, Resolution Principle, Unification, Semantic Nets, Conceptual Dependencies, Frames, and Scripts, Production Rules, Conceptual Graphs.

Unit-4

Dealing with Uncertainty and Inconsistencies Truth Maintenance System, Default Reasoning, Probabilistic Reasoning, Bayesian Probabilistic Inference, Possible World Representations, Basics of NLP.

Text books

1. Artificial Intelligence a Modern Approach, Stuart Russell and Peter Norvig, Pearson 3/ed.

Reference books

1. Artificial Intelligence, Rich & Knight , TMG , 3 e/d.
2. DAN.W. Patterson, Introduction to A.I and Expert Systems – PHI, 2007
3. W.F. Clocksin and Mellish, Programming in PROLOG, Narosa Publishing House, 3rd edition, 2001

CORE–13 Practical: Artificial Intelligence Lab

Write a Prolog program

1. To find the factorial of a number
2. To remove the nth item from a list.
3. To find the permutation of a set.
4. To implement append for two lists.
5. To implement palindrome.
6. To find the greater of two numbers X and Y.
7. To find the greatest number in the list of numbers.
8. To find the sum of given list of numbers.
9. To find the reverse of a list.
10. To solve 8 queens problem.
11. To solve 8-puzzle problem using best first search
12. To implement DFS.
13. To implement BFS.
14. To implement best first search.
15. To solve traveling salesman problem.

CORE – 14: Algorithm Design

Techniques OBJECTIVES:

-] To be able to learn design principles and concepts of algorithms.
-] To have a mathematical foundation in analysis of algorithm.

Unit-1

Introduction: Algorithm specification: Pseudo code, Space complexity and time complexity, Analysis and design of Insertion sort algorithm, Divide and Conquer paradigm, Recurrence relations, Solving Recurrences: Substitution methods, Recursion tree method, and Master method.

Unit-2

Searching and Sorting: Analysis of Linear Search, Binary Search, Merge Sort and Quick Sort, Heap Sort.

Hashing: Hash functions, Hash table, Collision resolution: Chaining and Open Addressing (Linear probing, Quadratic probing, Double hashing).

Unit-3

Greedy Technique: General Method, Applications: Fractional Knapsack Problem , Job Sequencing with Deadlines, Huffman Codes.

Dynamic Programming: General Method, Applications: Matrix Chain Multiplication, Longest common subsequence.

Unit-4

Graph Algorithms: Representations of Graphs, Breadth-first search, Depth-first search, Topological sort, Minimum Spanning Trees: Prim's and Kruskal's algorithm, Single-source shortest paths: Bellman-Ford algorithm, Dijkstra's algorithm.

Text books

1. Introduction to Algorithms, by Thomas H, Cormen, Charles E. Leiserson , Ronald L. Rivest, Clifford Stein, PHI.

Reference books

1. Algorithm Design, by Jon Kleinberg, Eva Tardos.

CORE – 14 Practical: Algorithm Design Techniques Lab

Using C or C++ implement the following

1. Quick sort.
2. Heap sort.
3. Merge sort.
4. Matrix Multiplication using recursion.
5. Linear Search.

6. Binary Search.
7. Huffman code.
8. Fractional knapsack problem.
9. Matrix chain multiplication.
10. Longest Common Subsequence.
11. Prim's algorithm.
12. Kruskal's algorithm.
13. BFS.
14. DFS.
15. Dijkstra Algorithm.

DSE-1: Numerical

Techniques OBJECTIVES:

-] To learn various numerical techniques.
-] To be able to implement different numerical techniques using programming language.

Unit-1

Floating point representation and computer arithmetic, Significant digits, Errors: Round-off error, Local truncation error, Global truncation error, Order of a method, Convergence and terminal conditions, Efficient computations.

Unit-2

Bisection method, Secant method, Regula-Falsi method Newton-Raphson method, Newton's method for solving nonlinear systems.

Unit-3

Interpolation: Lagrange's form and Newton's form Finite difference operators, Gregory Newton forward and backward differences Interpolation Piecewise polynomial interpolation: Linear interpolation.

Unit-4

Numerical integration: Trapezoid rule, Simpson's rule (only method), Newton-Cotes formulas, Gaussian quadrature, Ordinary differential equation: Euler's method Modified Euler's methods, Runge-Kutta second methods

Text books

1. S.S. Sastry, "Introductory Methods of Numerical Analysis", EEE , 5/ed.
2. M.K. Jain, S.R.K. Iyengar and R.K. Jain, Numerical Methods for Scientific and Engineering Computation, New Age International Publisher, 6/e (2012)

Reference books

1. Numerical Analysis: J. K. Mantri & S. Prahan, Laxmi Publication.
2. Introduction to Numerical Analysis, Josef Stoer and Roland Bulirsch, Springer.

DSE – 1 Practical: Numerical Techniques Lab

Implement using C/ C++ or MATLAB/ Scilab

1. Find the roots of the equation by bisection method.
2. Find the roots of the equation by secant/Regula-Falsi method.
3. Find the roots of the equation by Newton's method.
4. Find the solution of a system of nonlinear equation using Newton's method.
5. Find the solution of tri-diagonal system using Gauss Thomas method.
6. Find the solution of system of equations using Jacobi/Gauss-Seidel method.
7. Find the cubic spline interpolating function.
8. Evaluate the approximate value of finite integrals using Gaussian/Romberg integration.
9. Solve the boundary value problem using finite difference method.

DSE – 2: Unix Shell

Programming OBJECTIVES:

- To learn the basics of UNIX OS, UNIX commands and File system.
- To familiarize students with the Linux environment.
- To learn fundamentals of shell scripting and shell programming.
-] To be able to write simple programs using UNIX.

Unit-1

Introduction: Unix Operating systems, Difference between Unix and other operating systems, Features and Architecture, Installation, Booting and shutdown process, System processes (an overview), External and internal commands, Creation of partitions in OS, Processes and its creation phases – Fork, Exec, wait, exit.

Unit-2

User Management and the File System: Types of Users, Creating users, Granting rights, User management commands, File quota and various file systems available, File System Management and Layout, File permissions, Login process, Managing Disk Quotas, Links (hard links, symbolic links)

Unit-3

Shell introduction and Shell Scripting: Shell and various type of shell, Various editors present in Unix, Different modes of operation in vi editor, Shell script, Writing and executing the shell script, Shell variable (user defined and system variables), System calls, Using system calls, Pipes and Filters.

Unit-4

Unix Control Structures and Utilities: Decision making in Shell Scripts (If else, switch), Loops in shell, Functions, Utility programs (cut, paste, join, tr, uniq utilities), Pattern matching utility (grep).

Text Books:

1. Sumitabha, Das, Unix Concepts And Applications, Tata McGraw-Hill Education, 2017, 4/Ed.

Reference Books:

1. Nemeth Synder & Hein, Linux Administration Handbook, Pearson Education, 2010, 2/ Ed.

DSE – 2 Practical: Unix Programming Lab

1. Write a shell script to check if the number entered at the command line is prime or not.
2. Write a shell script to modify “cal” command to display calendars of the specified months.
3. Write a shell script to modify “cal” command to display calendars of the specified range of months.
4. Write a shell script to accept a login name. If not a valid login name display message “Entered login name is invalid”.
5. Write a shell script to display date in the mm/dd/yy format.
6. Write a shell script to display on the screen sorted output of “who” command along with the total number of users.
7. Write a shell script to display the multiplication table of any number.
8. Write a shell script to compare two files and if found equal asks the user to delete the duplicate file.
9. Write a shell script to find the sum of digits of a given number.
10. Write a shell script to merge the contents of three files, sort the contents and then display them page by page.
11. Write a shell script to find the LCD (least common divisor) of two numbers.
12. Write a shell script to perform the tasks of basic calculator.
13. Write a shell script to find the power of a given number.
14. Write a shell script to find the greatest number among the three numbers.
15. Write a shell script to find the factorial of a given number.
16. Write a shell script to check whether the number is Armstrong or not.

DSE-3: Data

Science

OBJECTIVES:

-] To learn emerging issues related to various fields of data science.
-] To understand the underlying principles of data science, exploring data analysis.
-] To learn the basics of R Programming.

Unit-1

Data Scientist’s Tool Box: Turning data into actionable knowledge, introduction to the tools that will be used in building data analysis software: version control, markdown, git, GitHub, R, and RStudio.

Unit-2

R Programming Basics: Overview of R, R data types and objects, reading and writing data, Control structures, functions, scoping rules, dates and times, Loop functions, debugging tools,

Simulation, code profiling.

Unit-3

Getting and Cleaning Data: Obtaining data from the web, from APIs, from databases and from colleagues in various formats, basics of data cleaning and making data “tidy”.

Unit-4

Exploratory Data Analysis: Essential exploratory techniques for summarizing data, applied before formal modeling commences, eliminating or sharpening potential hypotheses about the world that can be addressed by the data, common multivariate statistical techniques used to visualize high-dimensional data.

Text Books

1. Rachel Schutt, Cathy O'Neil, "Doing Data Science: Straight Talk from the Frontline" by Schroff/O'Reilly, 2013.

Reference Books

1. Foster Provost, Tom Fawcett, “Data Science for Business” What You Need to Know About Data Mining and Data-Analytic Thinking by O'Reilly, 2013.
2. John W. Foreman, “Data Smart: Using data Science to Transform Information into Insight” by John Wiley & Sons, 2013.
3. Eric Segel, “Predictive Analytics: The Power to Predict who Will Click, Buy, Lie, or Die”, 1st Edition, by Wiley, 2013.

DSE-3 Practical: Elementary Data Science Lab

1. Write a program that prints “Hello World” to the screen.
2. Write a program that asks the user for a number n and prints the sum of the numbers 1 to n
3. Write a program that prints a multiplication table for numbers up to 12.
4. Write a function that returns the largest element in a list.
5. Write a function that computes the running total of a list.
6. Write a function that tests whether a string is a palindrome.
7. Implement linear search.
8. Implement binary search.
9. Implement matrices addition, subtraction and Multiplication
10. Fifteen students were enrolled in a course. Their ages were:

20 20 20 20 20 21 21 21 22 22 22 22 23 23 23

- i. Find the median age of all students under 22 years.
- ii. Find the median age of all students.
- iii. Find the mean age of all students.
- iv. Find the modal age for all students.
- v. Two more students enter the class. The age of both students is 23. What is now mean, mode and median?

DSE-4: PROJECT WORK/ DISSERTATION OR DATA MINING

DSE-4: DATA MINING

OBJECTIVES:

-] To introduce the basic concepts of data warehousing, data mining, Issues, and Implication.
-] To learn the core topics like Association rules, Classification & Prediction and Clustering techniques.
-] To make a study on the Applications and Trends in Data Mining.

Unit-1

Data Warehouse Fundamentals: Introduction to Data Warehouse, OLTP Systems, OLAP, Differences between OLTP and OLAP, Characteristics of Data Warehouse, Functionality of Data Warehouse, Advantages and Applications of Data Warehouse, Advantages, Applications, Top- Down and Bottom-Up Development Methodology, Tools for Data warehouse development, Data Warehouse Types, Data cubes

Unit-2

Introduction to Data Mining: Data mining, Functionalities, Data Preprocessing: Preprocessing the Data, Data cleaning, Data Integration and Transformation, Data reduction, Discretization and Concept hierarchies.

Unit-3

Mining Association Rules: Basics Concepts – Single Dimensional Boolean Association Rules from Transaction Databases, Multilevel Association Rules from transaction databases, Multi dimension Association Rules from Relational Database and Data Warehouses. Apriori Algorithm, FP-Tree algorithm

Unit-4

Classification and Prediction: Introduction, Issues, Decision Tree Induction, Naïve Bayesian Classification, Classification based on Concepts from Association Rule Mining, Classifier Accuracy.

Text Books:

1. J. Han and M. Kamber, Data Mining Concepts and Techniques, Elsevier, 2011

Reference Books:

1. K.P. Soman ,Shyam Diwakar, V.Ajay ,2006, Insight into Data Mining Theory and Practice, Prentice Hall of India Pvt. Ltd - New Delhi.

2. Data Mining Techniques, Arun K. Pujari, Universities Press, 2006
3. Modern Approaches of Data Mining: Theory & Practice, M. Panda, S. Dehuri, M. R. Patra, Narosa Publishing House, 2018.

DSE – 4 Practical: Data Mining Lab

Using Scilab/ MATLAB/ C/ Python/ R

1. Build a Data Warehouse and perform it's operations.
2. Perform data preprocessing tasks and Demonstrate performing association rule mining on data sets.
3. Demonstrate performing classification on data sets.
4. Demonstrate performing clustering on data sets.
5. Demonstrate performing Regression on data sets.
6. Credit Risk Assessment. Sample Programs using German Credit Data.
7. Sample Programs using Hospital Management System.

SEC – 1: Python

Programming

OBJECTIVES:

-] To enable the students to understand the basic principles of the Python Language.
-] To use the tools to do simple programs in python.

Unit-1

Planning the Computer Program: Concept of problem solving, Problem definition, Program design, Debugging, Types of errors in programming, Documentation.

Unit-2

Techniques of Problem Solving: Flowcharting, decision table, algorithms, Structured programming concepts, Programming methodologies viz. top-down and bottom-up programming.

Unit-3

Overview of Programming: Structure of a Python Program, Elements of Python

Introduction to Python: Python Interpreter, Using Python as calculator, Python shell, Indentation. Atoms, Identifiers and keywords, Literals, Strings, Operators (Arithmetic operator, Relational operator, Logical or Boolean operator, Assignment, Operator, Ternary operator, Bit wise operator, Increment or Decrement operator)

Unit-4

Creating Python Programs: Input and Output Statements, Control statements (Branching, Looping, Conditional Statement, Exit function, Difference between break, continue and pass.), Defining Functions, default arguments.

Text Books

1. T. Budd, Exploring Python, TMH, 1st Ed, 2011

Reference Books

1. Allen Downey, Jeffrey Elkner, Chris Meyers , How to think like a computer scientist : learning with Python , Freely available online.2012

Online References:

1. Python Tutorial/Documentation www.python.org 2015
2. <http://docs.python.org/3/tutorial/index.html>
3. <http://interactivepython.org/courselib/static/pythonds>
4. <http://www.ibiblio.org/g2swap/byteofpython/read/>

Software Lab based on Python Programming:

1. Write a menu driven program to convert the given temperature from Fahrenheit to Celsius and vice versa depending upon users choice.
2. Write a Program to calculate total marks, percentage and grade of a student. Marks obtained in each of the three subjects are to be input by the user. Assign grades according to the following criteria:
 - Grade A: Percentage ≥ 80
 - Grade B: Percentage ≥ 70 and < 80
 - Grade C: Percentage ≥ 60 and < 70
 - Grade D: Percentage ≥ 40 and < 60
 - Grade E: Percentage < 40
3. Write a menu-driven program, using user-defined functions to find the area of rectangle, square, circle and triangle by accepting suitable input parameters from user.
4. Write a Program to display the first n terms of Fibonacci series.
5. Write a Program to find factorial of the given number.
6. Write a Program to find sum of the following series for n terms: $1 - 2/2! + 3/3! - \dots - n/n!$
7. Write a Program to calculate the sum and product of two compatible matrices.

SEC-2: Android

Programming

OBJECTIVES:

-] To learn the basics of Android Programming.
-] To develop simple Android applications.

Unit-1

Introduction: History of Android, Introduction to Android Operating Systems, Android Development Tools, Android Architecture.

Unit-2

Overview of object oriented programming using Java: OOPs Concepts: Inheritance, Polymorphism, Interfaces, Abstract class, Threads, Overloading and Overriding, Java Virtual Machine.

Unit-3

Development Tools: Installing and using Eclipse with ADT plug-in, Installing Virtual machine for Android sandwich/Jelly bean (Emulator), configuring the installed tools, creating an android project – Hello Word, run on emulator, Deploy it on USB-connected Android device.

User Interface Architecture: Application context, intents, Activity life cycle, multiple screen sizes.

Unit-4

User Interface Design: Form widgets, Text Fields, Layouts, Button control, toggle buttons, Spinners (Combo boxes), Images, Menu, Dialog.

Database: Understanding of SQLite database, connecting with the database.

Text Books:

1. Android application development for java programmers. By James C. Sheusi. Publisher: Cengage Learning, 2013.

Reference Book:

1. James C. Sheusi, “Android application Development for Java Programmers”, Cengage Learning, 2013.
2. M. Burton, & D. Felker, “Android Application Development for Dummies”, 2/e, Wiley India.

Online References:

1. <http://www.developer.android.com>
2. <http://docs.oracle.com/javase/tutorial/index.htm> (Available in the form of free downloadable ebooks also).
3. <http://developer.android.com/guide/components/fundamentals.html>
4. <http://developer.android.com/training/multiscreen/screensizes.html>
5. <http://developer.android.com/guide/topics/ui/controls.html>

Software Lab based on Android Programming:

1. Create “Hello World” application. That will display “Hello World” in the middle of the screen in the emulator. Also display “Hello World” in the middle of the screen in the Android Phone.
2. Create an application with login module. (Check username and password).
3. Create spinner with strings taken from resource folder (res >> value folder) and on changing the spinner value, Image will change.
4. Create a menu with 5 options and selected option should appear in text box.
5. Create a list of all courses in your college and on selecting a particular course teacher-in-charge of that course should appear at the bottom of the screen.
6. Create an application with three option buttons, on selecting a button colour of the screen will change.
7. Create and Login application as above. On successful login, pop up the message.
8. Create an application to Create, Insert, update, Delete and retrieve operation on the database.

AEC –1: Environmental Science

AEC – 2: English Communication/MIL

GE–1: Computer Fundamentals

OBJECTIVES:

-] To make the students understand and learn the basics of computer.
-] To make them familiar with the parts and functions of computer.
-] To learn the features of some emerging technologies.

Unit-1

Introduction: Introduction to computer system, uses, types.

Unit-2

Devices: Input and output devices (with connections and practical demo), keyboard, mouse, joystick, scanner, OCR, OMR, bar code reader, web camera, monitor, printer, plotter

Memory: Primary, secondary, auxiliary memory, RAM, ROM, cache memory, hard disks, optical disks

Unit-3

Computer Organisation and Architecture: C.P.U., registers, system bus, main memory unit, cache memory, Inside a computer, SMPS, Motherboard, Ports and Interfaces, expansion cards, ribbon cables, memory chips, processors.

Unit-4

Overview of Emerging Technologies: Bluetooth, cloud computing, big data, data mining, mobile computing and embedded systems.

Text Books:

1. A. Goel, Computer Fundamentals, Pearson Education, 2010.

Reference Books:

1. P. Aksoy, L. DeNardis, Introduction to Information Technology, Cengage Learning, 2006
2. P. K.Sinha, P. Sinha, Fundamentals of Computers, BPB Publishers, 2007

GE-1 Practical: Computer Fundamentals Lab

Practical exercises based on MS Office tools including document preparation and spreadsheet handling packages.

MS Word:

1. Prepare a grocery list having four columns (Serial number, The name of the product, quantity and price) for the month of February, 2019.
 - Font specifications for Title (Grocery List): 14-point Arial font in bold and italics.
 - The headings of the columns should be in 12-point and bold.
 - The rest of the document should be in 10-point Times New Roman.
 - Leave a gap of 12-points after the title.
2. Create a telephone directory.
 - The heading should be 16-point Arial Font in bold
 - The rest of the document should use 10-point font size
 - Other headings should use 10-point Courier New Font.
 - The footer should show the page number as well as the date last updated.
3. Design a time-table form for your college.
 - The first line should mention the name of the college in 16-point Arial Font and should be bold.
 - The second line should give the course name/teacher's name and the department in 14-point Arial.
4. Create the following documents:
 - a) A newsletter with a headline and 2 columns in portrait orientation, including at least one image surrounded by text.

- b) Use a newsletter format to promote upcoming projects or events in your classroom or college.

5. Enter the following data into a table given below:

Salesperson	Dolls	Trucks	Puzzles
Kennedy, Sally	1327	1423	1193
White, Pete	1421	3863	2934
Pillar, James	5214	3247	5467
York, George	2190	1278	1928
Banks, Jennifer	1201	2528	1203
Atwater, Kelly	4098	3079	2067

Add a column Region (values: S, N, N, S, S, S) between the Salesperson and Dolls columns to the given table Sort your table data by Region and within Region by Salesperson in ascending order: In this exercise, you will add a new row to your table, place the word “Total” at the bottom of the Salesperson column, and sum the Dolls, Trucks, and Puzzles columns.

MS Excel

6. Given the following worksheet

	A	B	C	D
1	Roll No.	Name	Marks	Grade
2	1001	Sachin	99	
3	1002	Sehwag	65	
4	1003	Rahul	41	
5	1004	Sourav	89	
6	1005	Har Bhajan	56	

Calculate the grade of these students on the basis of following guidelines:

If Marks	Then Grade
≥ 80	A+
$\geq 60 < 80$	A
$\geq 50 < 60$	B
< 50	F

7. Given the following worksheet

	A	B	C	D	E	F	G	
1	Salesman	Sales in (Rs.)						
2	No.	Qtr1	Qtr2	Qtr3	Qtr4	Total	Commission	
3	S001	5000	8500	12000	9000			
4	S002	7000	4000	7500	11000			
5	S003	4000	9000	6500	8200			
6	S004	5500	6900	4500	10500			
7	S005	7400	8500	9200	8300			
8	S006	5300	7600	9800	6100			

Calculate the commission earned by the salesmen on the basis of following Candidates:

If Total Sales	Commission
< 20000	0% of sales
> 20000 and < 25000	4% of sales
> 25000 and < 30000	5.5% of sales
> 30000 and < 35000	8% of sales
>= 35000	11% of sales

The total sales is sum of sales of all the four quarters.

8. Create Payment Table for a fixed Principal amount, variable rate of interests and time in the format below:

No. of Instalments	5%	6%	7%	8%	9%
3	XX	XX	XX	XX	XX
4	XX	XX	XX	XX	XX
5	XX	XX	XX	XX	XX
6	XX	XX	XX	XX	XX

9. A company XYZ Ltd. pays a monthly salary to its employees which consists of basic salary, allowances & deductions. The details of allowances and deductions are as follows:

Allowances

- HRA Dependent on Basic
 - 30% of Basic if Basic \leq 1000
 - 25% of Basic if Basic $>$ 1000 & Basic \leq 3000
 - 20% of Basic if Basic $>$ 3000
- DA Fixed for all employees, 30% of Basic
- Conveyance Allowance Rs. 50/- if Basic is \leq 1000
Rs. 75/- if Basic $>$ 1000 & Basic \leq 2000
Rs. 100 if Basic $>$ 2000
- Entertainment Allowance NIL if Basic is \leq 1000
Rs. 100/- if Basic $>$ 1000

Deductions

- Provident Fund 6% of Basic
- Group Insurance Premium Rs. 40/- if Basic is \leq 1500
Rs. 60/- if Basic $>$ 1500 & Basic \leq 3000
Rs. 80/- if Basic $>$ 3000

Calculate the following:

Gross Salary = Basic + HRA + DA + Conveyance + Entertainment

Total deduction = Provident Fund + Group Insurance Premium

Net Salary = Gross Salary – Total Deduction

9.

The following table gives year wise sale figure of five salesmen in Rs.

Salesman	2000	2001	2002	2003
S1	10000	12000	20000	50000
S2	15000	18000	50000	60000
S3	20000	22000	70000	70000
S4	30000	30000	100000	80000
S5	40000	45000	125000	90000

- Calculate total sale year wise.
- Calculate the net sale made by each salesman
- Calculate the maximum sale made by the salesman
- Calculate the commission for each salesman under the condition.
 - If total sales $>$ 4,00,000 give 5% commission on total sale made by the salesman.
 - Otherwise give 2% commission.
- Draw a bar graph representing the sale made by each salesman.
- Draw a pie graph representing the sale made by salesman in 2000.

GE – 2: C and Data Structure

OBJECTIVES:

-] To learn the basics of C programming language.
-] To understand the fundamentals of linear data structure.
-] To be able write simple C and data structure programs.

Unit-1

Algorithm, flowchart, program development steps, structure of C program, A Simple C program, identifiers, basic data types and sizes, Constants, variables, arithmetic, relational and logical operators, increment and decrement operators, conditional operator, bit-wise operators,

assignment operators, expressions, type conversions, conditional expressions, precedence and order of evaluation.

Input-output statements, statements and blocks, if and switch statements, loops- while, do-while and for statements, break, continue, goto and labels, programming examples.

Unit-2

Designing structured programs, Functions, basics, parameter passing, storage classes- extern, auto, register, static, scope rules, block structure, user defined functions, standard library functions, recursive functions, header files, C preprocessor, example c programs.

Unit-3

Arrays- concepts, declaration, definition, accessing elements, storing elements, arrays and functions, two-dimensional and multi-dimensional arrays, applications of arrays. pointers- concepts, initialization of pointer variables, pointers and function arguments, address arithmetic, Character pointers and functions, pointers to pointers, pointers and multidimensional arrays, dynamic memory managements functions, command line arguments, C program examples.

Unit-4

Introduction to data structures, representing stacks and queues in C using arrays, infix to post fix conversion, postfix expression evaluation, Applications of Queue.

Searching - Linear and binary search methods, sorting - Bubble sort, selection sort, Insertion sort, Quick sort.

Text Books:

1. E. Balagurusamy, "Programming in ANSI C", 4/e, (TMH)
2. Seymour Lipschutz, "Data Structure with C", - Schaum's Outlines MGH.

Reference Books:

1. B. Kernighan & Dennis Ritchie, "The C Programming Language", 2/e PHI
2. P.C. Sethi, P.K. Behera, "Programming using C", Kalyani Publisher, Ludhiana
3. Data Structures Using C - A. S. Tanenbaum, Y. Langsam, M. J. Augenstein, PHI/Pearson.

GE – 2 Practical: C and Data Structure Lab

1. Write a Program to find the greatest among three numbers.
2. Write a Program to check a number is leap year or not.
3. Write a Program to print the sum and product of digits of an integer.
4. Write a Program to reverse a number.
5. Write a Program to compute the sum of the first n terms of the following series
$$S = 1 + 1/2 + 1/3 + 1/4 + \dots$$
6. Write a function to find whether a given no. is prime or not.
7. Write a Program to compute factorial of a number.
8. Write a Program to print a triangle of stars as follows (take number of lines from user):

*

9. Write a program which takes the radius of a circle as input from the user, passes it to another function that computes the area and the circumference of the circle and displays the value of area and circumference from the main() function.
10. To insert and delete elements from appropriate position in an array.
11. To search an element and print the total time of occurrence in the array.
12. Array implementation of Stack.
13. Array implementation of Queue.
14. To perform Bubble sort.
15. To perform Selection sort.

GE – 3: Programming in Python

OBJECTIVES:

-] To enable the students to understand the core principles of the Python Language.
-] To use the tools to produce well designed programs in python.
-] To create effective GUI applications.

Unit-1

Introduction to Python: Python Interpreter, Python as calculator, Python shell, Indentation, identifier and keywords, literals, strings, operatory (Arithmetic, Relational or decrement operator). Input output statement, control statements, (Branding, looping, conditional statement, Exit function)

Unit-2

String manipulations: Subscript operator, indexing, slicing a string, other functions on strings string module.
Strings and number system, format functions: converting strings to numbers & Vice Versa.
List, tuples, sets, Dictionaries: Basic list operators, replacing, inserting, removing an element, searching, Sorting lists, dictionary literals, adding & removing keys, accessing & replacing values, traversing dictionaries , Array in Python.

Unit-3

Design with Functions: hiding redundancy, complexity, arguments & return values; Formal/Actual arguments, named arguments, program structure and design, Recursive functions, scope & Global statements, Importing modules, Math modules & Random modules. Exception Handling: Exceptions, except clause, try and finally clause, user defined exceptions.

File Handling: Manipulating files & directories, OS & SYS modules, Reading, Writing text & numbers from/to file.

Unit-4

Simple Graphics: “Turtle” module; simple drawing colors, shapes, digital images, image file formats, Graphical U&S interfaces: Event driver programming, Paradigm, tkinter module, creating.

Simple GUI: buttons, labels entry fields, dialogs, widget attributes-sizes fonts, colors, layout.

Text Books

1. Python Programming using problem solving approach by Reema Thareja, Oxford University Press.2017

Reference Books

1. Introduction to Computation and Programming Using Python with application to understanding data by Guttag John V. PHI
2. Introduction to Computer Science using Python by Charles Diiorbach, Wiley.

GE-3 Practical: Programming in Python Lab

1. Using for loop, print a table of Celsius/Fahrenheit equivalences. Let c be the Celsius temperatures ranging from 0 to 100, for each value of c, print the corresponding Fahrenheit temperature.
2. Using while loop, produce a table of sines, cosines and tangents. Make a variable x in range from 0 to 10 in steps of 0.2. For each value of x, print the value of sin(x), cos(x) and tan(x).
3. Write a program that reads an integer value and prints —leap year| or —not a leap year|.
4. Write a program that takes a positive integer n and then produces n lines of output shown as follows.

For example enter a size: 5

```
*
**
***
****
*****
```

5. Write a function that takes an integer `_n` as input and calculates the value of $1 + 1/1! + 1/2! + 1/3! + \dots + 1/n$
6. Write a function that takes an integer input and calculates the factorial of that number.
7. Write a function that takes a string input and checks if it's a palindrome or not.
8. Write a list function to convert a string into a list, as in `list('_abc')` gives [a, b, c].
9. Write a program to generate Fibonacci series.
10. Write a program to check whether the input number is even or odd.
11. Write a program to compare three numbers and print the largest one.
12. Write a program to print factors of a given number.
13. Write a method to calculate GCD of two numbers.
14. Write a program to create Stack Class and implement all its methods. (UseLists).
15. Write a program to create Queue Class and implement all its methods. (UseLists)
16. Write a program to implement linear and binary search on lists.
17. Write a program to sort a list using insertion sort and bubble sort and selection sort.

GE – 4: Web

Technology

OBJECTIVES

-] To learn the fundamentals of web designing.
-] To design and develop standard and interactive web pages.
-] To learn some popular web scripting languages.

Unit-1

Web Essentials: Clients, Servers and Communication:

The Internet – Basic Internet protocols – The WWW, HTTP request message – response message, web clients web servers – case study.

Introduction to HTML: HTML, HTML domains, basic structure of an HTML document – creating an HTML document, mark up tags, heading, paragraphs, line breaks, HTML tags. Elements of HTML, working with text, lists, tables and frames, working with hyperlink, images and multimedia, forms and controls

Unit-2

Introduction to cascading style sheets: Concepts of CSS, creating style sheet, CSS properties, CSS styling (background, text format, controlling fonts), working with the block elements and objects. Working with lists and tables, CSS ID and class. Box model (introduction, border properties, padding properties, margin properties), CSS colour, grouping, Dimensions, display, positioning, floating, align, pseudo class, Navigation bar, image sprites.

Unit-3

JavaScripts: Client side scripting, what is JavaScript, simple JavaScript, variables, functions, conditions, loops and repetitions. JavaScripts and objects, JavaScript own objects, the DOM and web browser environment, forms and validations.

DHTML: Combining HTML, CSS, JavaScripts, events and buttons, controlling your browser.

Unit-4

PHP: Starting to script on server side, PHP basics, variables, data types, operators, expressions, constants, decisions and loop making decisions. Strings – creating, accessing strings, searching, replacing and formatting strings. Arrays: Creation, accessing array, multidimensional arrays, PHP with Database.

Text Book:

1. Web Technologies – Black Book – DreamTech Press
2. Matt Doyle, Beginning PHP 5.3 (wrox-Wiley publishing)
3. John Duckett, Beginning HTML, XHTML, CSS and JavaScript.

Reference Book:

1. HTML, XHTML and CSS Bible, 5ed, Wiley India-Steven M. Schafer.

GE-4 Practical: Web Technology Lab

1. Acquaintance with elements, tags and basic structure of HTML files.
1. Practicing basic and advanced text for formatting.
2. Practice use of image, video and sound in HTML documents.
3. Designing of web pages- Document layout, list, tables.
4. Practicing Hyperlink of web pages, working with frames.
5. Working with forms and controls.
6. Acquaintance with creating style sheet, CSS properties and styling.
7. Working with background, text, font, list properties.
8. Working with HTML elements box properties in CSS.
9. Develop simple calculator for addition, subtraction, multiplication and division operation using java script.
10. Create HTML page with java script which takes integer number as a input and tells whether the number is odd or even.
11. Create HTML page that contains form with fields name, Email, mobile number, gender, favorite colour and button; now write a java script code to validate each entry. Also write a code to combine and display the information in text box when button is clicked.
12. Write a PHP program to check if number is prime or not.
13. Write a PHP program to print first ten Fibonacci numbers.
14. Create a MySQL data base and connect with PHP.
15. Write PHP script for string and retrieving user information from my SQL table.
 - (a) Write a HTML page which takes Name, Address, Email and Mobile number from user (register PHP).
 - (b) Store this data in MySQL data base.
 - (c) Next page display all user in HTML table using PHP (display PHP).
16. Using HTML, CSS, Javascript, PHP, MySQL, design a authentication module of a web page.

Equipment:

1.Desktop Computer

Core i5 (minimum 8th Generation Processor, 8 GB RAM, 2 TB HDD)

Number of Desktops: 30 (or as per student strength). It must be connected through structured Local Area Network (LAN).

2.Software

LibreOffice, Scilab, C, C++, Java, Assembler, VHDL, Linux/ Unix Prolog etc. , preferably Open Source Software.

Faculty Training:

Most of the Colleges are offering B.Sc. Computer Science (H) under self-financing mode. There is limited faculty to manage the course. It is assumed that for majority of such colleges there is no permanent faculty. If this is the case then faculty training is required for all Core Courses as well as Discipline Specific Elective Courses.

For colleges having adequate faculty, faculty training may be organized for the following Courses in phased manner (six month before the beginning of the Subject in the concerned semester).

- i.** Digital Logic
- ii.** Data Structures
- iii.** Operating Systems
- iv.** Database Systems
- v.** Java Programming
- vi.** Web Technology
- vii.** Artificial Intelligence
- viii.** Algorithm Design Techniques
- ix.** Unix Shell Programming
- x.** Data Mining
- xi.** Data Science
- xii.** Android Programming
- xiii.** Programming in Python

COMMON SYLLABUS FOR B.Sc. (ITM)

Course structure of B. Sc. (ITM)

Preamble

Information and Communication Technology (ICT) has today become integral part of all industry domains as well as fields of academics and research. The industry requirements and technologies have been steadily and rapidly advancing. Organizations are increasingly opting for open source systems. A genuine attempt has been made while designing the syllabus for this 3- year B. Sc. (ITM) course. It prepare the students for a career in Software industry. The core philosophy of overall syllabus is to:

- a. Introduce emerging trends to the students in gradual way,
- b. Groom the students for the challenges of ICT industry

The Government of Odisha has initiated several measures to bring equity, efficiency and excellence in the Higher Education System of the State of Odisha in line with the University Grants Commission (UGC). The important measures taken to enhance academic standards and quality in higher education include innovation and improvements in curriculum, teaching-learning process, examination and evaluation systems, besides governance and other matters.

The Government of Odisha has formulated various regulations and guidelines from time to time to improve the higher education system and maintain minimum standards and quality across the Universities & Colleges in Odisha in line with UGC. The academic reforms recommended by the UGC in the recent past have led to overall improvement in the higher education system. However, due to lot of diversity in the system of higher education, there are multiple approaches followed by universities towards examination, evaluation and grading system. While the Universities and Colleges must have the flexibility and freedom in designing the examination and evaluation methods that best fits the curriculum, syllabi and teaching-learning methods, there is a need to devise a sensible system for awarding the grades based on the performance of students. Presently the performance of the students is reported using the conventional system of marks secured in the examinations or grades or both. The conversion from marks to letter grades and the letter grades used vary widely across the Universities and Colleges in the states as well as the country. This creates difficulty for the academia and the employers to understand and infer the performance of the students graduating from different universities and colleges based on grades.

The grading system is considered to be better than the conventional marks system and hence it has been followed in the top institutions in India and abroad. So, it is desirable to introduce uniform grading system. This will facilitate student mobility across institutions within and across countries and also enable potential employers to assess the performance of students. To bring in the desired uniformity, in grading system and method for computing the cumulative grade point average (CGPA) based on the performance of students in the examinations, the UGC has formulated these guidelines, which is being adopted by the state of Odisha.

CHOICE BASED CREDIT SYSTEM (CBCS): The CBCS provides an opportunity for the students to choose courses from the prescribed courses comprising core, elective/minor or skill based courses. The courses can be evaluated following the grading system, which is considered to be better than the conventional marks system. Therefore, it is necessary to introduce uniform grading system in the entire higher education in Odisha. This will benefit the students to move across institutions within Odisha to begin with and across states and countries. The uniform grading system will also enable potential employers in assessing the performance of the candidates. In order to bring uniformity in evaluation system and computation of the Cumulative Grade Point Average (CGPA) based on student's performance in examinations, the UGC has formulated the guidelines to be followed.

Outline of Choice Based Credit System:

1. **Core Course:** A course, which should compulsorily be studied by a candidate as a core requirement is termed as a Core course.

2. **Elective Course:** Generally, a course which can be chosen from a pool of courses and which may be very specific or specialized or advanced or supportive to the discipline/ subject of study or which provides an extended scope or which enables an exposure to some other discipline/subject/domain or nurtures the candidate's proficiency/skill is called an Elective Course.

Discipline Specific Elective (DSE) Course: Elective courses may be offered by the main discipline/subject of study is referred to as Discipline Specific Elective. The University/Institute may also offer discipline related Elective courses of interdisciplinary nature (to be offered by main discipline/subject of study).

Dissertation/Project: An elective course designed to acquire special/advanced knowledge, such as supplement study/support study to a project work, and a candidate studies such a course on his own with an advisory support by a teacher/faculty member is called dissertation/project.

Generic Elective/ Inter-disciplinary (GE/ IC) Course: An elective course chosen generally from an unrelated discipline/subject, with an intention to seek exposure is called a Generic Elective/ Inter-disciplinary.

P.S.: A core course offered in a discipline/subject may be treated as an elective by other discipline/subject and vice versa and such electives may also be referred to as Generic Elective.

3. **Ability Enhancement Courses (AEC)/Competency Improvement Courses/Skill Development Courses/Foundation Course:** They ((i) Environmental Science, (ii) English/MIL Communication) are mandatory for all disciplines. AEC courses are value-based and/or skill-based and are aimed at providing hands-on-training, competencies, skills, etc.

Project work/Dissertation is considered as a special course involving application of knowledge in solving / analyzing /exploring a real life situation / difficult problem. A Project/ Dissertation work would be of 6 credits. A Project/Dissertation work may be given in lieu of a discipline specific elective paper.

GUIDELINES FOR PROJECT FORMULATION

As the project work constitutes a major component in most of the professional programs and it is to be carried out with due care and should be executed with seriousness by the candidates.

TYPE OF PROJECT

As majority of the students are expected to work out a real-life project in some industry/research and development laboratories/educational institutions/software companies, it is suggested that the project is to be chosen which should have some direct relevance in day-to-day activities of the candidates in his/her institution. It is not mandatory for a student to work on a real-life project. The student can formulate a project problem with the help of Guide.

PROJECT PROPOSAL (SYNOPSIS)

The project proposal should be prepared in consultation with the guide. The project proposal should clearly state the project objectives and the environment of the proposed project to be undertaken. The project work should compulsorily include the software development. The project proposal should contain complete details in the following form:

1. Title of the Project
2. Introduction and Objectives of the Project
3. Project Category (RDBMS/OOPS/Networking/Multimedia/Artificial Intelligence/Expert Systems etc.)
4. Analysis (DFDs at least up to second level, ER Diagrams/ Class Diagrams/ Database Design etc. as per the project requirements).
5. A complete structure which includes: Number of modules and their description to provide an estimation of the student's effort on the project. Data Structures as per the project requirements for all the modules. Process Logic of each module. Testing process to be used. Reports generation
6. Tools / Platform, Hardware and Software Requirement specifications
7. Future scope and further enhancement of the project.

SEME STER	COURSE OPTED	COURSE NAME	CREDITS
I	Ability Enhancement Course-1	AEC-1 (Environmental Science)	4
	Core Course-1	Digital Logic	4
	Core Course-1 Practical/Tutorial	Digital Logic LAB	2
	Core Course-2	Programming using C	4
	Core Course-2 Practical/Tutorial	Programming using C LAB	2
	Generic Elective/ Interdisciplinary Course -1	GE/IC-1 (Discrete Mathematical Structures)	4

	Generic Elective/ Interdisciplinary Course -1 Practical/Tutorial	GE/IC-1 LAB/Tutorial (Discrete Mathematical Structures LAB)	2
II	Ability Enhancement Course-2	AEC-2 (English/ MIL Communication)	4
	Core Course-3	Computer Organization	4
	Core Course-3 Practical / Tutorial	Computer Organization LAB	2
	Core Course-4	Data Structures	4
	Core Course-4 Practical/Tutorial	Data Structures LAB	2
	Generic Elective/ Interdisciplinary Course -2	GE/IC-2 (Numerical Techniques)	4
	Generic Elective/ Interdisciplinary Course -2 Practical/Tutorial	GE/IC-2 LAB/Tutorial (Numerical Techniques LAB)	2
III	Core Course-5	Programming using C++	4
	Core Course-5 Practical/Tutorial	Programming using C++ LAB	2
	Core Course-6	Database Systems	4
	Core Course-6 Practical/Tutorial	Database Systems LAB	2
	Core Course-7	Principles of Management	4
	Core Course-7 Practical/ Tutorial	Principles of Management Tutorial	2
	Skill Enhancement Course-1	SEC-1 (Python Programming)	4
	Generic Elective/ Interdisciplinary Course -3	GE/IC-3 (Statistical Techniques)	4
	Generic Elective/ Interdisciplinary Course -3 Practical/Tutorial	GE/IC-3 LAB/Tutorial (Statistical Techniques LAB)	2
IV	Core Course-8	JAVA Programming	4
	Core Course-8 Practical/Tutorial	JAVA Programming LAB	2
	Core Course-9	Business Accounting	4
	Core Course-9 Practical/Tutorial	Business Accounting Tutorial	2
	Core Course-10	Operating Systems	4
	Core Course-10 Practical/Tutorial	Operating Systems LAB	2
	Skill Enhancement Course-2	SEC-2 (Android Programming)	4
	Generic Elective/ Interdisciplinary Course -4	GE/IC-4 (Operations Research)	4
	Generic Elective/ Interdisciplinary Course -4 Practical/Tutorial	GE/IC-4 LAB/Tutorial (Operations Research LAB)	2
V	Core Course-11	Web Technology	4
	Core Course-11 Practical/Tutorial	Web Technology LAB	2
	Core Course-12	Software Engineering	4
	Core Course-12 Practical/Tutorial	Software Engineering Lab	2
	Discipline Specific Elective-1	DSE-1 (Data Science)	4
	Discipline Specific Elective-1 Practical/Tutorial	DSE-1 LAB/ Tutorial (Data Science LAB)	2
	Discipline Specific Elective-2	DSE-2 (Managerial Economics)	4

	Discipline Specific Elective-2 Practical/Tutorial	DSE-2 LAB/ Tutorial (Managerial Economics Tutorial)	2
VI	Core Course-13	Management Accounting	4
	Core Course-13 Practical/Tutorial	Management Accounting Tutorial	2
	Core Course-14	Computer Networks	4
	Core Course-14 Practical/Tutorial	Computer Networks LAB	2
	Discipline Specific Elective-3	DSE-3 (Financial Management)	4
	Discipline Specific Elective-3 Practical/Tutorial	DSE-3 LAB/ Tutorial (Financial Management Tutorial)	2
	Discipline Specific Elective-4	DSE-4 (Project Work / E-Commerce)	6/4
	Discipline Specific Elective-4 Practical/Tutorial	DSE-4 LAB/ Tutorial (E-Commerce Tutorial)	2

CORE Papers:

CORE – 1: Digital Logic

CORE – 2: Programming Using C

CORE – 3: Computer Organization

CORE – 4: Data Structure

CORE – 5: Programming Using C++

CORE – 6: Database Systems

CORE – 7: Principles of Management

CORE – 8: Java Programming CORE – 9:

Business Accounting CORE – 10:

Operating Systems CORE – 11: Web

Technologies CORE – 12: Software

Engineering CORE – 13: Management

Accounting CORE – 14: Computer

Networks

Discipline Specific Electives (DSE) Papers:

DSE–1: Data Science

DSE–2: Managerial Economics

DSE–3: Financial Management DSE–4:

Project Work / E-Commerce

Skill Enhancement Courses (SEC): SEC –

1: Python Programming SEC – 2:

Android Programming

Ability Enhancement Courses (AEC): AEC –

1: Environmental Science.

AEC – 2: English/ MIL Communication.

Generic Elective (GE)/ Interdisciplinary Course (IC):

GE/IC – 1: Discrete Mathematical Structures

GE/IC – 2: Numerical Techniques

GE/IC – 3: Statistical Techniques

GE/IC – 4: Operations Research

Detailed Syllabus

CORE–1: DIGITAL LOGIC

OBJECTIVES

- To understand different methods used for the simplification of Boolean functions and binary arithmetic.
- To design and implement combinational circuits, synchronous & asynchronous sequential circuits.
- To study in detail about Semiconductor Memory Systems.

Unit-1

Character Codes, Decimal System, Binary System, Decimal to Binary Conversion, Hexadecimal Notation, Boolean Algebra, Basic Logic Functions: Electronic Logic Gates, Synthesis of Logic Functions, Minimization of Logic Expressions, Minimization using Karnaugh Maps, Synthesis with NAND and NOR Gates, Tri-State Buffers

Unit-2

Arithmetic: Addition and Subtraction of Signed Numbers, Addition/ Subtraction Logic Unit, Design of Fast Adders: Carry-Lookahead Addition, Multiplication of Positive Numbers, Signed-Operand Multiplication: Booth Algorithm, Fast Multiplication: Bit-Pair Recoding Multipliers, Carry-Save Addition of Summands, Integer Division, Floating-Point Numbers and Operations: IEEE Standard for Floating-Point Numbers, Arithmetic Operations on Floating-Point Numbers, Guard Bits and Truncation, Implementing Floating-Point Operations.

Unit-3

Flip-Flops, Gated Latches, Master-Slave Flip-Flops, Edge-Triggering, T Flip-Flops, JK Flip-

Devices (PLDs), Programmable Array Logic (PAL), Complex Programmable Logic Devices (CPLDs), Field-Programmable Gate Array (FPGA), Sequential Circuits, UP/ DOWN Counters, Timing Diagrams, The Finite State Machine Model, Synthesis of Finite State Machines.

Unit-4

Memory System: Semiconductor RAM Memories, Internal Organization of Memory Chips, Static Memories, Asynchronous DRAMS, Synchronous DRAMS, Structure of Large Memories, Memory System Considerations, RAMBUS Memory. Read-Only Memories: ROM, PROM, EPROM, EEPROM, Flash Memory, Speed, Size, and Cost of Memory. Secondary Storage: Magnetic Hard Disks, Optical Disks, Magnetic Tape Systems.

Text Books:

1. Carl Hamacher, Z. Vranesic, S. Zaky: Computer Organization, 5/e (TMH)

Reference Books:

1. M. Morris Mano: Digital Logic and Computer Design, Pearson

CORE–1 Practical: Digital Logic Lab

1. Introduction to Xilinx software (VHDL)

Write the VHDL code for

2. Realizing all logic gates.
3. Combination Circuit.
4. ADDER.
5. SUBTRACTOR.
6. MUX.
7. DE-MUX.
8. Encoder.
9. Decoder.
10. PAL.
11. PLA.

Write the VHDL program for the following Sequential Logic Circuits

12. Flip Flops.
13. Shift Registers.
14. Counters.

CORE–2: PROGRAMMING USING

C OBJECTIVES:

- To learn basics of C programming language.
 - To be able to develop logics to create programs/ applications in C.
-

Unit-1

Introduction: Introduction to Programming Language, Introduction to C Programming, Keywords & Identifiers, Constants, Variables, Input and Output Operations, Compilation and pre-processing, **Data types:** Different data types, Data types qualifier, modifiers, Memory representation, size and range, **Operators:** Operators (Arithmetic, Relational, Logical, Bitwise, Assignment & compound assignment, Increment & Decrement, Conditional), Operator types (unary, binary, ternary). Expressions, Order of expression (Precedence and associativity)

Control structures: Decision Making and Branching (Simple IF Statement, IF...ELSE Statement, Nesting IF... ELSE Statement, ELSE IF Ladder), Selection control structure (Switch Statement).

Unit-2

Loops: The WHILE Statement, The DO...WHILE Statement, The FOR Statement, Jumps in Loops, **Array:** Concept of Array, Array Declaration, types of array (one and multiple dimension), Character Arrays and Strings, Subscript and pointer representation of array, Array of Pointers, Limitation of array, **Pointers:** Concept of Pointer (null pointer, wild pointer, dangling pointer, generic pointer), Pointer Expressions, Accessing the Address of a Variable, Declaring Pointer Variables, Initializations of Pointer Variable, Accessing a Variable through its Pointer, Pointer arithmetic.

Unit-3

Storage class: Types (auto, register, static, extern), scope rules, declaration and definition.

Function: Function & types (User defined function, library function) Function Definition, Declaration, Function Calls, Header file and library, Function Arguments, string handling function (strlen, strcmp, strcpy, strncpy, strcat, strstr), Function recursion, Functions Returning Pointers, Pointers to Functions, Command line arguments, Application of pointer (dynamic memory allocation).

Unit-4

Structure and Union: Defining, Declaring, Accessing, Initialization Structure, nested structure, self-referential structure, bit-field, Arrays of Structures, Structures and Functions, Unions, difference between structure and union, active data member, structure within union, Self-referential Structure.

File: File Management in C, Defining and Opening a File, File opening modes (read, write, append), Closing a File, File operations, file and stream, Error Handling During I/O Operations, sequential and random access file, low level and high level file.

Text Books:

1. E. Balagurusamy, “Programming in ANSI C”, 4/e, (TMH)

Reference Books:

1. B. Kernighan & Dennis Ritchie, “The C Programming Language”, 2/e PHI

2. Paul Deitel, Harvey Deitel, "C: How to Program", 8/e, Prentice Hall.
3. P.C. Sethi, P.K. Behera, "Programming using C", Kalyani Publisher, Ludhiana

Core-2 Practical/Tutorial: Programming Fundamentals using C Lab

1. Write a Program to find greatest among three numbers.
2. Write a Program to all arithmetic operation using switch case.
3. Write a Program to print the sum and product of digits of an integer.
4. Write a Program to reverse a number.
5. Write a Program to compute the sum of the first n terms of the following series

$$S = 1 + 1/2 + 1/3 + 1/4 + \dots$$
6. Write a Program to compute the sum of the first n terms of the following series

$$S = 1 - 2 + 3 - 4 + 5 - \dots$$
7. Write a function that checks whether a given string is Palindrome or not. Use this function to find whether the string entered by user is Palindrome or not.
8. Write a function to find whether a given no. is prime or not. Use the same to generate the prime numbers less than 100.
9. Write a Program to compute the factors of a given number.
10. Write a program to swap two numbers using macro.
11. Write a Program to print a triangle of stars as follows (take number of lines from user):

```

*
***
*****
*****

```

12. Write a Program to perform following actions on an array entered by the user:
 - a) Print the even-valued elements
 - b) Print the odd-valued elements
 - c) Calculate and print the sum and average of the elements of array
 - d) Print the maximum and minimum element of array
 - e) Remove the duplicates from the array
 - f) Print the array in reverse order

The program should present a menu to the user and ask for one of the options. The menu should also include options to re-enter array and to quit the program.
13. Write a Program that prints a table indicating the number of occurrences of each alphabet in the text entered as command line arguments.
14. Write a program that swaps two numbers using pointers.
15. Write a program in which a function is passed address of two variables and then alter its contents.
16. Write a program which takes the radius of a circle as input from the user, passes it to another function that computes the area and the circumference of the circle and displays the value of area and circumference from the main() function.
17. Write a program to find sum and average of n elements entered by the user. To write this program, allocate memory dynamically using malloc() / calloc() functions.
18. Write a menu driven program to perform following operations on strings:
 - a) Show address of each character in string
 - b) Concatenate two strings without using strcat function.
 - c) Concatenate two strings using strcat function.
 - d) Compare two strings
 - e) Calculate length of the string (use pointers)
 - f) Convert all lowercase characters to uppercase
 - g) Convert all uppercase characters to lowercase
 - h) Calculate number of vowels
 - i) Reverse the string
19. Given two ordered arrays of integers, write a program to merge the two-arrays to get an

ordered array.

20. Write a program to copy the content of one file to other.

CORE-3: COMPUTER ORGANIZATION

OBJECTIVES

- To study the basic organization of digital computers (CPU, memory, I/O, software).
- To have a better understanding and utilization of digital computers.
- To be familiar with Assembly Language Programming (ALP)

Unit-1

Basic Structure of Computers: Computer Types, Functional Units, Input Unit, Memory Unit, Arithmetic and Logic Unit, Output Unit, Control Unit, Basic Operational Concepts, Bus Structures, Software. Machine Instructions and Programs: Numbers, Arithmetic Operations, and Characters: Number Representation, Addition of Positive Numbers, Addition and Subtraction of Signed Numbers, Overflow of Integer Arithmetic, Floating-Point Numbers & Operations, Characters, Memory Locations and Addresses, Byte Addressability, Word Alignment, Accessing Numbers, Characters, and Character Strings, Memory Operations, Instructions and Instruction Sequencing, Register Transfer Notation, Basic Instruction Types, Instruction Execution and Straight-Line Sequencing, Branching, Condition Codes, Generating Memory Addresses, Addressing Modes, Implementation of Variables and Constants, Indirection and Pointers, Indexing and Arrays, Relative Addressing.

Unit-2

Basic Processing Unit: Register Transfers, Performance on Arithmetic or Logic Operation, fetching a Word from Memory, Storing a Word in Memory. Execution of a Complete Instruction, Branch Instruction, Multiple Bus Organization Hardwired Control, A Complete Processor. Micro-programmed Control: Microinstructions, Microprogram Sequencing, Wide-Branch Addressing, Microinstructions with Next-Address Field, Prefetching Microinstructions, Emulation.

UNIT-3

Input/ Output Organization: Accessing I/O Devices, Interrupts, Interrupt Hardware, Enabling & Disabling Interrupts, Handling Multiple Devices, Controlling Device Requests, Exceptions. Direct Memory Access, Bus Arbitration, Buses, Synchronous Bus, Asynchronous Bus, Interface Circuits: Parallel Port, Serial Port, Standard I/O Interfaces, Peripheral Component Interconnect (PCI) Bus, SCSI Bus, Universal Serial Bus (USB)

Unit-4

Pipelining: Role of Cache Memory, Pipeline Performance, Data Hazards: Operand Forwarding, Handling Data Hazards in Software, Side Effects. Instruction Hazards: Unconditional Branches, Conditional Branches and Branch Prediction. Influence on Instruction Sets: Addressing Modes, Condition Codes, Data path and Control Considerations. Superscalar Operation: Out-of-Order Execution, Execution Completion, Dispatch Operation, RISC & CISC Processors.

Text Books

1. Carl Hamacher, Z. Vranesic, S. Zaky: Computer Organization, 5/Ed (TMH)

Reference Books

1. William Stallings: Computer Organization and Architecture (Design for Performance), 9/Ed
2. S. Brown, & Z. Vranesic, "Fundamentals of Digital Logic Design with VHDL", 2/Ed, McGraw-Hill

CORE–3 Practical/Tutorial: Computer Organization Lab

1. Study of the complete Architecture of 8085 Microprocessor along with its instruction set.
2. Introduction to GNU Simulator 8085, with its features.
3. Write an Assembly Language Program to add N consecutive numbers.
4. Write an Assembly Language Program to find the smallest and largest number from a given series.
5. Write an Assembly Language Program for subtraction of two 8-bit numbers.
6. Write an Assembly Language Program for displaying a Rolling message “Hello 123”.
7. Write an Assembly Language Program to perform ASCII to Decimal conversion.
8. Write an Assembly Language Program to add two unsigned binary numbers.
9. Write an Assembly Language Program to subtraction of two unsigned binary numbers.

Demonstrate the followings:

10. Assembling and Dis-assembling of computer.
11. Trouble shooting in Computer.

CORE–4: DATA STRUCTURE

OBJECTIVES

- To learn how the choice of data structures impacts the performance of programs.
- To study specific data structures such as arrays, linear lists, stacks, queues, hash tables, binary trees, binary search trees, heaps and AVL trees.
- To learn efficient searching and sorting techniques.

Unit-1

Introduction: Basic Terminology, Data structure, Time and space complexity, Review of Array, Structures, Pointers.

Linked Lists: Dynamic memory allocation, representation, Linked list insertion and deletion, Searching, Traversing in a list, Doubly linked list, Sparse matrices.

Unit-2

Stack: Definition, Representation, Stack operations, Applications (Infix–Prefix–Postfix Conversion & Evaluation, Recursion).

Queues: Definition, Representation, Types of queue, Queue operations, Applications.

Unit-3

Trees: Tree Terminologies, General Tree, Binary Tree, Representations, Traversing, BST, Operations on BST, Heap tree, AVL Search Trees, M-way search tree, Applications of all trees.

Unit-4

Sorting: Exchange sorts, Selection Sort, Bubble sort, Insertion Sorts, Merge Sort, Quick Sort, Radix Sort, Heap sort.

Searching: Linear search, Binary search.

Text Books:

1. Classic Data Structure , D. Samanta , PHI , 2/ed.

Reference Books:

1. Ellis Horowitz, Sartaj Sahni, "Fundamentals of Data Structures", Galgotia Publications, 2000.
2. Sastry C.V., Nayak R, Ch. Rajaramesh, Data Structure & Algorithms, I. K. International Publishing House Pvt. Ltd, New Delhi.

CORE – 4 Practical/Tutorial: Data Structure Lab

Write a C/ C++ Program for the followings

1. To insert and delete elements from appropriate position in an array.
2. To search an element and print the total time of occurrence in the array.
3. To delete all occurrence of an element in an array.
4. Array implementation of Stack.
5. Array implementation of Linear Queue.
6. Array implementation of Circular Queue.
7. To implement linear linked list and perform different operation such as node insert and delete, search of an item, reverse the list.
8. To implement circular linked list and perform different operation such as node insert and delete.
9. To implement double linked list and perform different operation such as node insert and delete.
10. Linked list implementation of Stack.
11. Linked list implementation of Queue.
12. Polynomial representation using linked list.
13. To implement a Binary Search Tree.
14. To represent a Sparse Matrix.
15. To perform binary search operation.
16. To perform Bubble sort.
17. To perform Selection sort.

18. To perform Insertion sort.
19. To perform Quick sort.
20. To perform Merge sort.

CORE-5: PROGRAMMING USING C++

OBJECTIVES

- To know about the Object Oriented Programming concepts.
- To learn basics of C++ programming language.
- To be able to develop logics to create programs/ applications in C++.

Unit-1

Principles of Object-Oriented Programming: Object-Oriented Programming (OOP) Paradigm, Basic Concepts of OOP, Benefits of OOP, Characteristics of OOPS, Object Oriented Languages, Applications of OOP.

Introduction to C++, Difference between C & C++, Tokens, Data types, Operators, Structure of C++ Program, C++ statements, Expressions and Control Structures.

Functions in C++: Argument passing in function, Inline Functions, Default Arguments, Const. Arguments, Friend function.

Unit-2

Classes and Objects: Defining Member Functions, Making an outside Function Inline, Nested Member Functions, Private Member Functions, Arrays within a Class, Memory Allocation for Objects, Static Data Members, Static Member Functions, Arrays of Objects, Objects as Function Arguments, Friend Functions.

Constructors & Destructors: Constructors, Parameterized Constructors, Constructors with Default Arguments, Dynamic Initialization of Objects, Copy Constructor, Dynamic Constructors, Destructors.

Unit-3

Inheritance: Basics of Inheritance, Type of Inheritance, Virtual Base Classes, Abstract Classes, Member Classes, Nesting of Classes. Polymorphism: Pointers, Pointers to Objects, this Pointer, Pointers to Derived Classes, Virtual Functions, Pure Virtual Functions, Function Overloading, Operator Overloading.

Unit-4

Managing Console I/O Operations: C++ Streams, C++ Stream Classes, Unformatted I/O Operations, Formatted Console I/O Operations, Managing Output with Manipulators.

Files: Classes for File Stream Operations, Opening and Closing a File, Detecting end-of-file, File Modes, File Pointers and their Manipulations, Sequential Input and Output Operations, Updating a File: Random Access, Error Handling during File Operations, Command-line Arguments.

Text Books

1. E. Balgurusawmy, Object Oriented Programming with C++, 4/e (TMH).
2. Paul Deitel, Harvey Deitel, "C++: How to Program", 9/e. Prentice Hall.

Reference Books:

1. Bjarne Stroustrup, Programming - Principles and Practice using C++, 2/e, Addison-Wesley 2014
2. Herbtz Schildt, C++: The Complete reference, MGH, 4/ed.
3. P. C. Sethi, P. K. Behera, "Programming in C++"- Kalyani Publisher, Ludhiana

CORE-5 Practical/Tutorial: Programming using C++ Lab

1. Write a Program to find greatest among three numbers using nested if...else statement.
2. Write a Program to check a number is prime or not.
3. Write a Program to find the GCD and LCM of two numbers.
4. Write a program to print the result for following series: $1! + 2! + 3! + \dots$
5. Write a program to print multiplication table from 1 to 10.
6. Write a Program for Swapping of two numbers using pass by value.
7. Write a Program for Swapping of two numbers using pass by address.
8. Write a Program for Swapping of two numbers using pass by reference.
9. Write a Program to find sum of four numbers using default argument passing.
10. Write a Program to find square and cube of a number using inline function.
11. Write a Program to find the factorial of a number.
12. Write a Program to find reverse of a number.
13. Write a program to find sum of four numbers using default argument passing in member function.
14. Write a Program to find area of circle, triangle and rectangle using function overloading.
15. Write a program to distinguish the properties of static and non-static ata members.
16. Write a program to show the method of accessing static private member function.
17. Write a program to show the ways of calling constructors and destructors.
18. Write a program to perform ++ operator overloading using member function.
19. Write a program to perform ++ operator overloading using friend function.
20. Write a program to perform + operator overloading for two complex number addition.
21. Write a program to perform + operator overloading for string concatenation.
22. Write a program to perform single inheritance.
23. Write a program to perform multiple inheritance.
24. Write a program to create an integer array using new operator and find the sum and average of array elements.
25. Write a program to implement virtual destructor.
26. Create the Person class. Create some objects of this class (by taking information from the user). Inherit the class Person to create two classes Teacher and Student class. Maintain the respective information in the classes and create, display and delete objects of these two classes (Use Runtime Polymorphism).
27. Write a program to Copy the contents of one file to other.

CORE-6: DATABASE SYSTEMS**OBJECTIVES**

- To learn the fundamental elements of database system.
- To learn the basic concepts of relational database management systems.

- To learn various SQL commands.

Unit-1

Introduction to Database and Database Users, Database System Concepts and Architecture: data Models, schema, and instances, Conceptual Modeling and Database Design: Entity Relationship (ER) Model: Entity Types, Entity Sets, Attributes, Keys, Relationship Types, Relationship Sets, Roles and Structural Constraints, Weak Entity Types, ER Naming Conventions. Enhanced Entity-Relationship (EER) Model.

Unit-2

Database Design Theory and Normalization: Functional Dependencies, Normal Forms based on Primary Keys, Second and third Normal Forms, Boyce-Codd Normal Form, Multivalued Dependency and Fourth Normal Form, Join Dependencies and Fifth Normal Form.

Unit-3

Relational data Model and SQL: Relational Model Concepts, Basic SQLs, SQL Data Definition and Data types, Constraints in SQL, Retrieval Queries in SQL, INSERT, DELETE, UPDATE Statements in SQL, Relational Algebra and Relational Calculus: Unary Relational Operations: SELECT and PROJECT, Binary Relation: JOIN and DIVISION.

Unit-4

Introduction to Transaction Processing Concepts and Theory: Introduction to Transaction Processing, Transaction and System Concepts, Properties of Transactions, Recoverability, Serializability, Concurrency Control Techniques, Locking techniques for Concurrency Control, Concurrency Control based on Time-Stamp Ordering.

Text Book:

1. Fundamentals of Database Systems, 6th edition, Ramez Elmasri, Shamkant B. Navathe, Pearson Education

Reference Book:

1. An Introduction to Database System, Date C. J. - Pearson Education, New Delhi - 2005

CORE-6 Practical/Tutorial: Database Systems Labs

Create and use the following database schema to answer the given queries.

EMPLOYEE Schema

Field	Type	NULL	KEY	DEFAULT
Eno	Char(3)	NO	PRI	NIL
Ename	Varchar(50)	NO		NIL

Job_type	Varchar(50)	NO		NIL
Manager	Char(3)	Yes	FK	NIL
Hire_date	Date	NO		NIL
Dno	Integer	YES	FK	NIL
Commission	Decimal(10,2)	YES		NIL
Salary	Decimal(7,2)	NO		NIL

DEPARTMENT Schema

Field	Type	NULL	KEY	DEFAULT
Dno	Integer	No	PRI	NULL
Dname	Varchar(50)	Yes		NULL
Location	Varchar(50)	Yes		New Delhi

Query List

1. Query to display Employee Name, Job, Hire Date, Employee Number; for each employee with the Employee Number appearing first.
2. Query to display unique Jobs from the Employee Table.
3. Query to display the Employee Name concatenated by a Job separated by a comma.
4. Query to display all the data from the Employee Table. Separate each Column by a comma and name the said column as THE_OUTPUT.
5. Query to display the Employee Name and Salary of all the employees earning more than \$2850.
6. Query to display Employee Name and Department Number for the Employee No= 7900.
7. Query to display Employee Name and Salary for all employees whose salary is not in the range of \$1500 and \$2850.
8. Query to display Employee Name and Department No. of all the employees in Dept 10 and Dept 30 in the alphabetical order by name.
9. Query to display Name and Hire Date of every Employee who was hired in 1981.
10. Query to display Name and Job of all employees who don't have a current Manager.
11. Query to display the Name, Salary and Commission for all the employees who earn commission.
12. Sort the data in descending order of Salary and Commission.
13. Query to display Name of all the employees where the third letter of their name is 'A'.
14. Query to display Name of all employees either have two 'R's or have two 'A's in their name and are either in Dept No = 30 or their Managers Employee No = 7788.
15. Query to display Name, Salary and Commission for all employees whose Commission Amount is 14 greater than their Salary increased by 5%.
16. Query to display the Current Date.
17. Query to display Name, Hire Date and Salary Review Date which is the 1st Monday after six months of employment.
18. Query to display Name and calculate the number of months between today and the date each employee was hired.
19. Query to display the following for each employee <E-Name> earns <Salary> monthly but wants <3*Current Salary>. Label the Column as Dream Salary.
20. Query to display Name with the 1st letter capitalized and all other letter lower case and length of their name of all the employees whose name starts with 'J', 'A' and 'M'.

21. Query to display Name, Hire Date and Day of the week on which the employee started.
22. Query to display Name, Department Name and Department No for all the employees.
23. Query to display Unique Listing of all Jobs that are in Department # 30.
24. Query to display Name, Department Name of all employees who have an 'A' in their name.
25. Query to display Name, Job, Department No. and Department Name for all the employees working at the Dallas location.
26. Query to display Name and Employee no. Along with their Manger's Name and the Manager's employee no; along with the Employees Name who do not have a Manager.
27. Query to display Name, Department No. And Salary of any employee whose department No. and salary matches both the department no. And the salary of any employee who earns a commission.
28. Query to display Name and Salaries represented by asterisks, where each asterisk (*) signifies \$100.
29. Query to display the Highest, Lowest, Sum and Average Salaries of all the employees.
30. Query to display the number of employees performing the same Job type functions.
31. Query to display the no. of managers without listing their names.
32. Query to display the Department Name, Location Name, No. of Employees and the average salary for all employees in that department.
33. Query to display Name and Hire Date for all employees in the same dept. as Blake.
34. Query to display the Employee No. And Name for all employees who earn more than the average salary.
35. Query to display Employee Number and Name for all employees who work in a department with any employee whose name contains a 'T'.
36. Query to display the names and salaries of all employees who report to King.
37. Query to display the department no, name and job for all employees in the Sales department.

CORE-7: PRINCIPLES OF

MANAGEMENT OBJECTIVES

- To understand the basic principles of management.
- To provide a basis of understanding towards working of business organization through the process of management.

Unit-1

Nature of Management: Meaning, Definition, it's nature purpose, importance & Functions, Management as Art, Science & Profession- Management as social System Concepts of management-Administration-Organization.

Evolution of Management Thought: Contribution of F.W.Taylor, Henri Fayol ,Elton Mayo, Chester Barhard & Peter Drucker to the management thought. Various approaches to management (i.e. Schools of management thought)Indian Management Thought.

Unit-2

Functions of Management (Part-I)

Planning - Meaning - Need & Importance, types levels– advantages & limitations, Forecasting - Need & Techniques, Decision making - Types - Process of rational decision

making & techniques of decision making,

Organizing - Elements of organizing & processes: Types of organizations, Delegation of authority - Need, difficulties in delegation – Decentralization,

Unit-3

Functions of Management (Part-II)

Staffing - Meaning & Importance, Direction - Nature – Principles, Communication - Types & Importance, Motivation - Importance – theories, Leadership - Meaning - styles, qualities & functions of leaders

Controlling-Need, Nature, importance, Process & Techniques, Coordination - Need, Importance.

Unit-4

Strategic Management

Definition, Classes of Decisions, Levels of Decision, Strategy, Role of different Strategist, Relevance of Strategic Management and its Benefits, Strategic Management in India.

Text Books:

1. Horold Koontz and Itenz Weibrich, Essential of Management, McGraw Hills International
2. K.Aswathapa, Essential of Business Administration, Himalaya Publishing House

Reference Books:

1. L.M.Parasad Principles & practice of management - Sultan Chand & Sons - New Delhi
2. Tripathi, Reddy, Principles of Management, Tata McGraw Hill

CORE-7 Practical/Tutorial: Principles of Management Tutorial Classes

CORE – 8: JAVA PROGRAMMING

OBJECTIVES

1. To learn the fundamentals of Object Oriented Programming in Java environment.
2. To learn the use of Java language and the Java Virtual Machine.
3. To write simple Java programming applications.

Unit-1

Introduction to Java: Java History, Architecture and Features, Understanding the semantic and syntax differences between C++ and Java, Compiling and Executing a Java Program, Variables, Constants, Keywords (super, this, final, abstract, static, extends, implements, interface) , Data Types, Wrapper class, Operators (Arithmetic, Logical and Bitwise) and Expressions, Comments, Doing Basic Program Output, Decision Making Constructs (conditional statements and loops) and Nesting, Java Methods (Defining, Scope, Passing and Returning Arguments, Type Conversion and Type and Checking, Built-in Java Class Methods). Input through keyboard using Command line Argument, the Scanner class, Buffered Reader class.

Unit-2

Object-Oriented Programming Overview: Principles of Object-Oriented Programming, Defining & Using Classes, Class Variables & Methods, Objects, Object reference, Objects as parameters, final classes, Garbage Collection.

Constructor- types of constructor, this keyword, super keyword. Method overloading and Constructor overloading. Aggregation vs Inheritance, Inheritance: extends vs implements, types of Inheritance, Interface, Up-Casting, Down-Casting, Auto-Boxing, Enumerations, Polymorphism, Method Overriding and restrictions. Package: Pre-defined packages and Custom packages.

Unit-3

Arrays: Creating & Using Arrays (1D, 2D, 3D and Jagged Array), Array of Object, Referencing Arrays Dynamically. Strings and I/O: Java Strings: The Java String class, Creating & Using String Objects, Manipulating Strings, String Immutability& Equality, Passing Strings To & From Methods, String Buffer Classes and StringBuilder Classes. IO package: Understanding Streams File class and its methods, Creating, Reading, Writing using classes: Byte and Character streams, File Output Stream, File Input Stream, File Writer, File Reader, Input Stream Reader, Print Stream, Print Writer. Compressing and Uncompressing File.

Unit-4

Exception Handling, Threading, Networking and Database Connectivity: Exception types, uncaught exceptions, throw, built-in exceptions, Creating your own exceptions; Multi-threading: The Thread class and Runnable interface, creating single and multiple threads, Thread prioritization, synchronization and communication, suspending/resuming threads. Using java.net package, Overview of TCP/IP and Datagram programming. Accessing and manipulating databases using JDBC.

Text Books:

1. E. Balagurusamy, “Programming with Java”, TMH, 4/Ed,

Reference books:

1. Herbert Schildt, “The Complete Reference to Java”, TMH, 10/Ed.

CORE – 8 Practical/Tutorial: Java Programming Lab

1. To find the sum of any number of integers entered as command line arguments.
2. To find the factorial of a given number.
3. To convert a decimal to binary number.
4. To check if a number is prime or not, by taking the number as input from the keyboard.
5. To find the sum of any number of integers interactively, i.e., entering every number from the keyboard, whereas the total number of integers is given as a command line argument
6. Write a program that show working of different functions of String and StringBufferclass like set Char At(), set Length(), append(), insert(), concat ()and equals().
7. Write a program to create a – “distance” class with methods where distance is computed in terms of feet and inches, how to create objects of a class and to see the use of this pointer
8. Modify the – “distance” class by creating constructor for assigning values (feet and inches) to the distance object. Create another object and assign second object as reference variable to another object reference variable. Further create a third object which is a clone of the first object.
9. Write a program to show that during function overloading, if no matching argument is found, then Java will apply automatic type conversions (from lower to higher data type)
10. Write a program to show the difference between public and private access specifiers. The program should also show that primitive data types are passed by value and objects are passed by reference and to learn use of final keyword.

11. Write a program to show the use of static functions and to pass variable length arguments in a function.
14. Write a program to demonstrate the concept of boxing and unboxing.
15. Create a multi-file program where in one file a string message is taken as input from the user and the function to display the message on the screen is given in another file (make use of Scanner package in this program).
16. Write a program to create a multilevel package and also creates a reusable class to generate Fibonacci series, where the function to generate Fibonacci series is given in a different file belonging to the same package.
17. Write a program that creates illustrates different levels of protection in classes/subclasses belonging to same package or different packages
18. Write a program – “Divide By Zero” that takes two numbers a and b as input, computes a/b, and invokes Arithmetic Exception to generate a message when the denominator is zero.
19. Write a program to show the use of nested try statements that emphasizes the sequence of checking for catch handler statements.
20. Write a program to create your own exception types to handle situation specific to your application (Hint: Define a subclass of Exception which itself is a subclass of Throwable).
21. Write a program to demonstrate priorities among multiple threads.
22. Write a program to demonstrate different mouse handling events like mouse Clicked(), mouse Entered(), mouse Exited(), mouse Pressed(), mouse Released() & mouse Dragged().
23. Write a program to demonstrate different keyboard handling events.

CORE – 9: BUSINESS

ACCOUNTING OBJECTIVES

- To impart the basic business accounting knowledge.

Unit-1

Introduction: Financial Accounting-definition and Scope, objectives of Financial Accounting, Accounting v/s Book Keeping terms used in accounting, users of accounting information and limitations of Financial Accounting.

Conceptual Framework: Accounting Concepts, Principles and Conventions, Accounting Standards concept, objectives, benefits, brief review of Accounting Standards in India, Accounting Policies, Accounting as a measurement discipline, valuation Principles, accounting estimates

Unit-2

Recording of transactions: Voucher system; Accounting Process, Journals, Subsidiary Books, Ledger, Cash Book, Bank Reconciliation Statement, Trial Balance.

Depreciation: Meaning, need & importance of depreciation, methods of charging depreciation.

Unit-3

Preparation of final accounts: Preparation of Trading and Profit & Loss Account and

Balance Sheet of sole proprietary business

Unit-4

Introduction to Company Final Accounts: Important provisions of Companies Act, 1956 in respect of preparation of Final Accounts, Understanding of final accounts of a Company.

Computerized Accounting: Computers and Financial application, Accounting Software packages, An overview of computerized accounting system - Salient features and significance, Concept of grouping of accounts, Codification of accounts, Maintaining the hierarchy of ledger, Generating Accounting Reports.

Text Books :

1. Anil Chowdhry, "Fundamentals of Accounting & Financial Analysis", Pearson Education
2. Rajesh Agarwal, R. Srinivasan, "Accounting Made Easy", TMH

Reference Books:

1. Amrish Gupta, "Financial Accounting for Management", Pearson Education
2. S. N. Maheshwari, "Financial Accounting for Management: Vikas Publishing House

CORE-9 Practical/Tutorial: Business Accounting Tutorial

CORE-10: OPERATING SYSTEM

OBJECTIVES

- To understand Operating system structure and services.
- To understand the concept of a Process, memory, storage and I/O management.

Unit-1

Introduction to Operating System, System Structures: Operating system services, system calls, system programs, Operating system design and implementation, Operating system structure.

Unit-2

Process Management: Process Concept, Operations on processes, Process scheduling and algorithms, Inter-process Communication, Concepts on Thread and Process, Deadlocks: Deadlock detection, deadlock prevention, and deadlock avoidance fundamentals.

Unit-3

Memory Management Strategies: Swapping, Contiguous Memory Allocation, Paging, Segmentation, Virtual Memory Management: Concepts, implementation (Demand Paging), Page Replacement, Thrashing.

Unit-4

Storage Management: File System concept, Access Methods, File System Mounting, File Sharing and File Protection, Implementing File Systems, Kernel I/O Systems.

Text book:

1. Operating System Concepts, Abraham Silberschatz, Peter B. Galvin, and Greg Gagne,

Reference book:

1. Modern Operating System, Tanenbaum, Pearson, 4/Ed. 2014
2. Richard F Ashley, Linux with Operating System Concepts, Chapman and Hall/CRC
Published August 26, 2014
3. Richard Blum, Linux Command Line and Shell Scripting Bible, O' Reilly

CORE-10 Practical/Tutorial: Operating System Lab

1. Write a program (using *fork()* and/or *exec()* commands) where parent and child execute:
 - a) same program, same code.
 - b) same program, different code.
 - c) before terminating, the parent waits for the child to finish its task.
2. Write a program to report behavior of Linux kernel including kernel version, CPU type and model. (CPU information)
3. Write a program to report behavior of Linux kernel including information on configured memory, amount of free and used memory. (memory information)
4. Write a program to print file details including owner access permissions, file access time, where file name is given as argument.
5. Write a program to copy files using system calls.
6. Write a program using C to implement FCFS scheduling algorithm.
7. Write a program using C to implement Round Robin scheduling algorithm.
8. Write a program using C to implement SJF scheduling algorithm.
9. Write a program using C to implement non-preemptive priority based scheduling algorithm.
10. Write a program using C to implement preemptive priority based scheduling algorithm.
11. Write a program using C to implement SRTF scheduling algorithm.
12. Write a program using C to implement first-fit, best-fit and worst-fit allocation strategies.

CORE – 11: WEB TECHNOLOGY

OBJECTIVES

- To learn the fundamentals of web designing.
- To design and develop standard and interactive web pages.
- To learn some popular web scripting languages.

Unit-1

Web Essentials: Clients, Servers and Communication:

The Internet – Basic Internet protocols – The WWW, HTTP request message – response message, web clients web servers – case study.

Introduction to HTML: HTML, HTML domains, basic structure of an HTML document – creating an HTML document, mark up tags, heading, paragraphs, line breaks, HTML tags. Elements of HTML, working with text, lists, tables and frames, working with hyperlink, images and multimedia, forms and controls

Unit-2

Introduction to cascading style sheets: Concepts of CSS, creating style sheet, CSS properties, CSS styling (background, text format, controlling fonts), working with the block elements and objects. Working with lists and tables, CSS ID and class. Box model (introduction, border properties, padding properties, margin properties), CSS colour, grouping, Dimensions, display, positioning, floating, align, pseudo class, Navigation bar, image sprites.

Unit-3

Java scripts: Client side scripting, what is java script, simple java script, variables, functions, conditions, loops and repetitions. Java scripts and objects, java script own objects, the DOM and web browser environment, forms and validations.

DHTML: Combining HTML, CSS, java scripts, events and buttons, controlling your browser.

Unit-4

PHP: Starting to script on server side, PHP basics, variables, data types, operators, expressions, constants, decisions and loop making decisions. Strings – creating, accessing strings, searching, replacing and formatting strings. Arrays: Creation, accessing array, multidimensional arrays, PHP with Database.

Text Book:

1. Web Technologies – Black Book – DreamTech Press
2. Matt Doyle, Beginning PHP 5.3 (wrox-Willey publishing)
3. John Duckett, Beginning HTML, XHTML, CSS and Java script.

Reference Book:

1. HTML, XHTML and CSS Bible, 5ed, Willey India-Steven M. Schafer.

CORE – 11 Practical/Tutorial: Web Technology Lab

1. Acquaintance with elements, tags and basic structure of HTML files.
2. Practicing basic and advanced text for formatting.
3. Practice use of image, video and sound in HTML documents.
4. Designing of web pages- Document layout, list, tables.
5. Practicing Hyperlink of web pages, working with frames.
6. Working with forms and controls.
7. Acquaintance with creating style sheet, CSS properties and styling.
8. Working with background, text, font, list properties.
9. Working with HTML elements box properties in CSS.

10. Develop simple calculator for addition, subtraction, multiplication and division operation using java script.
11. Create HTML page with java script which takes integer number as a input and tells whether the number is odd or even.
12. Create HTML page that contains form with fields name, Email, mobile number, gender, favorite colour and button; now write a java script code to validate each entry. Also write a code to combine and display the information in text box when button is clicked.
13. Write a PHP program to check if number is prime or not.
14. Write a PHP program to print first ten Fibonacci numbers.
15. Create a MySQL data base and connect with PHP.
16. Write PHP script for string and retrieving user information from my SQL table.
 - a. Write a HTML page which takes Name, Address, Email and Mobile number from user (register PHP).
 - b. Store this data in MySQL data base.
 - c. Next page display all user in HTML table using PHP (display .PHP).
17. Using HTML, CSS, Javascript, PHP, MySQL, design a authentication module of a web page.

CORE – 12: SOFTWARE ENGINEERING

OBJECTIVES:

- To learn the way of developing software with high quality and the relevant techniques.
- To introduce software engineering principles for industry standard.
- To focus on Project management domain and Software risks management.

Unit-1

Introduction: Evolution of Software to an Engineering Discipline, Software Development Projects, Exploratory Style of Software Development, Emergence of Software Engineering, Changes in Software Development Practices, Computer Systems Engineering.

Software Lifecycle Models: Waterfall Model and its Extensions, Rapid Application Development (RAD), Agile Development Models, Spiral Model.

Unit-2

Software Project Management: Software Project Management Complexities, Responsibilities of a Software Project Manager, Project Planning, Metrics for Project Size Estimation, Project Estimation Techniques, Empirical Estimation Techniques, COCOMO, Halstead's Software Science, Staffing Level Estimation, Scheduling, Organization and Team Structures, Staffing, Risk Management, Software Configuration Management.

Unit-3

Requirement Analysis and Specification: Requirements Gathering and Analysis, Software Requirement Specifications, Formal System Specification Axiomatic Specification, Algebraic Specification, Executable Specification and 4GL.

Software Design: Design Process, Characterize a Good Software Design, Cohesion and Coupling, Layered Arrangements of Modules, Approaches to Software Design (Function Oriented & Object-Oriented).

Unit-4

Coding and Testing: Coding: Code Review, Software Documentation, Testing, Unit Testing, Black Box and White Box Testing, Debugging, Program Analysis Tools, Integration Testing, System Testing, Software Maintenance.

Text Book:

1. Fundamental of Software Engineering, Rajib Mall, Fifth Edition, PHI Publication, India.

Reference Books:

1. Software Engineering– Ian Sommerville, 10/Ed, Pearson.
2. Software Engineering Concepts and Practice – Ugrasen Suman, Cengage Learning India Pvt, Ltd.

CORE – 12 Practical/Tutorial: Software Engineering Lab

S. No. Practical Title

1. • Problem Statement,
 - Process Model
2. Requirement Analysis:
 - Creating a Data Flow
 - Data Dictionary, Use Cases
3. Project Management:
 - Computing FP
 - Effort
 - Schedule, Risk Table, Timeline chart
4. Design Engineering:
 - Architectural Design
 - Data Design, Component Level Design
5. Testing:
 - Basis Path Testing

Sample Projects:

1. **Criminal Record Management:** Implement a criminal record management system for jailers, police officers and CBI officers.
2. **Route Information:** Online information about the bus routes and their frequency and fares
3. **Car Pooling:** To maintain a web based intranet application that enables the corporate employees within an organization to avail the facility of carpooling effectively.
4. Patient Appointment and Prescription Management System
5. Organized Retail Shopping Management Software
6. Online Hotel Reservation Service System

7. Examination and Result computation system
8. Automatic Internal Assessment System
9. Parking Allocation System
10. Wholesale Management System

CORE – 13: MANAGEMENT ACCOUNTING OBJECTIVES

- To encourage the acquisition of knowledge and skills relating to the application of management accounting concepts and techniques for business decisions.
- To introduce the short-term and long-term strategic decision-making models.

Unit-1

Nature, Scope of Management Accounting: Meaning, definition, nature and scope of Management Accounting; Comparison of Management Accounting with Cost Accounting and Financial Accounting. Cost concepts: Meaning, Scope, Objectives, and Importance of Cost Accounting; Cost, Costing, Cost Control, and Cost Reduction; Elements of Cost, Components of total Cost, Cost Sheet. Classification of Costs: Fixed, Variable, Semi- variable, and Step Costs; Product, and Period Costs; Direct, and Indirect Costs; Relevant, and Irrelevant Costs; Shut-down, and Sunk Costs; Controllable, and Uncontrollable Costs; Avoidable, and Unavoidable Costs; Imputed / Hypothetical Costs; Out-of-pocket Costs; Opportunity Costs; Expired, and Unexpired Costs; Conversion Cost. Cost Ascertainment: Cost Unit and Cost Center. Introduction to Overhead allocation, Overhead apportionment, and Overhead absorption.

Unit-2

Cost-Volume-Profit Analysis: Contribution, Profit-Volume Ratio, Margin of safety, Cost Break-even Point, Composite Break-even Point, Cash Break-even Point, Key Factor, Break-even Analysis. Relevant Costs and Decision Making: Pricing, Product Profitability, Make or Buy, Exploring new markets, Export Order, Sell or Process Further, Shut down vs. Continue.

Unit-3

Budgets and Budgetary Control: Meaning, Types of Budgets, Steps in Budgetary Control, Fixed and Flexible Budgeting, Cash Budget. Responsibility Accounting: Concept, Significance, Different responsibility centers, Divisional performance – Financial measures, Transfer pricing.

Unit-4

Standard Costing and Variance Analysis: Meaning of Standard Cost and Standard Costing, Advantages, Limitations and Applications; Material, Labor, Overhead and Sales variances. Introduction to Target Costing, Life Cycle Costing, Quality Costing, and Activity based Costing.

Text Books:

1. C.T. Horngren, Gary L. Sundem, Jeff O. Schatzberg, and Dave Burgstahler: Introduction to Management Accounting, Pearson
2. M.N. Arora: A Textbook of Cost and Management Accounting, Vikas Publishing House Pvt. Ltd.

Reference Books:

1. M.Y. Khan, and P.K. Jain, Management Accounting: Text Problems and Cases, McGraw Hill Education (India) Pvt. Ltd.

CORE – 13 Practical/Tutorial: Management Accounting Tutorial

CORE – 14: COMPUTER NETWORKS

OBJECTIVES

- To learn how do computers and terminals actually communicate with each other.
- To understand the parts of a communication network and how they work together.

Unit-1

Introduction to Data Communications and Network Models: Protocols and Standards, Layers in OSI Models, Analog and Digital Signals, Transmission Modes, Transmission Impairment, Data Rate Limits, Performance, Digital Transmission, Network Devices & Drivers: Router, Modem, Repeater, Hub, Switch, Bridge (fundamental concepts only).

Unit-2

Signal Conversion: Digital-to-Digital Conversion, Analog-to-Digital Conversion, Digital-to-analog Conversion, Analog-to-analog Conversion.

Transmission Media: Guided Media, Unguided Media, Switching Techniques: Packet Switching, Circuit Switching, Datagram Networks, Virtual-Circuit Networks, and Structure of a Switch.

Unit-3

Error Detection and Correction: Checksum, CRC, Data Link Control: Framing, Flow and Error Control, Noiseless Channels, Noisy channels, (Stop and Wait ARQ, Sliding Window Protocol, Go Back N, Selective Repeat) HDLC, Point-to-Point Protocol. Access Control: TDM, CSMA/CD, and Channelization (FDMA, TDMA, and CDMA).

Unit-4

Network Layer: Logical Addressing, IPv4 Addresses, IPv6 Addresses, Virtual-Circuit Networks: Frame Relay and ATM, Transport Layer: Process-Process Delivery: UDP, TCP. Application layers: DNS, SMTP, POP, FTP, HTTP, Basics of WiFi (Fundamental concepts only), Network Security: Authentication, Basics of Public Key and Private Key, Digital Signatures and Certificates (Fundamental concepts only).

Text Books:

1. Data Communications and Networking, Fourth Edition by Behrouza A. Forouzan, TMH.

Reference Books:

1. Computer Networks, A. S. Tanenbaum, 4th edition, Pearson Education.

CORE – 14 Practical/Tutorial: Computer Networks Lab

Use C/C++/ any Network Simulator

1. Simulate Even Parity generator and checker.

2. Simulate two dimensional Parity generator and checker.

3. Simulate checksum generator and checker.
4. Simulate Hamming code method.
5. Simulate Cyclic Redundancy Check (CRC) error detection algorithm for noisy channel.
6. Simulate and implement stop and wait protocol for noisy channel.
7. Simulate and implement go back n sliding window protocol.
8. Simulate and implement selective repeat sliding window protocol.
9. Simulate and implement distance vector routing algorithm.

DSE-1: DATA SCIENCE

OBJECTIVES:

- To learn emerging issues related to various fields of data science.
- To understand the underlying principles of data science, exploring data analysis.
- To learn the basics of R Programming.

Unit-1

Data Scientist's Tool Box: Turning data into actionable knowledge, introduction to the tools that will be used in building data analysis software: version control, markdown, git, GitHub, R, and RStudio.

Unit-2

R Programming Basics: Overview of R, R data types and objects, reading and writing data, Control structures, functions, scoping rules, dates and times, Loop functions, debugging tools, Simulation, code profiling.

Unit-3

Getting and Cleaning Data: Obtaining data from the web, from APIs, from databases and from colleagues in various formats, basics of data cleaning and making data "tidy".

Unit-4

Exploratory Data Analysis: Essential exploratory techniques for summarizing data, applied before formal modeling commences, eliminating or sharpening potential hypotheses about the world that can be addressed by the data, common multivariate statistical techniques used to visualize high-dimensional data.

Text Books:

1. Rachel Schutt, Cathy O'Neil, "Doing Data Science: Straight Talk from the Frontline" : Schroff/O'Reilly, 2013.

Reference Books:

1. Foster Provost, Tom Fawcett, "Data Science for Business" What You Need to Know About Data Mining and Data-Analytic Thinking by O'Reilly, 2013.
2. John W. Foreman, "Data Smart: Using Data Science to Transform Information into Insight" : John Wiley & Sons, 2013.
3. Eric Seigel, "Predictive Analytics: The Power to Predict who Will Click, Buy, Lie, or Die", 1st Edition, by Wiley, 2013.

DSE-1 Practical/Tutorial: Data Science Lab

1. Write a program that prints "Hello World" to the screen.
2. Write a program that asks the user for a number n and prints the sum of the numbers 1 to n

3. Write a program that prints a multiplication table for numbers up to 12.
4. Write a function that returns the largest element in a list.
5. Write a function that computes the running total of a list.
6. Write a function that tests whether a string is a palindrome.
7. Implement linear search.
8. Implement binary search.
9. Implement matrices addition, subtraction and Multiplication
10. Fifteen students were enrolled in a course. Their ages were:

20 20 20 20 20 21 21 21 22 22 22 22 23 23 23

- i. Find the median age of all students under 22 years
- ii. Find the median age of all students
- iii. Find the mean age of all students
- iv. Find the modal age for all students
- v. Two more students enter the class. The age of both students is 23. What is now mean, mode and median?

DSE-2: MANAGERIAL

ECONOMICS OBJECTIVES:

- To introduce the economic concepts.
- To familiarize with the students the importance of economic approaches in managerial decision making.
- To understand the applications of economic theories in business decisions.

Unit-1:

Demand, Supply and Market equilibrium: individual demand, market demand, individual supply, market supply, market equilibrium; Elasticity of demand and supply: Price elasticity of demand, income elasticity of demand, cross price elasticity of demand, elasticity of supply; Theory of consumer behavior: cardinal utility theory, ordinal utility theory (indifference curves, budget line, consumer choice, price effect, substitution effect, income effect for normal, inferior and giffen goods), revealed preference theory.

Unit-2:

Producer and optimal production choice: optimizing behavior in short run (geometry of product curves, law of diminishing margin productivity, three stages of production), optimizing behavior in long run (isoquants, isocost line, optimal combination of resources) Costs and scale: traditional theory of cost (short run and long run, geometry of cot curves, envelope curves), modern theory of cost (short run and long run), economies of scale, economies of scope.

Unit-3:

Theory of firm and market organization: perfect competition (basic features, short run equilibrium of firm/industry, long run equilibrium of firm/industry, effect of changes in demand, cost and imposition of taxes); monopoly (basic features, short run equilibrium, long run equilibrium, effect of changes in demand, cost and imposition of taxes, comparison with perfect competition, welfare cost of monopoly), price discrimination, multiplant monopoly;

monopolistic competition (basic features, demand and cost, short run equilibrium, long run equilibrium, excess capacity); oligopoly (Cournot's model, kinked demand curve model, dominant price leadership model, prisoner's dilemma)

Unit-4:

Factor market: demand for a factor by a firm under marginal productivity theory (perfect competition in the product market, monopoly in the product market), market demand for a factor, supply of labour, market supply of labour, factor market equilibrium.

Text Books:

1. Yogesh Maheswari, Managerial Economics, PHI Learning, New Delhi.
2. G. S. Gupta, Managerial Economics, Tata Mcgraw-Hill, New Delhi.

Reference Books:

1. Moyer & Harris, Managerial Economics, Cengage Learning, New Delhi.
2. Geetika, Ghosh & Choudhury, Managerial Economics, Tata Mcgrawhill, New Delhi.
3. Dominick Salvatore, Principles of Microeconomics, Oxford University Press, (5th Ed.)

DSE-2 Practical/Tutorial: Managerial Economics

Tutorial DSE-3: FINANCIAL MANAGEMENT

OBJECTIVES:

- To introduce students to financial planning, its objectives, its benefits, its stages, and the factors that help towards the success of financial planning.
- To introduce students about the methods used in financial planning to assess the short-term financial needs.

Unit-1

Nature of Financial Management: Finance and related disciplines; Scope of Financial Management; Profit Maximization, Wealth Maximization - Traditional and Modern Approach; Functions of finance – Finance Decision, Investment Decision, Dividend Decision; Objectives of Financial Management; Organization of finance function; Concept of Time Value of Money, present value, future value, and annuity; Risk & Return: Historical return, expected return, absolute return, holding period return, annualized return, arithmetic & geometric return; Risk - Systematic & unsystematic risk – their sources and measures.

Unit-2

Long -term investment decisions: Capital Budgeting - Principles and Techniques; Nature and meaning of capital budgeting; Estimation of relevant cash flows and terminal value; Evaluation techniques - Accounting Rate of Return, Net Present Value, Internal Rate of Return & MIRR, Net Terminal Value, Profitably Index Method. Concept and Measurement of Cost of Capital: Explicit and Implicit costs; Measurement of cost of capital; Cost of debt; Cost of perpetual debt; Cost of Equity Share; Cost of Preference Share; Cost of Retained Earning; Computation of over-all cost of capital based on Historical and Market weights.

Unit-3

Capital Structures: Approaches to Capital Structure Theories - Net Income approach, Net Operating Income approach, Modigliani-Miller (MM) approach, Traditional approach, Capital Structure and Financial Distress, Trade-Off Theory. Dividend Policy Decision - Dividend and Capital; The irrelevance of dividends: General, MM hypothesis; Relevance of

dividends: Walter's model, Gordon's model; Leverage Analysis: Operating and Financial Leverage; EBIT -EPS analysis; Combined leverage.

Unit-4

Working Capital Management: Management of Cash - Preparation of Cash Budgets (Receipts and Payment Method only); Cash management technique, Receivables Management-Objectives; Credit Policy, Cash Discount, Debtors Outstanding and Ageing Analysis; Costs - Collection Cost, Capital Cost, Default Cost, Delinquency Cost, Inventory Management (Very Briefly) - ABC Analysis; Minimum Level; Maximum Level; Reorder Level; Safety Stock; EOQ, Determination of Working Capital.

Text Books:

1. M. Y. Khan, P. K. Jain, Financial Management Text Problem and Cases, TMH.
2. I. M. Pandey, Financial Management, Theory and Practices, Vikas Publishing House.

Reference Books:

1. R. A. Brealey, S. C. Myers, F. Allen, P. Mohanty: Principles of Corporate Finance, McGraw Hill Higher Education.
2. J. V. Horne, J. M. Wachowicz, Fundamentals of Financial Management, Prentice Hall.

DSE-3 Practical/Tutorial: Financial Management Tutorial

DSE-4: SOFTWARE PROJECT WORK / E-COMMERCE DSE-4: E-

COMMERCE

OBJECTIVES

- To introduce the concepts of electronic commerce.
- To make the user understand how electronic commerce is affecting business enterprises, governments, consumers and people in general.

Unit-1

Introduction to E-Commerce: Definition and scope of E-Commerce and M-Commerce, E-Commerce trade cycle, Electronic Markets, Internet Commerce, Benefits and Impacts of E-Commerce.

Elements of E-Commerce: Various elements, e-visibility, e-shops, Delivery of goods and services, Online payments, After-sales services, Internet E-Commerce security.

Unit-2

EDI and Electronic Payment Systems: Introduction and definition of EDI, EDI layered Architecture, EDI technology and standards, EDI communications and transactions, Benefits and applications of EDI with example, Electronic Payment Systems: credit/debit/smart cards, e-credit accounts, e-money.

Unit-3

Introduction to EC models: Inter-organization and intra-organization E-Commerce, E-Commerce Models: B2B, B2C, C2B, C2C, G2C, C2G

E-Business: Introduction to Internet bookshops, Grocery Suppliers, Software Supplies and support, Electronic newspapers, Virtual auctions, Online share dealing, e-diversity.

Unit-4

E-Security and Legal Issues: Security concerns in E-Commerce, Privacy, integrity, authenticity, non-repudiation, confidentiality, SSL, Digital Signatures and fire walls, IT Act 2000, Cyber-crimes and cyber laws

Mobile Commerce and Future of E-Commerce: Introduction to Mobile Commerce, Benefits of Mobile Commerce, Impediments of M-Commerce, M-Commerce framework, Emerging and future trends.

Text Books:

1. G.S.V.Murthy, E-Commerce Concepts, Models, Strategies, Himalaya Publishing House.
2. Henry Chan, Raymond Lee, Tharam Dillon, Elizabeth Chang, "E-Commerce Fundamentals and Applications, Wiley Student Edition.

Reference Books:

1. Gray P. Schneider , Electronic commerce, International Student Edition.

DSE-4 Practical/Tutorial: E-Commerce Tutorial

SEC – 1: PYTHON PROGRAMMING

OBJECTIVES:

- To enable the students to understand the basic principles of the Python Language.
- To use the tools to do simple programs in python.

Unit-1

Planning the Computer Program: Concept of problem solving, Problem definition, Program design, Debugging, Types of errors in programming, Documentation.

Unit-2

Techniques of Problem Solving: Flowcharting, decision table, algorithms, Structured programming concepts, Programming methodologies viz. top-down and bottom-up programming.

Unit-3

Overview of Programming: Structure of a Python Program, Elements of Python

Introduction to Python: Python Interpreter, Using Python as calculator, Python shell, Indentation. Atoms, Identifiers and keywords, Literals, Strings, Operators (Arithmetic operator, Relational operator, Logical or Boolean operator, Assignment, Operator, Ternary operator, Bit wise operator, Increment or Decrement operator)

Unit-4

Creating Python Programs: Input and Output Statements, Control statements (Branching, Looping, Conditional Statement, Exit function, Difference between break, continue and pass.), Defining Functions, default arguments.

Text Books

1. T. Budd, Exploring Python, TMH, 1st Ed, 2011

Reference Books

1. Allen Downey, Jeffrey Elkner, Chris Meyers , How to think like a computer scientist : learning with Python , Freely available online.2012

Online References:

1. Python Tutorial/Documentation www.python.org 2015
2. <http://docs.python.org/3/tutorial/index.html>
3. <http://interactivepython.org/courselib/static/pythonds>
4. <http://www.ibiblio.org/g2swap/byteofpython/read/>

Software Lab based on Python Programming:

1. Write a menu driven program to convert the given temperature from Fahrenheit to Celsius and vice versa depending upon users choice.
2. Write a Program to calculate total marks, percentage and grade of a student. Marks obtained in each of the three subjects are to be input by the user. Assign grades according to the following criteria:
Grade A: Percentage ≥ 80
Grade B: Percentage ≥ 70 and < 80
Grade C: Percentage ≥ 60 and < 70
Grade D: Percentage ≥ 40 and < 60
Grade E: Percentage < 40
3. Write a menu-driven program, using user-defined functions to find the area of rectangle, square, circle and triangle by accepting suitable input parameters from user.
4. Write a Program to display the first n terms of Fibonacci series.
5. Write a Program to find factorial of the given number.
6. Write a Program to find sum of the following series for n terms: $1 - 2/2! + 3/3! - \dots - n/n!$
7. Write a Program to calculate the sum and product of two compatible matrices.

AEC-1: Environmental Science

AEC-2: English Communication/MIL

SEC-2: ANDROID PROGRAMMING

Assessment: 10)

OBJECTIVES:

- To learn the basics of Android Programming.
- To develop simple Android applications.

Unit-1

Introduction: History of Android, Introduction to Android Operating Systems, Android Development Tools, Android Architecture.

Unit-2

Overview of Object Oriented programming using Java: OOPs Concepts: Inheritance, Polymorphism, Interfaces, Abstract class, Threads, Overloading and Overriding, Java Virtual Machine.

Unit-3

Development Tools: Installing and using Eclipse with ADT plug-in, Installing Virtual machine for Android sandwich/Jelly bean (Emulator), configuring the installed tools, creating

an android project – Hello Word, run on emulator, Deploy it on USB-connected Android device.

User Interface Architecture: Application context, intents, Activity life cycle, multiple screen sizes.

Unit-4

User Interface Design: Form widgets, Text Fields, Layouts, Button control, toggle buttons, Spinners (Combo boxes), Images, Menu, Dialog.

Database: Understanding of SQLite database, connecting with the database.

Text Books:

1. Android application development for java programmers. By James C. Sheusi. Publisher: Cengage Learning, 2013.

Reference Book:

1. James C. Sheusi, “Android application Development for Java Programmers”, Cengage Learning, 2013.
2. M. Burton, & D. Felker, “Android Application Development for Dummies”, 2/e, Wiley India.

Online References:

1. <http://www.developer.android.com>
2. <http://docs.oracle.com/javase/tutorial/index.htm> (Available in the form of free downloadable ebo
3. <http://developer.android.com/guide/components/fundamentals.html>
4. <http://developer.android.com/training/multiscreen/screensizes.html>
5. <http://developer.android.com/guide/topics/ui/controls.html>

Software Lab based on Android Programming:

1. Create “Hello World” application. That will display “Hello World” in the middle of the screen in the emulator. Also display “Hello World” in the middle of the screen in the Android Phone.
2. Create an application with login module. (Check username and password).
3. Create spinner with strings taken from resource folder (res >> value folder) and on changing the spinner value, Image will change.
4. Create a menu with 5 options and selected option should appear in text box.
5. Create a list of all courses in your college and on selecting a particular course teacher-in- charge of that course should appear at the bottom of the screen.
6. Create an application with three option buttons, on selecting a button colour of the screen will change.
7. Create and Login application as above. On successful login, pop up the message.
8. Create an application to Create, Insert, update, Delete and retrieve operation on the database.

GE/IC–1: DISCRETE MATHEMATICAL

STRUCTURES OBJECTIVES

- To learn the mathematical foundations for Computer Science.
- Topics covered essential for understanding various courses.

Unit-1

Logics and Proof: Propositional Logic, Propositional Equivalences, Predicates and Quantifiers Nested Quantifiers, Rules inference, Mathematical Induction.

Sets and Functions: Sets, Relations, Functions, Closures of Equivalence Relations, Partial ordering well ordering, Lattice, Sum of products and product of sums principle of Inclusions and Exclusions

Unit-2

Combinatory: Permutations, Combinations, Pigeonhole principle

Recurrence Relation: Linear and Non-linear Recurrence Relations, Solving Recurrence Relation using Generating Functions.

Unit-3

Graphs: Introduction to graphs, graphs terminologies, Representation of graphs, Isomorphism,

Connectivity & Paths: Connectivity, Euler and Hamiltonian Paths, Introduction to tree, tree traversals, spanning tree and tree search: Breadth first search, Depth first search, cut-set, cut- vertex.

Unit-4

Modeling Computation: Finite State Machine, Deterministic Finite Automata (DFA), Non- Deterministic Finite Automata (NFA), Grammars and Language, Application of Pumping Lemma for Regular Language.

Text Books:

1. “Discrete Mathematics and its Applications with Combinatory and Graph Theory” 7th edition by Kenneth H. Rosen.

Reference Books:

1. Elements of Discrete Mathematics by C. L. Liu and D.P. Mohapatra, TMH, 2012
2. J. P Tremblay, R. Manohar, “Discrete Mathematical Structures with Applications to Computer Science”, TMH, 1997.

GE/IC-1 Practical/Tutorial: Discrete Mathematical Structures Lab

Write the following programs using C/ C++

1. Tower of Hanoi
2. Graph representation using Adjacency List.
3. Graph representation using Adjacency Matrix.

4. String Matching using finite state machine.
5. Detecting whether a number is even or odd using Finite State Machine.
6. To identify keywords such as char, const, continue using Finite State Machine.
7. To find the power set for a given set.
8. To find GCD of two numbers using recursion.
9. To find Binomial coefficients.
10. To find Permutation and Combination result for a given pair of values n and r.
11. To check a number is prime or not.
12. To calculate the Euclidean distance between two points.
13. To find the Roots of polynomials.
14. Find the shortest path pair in a plane.

GE/IC-2: NUMERICAL

TECHNIQUES OBJECTIVES:

- To learn various numerical techniques.
- To be able to implement different numerical techniques using programming language.

Unit-1

Floating point representation and computer arithmetic, Significant digits, Errors: Round-off error, Local truncation error, Global truncation error, Order of a method, Convergence and terminal conditions, Efficient computations.

Unit-2

Bisection method, Secant method, Regula-Falsi method Newton-Raphson method, Newton's method for solving nonlinear systems.

Unit-3

Interpolation: Lagrange's form and Newton's form Finite difference operators, Gregory Newton forward and backward differences Interpolation Piecewise polynomial interpolation: Linear interpolation.

Unit-4

Numerical integration: Trapezoid rule, Simpson's rule (only method), Newton-Cotes formulas, Gaussian quadrature, Ordinary differential equation: Euler's method Modified Euler's methods, Runge-Kutta second methods

Text books

1. S.S. Sastry, "Introductory Methods of Numerical Analysis", EEE , 5/ed.
2. M.K. Jain, S.R.K. Iyengar and R.K. Jain, Numerical Methods for Scientific and Engineering Computation, New Age International Publisher, 6/e (2012)

Reference books

1. Numerical Analysis: J. K. Mantri & S. Prahan, Laxmi Publication.
2. Introduction to Numerical Analysis, Josef Stoer and Roland Bulirsch, Springer.

GE/IC – 2 Practical/Tutorial: Numerical Methods Lab

Implement using C/ C++ or MATLAB/ Scilab

1. Find the roots of the equation by bisection method.
2. Find the roots of the equation by secant/Regula-Falsi method.
3. Find the roots of the equation by Newton's method.
4. Find the solution of a system of nonlinear equation using Newton's method.
5. Find the solution of tri-diagonal system using Gauss Thomas method.
6. Find the solution of system of equations using Jacobi/Gauss-Seidel method.
7. Find the cubic spline interpolating function.
8. Evaluate the approximate value of finite integrals using Gaussian/Romberg integration.
9. Solve the boundary value problem using finite difference method.

GE/IC-3: STATISTICAL

TECHNIQUES OBJECTIVES

- To understand the concept of population and sample.
- To use frequency distribution to make decision.
- To understand and to calculate various types of averages and variation.

Unit-1

Statistical Methods: Definition and scope of Statistics, concepts of statistical population and sample. **Data:** quantitative and qualitative, attributes, variables, scales of measurement nominal, ordinal, interval and ratio. **Presentation:** tabular and graphical, including histogram.

Unit-2

Measures of Central Tendency: mathematical and positional. **Measures of Dispersion:** range, quartile deviation, mean deviation, standard deviation, coefficient of variation, Moments, absolute moments, factorial moments, skewness and kurtosis, Sheppard's corrections.

Unit-3

Bivariate data: Definition, scatter diagram, simple, partial and multiple correlation (3-variables only), rank correlation. Simple linear regression.

Unit-4

Principle of least squares and fitting of polynomials and exponential curves. Theory of

attributes: Independence and association of attributes, consistency of data, measures of association and contingency, Yule's coefficient of colligation.

Text Books:

1. S.C. Gupta, Fundamentals of Statistics, Sultan chand & sons, Delhi.
2. A.M.Goon, M.K.Gupta and B. Dasgupta, Fundamentals of Statistics, The World Press, Kolkata.

Reference Books:

1. S.P. Gupta, Statistical Methods, Sultan Chand and sons New Delhi

GE/IC-3 Practical/Tutorial: Statistical Techniques Lab

List of Practical

1. Graphical representation of data.
2. Problems based on measures of central tendency.
3. Problems based on measures of dispersion.
4. Problems based on combined mean and variance and coefficient of variation.
5. Problems based on moments, skewness and kurtosis.
6. Fitting of polynomials, exponential curves.
7. Karl Pearson's correlation coefficient.
8. Correlation coefficient for a bivariate frequency distribution.
9. Lines of regression, angle between two lines of regression and estimated values of variables.
10. Spearman rank correlation with and without ties.
11. Partial and multiple correlations.
12. Planes of regression and variances of residuals for given simple correlations.

GE/IC-4: OPERATIONS

RESEARCH OBJECTIVES:

- To enable the students to understand various operational research methods.
- To learn various methods of solving optimization problems.

Unit-1

Linear Programming: Formulation of L.P. Problems, Graphical Solutions (Special cases: Multiple optimal solution, infeasibility, unbounded solution); Simplex Methods (Special cases: Multiple optimal solution, infeasibility, degeneracy, unbounded solution) Big-M method and Two-phase method; Duality and Sensitivity (emphasis on formulation & economic interpretation); Formulation of Integer programming, Zero- one programming, Goal Programming.

Unit-2

Elementary Transportation: Formulation of Transport Problem, Solution by N.W. Corner Rule, Least Cost method, Vogel's Approximation Method (VAM), Modified Distribution Method. (Special cases: Multiple Solutions, Maximization case, Unbalanced case, prohibited routes) Elementary Assignment: Hungarian Method, (Special cases: Multiple Solutions, Maximization case, Unbalanced case, Restrictions

on assignment.)

Unit-3

Network Analysis: Construction of the Network diagram, Critical Path - float and slack analysis (Total float, free float, independent float), PERT, Project Time Crashing

Unit-4

Decision Theory: Pay off Table, Opportunity Loss Table, Expected Monetary Value, Expected Opportunity Loss, Expected Value of Perfect Information and Sample Information

Text Books:

1. N. D. Vohra, Quantitative Management, Tata McGraw Hill.
2. P. K. Gupta, Man Mohan, Kanti Swarup, Operations Research, Sultan Chand.

Reference Books:

1. V. K. Kapoor, Operations Research, Sultan Chand & Sons.
2. J. K. Sharma, Operations Research Theory & Applications, Macmillan India Limited.

GE/IC-4 Practical/Tutorial: Operations Research Lab

Use C/C++ for implantation of the following Problems.

1. Mathematical formulation of L.P.P and solving the problem using graphical method.
2. Mathematical formulation of L.P.P and solving the problem using Simplex technique.
3. Allocation problem using Transportation model
4. Allocation problem using Assignment model
5. Networking problem using CPM and PERT

Equipment:

1.Desktop Computer

Core i5 (minimum 8th Generation Processor, 8 GB RAM, 2 TB HDD)

Number of Desktops: 30 (or as per student strength). It must be connected through structured Local Area Network (LAN).

2.Software

LibreOffice, Scilab, C, C++, Java, Assembler, VHDL, Linux/ Unix Prolog etc. , preferably Open Source Software.

Faculty Training:

Faculty training may be organized for the following Courses in phased manner (six month before the beginning of the Subject in the concerned semester).

- i. Digital Logic
- ii. Computer Organization
- iii. Data Structures
- iv. Operating Systems
- v. Database Systems
- vi. Java Programming
- vii. Web Technology
- viii. Data Science
- ix. Android Programming
- x. Python Programming

CORSE STRUCTURE OF U.G. MATHEMATICS

Preamble

Mathematics is an indispensable tool for much of science and engineering. It provides the basic language for understanding the world and lends precision to scientific thought. The mathematics program at Universities of Odisha aims to provide a foundation for pursuing research in Mathematics as well as to provide essential quantitative skills to those interested in related fields. With the maturing of the Indian industry, there is a large demand for people with strong analytical skills and broad-based background in the mathematical sciences.

COURSE STRUCTURE FOR MATHEMATICS HONORS

Semester	Course	Course Name	Credits
I	AECC-I	AECC-I	04
	C-I	Calculus	04
	C-I	Practical	02
	C-II	Discrete Mathematics	05
	C-II	Tutorial	01
	GE-I	GE-I	05
	GE-I	Tutorial	01
			22
II	AECC-II	AECC-II	04
	C-III	Real Analysis	05
	C-III	Tutorial	01
	C-IV	Differential equations	04
	C-IV	Practical	02
	GE-II	GE-II	05
	GE-II	Tutorial	01
			22
III	C-V	Theory of Real functions	05
	C-V	Tutorial	01
	C-VI	Group Theory-I	05
	C-VI	Tutorial	01
	C-VII	Partial differential equations and system of ODEs	04
	C-VII	Practical	02
	GE-III	GE-III	05
	GE-III	Tutorial	01
SECC-I	SECC-I	04	

			28
IV	C-VIII	Numerical Methods and Scientific Computing	04
	C-VIII	Practical	02
	C-IX	Topology of Metric spaces	05
	C-IX	Tutorial	01
	C-X	Ring Theory	05
	C-X	Tutorial	01
	GE-IV	GE-IV (Theory)	05
	GE-IV	Tutorial	01
	SECC-II	SECC-II	04
			28
Semester	Course	Course Name	Credits
V	C-XI	Multivariable Calculus	05
	C-XI	Tutorial	01
	C-XII	Linear Algebra	05
	C-XII	Tutorial	01
	DSE-I	Linear Programming	05
	DSE-I	Tutorial	01
	DSE-II	Probability and Statistics	05
	DSE-II	Tutorial	01
			24
VI	C-XIII	Complex analysis	05
	C-XIII	Tutorial	01
	C-XIV	Group Theory-II	05
	C-XIV	Tutorial	01
	DSE-III	Differential Geometry	05
	DSE-III	Tutorial	01
	DSE-IV	Number Theory/Project	06
			24
		TOTAL	148

B.A./B.SC.(HONOURS)-MATHEMATICS

HONOURS PAPERS:

Core course – 14 papers

Discipline Specific Elective – 4 papers (out of the 5 papers suggested)

Generic Elective for non Mathematics students – 4 papers. In case University offers 2 subjects as GE, then papers 1 and 2 will be the GE paper.

Marks per paper –

For practical paper: Mid term : 15 marks, End term : 60 marks, Practical- 25 marks

For non practical paper: Mid term : 20 marks, End term : 80 marks

Total – 100 marks Credit per paper – 6

Teaching hours per paper –

Practical paper-40 hours theory classes + 20 hours Practical classes

Non Practical paper-50 hours theory classes + 10 hours tutorial

CORE PAPER-1

CALCULUS

Objective: The main emphasis of this course is to equip the student with necessary analytic and technical skills to handle problems of mathematical nature as well as practical problems. More precisely, main target of this course is to explore the different tools for higher order derivatives, to plot the various curves and to solve the problems associated with differentiation and integration of vector functions.

Expected Outcomes: After completing the course, students are expected to be able to use Leibnitz's rule to evaluate derivatives of higher order, able to study the geometry of various types of functions, evaluate the area, volume using the techniques of integrations, able to identify the difference between scalar and vector, acquired knowledge on some the basic properties of vector functions.

UNIT-I

Hyperbolic functions, higher order derivatives, Leibnitz rule and its applications to problems of the type $e^{ax+b} \sin x, e^{ax+b} \cos x, (ax+b)^n \sin x, (ax+b)^n \cos x$, concavity and inflection points, asymptotes, curve tracing in Cartesian coordinates, tracing in polar coordinates of standard curves, L' Hospitals rule, Application in business ,economics and life sciences.

UNIT-II

Riemann integration as a limit of sum, integration by parts, Reduction formulae, derivations and illustrations of reduction formulae of the type $\int \sin^n x dx, \int \cos^n x dx, \int \tan^n x dx, \int \sec^n x dx, \int (\log x)^n dx, \int \sin^n x \cos^n x dx,$ definite integral, integration by substitution.

UNIT-III

Volumes by slicing, disks and washers methods, volumes by cylindrical shells, parametric equations, parameterizing a curve, arc length, arc length of parametric curves, area of surface of revolution, techniques of sketching conics, reflection properties of conics, rotation of axes and second degree equations, classification into conics using the discriminant, polar equations of conics.

UNIT-IV

Triple product, introduction to vector functions, operations with vector-valued functions, limits and continuity of vector functions, differentiation and integration of vector functions, tangent and normal components of acceleration.

LIST OF PRACTICALS

(Using any software/ MATLAB to be performed on a Computer.)

- 1 Plotting the graphs of the functions $e^{ax+b}, \log(ax+b), 1/ax+b, \sin(ax+b), \cos(ax+b)$ and $|ax+b|$ to illustrate the effect of a and b on the graph.
- 2 Plotting the graphs of the polynomial of degree 4 and 5.
- 3 Sketching parametric curves (E.g. Trochoid, cycloid, hypocycloid).

- 4 Obtaining surface of revolution of curves.
- 5 Tracing of conics in Cartesian coordinates /polar coordinates.
- 6 Sketching ellipsoid, hyperboloid of one and two sheets (using Cartesian co-ordinates).

BOOKS RECOMMENDED:

1. H. Anton, I. Bivens and S. Davis, *Calculus*, 10thEd.,John Wiley and Sons (Asia)P.Ltd., Singapore, 2002.
2. Shanti Narayan, P. K. Mittal, *Differential Calculus*, S. Chand, 2014.
3. Shanti Narayan, P. K. Mittal, *Integral Calculus*, S. Chand, 2014.

BOOKS FOR REFERNCE:

1. James Stewart, *Single Variable Calculus, Early Transcendentals*, Cengage Learning, 2016.
2. G.B. Thomas and R.L. Finney, *Calculus*, 9th Ed., Pearson Education, Delhi,2005.

CORE PAPER-II

DISCRETE MATHEMATICS

Objective: This is a preliminary course for the basic courses in mathematics and all its applications. The objective is to acquaint students with basic counting principles, set theory and logic, matrix theory and graph theory.

Expected Outcomes: The acquired knowledge will help students in simple mathematical modeling. They can study advance courses in mathematical modeling, computer science, statistics, physics, chemistry etc.

UNIT-I

Sets, relations, Equivalence relations, partial ordering, well ordering, axiom of choice, Zorn's lemma, Functions, cardinals and ordinals, countable and uncountable sets, statements, compound statements, proofs in Mathematics, Truth tables, Algebra of propositions, logical arguments, Well-ordering property of positive integers, Division algorithm, Divisibility and

Euclidean algorithm, Congruence relation between integers, modular arithmetic, Chinese remainder theorem, Fermat's little theorem.

UNIT-II

Principles of Mathematical Induction, pigeonhole principle, principle of inclusion and exclusion
Fundamental Theorem of Arithmetic, permutation combination circular permutations binomial
and multinomial theorem, Recurrence relations, generating functions, generating function from
recurrence relations.

UNIT-III

Matrices, algebra of matrices, determinants, fundamental properties, minors and cofactors,
product of determinant, adjoint and inverse of a matrix, Rank and nullity of a matrix,
Systems of linear equations, row reduction and echelon forms, solution sets of linear
systems, applications of linear systems, Eigen values, Eigen vectors of a matrix.

UNIT-IV

Graph terminology, types of graphs, sub-graphs, isomorphic graphs, Adjacency and
incidence matrices, Paths, Cycles and connectivity, Eulerian and Hamiltonian paths, Planar
graphs.

BOOKS RECOMMENDED:

1. Edgar G. Goodaire and Michael M. Parmenter, Discrete Mathematics with Graph Theory, 3rd Ed., Pearson Education (Singapore) P. Ltd., Indian Reprint, 2005.
2. Kenneth Rosen Discrete mathematics and its applications Mc Graw Hill Education 7th edition.
3. V Krishna Murthy, V. P. Mainra, J. L. Arora, An Introduction to Linear Algebra, Affiliated East-West Press Pvt. Ltd.

BOOKS FOR REFERENCE:

1. J. L. Mott, A. Kendel and T.P. Baker: Discrete mathematics for Computer Scientists and Mathematicians, Prentice Hall of India Pvt Ltd, 2008.

CORE PAPER-III

REAL ANALYSIS

Objective: The objective of the course is to have the knowledge on basic properties of the field of real numbers, studying Bolzano-Weierstrass Theorem, sequences and convergence of sequences, series of real numbers and its convergence etc. This is one of the core courses essential to start doing mathematics.

Expected Outcome: On successful completion of this course, students will be able to handle fundamental properties of the real numbers that lead to the formal development of real analysis and understand limits and their use in sequences, series, differentiation and integration. Students will appreciate how abstract ideas and rigorous methods in mathematical analysis can be applied to important practical problems.

UNIT-I

Review of Algebraic and Order Properties of R , ε -neighborhood of a point in R , Bounded above sets, Bounded below sets, Bounded Sets, Unbounded sets, Suprema and Infima, The Completeness Property of R , The Archimedean Property, Density of Rational (and Irrational) numbers in R , Intervals, Interior point, , Open Sets, Closed sets, , Limit points of a set , Illustrations of Bolzano-Weierstrass theorem for sets, closure, interior and boundary of a set.

UNIT-II

Sequences and Subsequences, Bounded sequence, Convergent sequence, Limit of a sequence. Limit Theorems, Monotone Sequences, Divergence Criteria, Bolzano Weierstrass Theorem for Sequences, Cauchy sequence, Cauchy's Convergence Criterion. Infinite series, convergence and divergence of infinite series, Cauchy Criterion, Tests for convergence: Comparison test, Limit Comparison test, Ratio Test, Cauchy's nth root test, Integral test, Alternating series, Leibniz test, Absolute and Conditional convergence.

UNIT-III

Limits of functions (epsilon-delta approach), sequential criterion for limits, divergence criteria. Limit theorems, one sided limits, Infinite limits and limits at infinity, Continuous functions, sequential criterion for continuity & discontinuity. Algebra of continuous functions, Continuous functions on an interval, Boundedness Theorem, Maximum Minimum Theorem, Bolzano's Intermediate value theorem, location of roots theorem, preservation of

intervals theorem. Uniform continuity, non-uniform continuity criteria, uniform continuity theorem, Monotone and Inverse Functions.

UNIT-IV

Differentiability of a function at a point & in an interval, Caratheodory's theorem, chain Rule, algebra of differentiable functions, Mean value theorem, interior extremum theorem. Rolle's theorem, intermediate value property of derivatives, Darboux's theorem. Applications of mean value theorem to inequalities.

BOOKS RECOMMENDED:

1.R.G. Bartle and D. R. Sherbert, Introduction to Real Analysis (3rd Edition), John Wiley and Sons (Asia) Pvt. Ltd., Singapore,2002.

2 G. Das and S. Pattanayak, Fundamentals of Mathematical Analysis, TMH Publishing Co.

BOOKS FOR REFERENCE:

1. S.C. Mallik and S. Arora-Mathematical Analysis, New Age International Publications.

2 A.Kumar, S. Kumaresan, *A basic course in Real Analysis*, CRC Press, 2014.

3 Brian S. Thomson, Andrew. M. Bruckner, and Judith B. Bruckner, *Elementary Real Analysis*, Prentice Hall,2001.

4 Gerald G. Bilodeau, Paul R. Thie, G.E. Keough, *An Introduction to Analysis*, Jones & Bartlett, Second Edition, 2010.

CORE PAPER-IV

DIFFERENTIAL EQUATIONS

Objective: Differential Equations introduced by Leibnitz in 1676 models almost all Physical, Biological, Chemical systems in nature. The objective of this course is to familiarize the students with various methods of solving differential equations and to have a qualitative applications through models. The students have to solve problems to understand the methods.

Expected Outcomes: A student completing the course is able to solve differential equations and is able to model problems in nature using Ordinary Differential Equations. This is also

prerequisite for studying the course in Partial Differential Equations and models dealing with Partial Differential Equations.

UNIT-I

Differential equations and mathematical models, General, Particular, explicit, implicit and singular solutions of a differential equation. Exact differential equations and integrating factors, separable equations and equations reducible to this form, linear equations and Bernoulli's equation, special integrating factors and transformations.

UNIT-II

Introduction to compartmental models, Exponential decay radioactivity (case study of detecting art forgeries), lake pollution model (with case study of Lake Burley Griffin), drug assimilation into the blood (case study of dull, dizzy and dead), exponential growth of population, Density dependent growth, Limited growth with harvesting.

UNIT-III

General solution of homogeneous equation of second order, principle of superposition, Wronskian, its properties and applications, method of undetermined coefficients, Method of variation of parameters, Linear homogeneous and non-homogeneous equations of higher order with constant coefficients, Euler's equation.

UNIT-IV

Equilibrium points, Interpretation of the phase plane, predatory-pray model and its analysis, epidemic model of influenza and its analysis, battle model and its analysis.

Practical / Lab work to be performed on a computer:

Modeling of the following problems using *Matlab / Mathematica / Maple* etc.

1. Plotting of second & third order solution family of differential equations.
2. Growth & Decay model (exponential case only).
3. (a) Lake pollution model (with constant/seasonal flow and pollution concentration)/
(b) Case of single cold pill and a course of cold pills.
(c) Limited growth of population (with and without harvesting).

4. (a) Predatory- prey model (basic volterra model, with density dependence, effect of DDT, two prey one predator).
(b) Epidemic model of influenza (basic epidemic model, contagious for life, disease with carriers).
(c) Battle model (basic battle model, jungle warfare, long range weapons).
5. Plotting of recursive sequences.

BOOKS RECOMMENDED:

1. J. Sinha Roy and S Padhy: A course of Ordinary and Partial differential equation Kalyani Publishers, New Delhi.
2. Belinda Barnes and Glenn R. Fulford, *Mathematical Modeling with Case Studies, A Differential Equation Approach using Maple and Matlab*, 2ndEd., Taylor and Francis group, London and New York, 2009.

BOOKS FOR REFERENCE:

1. Simmons G F, Differential equation, Tata Mc Graw Hill, 1991.
2. Martin Braun, Differential Equations and their Applications, Springer International, Student Ed.
3. S. L. Ross, Differential Equations, 3rd Edition, John Wiley and Sons, India.
4. C.Y. Lin, Theory and Examples of Ordinary Differential Equations, World Scientific, 2011.

***CORE PAPER-V THEORY
OF REAL FUNCTIONS***

Objective: The objective of the course is to have knowledge on limit theorems on functions, limits of functions, continuity of functions and its properties, uniform continuity, differentiability of functions, algebra of functions and Taylor's theorem and, its applications. The student how to deal with real functions and understands uniform continuity, mean value theorems.

Expected Outcome: On the completion of the course, students will have working

knowledge on the concepts and theorems of the elementary calculus of functions of one real variable. They will work out problems involving derivatives of function and their applications. They can use derivatives to analyze and sketch the graph of a function of one variable, can also obtain absolute value and relative extrema of functions. This knowledge is basic and students can take all other analysis courses after learning this course.

UNIT-I

L' Hospital's Rules, other Intermediate forms, Cauchy's mean value theorem, Taylor's theorem with Lagrange's form of remainder, Taylor's theorem with Cauchy's form of remainder, application of Taylor's theorem to convex functions, Relative extreme, Taylor's series and Maclaurin's series, expansions of exponential and trigonometric functions.

UNIT-II

Riemann integration; inequalities of upper and lower sums; Riemann conditions of integrability. Riemann sum and definition of Riemann integral through Riemann sums; equivalence of two definitions; Riemann integrability of monotone and continuous functions; Properties of the Riemann integral; definition and integrability of piecewise continuous and monotone functions. Intermediate Value theorem for Integrals; Fundamental theorems of Calculus.

UNIT-III

Improper integrals: Convergence of Beta and Gamma functions. Pointwise and uniform convergence of sequence of functions, uniform convergence, Theorems on continuity, derivability and integrability of the limit function of a sequence of functions.

UNIT-IV

Series of functions; Theorems on the continuity and derivability of the sum function of a series of functions; Cauchy criterion for uniform convergence and Weierstrass M-Test Limit superior and Limit inferior, Power series, radius of convergence, Cauchy Hadamard Theorem, Differentiation and integration of power series; Abel's Theorem; Weierstrass Approximation Theorem.

BOOKS RECOMMENDED:

1. R.G. Bartle & D. R. Sherbert, Introduction to Real Analysis, John Wiley & Sons.
2. G. Das and S. Pattanayak, *Fundamentals of mathematics analysis*, TMH Publishing Co.

3. S. C. Mallik and S. Arora, *Mathematical analysis*, New Age International Ltd., New Delhi.

BOOK FOR REFERENCES:

1. A. Kumar, S. Kumaresan, *A basic course in Real Analysis*, CRC Press, 2014
2. K. A. Ross, *Elementary analysis: the theory of calculus*, Undergraduate Texts in Mathematics, Springer (SIE), Indian reprint, 2004A. Mattuck, *Introduction to Analysis*, Prentice Hall
3. Charles G. Denlinger, *Elements of real analysis*, Jones and Bartlett (Student Edition), 2011.

CORE PAPER-VI
GROUP THEORY-I

Objective: Group theory is one of the building blocks of modern algebra. Objective of this course is to introduce students to basic concepts of group theory and examples of groups and their properties. This course will lead to future basic courses in advanced mathematics, such as Group theory-II and ring theory.

Expected Outcomes: A student learning this course gets idea on concept and examples of groups and their properties. He understands cyclic groups, permutation groups, normal subgroups and related results. After this course he can opt for courses in ring theory, field theory, commutative algebras, linear classical groups etc. and can be apply this knowledge to problems in physics, computer science, economics and engineering.

UNIT-I

Symmetries of a square, Dihedral groups, definition and examples of groups including permutation groups and quaternion groups (illustration through matrices), elementary properties of groups, Subgroups and examples of subgroups, centralizer, normalizer, center of a group,

UNIT-II

Product of two subgroups, Properties of cyclic groups, classification of subgroups of cyclic groups, Cycle notation for permutations, properties of permutations, even and odd permutations,

alternating group,

UNIT-III

Properties of cosets, Lagrange's theorem and consequences including Fermat's Little theorem, external direct product of a finite number of groups, normal subgroups, factor groups.

UNIT-IV

Cauchy's theorem for finite abelian groups, group homomorphisms, properties of homomorphisms, Cayley's theorem, properties of isomorphisms, first, second and third isomorphism theorems.

BOOKS RECOMMENDED:

1. Joseph A. Gallian, *Contemporary Abstract Algebra* (4th Edition), Narosa Publishing House, New Delhi
2. John B. Fraleigh, *A First Course in Abstract Algebra*, 7th Ed., Pearson, 2002.

BOOK FOR REFERENCES:

1. M. Artin, *Abstract Algebra*, 2nd Ed., Pearson, 2011.
2. Joseph I. Rotman, *An Introduction to the Theory of Groups*, 4th Ed., Springer Verlag, 1995.
3. I. N. Herstein, *Topics in Algebra*, Wiley Eastern Limited, India, 1975.

CORE PAPER-VII

PARTIAL DIFFERENTIAL EQUATIONS AND SYSTEM OF ODES

Objective: The objective of this course is to understand basic methods for solving Partial Differential Equations of first order and second order. In the process, students will be exposed to Charpit's Method, Jacobi Method and solve wave equation, heat equation, Laplace Equation etc. They will also learn classification of Partial Differential Equations and system of ordinary differential equations.

Expected Outcomes: After completing this course, a student will be able to take more courses on wave equation, heat equation, diffusion equation, gas dynamics, non linear evolution equations etc. All these courses are important in engineering and industrial applications for solving boundary value problem.

UNIT-I

Partial Differential Equations - Basic concepts and Definitions, Mathematical Problems. First-Order Equations: Classification, Construction and Geometrical Interpretation. Method of Characteristics for obtaining General Solution of Quasi Linear Equations. Canonical Forms of First-order Linear Equations. Method of Separation of Variables for solving first order partial differential equations.

UNIT-II

Derivation of Heat equation, Wave equation and Laplace equation. Classification of second order linear equations as hyperbolic, parabolic or elliptic. Reduction of second order Linear Equations to canonical forms.

UNIT-III

The Cauchy problem, Cauchy problem of an infinite string. Initial Boundary Value Problems, Semi-Infinite String with a fixed end, Semi-Infinite String with a Free end. Equations with non-homogeneous boundary conditions, Non- Homogeneous Wave Equation. Method of separation of variables, Solving the Vibrating String Problem, Solving the Heat Conduction problem

UNIT-IV

Systems of linear differential equations, types of linear systems, differential operators, an operator method for linear systems with constant coefficients, Basic Theory of linear systems in normal form, homogeneous linear systems with constant coefficients: Two Equations in two unknown functions, The method of successive approximations.

LIST OF PRACTICALS (USING ANY SOFTWARE)

- (i) Solution of Cauchy problem for first order PDE.
- (ii) Finding the characteristics for the first order PDE.
- (iii) Plot the integral surfaces of a given first order PDE with initial data.

- (iv) Solution of wave equation $\frac{\partial^2 u}{\partial t^2} - c^2 \frac{\partial^2 u}{\partial x^2} = 0$ for the following associated conditions

(a) $u(x, 0) = \phi(x), u_t(x, 0) = \psi(x), x \in R, t > 0$

(b) $u(x, 0) = \phi(x), u_t(x, 0) = \psi(x), u(0, t) = 0, x \in (0, \infty), t > 0$

(c) $u(x, 0) = \phi(x), u_t(x, 0) = \psi(x), u_x(0, t) = 0, x \in (0, \infty), t > 0$

(d) $u(x, 0) = \phi(x), u_t(x, 0) = \psi(x), u(0, t) = 0, u(l, t) = 0, 0 < x < l, t > 0$

$$\frac{\partial u}{\partial t} - \frac{\partial^2 u}{\partial x^2} = 0$$

(v) Solution of wave equation $\frac{\partial^2 u}{\partial t^2} - \frac{\partial^2 u}{\partial x^2} = 0$ for the following associated conditions

$$u(x, 0) = \bar{x}, u(0, t) = a, u(l, t) = b, 0 < x < l, t > 0$$

$$u_t(x, 0) = \psi(x), x \in R, 0 < t < T$$

$$u(x, 0) = \phi(x), u(0, t) = a, x \in (0, \infty), t \in [0, \infty)$$

BOOKS RECOMMENDED :

1. Tyn Myint-U and Lokenath Debnath, *Linear Partial Differential Equations for Scientists and Engineers*, 4th edition, Birkhauser, Indian reprint, 2014.
2. S.L. Ross, *Differential equations*, 3rd Ed., John Wiley and Sons, India,

BOOK FOR REFERENCES:

1. J Sinha Roy and S Padhy: A course of Ordinary and Partial differential equation Kalyani Publishers, New Delhi,
2. Martha L Abell, James P Braselton, *Differential equations with MATHEMATICA*, 3rd Ed., Elsevier Academic Press, 2004.
3. Robert C. Mc Owen: *Partial Differential Equations*, Pearson Education Inc.
4. T Amarnath: *An Elementary Course in Partial Differential Equations*, Narosa Publications.

CORE PAPER-VIII

NUMERICAL METHODS AND SCIENTIFIC COMPUTING

Use of Scientific Calculator is allowed.

Objective: Calculation of error and approximation is a necessity in all real life, industrial and scientific computing. The objective of this course is to acquaint students with various numerical

methods of finding solution of different type of problems, which arises in different branches of science such as locating roots of equations, finding solution of systems of linear equations and differential equations, interpolation, differentiation, evaluating integration.

Expected Outcome: Students can handle physical problems to find an approximate solution. After getting trained a student can opt for advance courses in numerical analysis in higher mathematics. Use of good mathematical software will help in getting the accuracy one need from the computer and can assess the reliability of the numerical results, and determine the effect of round off error or loss of significance.

UNIT-I

Rate of convergence, Algorithms, Errors: Relative, Absolute, Round off, Truncation. Approximations in Scientific computing, Error propagation and amplification, conditioning, stability and accuracy, computer arithmetic mathematical software and libraries, visualisation, Numerical solution of non-linear equations: Bisection method, Regula- Falsi method, Secant method, Newton- Raphson method, Fixed-point Iteration method.

UNIT-II

Rate of convergence of the above methods. System of linear algebraic equations: Gaussian Elimination and Gauss Jordan methods. Gauss Jacobi method, Gauss Seidel method and their convergence analysis. Computing eigen-values and eigenvectors

UNIT-III

Polynomial interpolation: Existence uniqueness of interpolating polynomials. Lagrange and Newtons divided difference interpolation, Error in interpolation, Central difference & averaging operators, Gauss-forward and backward difference interpolation. Hermite and Spline interpolation, piecewise polynomial interpolation.

UNIT-IV

Numerical Integration: Some simple quadrature rules, Newton-Cotes rules, Trapezoidal rule, Simpsons rule, Simpsons *3/8th* rule, Numerical differentiation and integration, Chebyshev differentiation and FFT, Richard-son extrapolation.

PRACTICAL/LAB WORK TO BE PERFORMED ON A COMPUTER:

Use of computer aided software (CAS), for example *Matlab / Mathematica / Maple / Maxima* etc., for developing the following Numerical programs:

- (i) Calculate the sum $1/1 + 1/2 + 1/3 + 1/4 + \dots + 1/N$.
- (ii) To find the absolute value of an integer.

- (iii) Enter- 100 integers into an array and sort them in an ascending' order.
- (iv) Any two of the following
 - (a) Bisection Method
 - (b) Newton Raphson Method
 - (c) Secant Method
 - (d) Regular Falsi Method
 - (v) Gauss-Jacobi Method
 - (vi) SOR Method or Gauss-Siedel Method
 - (vii) Lagrange Interpolation or Newton Interpolation
 - (viii) Simpson's rule.

Note: For any of the CAS *Matlab / Mathematica / Maple / Maxima* etc., Data types-simple data types, floating data types, character data types, arithmetic operators and operator precedence, variables and constant declarations, expression, input/output, relational operators, logical operators and logical expressions, control statements and loop statements, Arrays should be introduced to the students.

BOOKS RECOMMENDED:

1. M. K. Jain, S. R. K. Iyengar and R. K. Jain, *Numerical Methods for Scientific and Engineering Computation*, New age International Publisher, India,
2. Michael Heath: *Scientific Computing : An introductory Survey*.

BOOK FOR REFERENCES:

1. B. Bradie, *A Friendly Introduction to Numerical Analysis*, Pearson Education, India, 2007.
2. Kendall E. Atkinson: *An Introduction to Numerical Analysis*
3. C. F. Gerald and P. O. Wheatley, *App.ied Numerical Analysis*, Pearson Education, India, 7th Edition, 2008
4. S. D. Conte & S. de Boor: *Elementary Numerical Analysis: An Algorithmic Approach*.

CORE PAPER-IX

TOPOLOGY OF METRIC SPACES

Objective: This is an introductory course in topology of metric spaces. The objective of this

course is to impart knowledge on open sets, closed sets, continuous functions, connectedness and compactness in metric spaces.

Expected Outcomes: On successful completion of the course students will learn to work with abstract topological spaces. This is a foundation course for all analysis courses in future.

UNIT-I

Metric spaces, sequences in metric spaces, Cauchy sequences, complete metric spaces, open and closed balls, neighborhood, open set, interior of a set, limit point of a set, closed set, diameter of a set, Cantor's theorem,

UNIT-II

Subspaces, Countability Axioms and Separability, Baire's Category theorem

UNIT-III

Continuity: Continuous mappings, Extension theorems, Real and Complex valued Continuous functions, Uniform continuity, Homeomorphism, Equivalent metrics and isometry, uniform convergence of sequences of functions.

UNIT-IV

Contraction mappings and applications, connectedness, Local connectedness, Bounded sets and compactness, other characterization of compactness, continuous functions on compact spaces,

BOOKS RECOMMENDED:

1. Satish Shirali & Harikishan L. Vasudeva, *Metric Spaces*, Springer Verlag London (2006)
(First Indian Reprint 2009)

BOOK FOR REFERENCES:

1. S. Kumaresan, *Topology of Metric Spaces*, Narosa Publishing House, Second Edition 2011.

CORE PAPER-X ***RING THEORY***

Objective: This is a second course in modern algebra which deals with ring theory. Some

basics of ring theory like rings, subrings, ideals, ring homomorphisms and their properties and. This course is an integral part of any course on Modern algebra the others being Group theory and Field Theory.

Expected Outcomes: After completing this course, this will help students to continue more courses in advanced Ring theory modules, Galois groups.

UNIT-I

Definition and examples of rings, properties of rings, subrings, integral domains and fields, characteristic of a ring, Ideals, ideal generated by a subset of a ring, factor rings, operations on ideals.

UNIT-II

Prime and maximal ideals. Ring homomorphisms, properties of ring homomorphisms, Isomorphism theorems I, II and III, field of quotients.

UNIT-III

Polynomial rings over commutative rings, division algorithm and consequences, principal ideal domains, factorization of polynomials, reducibility tests, irreducibility tests, Eisenstein criterion, Unique factorization in $\mathbb{Z}[x]$.

UNIT-IV

Divisibility in integral domains, irreducibles, primes, unique factorization domains, Euclidean domains.

BOOKS RECOMMENDED:

1. Joseph A. Gallian, *Contemporary Abstract Algebra* (4th Edition), Narosa Publishing House, New Delhi.
2. John B. Fraleigh, *A First Course in Abstract Algebra*, 7th Ed., Pearson, 2002.

BOOK FOR REFERENCES:

1. M. Artin, *Abstract Algebra*, 2nd Ed., Pearson, 2011.
2. Joseph 1. Rotman, *An Introduction to the Theory of Groups*, 4th Ed., Springer Verlag, 1995.
3. I. N. Herstein, *Topics in Algebra*, Wiley Eastern Limited, India, 1975.

CORE PAPER - XI
MULTIVARIATE CALCULUS

Objective: The objective of this course to introduce functions of several variable to a student after he has taken a course in one variable calculus. The course will introduce partial derivatives and several of its consequences and will introduce double and triple integrals along with line integrals which are fundamental to all streams where calculus can be used.

Expected Outcomes: After reading this course a student will be able to calculate partial derivatives, directional derivatives, extreme values and can calculate double, triple and line integrals. He will have idea of basic vector calculus including green's theorem, divergence theorem and stokes theorem. He can take courses in calculus on manifolds, Differential geometry and can help in numerical computations involving several variables.

UNIT-I

Functions of several variables, limit and continuity of functions of two variables. Partial differentiation, total differentiability and differentiability, sufficient condition for differentiability. Chain rule for one and two independent parameters, directional derivatives, the gradient, maximal and normal property of the gradient, tangent planes.

UNIT-II

Extrema of functions of two variables, method of Lagrange multipliers, constrained optimization problems.

Definition of vector field, divergence and curl, Double integration over rectangular region, double integration over nonrectangular region. Double integrals in polar co-ordinates,

UNIT-III

Triple integrals, Triple integral over a parallelepiped and solid regions. Volume by triple integrals, cylindrical and spherical co-ordinates. Change of variables in double integrals and triple integrals.

UNIT-IV

Line integrals, Applications of line integrals: Mass and Work. Fundamental theorem for line integrals, conservative vector fields, independence of path. Green's theorem, surface integrals,

integrals over parametrically defined surfaces. Stokes' theorem, The Divergence theorem.

BOOKS RECOMMENDED:

1. M. J, Strauss, G. L. Bradley and K. J. Smith, *Calculus* (3rd Edition), Dorling Kindersley (India) Pvt. Ltd. (Pearson Education), Delhi, 2007.
2. S C Mallik and S Arora: *Mathematical Analysis*, New Age International Publications

BOOK FOR REFERENCES:

1. G.B. Thomas and R.L. Finney, *Calculus*, 9th Ed., Pearson Education, Delhi, 2005.
2. E. Marsden, A.J. Tromba and A. Weinstein, *Basic Multivariable Calculus*, Springer(SIE). Indian reprint, 2005.
3. James Stewart, *Multivariable Calculus, Concepts and Contexts*, 2nd Ed., Brooks/Cole, Thomson Learning, USA, 2001.
4. S Ghorpade, B V Limaye, *Multivariable calculus*, Springer international edition

CORE PAPER –XII

LINEAR ALGEBRA

Objective: Linear algebra is a basic course in almost all branches of science. A full course in undergraduate program will help students in finding real life applications later.. The objective of this course is to introduce a student the basics of linear algebra and some of its application

Expected Outcomes: The student will use this knowledge wherever he/She goes after undergraduate program. It has applications in computer science, finance mathematics, industrial mathematics, bio mathematics and what not.

UNIT-I

Vector spaces, subspaces, examples, algebra of subspaces, quotient spaces, linear combination of vectors, linear span, linear independence, basis and dimension, dimension of subspaces.

Linear transformations, null space, range, rank and nullity of a linear transformation.

UNIT-II

Matrix representation of a linear transformation, Algebra of linear transformations, Isomorphisms, Isomorphism theorems, invertibility and isomorphisms, change of coordinate

matrix, Dual spaces, dual basis, double dual, transpose of a linear transformation and its matrix in the dual basis, annihilators, Basics of Fields.

UNIT-III

Eigenspaces of a linear operator, diagonalizability. Invariant subspaces and Cayley-Hamilton theorem, the minimal polynomial for a linear operator, Inner product spaces and norms, Gram-Schmidt orthogonalization process,

UNIT-IV

Orthogonal complements, Bessel's inequality, the adjoint of a linear operator, Least Squares Approximation, minimal solutions to systems of linear equations, Normal and self-adjoint operators, Orthogonal projections and Spectral theorem.

BOOKS RECOMMENDED:

1. Stephen H. Friedberg, Arnold J. Insel, Lawrence E. Spence, *Linear Algebra* (4th Edition), Pearson, 2018.

BOOKS FOR REFERENCE:

1. Rao A R and Bhim Sankaram Linear Algebra Hindustan Publishing house.
2. Gilbert Strang, Linear Algebra and its Applications, Thomson, 2007.

CORE PAPER-XIII ***COMPLEX ANALYSIS***

Objectives: The objective of the course is aimed to provide an introduction to the theories for functions of a complex variable. The concepts of analyticity and complex integration are presented. The Cauchy's theorem and its applications, the calculus of residues and its applications are discussed in detail.

Expected Outcomes: Students will be able to handle certain integrals not evaluated earlier and will know a technique for counting the zeros of polynomials. This course is prerequisite to many other advance analysis courses.

UNIT-I

Complex Numbers and Complex plane: Basic properties, convergence, Sets in the Complex plane, Functions on the Complex plane: Continuous functions, holomorphic functions, power series, Integration along curves.

UNIT-II

Cauchy's Theorem and Its Applications: Goursat's theorem, Local existence of primitives and Cauchy's theorem in a disc, Evaluation of some integrals, Cauchy's integral formulas.

UNIT-III

Morera's theorem, Sequences of holomorphic functions, Holomorphic functions defined in terms of integrals, Schwarz reflection principle, Zeros and poles.

UNIT-IV

Meromorphic Functions and the Logarithm: The residue formula, Examples, Singularities and meromorphic functions, The argument principle and applications, The complex logarithm.

BOOKS RECOMMENDED:

1. Elias M. Stein & Rami Shakarchi, *Complex Analysis*, Princeton University press, Princeton and Oxford, 2003.

BOOKS FOR REFERENCE:

1. James Ward Brown and Ruel V. Churchill, *Complex Variables and Applications* (Eighth Edition), McGraw - Hill International Edition, 2009.
2. G. F. Simmons, *Introduction to Topology and Modern Analysis*, McGraw-Hill, Edition 2004.
3. Joseph Bak and Donald I. Newman, *Complex analysis* (2nd Edition), Undergraduate Texts in Mathematics, Springer-Verlag New York, Inc., New York, 1997.

CORE PAPER-XIV

GROUP-THEORY-II

Objective: The objective of this course is to be exposed to more advanced results in group theory after completing a basic course. The course introduces results on automorphism, commutator subgroup, group action Sylow theorems etc.

Expected Outcomes: The knowledge of automorphism helps to study more on field theory. Students learn on direct products, group actions, class equations and their applications with proof of all results . This course helps to opt for more advanced courses in algebra and linear classical groups.

UNIT-I

Automorphism, inner automorphism, automorphism groups, automorphism groups of finite and infinite cyclic groups, applications of factor groups to automorphism groups. characteristic subgroups.

UNIT-II

Commutator subgroup and its properties, Properties of external direct products, the group of units modulo n as an external direct product, internal direct products, Fundamental Theorem of finite abelian groups.

UNIT-III

Group actions, stabilizers and kernels, permutation representation associated with a given group action, Application of group actions: Generalized Cayley's theorem, Index theorem.

UNIT-IV

Groups acting on themselves by conjugation, class equation and consequences, conjugacy in S_n , p - groups, Sylow's theorems and consequences, Cauchy's theorem, Simplicity of A_n for $n \geq 5$ non-simplicity tests.

BOOKS RECOMMENDED:

1. John B. Fraleigh, *A First Course in Abstract Algebra*, Narosa Publishing House, New Delhi.
2. Joseph A. Gallian *Contemporary Abstract Algebra* (4th Edition), Narosa Publishing House, New Delhi.

BOOK FOR REFERENCES:

1. M. Artin, *Abstract Algebra*, 2nd Ed., Pearson, 2011.
2. David S. Dummit and Richard M. Foote, *Abstract Algebra*, 3rd Ed., John Wiley and Sons (Asia) Pvt. Ltd., Singapore, 2004.
3. J.R. Durbin, *Modern Algebra*, John Wiley & Sons, New York Inc., 2000.

Discipline Specific Elective Paper-1

LINEAR PROGRAMMING

Objective: The objective of this course is to familiarize industrial problems to students with various methods of solving Linear Programming Problems, Transportation Problems, Assignment Problems and their applications. Also, students will know the application of linear Programming method in Game Theory.

Expected Outcomes: More knowledge on this topic in higher studies will help students to deal industrial models. This is also prerequisite for studying advanced courses in Nonlinear Programming Problems, Inventory Control Problem and Queuing Theory etc.

UNIT-I

Introduction to linear Programming problem, Theory of simplex method, optimality and unboundedness, the simplex algorithm, simplex method in tableau format, introduction to artificial variables, two-phase method, Big-M method and their comparison.

UNIT-II

Duality, formulation of the dual problem, primal-dual relationships, Fundamental Theorem of Duality, economic interpretation of the dual.

UNIT-III

Transportation problem and its mathematical formulation, northwest-corner method least cost method and Vogel approximation method for determination of starting basic solution, algorithm for solving transportation problem. Assignment problem and its mathematical formulation, Hungarian method for solving assignment problem.

UNIT-IV

Game theory: formulation of two person zero sum games, solving two person zero sum games, games with mixed strategies, graphical solution procedure, linear programming solution of games.

BOOKS RECOMMENDED:

1. Kanti Swarup, Operations Research, Sultan Chand & Sons, New Delhi. Books.

BOOKS FOR REFERENCE:

1. S. Hillier and G.J. Lieberman, *Introduction to Operations Research- Concepts and Cases* (9th Edition), TataMcGraw Hill, 2010.
2. Mokhtar S. Bazaraa, John J. Jarvis and Hanif D. Sherali, *Linear Programming and Network Flows* (2nd edition), John Wiley and Sons, India, 2004.
3. G. Hadley, *Linear Programming*, Narosa Publishing House, New Delhi, 2002.
4. Hamdy A. Taha, *Operations Research: An Introduction* (10th edition), Pearson, 2017.

Discipline Specific Elective Paper-II

Probability and Statistics

Objective: The objective of the course is to expertise the student to the extensive role of statistics in everyday life and computation, which has made this course a core course in all branches of mathematical and engineering sciences.

Expected Outcome: The students shall learn probability and statistics for various random variables, multivariate distributions, correlations and relations. He shall learn law of large numbers and shall be able to do basic numerical calculations.

UNIT-I

Probability: Introduction, Sample spaces, Events, probability of events, rules of probability, conditional probability, independent events, Bayes's theorem,

Probability distributions and probability densities: random variables, probability distributions, continuous random variables, probability density functions, Multivariate distributions, joint distribution function, joint probability density function, marginal distributions, conditional distributions, conditional density, The theory in practice, data analysis, frequency distribution, class limits, class frequencies, class boundary, class interval, class mark, skewed data, multimodality, graphical representation of the data, measures of location and variability. Population, sample, parameters

UNIT-II

Mathematical Expectation: Introduction, expected value of random variable, moments, Chebyshev's theorem, moment generating functions, product moments, moments of linear combinations of random variables, conditional expectations, the theory in practice, measures of location, dispersion

UNIT-III

Special probability distributions: Discrete Uniform distribution, binomial distribution, Negative binomial, geometric, hypergeometric, poisson, multinomial distribution, multinomial. Special probability densities; Uniform distribution, gamma, exponential, gamma, chi-square, beta distribution, normal, normal approximation to binomial, bivariate normal, Functions of random variables, distribution function technique, transformation technique-one variable, several variables, moment generating function technique,

UNIT-IV

Sampling distributions: population distribution, random sample, sampling distribution of mean, Central Limit theorem, Sampling distribution of the mean: finite populations, chi-square, t, F distributions, regression and correlation: Bivariate regression, regression equation, Linear regression, method of least squares.

BOOKS RECOMMENDED:

1. Irwin Miller and Marylees Miller, *John E. Freund's Mathematical Statistics with Applications* (8th Edition), Pearson, Asia, 2014.

BOOK FOR REFERENCES:

1. Robert V. Hogg, Joseph W. McKean and Allen T. Craig, *Introduction to Mathematical Statistics*, Pearson Education, Asia, 2007.
2. Alexander M. Mood, Franklin A. Graybill and Duane C. Boes, *Introduction to the Theory of Statistics*, (3rd Edition), Tata McGraw- Hill, Reprint 2007.
3. Sheldon Ross, *Introduction to Probability Models* (9th Edition), Academic Press, Indian Reprint, 2007.

Discipline Specific Elective Paper-III

DIFFERENTIAL GEOMETRY

Objective: After learning methods on curve tracing and Analytic Geometry, the objective of this course is to teach Differential geometry of curves and surfaces which trains a student using tools in calculus to derive intrinsic properties of plain curves and space curves.

Expected Outcome: After completing this course a student will learn on Serret-Frenet formulae, relation between tangent, normal and binormals, first and second fundamental forms and ideas on various curvatures. He has scope to take more advanced courses in surface theory and geometry.

UNIT-I

Theory of Space Curves: Space curves, Planer curves, Curvature, torsion and Serret-Frenet formulae. Osculating circles, Osculating circles and spheres. Existence of space curves.

UNIT-II

Evolutes and involutes of curves. Theory of Surfaces: Parametric curves on surfaces, surfaces of revolution, helicoids, Direction coefficients. First and second Fundamental forms.

UNIT-III

Principal and Gaussian curvatures. Lines of curvature, Euler's theorem. Rodrigue's formula, Conjugate and Asymptotic lines. Developables: Developable associated with space curves and curves on surfaces, Minimal surfaces.

UNIT-IV

Geodesics: Canonical geodesic equations. Nature of geodesics on a surface of revolution. Clairaut's theorem. Normal property of geodesics. Torsion of a geodesic. Geodesic curvature. Gauss-Bonnet theorem. Surfaces of constant curvature.

BOOKS RECOMMENDED:

1. T.J. Willmore, *An Introduction to Differential Geometry*, Dover Publications, 2012.

BOOK FOR REFERENCES:

1. A. Pressley, *Elementary Differential Geometry*, Springer International Edition, 2014.
2. O'Neill, *Elementary Differential Geometry*, 2nd Ed., Academic Press, 2006.
3. C.E. Weatherburn, *Differential Geometry of Three Dimensions*, Cambridge University Press 2003.
4. D.J. Struik, *Lectures on Classical Differential Geometry*, Dover Publications, 1988.

Discipline Specific Elective Paper-IV ***NUMBER THEORY***

Objective: The main objective of this course is to build up the basic theory of the integers, prime numbers and their primitive roots, the theory of congruence, quadratic reciprocity law and number theoretic functions, Fermat's last theorem, to acquire knowledge in cryptography specially in RSA encryption and decryption.

Expected Outcomes: Upon successful completion of this course students will be able to know the basic definitions and theorems in number theory, to identify order of an integer, primitive roots, Euler's criterion, the Legendre symbol, Jacobi symbol and their properties, to understand modular arithmetic number-theoretic functions and apply them to cryptography.

UNIT-I

Linear Diophantine equation, prime counting function, statement of prime number theorem, Goldbach conjecture, linear congruences, complete set of residues, Chinese remainder theorem, Fermat's little theorem, Wilson's theorem.

UNIT-II

Number theoretic functions, sum and number of divisors, totally multiplicative functions, definition and properties of the Dirichlet product, the Mobius inversion formula, the greatest integer function, Euler's phi-function, Euler's theorem, reduced set of residues, some properties of Euler's phi-function.

UNIT-III

Order of an integer modulo n , primitive roots for primes, composite numbers having primitive roots, Euler's criterion, the Legendre symbol, Jacobi symbol and their properties, quadratic reciprocity, quadratic congruences with composite moduli.

UNIT-IV

Affine ciphers, Hill ciphers, public key cryptography, RSA encryption and decryption, the equation $x^2 + y^2 = z^2$, Fermat's Last Theorem.

BOOKS RECOMMENDED:

1. David M. Burton, *Elementary Number Theory* (6th Edition), Tata McGraw-Hill Edition, Indian reprint, 2007.

BOOK FOR REFERENCES:

1. Thomas Koshy, *Elementary Number Theory with Applications* (2nd Edition),

Academic Press, 2007.

2. Neville Robinns, *Beginning Number Theory* (2nd Edition), Narosa Publishing House Pvt. Limited, Delhi, 2007.

OR

Discipline Specific Elective Paper-IV

PROJECT

Guidelines for +3 (CBCS) Under Graduate(B.A./B.Sc.) Mathematics (Honours) Project

1. Any student registering for doing project is required to inform the HOD, Mathematics the name of his/her project supervisor(s) at the time of pre-registration.
2. By the last date of add and drop, the student must submit the “Project Registration Form”, appended as Annexure-I to this document, to the HOD, Mathematics. This form requires a project title, the signature of the student, signature(s) of the supervisor(s) and the signature of the HOD, Mathematics of the college/university.
3. The project supervisor(s) should normally be a faculty member(s) of the Department of Mathematics and the topic of the project should be relevant to Mathematical Sciences. If a student desires to have a Project Supervisor from another department of the institute, the prior approval for the same should be sought from the HOD, Mathematics.
4. A student may have at the most two Project Supervisors. If a student desires to have two supervisors, at least one of these should be from the Department of Mathematics.
5. The student(s) will be required to submit one progress report and a final report of the Project to the HOD, Mathematics. The progress report is to be submitted in the sixth week of the semester in which the project is undertaken. The hard copy and an electronic version of the final report of the project should be submitted two weeks before the end semester examination of the sixth semester. In addition the student will be required to make an oral presentation in front of a committee (Under Graduate (B.A./ B.Sc.) Mathematics (Honours) Project committee of the college in which supervisor is one of the members) constituted for this purpose by the Department of Mathematics of the college.
6. The student is expected to devote about 100 hours. The project will be evaluated by a committee of faculty members at the end of the sixth semester. The committee will be constituted by the Under Graduate (B.A./B.Sc.) Mathematics (Honours) Project committee of the college keeping in mind the areas of project they will cover.

7. In each semester the grade of a student will be awarded by the committee in consultation with his/her project supervisor(s). The project is evaluated on the basis of the following components: First Progress Reports: 20%; second/Final Report: 30%; Presentation: 30%; Viva: 20%.
8. Project progress reports should normally be no longer than 250 words and final report should not be longer than 40 A4 size pages in double spacing. Each final project report need to contain the following: (i) Abstract (ii) Table of contents (iii) Review of literature (iv) Main text(v) List of references. It may be desirable to arrange the main text as an introduction, the main body and conclusions.

GUIDELINES FOR STRUCTURING CONTENTS

Sequence of Contents:

The following sequence for the thesis organization should be followed:

- | | |
|--------------------------|--|
| (i) Preliminaries | Title Page
Certificate
Abstract/Synopsis
Acknowledgement and/ or Dedication
Table of Contents
List of Figures, Tables, Illustrations,
Symbols, etc (wherever applicable) |
| (ii) Text of Thesis | Introduction
The body of the thesis, summary and conclusions |
| (iii) Reference Material | List of References, Bibliography |
| (iv) Appendices | |

NOTE:

1. *Synopsis/Abstract* should be self-complete and contain no citations for which the thesis has to

be referred.

2. The Text of the Thesis

(a) Introduction:

Introduction may be the first chapter or its first major division. In either case, it should contain a brief statement of the problem investigated. It should outline the scope, aim, general character of the research and the reasons for the student's interest in the problem.

(b) The body of Thesis

This is the substance of the dissertation inclusive of all divisions, subdivisions, tables, figures, etc.

(c) Summary and conclusions

If required, these are given as the last major division (chapter) of the text. A further and final subdivision titled "*Scope for Further Work*" may follow.

(d) Reference material

The list of references should appear as a consolidated list with references listed either alphabetically or sequentially as they appear in the text of the thesis.

For referencing an article in a scientific journal the suggested format should contain the following information: authors, title, name of journal, volume number, page numbers and year. For referencing an article published in a book, the suggested format should contain, authors, the title of the book, editors, publisher, year, page number of the article in the book being referred to. For referencing a thesis the suggested format should contain, author, the title of thesis, where thesis was submitted or awarded, year.

ANNEXURE – I
DEPARTMENT OF MATHEMATICS
PROJECT REGISTRATION FORM

Name of the college/university: Name of the student:

Roll No. :

e-mail :

Name of the supervisor(s):

Department(s):

e-mail(s):

Title of the Project: Signature of the Student: Signature of supervisor(s): (i)

(ii) Signature of HOD, Mathematics:

GENERIC ELECTIVES (TWO PAPER CHOICE)

Generic Elective Paper I CALCULUS

AND DIFFERENTIAL EQUATIONS

Objective: Calculus invented by Newton and Leibnitz is powerful analytical tool to solve mathematical problems which arise in all branches of science and engineering. The main emphasis of this course is to equip the student with necessary analytic and technical skills to handle problems of a mathematical nature as well as practical problems using calculus and differential equation. The aim should be to expose the students to basic ideas quickly without much theoretical emphasis with importance on applications.

Excepted Outcomes: After completing the course, students are expected to be able to apply knowledge of calculus and differential equations in the areas of their own interest.

UNIT-I

Curvature, Asymptotes, Tracing of Curves (Catenary, Cycloid, Folium of Descartes), Rectification, Quadrature, Elementary ideas about Sphere, Cones, Cylinders and Conicoids.

UNIT-II

Review of limits, continuity and differentiability of functions of one variable and their properties, Rolle's theorem, Mean value theorems, Taylor's theorem with Lagrange's theorem and Cauchy's form of remainder, Taylor's series, Maclaurin's series of $\sin x$, $\cos x$, e^x , $\log(1+x)$, $(1+x)^m$, L' Hospital's Rule, other Intermediate forms.

UNIT-III

Limit and Continuity of functions of several variables, Partial derivatives, Partial derivatives of higher orders, Homogeneous functions, Change of variables, Mean value theorem, Taylor's theorem and Maclaurin's theorem for functions of two variables (statements & applications), Maxima and Minima of functions of two and three variables, Implicit functions, Lagrange's multipliers (Formulae & its applications), Concepts of Multiple integrals & its applications.

UNIT-IV

Ordinary Differential Equations of order one and degree one (variables separable, homogeneous, exact and linear). Equations of order one but higher degree. Second order linear equations with constant coefficients, homogeneous forms, Second order equations with variable coefficients, Variation of parameters.

BOOKS RECOMMENDED:

1. Shanti Narayan, P. K. Mittal, Differential Calculus, S. Chand, 2014.
2. Shanti Narayan, P. K. Mittal, Integral Calculus, S. Chand, 2014.
3. S.C. Mallik and S. Arora-Mathematical Analysis, New Age International Publications.
4. J. Sinharoy and S. Padhy: A Course of Ordinary and Partial Differential Equations, Kalyani Publishers.

BOOK FOR REFERENCES:

1. H.Anton,I.Bivens and S.Davis,*Calculus*,10th Ed.,John Wiley and Sons (Asia) P. Ltd., Singapore, 2002.
2. Shanti Narayan and P.K. Mittal-Analytical Solid Geometry, S. Chand & Company Pvt. Ltd., New Delhi.
- 3.Martin Braun-Differential Equations and their Applications-Martin Braun, Springer International.
4. B. P.Acharya and D. C.Sahu: Analytical Geometry of Quadratic Surfaces, Kalyani Publishers.

Generic Elective Paper II

ALGEBRA

Objective: This is a preliminary course for the basic courses in mathematics like, abstract algebra and linear algebra. The objective is to acquaint students with the properties of natural

numbers i.e. Euclidean algorithm, congruence relation, fundamental theorem of arithmetic, etc. The basics of linear algebra i.e. vector spaces, matrices are introduced here.

Expected Outcomes: The acquired knowledge will help students to study further courses in mathematics like, group theory, ring theory and field theory and linear algebra. It has applications not only in higher mathematics but also in other science subjects like computer science, statistics, physics, chemistry etc.

UNIT-I

Sets, relations, Equivalence relations, partial ordering, well ordering, Functions, Composition of functions, Invertible functions, One to one correspondence and cardinality of a set, statements, compound statements, proofs in Mathematics, Truth tables, Algebra of propositions, logical arguments

UNIT-II

Well-ordering property of positive integers, Division algorithm, Divisibility and Euclidean algorithm, Congruence relation between integers, Principles of Mathematical Induction, statement of Fundamental Theorem of Arithmetic.

UNIT-III

Matrices, algebra of matrices, determinants, fundamental properties, minors and cofactors, product of determinant, adjoint and inverse of a matrix, Rank and nullity of a matrix, Systems of linear equations, row reduction and echelon forms, solution sets of linear systems, applications of linear systems,.

UNIT-IV

Vector spaces and subspaces, examples, linear independence, linear dependence, basis, dimension, examples, Introduction to linear transformations, matrix representation of a linear transformation, Eigen values, Eigen vectors of a matrix.

BOOKS RECOMMENDED:

1. Edgar G. Goodaire and Michael M. Parmenter, Discrete Mathematics with Graph Theory, 3rd Ed., Pearson Education (Singapore) P. Ltd., Indian Reprint, 2005.
2. V Krishna Murthy, V P Mainra, J L Arora, An Introduction to Linear Algebra ,

Affiliated East-West Press Pvt. Ltd

BOOKS FOR REFERENCE:

1. David C. Lay, Linear Algebra and its Applications, 3rd Ed., Pearson Education Asia, Indian Reprint, 2007.
2. B S Vatsa and Suchi Vatsa Theory of Matrices New age International third edition 2010.
3. Ward Cheney, David Kincaid. Linear algebra theory and applications, Jones and Bartlett, 2010.

OR

GENERIC ELECTIVES (FOUR PAPERS CHOICE)

Generic Elective Paper I CALCULUS AND

DIFFERENTIAL EQUATIONS

Objective: Calculus invented by Newton and Leibnitz is powerful analytical tool to solve mathematical problems which arise in all branches of science and engineering. The main emphasis of this course is to equip the student with necessary analytic and technical skills to handle problems of a mathematical nature as well as practical problems using calculus and differential equation. The aim should be to expose the students to basic ideas quickly without much theoretical emphasis with importance on applications.

Excepted Outcomes: After completing the course, students are expected to be able to apply knowledge of calculus and differential equations in the areas of their own interest.

UNIT-I

Curvature, Asymptotes, Tracing of Curves (Catenary, Cycloid, Folium of Descartes), Rectification, Quadrature, Elementary ideas about Sphere, Cones, Cylinders and Conicoids.

UNIT-II

Review of limits, continuity and differentiability of functions of one variable and their properties, Rolle's theorem, Mean value theorems, Taylor's theorem with Lagrange's theorem and Cauchy's form of remainder, Taylor's series, Maclaurin's series of $\sin x$, $\cos x$, e^x , $\log(1+x)$, $(1+x)^m$, L'Hospital's Rule, other Intermediate forms.

UNIT-III

Limit and Continuity of functions of several variables, Partial derivatives, Partial derivatives of higher orders,

Homogeneous functions, Change of variables, Mean value theorem, Taylors theorem and Maclaurin's theorem for functions of two variables(statements & applications), Maxima and Minima of functions of two and three variables, Implicit functions, Lagranges multipliers (Formulae & its applications), Concepts of Multiple integrals & its applications.

UNIT-IV

Ordinary Differential Equations of order one and degree one (variables separable, homogeneous, exact and linear). Equations of order one but higher degree. Second order linear equations with constant coefficients, homogeneous forms, Second order equations with variable coefficients, Variation of parameters.

BOOKS RECOMMENDED:

1. Shanti Narayan, P. K. Mittal, Differential Calculus, S. Chand, 2014.
2. Shanti Narayan, P. K. Mittal, Integral Calculus, S. Chand, 2014.
3. S.C. Mallik and S. Arora-Mathematical Analysis, New Age International Publications.
4. J. Sinharoy and S. Padhy: A Course of Ordinary and Partial Differential Equations, Kalyani Publishers.

BOOKS FOR REFERENCE:

1. H. Anton, I. Bivens and S. Davis, *Calculus*, 10th Ed., John Wiley and Sons (Asia) P.Ltd., Singapore, 2002.
2. Shanti Narayan and P.K. Mittal-Analytical Solid Geometry, S. Chand & Company Pvt. Ltd., New Delhi.
3. Martin Braun-Differential Equations and their Applications-Martin Braun, Springer International.
4. B. P. Acharya and D. C. Sahu: Analytical Geometry of Quadratic Surfaces, Kalyani Publishers.

Generic Elective Paper II

ALGEBRA

Objective: This is a preliminary course for the basic courses in mathematics like, abstract algebra and linear algebra. The objective is to acquaint students with the properties of natural numbers i.e. Euclidean algorithm, congruence relation, fundamental theorem of arithmetic, etc. The basics of linear algebra i.e. vector spaces, matrices are introduced here.

Expected Outcomes: The acquired knowledge will help students to study further courses in mathematics like, group theory, ring theory and field theory and linear algebra. It has applications not only in higher mathematics but also in other science subjects like computer science, statistics, physics, chemistry etc.

UNIT-I

Sets, relations, Equivalence relations, partial ordering, well ordering, Functions, Composition of functions, Invertible functions, One to one correspondence and cardinality of a set, statements, compound statements, proofs in Mathematics, Truth tables, Algebra of propositions, logical arguments

UNIT-II

Well-ordering property of positive integers, Division algorithm, Divisibility and Euclidean algorithm, Congruence relation between integers, Principles of Mathematical Induction, statement of Fundamental Theorem of Arithmetic.

UNIT-III

Matrices, algebra of matrices, determinants, fundamental properties, minors and cofactors, product of determinant, adjoint and inverse of a matrix, Rank and nullity of a matrix, Systems of linear equations, row reduction and echelon forms, solution sets of linear systems, applications of linear systems,.

UNIT-IV

Vector spaces and subspaces, examples, linear independence, linear dependence, basis, dimension, examples, Introduction to linear transformations, matrix representation of a linear transformation, Eigen values, Eigen vectors of a matrix.

BOOKS RECOMMENDED:

- 1 Edgar G. Goodaire and Michael M. Parmenter, Discrete Mathematics with Graph Theory, 3rd Ed., Pearson Education (Singapore) P. Ltd., Indian Reprint, 2005.
- 2 V Krishna Murthy, V P Mainra, J L Arora, An Introduction to Linear Algebra, Affiliated East-West Press Pvt. Ltd

BOOKS FOR REFERENCE:

1. David C. Lay, Linear Algebra and its Applications, 3rd Ed., Pearson Education Asia, Indian Reprint, 2007.

2. B S Vatsa and Suchi Vatsa Theory of Matrices New age International third edition 2010.
3. Ward Cheney, David Kincaid. Linear algebra theory and applications, Jones and Bartlett ,2010

Generic Elective Paper III

REAL ANALYSIS

Objective: The objective of the course is to have the knowledge on basic properties of the field of real numbers, studying Bolzano-Weierstrass Theorem , sequences and convergence of sequences, series of real numbers and its convergence etc. This is one of the core courses essential to start doing mathematics.

Expected Outcome: On successful completion of this course, students will be able to handle fundamental properties of the real numbers that lead to the formal development of real analysis and understand limits and their use in sequences, series, differentiation and integration. Students will appreciate how abstract ideas and rigorous methods in mathematical analysis can be applied to important practical problems.

UNIT-I

Review of Algebraic and Order Properties of R , ε -neighborhood of a point in R , Idea of countable sets, uncountable sets and uncountability of R , Bounded above sets, Bounded below sets, Bounded Sets, Unbounded sets, Suprema and Infima, The Completeness Property of R , The Archimedean Property, Density of Rational (and Irrational) numbers in R .

UNIT-II

Intervals, Interior point, Open Sets, Closed sets, Limit points of a set , Illustrations of Bolzano- Weierstrass theorem for sets, closure, interior and boundary of a set. Sequences, Bounded sequence, Convergent sequence, Limit of a sequence. Limit Theorems, Monotone Sequences, Monotone Convergence Theorem. Subsequences, Divergence Criteria, Monotone Subsequence Theorem (statement only). Bolzano Weierstrass Theorem for Sequences, Cauchy sequence, Cauchy's Convergence Criterion.

UNIT-III

Infinite series, convergence and divergence of infinite series, Cauchy Criterion, Tests for convergence: Comparison test, Limit Comparison test, Ratio Test, Cauchy's nth root test, Integral test, Alternating series, Leibniz test, Absolute and Conditional convergence.

UNIT-IV

Sequence and Series of functions, pointwise and uniform convergences, M_n test, M test, statement of results about uniform convergence, differentiability and integrability of function, power series and radius of convergence.

BOOKS RECOMMENDED:

1. S.C. Mallik and S. Arora- Mathematical Analysis, New Age International Publications.
2. G. Das and S. Pattanayak, Fundamentals of Mathematical Analysis, TMH Publishing Co.

BOOKS FOR REFERENCE:

1. R.G. Bartle and D. R. Sherbert, Introduction to Real Analysis (3rd Edition), John Wiley and Sons (Asia) Pvt. Ltd., Singapore, 2002.
2. A. Kumar, S. Kumaresan, *A basic course in Real Analysis*, CRC Press, 2014.
3. Brian S. Thomson, Andrew. M. Bruckner, and Judith B. Bruckner, *Elementary Real Analysis*, Prentice Hall, 2001.
4. Gerald G. Bilodeau, Paul R. Thie, G.E. Keough, *An Introduction to Analysis*, Jones & Bartlett, Second Edition, 2010.

Generic Elective Paper IV NUMERICAL

METHODS

Objective: Calculation of error and approximation is a necessity in all real life, industrial and scientific computing. The objective of this course is to acquaint students with various numerical methods of finding solution of different type of problems, which arises in different branches of science such as locating roots of equations, finding solution of nonlinear equations, systems of linear equations, differential equations, Interpolation, differentiation, evaluating integration.

Expected Outcome: Students can handle physical problems to find an approximated solution. After getting trained a student can opt for advance courses in Numerical analysis in higher mathematics. Use of good mathematical software will help in getting the accuracy one need from the computer and can assess the reliability of the numerical results, and determine the effect of round off error or loss of significance.

UNIT-I

Algorithms, Convergence, Bisection method, False position method, Fixed point iteration method, Newton's method, Secant method.

Gauss Elimination and Gauss Jordan methods, LU decomposition, Gauss-Jacobi, Gauss- Siedel.

UNIT-II

Lagrange and Newton interpolation: linear and higher order, finite difference operators.

UNIT-III

Numerical differentiation: forward difference, backward difference and central Difference.

UNIT-IV

Integration: trapezoidal rule, Simpson's rule, Euler's method, Runge-Kutta methods of orders two and four.

BOOKS RECOMMENDED:

1. M.K. Jain, S.R.K. Iyengar and R.K. Jain, *Numerical Methods for Scientific and Engineering Computation*, 5th Ed., New age International Publisher, India, 2007.

BOOKS FOR REFERENCE:

1. S. S. Sastry, *Introductory method for Numerical Analysis*, PHI New Delhi, 2012.
2. S. D. Conte and Carl De Boor, *Elementary Numerical Analysis*, Mc Graw Hill, 1980.

Course structure of UG Physics Honors

SEMESTER	COURSE OPTED	COURSE NAME	Credits
I 4 Papers (400 Marks)	Ability Enhancement Compulsory Course-I	AECC-1	4
	Core course-I	Mathematical Physics-I	4
	Core Course-I Practical/Tutorial	Mathematical Physics-I Lab	2
	Core course-II	Mechanics	4
	Core Course-II Practical/Tutorial	Mechanics Lab	2
	Generic Elective -1	GE-1	4
	Generic Elective -1	Practical/Tutorial	2
II 4 Papers (400 Marks)	Ability Enhancement Compulsory Course-II	AECC-II	4
	Core course-III	Electricity and Magnetism	4
	Core Course-III Practical/Tutorial	Electricity and Magnetism Lab	2
	Core course-IV	Waves and Optics	4
	Core Course-IV Practical/Tutorial	Waves and Optics Lab	2
	Generic Elective -2	GE-2	4
	Generic Elective -2	Practical/Tutorial	2
III 5 Papers (500 Marks)	Core course-V	Mathematical Physics-II	4
	Core Course-V Practical/Tutorial	Mathematical Physics-II Lab	2
	Core course-VI	Thermal Physics	4
	Core Course-VI Practical/Tutorial	Thermal Physics Lab	2
	Core course-VII	Analog Systems and Applications	4
	Core Course-VII Practical/Tutorial	Analog Systems & Applications Lab	2
	Skill Enhancement Compulsory Course - 1	SECC-1	4
	Generic Elective -3	GE-3	4
	Generic Elective -3	Practical/Tutorial	2
IV 5 Papers (500 Marks)	Core course-VIII	Mathematical Physics III	4
	Core Course-VIII Practical/Tutorial	Mathematical Physics-III Lab	2
	Core course-IX	Elements of Modern Physics	4
	Core Course-IX Practical/Tutorial	Elements of Modern Physics Lab	2
	Core course-X	Digital Systems and Applications	4
	Core Course-X Practical/Tutorial	Digital Systems & Applications Lab	2
	Skill Enhancement Compulsory Course - 2	SECC -2	4
	Generic Elective -4	GE-4	4
	Generic Elective -4	Practical/Tutorial	2
V	Core course-XI	Quantum Mechanics &	4

4 Papers (400 Marks)		Applications	
	Core Course-XI Practical/Tutorial	Quantum Mechanics Lab	2
	Core course-XII	Solid State Physics	4
	Core Course-XII Practical/Tutorial	Solid State Physics Lab	2
	Discipline Specific Elective -1	DSE-1	5
	Discipline Specific Elective -1	Practical/Tutorial	1
	Discipline Specific Elective -2	DSE-2	5
	Discipline Specific Elective- 2	Practical/Tutorial	1
VI 4 Papers (400 Marks)	Core course-XIII	Electro-magnetic Theory	4
	Core Course-XIII Practical/Tutorial	Electro-magnetic Theory Lab	2
	Core course-XIV	Statistical Mechanics	4
	Core Course-XIV Practical/Tutorial	Statistical Mechanics Lab	2
	Discipline Specific Elective -3	DSE-3	5
	Discipline Specific Elective -3	Practical/Tutorial	1
	Discipline Specific Elective-4	DSE-4	4/5
	Discipline Specific Elective -4	Practical/Tutorial	2/1
	Alternative to Discipline Specific Elective-4	(Eligible Students may do a Project in DSE-IV)	6
	Total Credits	148	

Generic Elective Papers (GE) (Minor-Physics) for other Departments/Disciplines: (Credit: 06 each)

Depending on their requirements, Universities may choose 2 (two)GE subjects with 2 papers from each subject or only one GE subject with 4 papers from it.

Two papers GE subject will be :

- 1. GE-I** (Mechanics & Properties of matter, Oscillation & Waves, Thermal Physics, Electricity and Magnetism & Electronics) + Lab
- 2. GE-II** (Optics, Special Theory of Relativity, Atomic Physics, Quantum Mechanics and Nuclear Physics)+ Lab

A student who chooses to read only Physics subject GE will take 4 DSC papers of the Pass Course as below

- 1. GE-I as DSC-1**(Mechanics)+ Lab
- 2. GE-II as DSC-2**,(Electricity, Magnetism & Emt))+ Lab
- 3. GE-III as DSC-3**,(Thermal Physics & Statical Mechanics))+ Lab
- 4. GE-IV as DSC-4** (Waves and Optics)+ Lab

(GE-I same paper as DSC-1,GE-II same as DSC-2 ,GE-III same as DSC-3,GE-IV same as DSC-4)

SEC papers can be chosen from the general pool or physics specific courses as indicated.

PHYSICS

HONOURS PAPERS:

Core course – 14 papers

Discipline Specific Elective – 4 papers (out of the 5 papers suggested)

Generic Elective for non Physics students – 4 papers. In case University offers 2 subjects as GE, then papers 1 and 2 will be the GE paper.

Marks per paper –

For practical paper: Mid term : 15 marks, End term : 60 marks, Practical- 25 marks

For non practical paper: Mid term : 20 marks, End term : 80 marks

Total – 100 marks Credit per paper – 6

Teaching hours per paper –

Practical paper-40 hours theory classes + 20 hours Practical classes

Non Practical paper-50 hours theory classes + 10 hours tutorial

CORE PAPER-1

MATHEMATICAL PHYSICS-I

The emphasis of course is on applications in solving problems of interest to physicists. The students are to be examined entirely on the basis of problems, seen and unseen.

UNIT-I

Calculus -I: Plotting of functions, Intuitive ideas of continuous, differentiable functions and plotting of curves, Approximation: Taylor and binomial series (statements only), First Order Differential Equations and Integrating Factor, Second Order Differential equations: Homogeneous Equations with constant coefficients, Wronskian and general solution, Statement of existence and Uniqueness Theorem for Initial Value Problems, Particular Integral.

UNIT-II

Calculus-II: Calculus of functions of more than one variable: Partial derivatives, exact and inexact differentials. Integrating factor, with simple illustration, Constrained Maximization using Lagrange Multipliers,

Vector algebra: Recapitulation of vectors: Properties of vectors under rotations. Scalar product and its invariance under rotations, Vector product, Scalar triple product and their interpretation in terms of area and volume respectively, Scalar and Vector fields.

UNIT-III

Orthogonal Curvilinear Coordinates: Orthogonal Curvilinear Coordinates, Derivation of Gradient, Divergence, Curl and Laplacian in Cartesian, Spherical and Cylindrical Coordinate Systems, Comparison of velocity and acceleration in cylindrical and spherical coordinate system

Dirac Delta function and its properties: Definition of Dirac delta function. Representation as limit of a Gaussian function and rectangular Function, Properties of Dirac delta function.

UNIT-IV

Vector Differentiation: Directional derivatives and normal derivative, Gradient of a scalar field and its geometrical interpretation, Divergence and curl of a vector field, Del and Laplacian operators, Vector identities

Vector Integration: Ordinary Integrals of Vectors, Multiple integrals, Jacobian, Notion of infinitesimal line, surface and volume elements, Line, surface and volume integrals of Vector fields, Flux of a vector field, Gauss' divergence theorem, Green's and Stokes Theorems and their applications (no rigorous proofs)

Text Books:

- 1 Mathematical Methods for Physicists, G.B. Arfken, H.J. Weber, F.E. Harris (2013, 7th Edition., Elsevier)
- 2 Advanced Engineering Mathematics, Erwin Kreyszig (Wiley India) , 2008

Reference books:

- 1 Mathematical Physics C. Harper (Prentice Hall India), 2006
- 2 Complex Variable: Schaum's Outlines Series M. Spiegel (2nd Edition , McGraw Hill Education)
- 3 Complex variables and applications, J. W. Brown and R.V.Churchill
Mathematical Physics, Satya Prakash (Sultan Chand)
- 4 Mathematical Physics, B. D. Gupta (4th edition, Vikas Publication), 2009
- 5 Mathematical Physics and Special Relativity, M. Das, P.K. Jena and B.K.Dash (Srikrishna Prakashan) ,2009
- 6 Mathematical Physics–H.K.Dass, Dr. Rama Verma (S. Chand Publishing) , 2011

CORE PAPER I LAB:

The aim of this Lab is not just to teach computer programming and numerical analysis but to emphasize its role in solving problems in Physics.

- Highlights the use of computational methods to solve physical problems
- The course will consist of lectures(both theory and practical)in the Lab
- Evaluation done not on the programming but on the basis of formulating the problem
- Aim at teaching students to construct the computational problem to be solved
- Students can use any one operating system Linux or Microsoft Windows

Introduction and Overview: Computer architecture and organization, memory and Input/output devices.

Basics of scientific computing: Binary and decimal arithmetic, Floating point numbers, algorithms, Sequence, Selection and Repetition, single and double precision arithmetic, underflow and overflow emphasize the importance of making equations in terms of dimension less variables, Iterative methods. Algorithm

Errors and error Analysis: Truncation and round off errors, Absolute and relative errors, Floating point computations. Systematic and Random Errors, Propagation of Errors, Normal Law of Errors, Standard and Probable Error.

Review of C and C++ Programming: Introduction to Programming, constants,

variables and Fundamentals data types, operators and Expressions, I/O statements, scanf and printf, c in and c out, Manipulators for data formatting, Control statements (decision making and looping statements) (If Statement, Ifelse Statement, Nested If structure, Else If Statement, Ternary operator, Go to Statement. Switch Statement. Unconditional and Conditional Looping. While Loop. Do-While Loop. FOR Loop. Break and Continue Statements. Nested Loops), Arrays (1D and 2D) and strings, user defined functions, Structures and Unions, Idea of classes and objects

Programs: Sum and average of a list of numbers, largest of a given list of numbers and its location in the list, sorting of numbers in ascending descending order, Binary search,

Random number generation: Area of circle, area of square, volume of sphere, value of π and applications in physics lab.

Reference Books:

- 1 Introduction to Numerical Analysis, S.S. Sastry, 5th Edition., 2012, PHI Learning Pvt. Ltd.
- 2 Schaum's Outline of Programming with C++.J.Hubbard,2000,McGraw–Hill Pub.
- 3 Numerical Recipes in C:The Art of Scientific Computing, W.H. Pressetal, 3rd Edition. 2007, Cambridge University Press.
- 4 A first course in Numerical Methods, U.M. Ascher and C. Greif, 2012, PHI Learning.
- 5 Elementary Numerical Analysis, K.E. Atkinson, 3rd Edn. , 2007, Wiley India Edition.
- 6 Numerical Methods for Scientists and Engineers, R.W. Hamming, 1973, Courier Dover Pub.
- 7 An Introduction to computational Physics,T.Pang, 2nd Edn., 2006, Cambridge Univ. Press.

CORE II MECHANICS

UNIT-I

Rotational Dynamics: Centre of Mass, Motion of CoM, Centre of Mass and Laboratory frames, Angular momentum of a particle and system of particles, Principle of conservation of angular momentum, Rotation about a fixed axis, Moment of Inertia, Perpendicular and Parallel Axis Theorems, Routh Rule, Calculation of moment of inertia for cylindrical and spherical bodies, Kinetic energy of rotation, Eulers Equations of Rigid Body motion, Motion involving both translation and rotation. Moment of Inertia of a Fly wheel.

Non-Inertial Systems: Non-inertial frames and fictitious forces, Uniformly rotating frame, Laws of Physics in rotating coordinate systems, Centrifugal force, Coriolis force and its applications.

UNIT-II Elasticity: Relation between Elastic constants, Twisting torque on a Cylinder or Wire, Bending of beams, External bending moment, Flexural rigidity, Single and double cantilever

Surface Tension: Excess pressure across a curved membrane, Quink's drop

Fluid Motion: Kinematics of Moving Fluids: Poiseuilles Equation for Flow of a Liquid through a Capillary Tube, Surface tension, Gravity waves and ripple

Viscosity: Poiseuilles Equation for Flow of a Liquid with corrections.

UNIT-III Gravitation and Central Force Motion: Law of gravitation, Gravitational potential energy, Inertial and gravitational mass, Potential and field due to spherical shell and solid sphere, Motion of a particle under a central force field, Two-body problem and its reduction to one-body problem and its solution, Differential Equation of motion with central force and its solution, The first Integrals (two), Concept of power Law Potentials, Keplers Laws of Planetary motion, Satellites:. Geosynchronous orbits, Weightlessness, Basic idea of global positioning system (GPS), Physiological effects on astronauts.

UNIT-IV

Oscillations: Simple Harmonic Oscillations. Kinetic energy, potential energy, total energy and their time-average values. Damped oscillation. Equation of motion and solution (cases of oscillatory, critically damped and over damped) Forced oscillations: Transient and steady states; Resonance, sharpness of resonance; power dissipation and Quality Factor, Bar Pendulum, Katers Pendulum

Special Theory of Relativity: Michelson-Morley Experiment and its out- come, Postulates of Special Theory of Relativity, Lorentz Transformations, Simultaneity and order of events, Lorentz contraction, Timedilation, Relativistic transformation of velocity, Frequency and wave number, Relativistic addition of velocities, Variation of mass with velocity, Massless Particles, Mass-energy Equivalence, Relativistic Doppler effect, Relativistic Kinematics, Transformation of Energy and Momentum.

Text Books:

- 1 Mechanics, D.S. Mathur, PS Hemne (S. Chand Publishing) ,2012
- 2 Introduction to Special Relativity, R. Resnick (John Wiley), 2007

Reference Books:

- 1 Introduction to Mechanics Daniel Klapnner and Robert Kolenkow, McgrawHill.2007
- 2 Mech•anics by K.R Simon, 1971
- 3 Mech•anics, Berkeley Physics, vol.1, C.Kittel, W. Knight, etal (Tata McGraw-Hill), 2007
- 4 Physics, Resnick, Halliday and Walker (8/e.2010,Wiley)
- 5 Theoretical Mechanics-M.R. Spiegel (Tata McGraw Hill), 2017
- 6 Feynman Lectures, Vol. I, R.P.Feynman, R.B.Leighton, M.Sands (Pearson),2012
- 7 Mechanics-M.Das, P.K.Jena and R.N. Mishra (Srikrishna Publications), 2009

CORE PAPER-II LAB

(minimum 5 experiments are to be done):

- 1 To study surface tension by capillary rise method

- 2 To determine the height of a building using a Sextant.
- 3 To study the Motion of Spring and calculate (a) Spring constant, (b) g and (c) Modulus of rigidity.
- 4 To determine the Moment of Inertia of a Flywheel.
- 5 To determine Coefficient of Viscosity of water by Capillary Flow Method (Poiseuille's method).
- 6 To determine the Modulus of Rigidity of a Wire by Maxwell's needle.
- 7 To determine the value of g using Bar Pendulum.
- 8 To determine the value of g using Kater's Pendulum

Reference Books:

- 1 Advanced Practical Physics for students, B. L. Flint and H.T. Worsnop, 1971, Asia Publishing House
- 2 Advanced level Physics Practicals, Michael Nelson and Jon M. Ogborn, 4th Edition, reprinted 1985, Heinemann Educational Publishers
- 3 A Text Book of Practical Physics, I. Prakash and Ramakrishna, 11th Edn, 2011, Kitab Mahal.

CORE PAPER-III

ELECTRICITY AND MAGNETISM

UNIT-I

Electric Field and Electric Potential

Electric field: Electric field lines, Electric flux, Gauss Law with applications to charge distributions with spherical, cylindrical and planar symmetry, Conservative nature of Electrostatic Field. Electrostatic Potential, Potential and Electric Field of a dipole, Force and Torque on a dipole placed in electric field, Potential calculation in different simple cases, Laplace and Poisson's equations, The Uniqueness Theorem, Method of Images and its application to (1) Plane Infinite Sheet and (2) Sphere.

Electrostatic energy of system of charges, Electrostatic energy of a charged sphere, Conductors in an electrostatic Field, Surface charge and force on a conductor.

UNIT-II

Magnetic Field: Magnetic Force, Lorentz Force, Biot Savarts Law, Current Loop as a Magnetic Dipole and its Dipole Moment (analogy with Electric Dipole), Amperes Circuital Law and its application to (1) Solenoid (2) Toroid (3) Helmholtz coil, Properties of B: curl and divergence, Vector Potential, Ballistic Galvanometer: Torque on a current Loop, Current and Charge Sensitivity, Electromagnetic damping, Logarithmic damping, CDR.

UNIT-III

Dielectric Properties of Matter: Electric Field in matter, Polarization, Polarization Charges, Electrical Susceptibility and Dielectric Constant, Capacitor (parallel plate, spherical, cylindrical) filled with dielectric, Displacement vector D, Relations between E, P and D, Gauss Law in dielectrics. Magnetic Properties of Matter: Magnetization vector (M), Magnetic Intensity (H), Magnetic Susceptibility and permeability, Relation between B, H, M, Ferromagnetism, B-H curve and hysteresis.

Electromagnetic Induction: Faradays Law, Lenzs Law, Self Inductance and Mutual Inductance, Reciprocity Theorem, Energy stored in a Magnetic Field, Introduction to Maxwell's Equations

UNIT-IV

Electrical Circuits: AC Circuits: Kirchhoff's laws for AC circuits, Complex Reactance and Impedance, Series LCR Circuit: (1) Resonance (2) Power Dissipation (3) Quality Factor, (4) Band Width, Parallel LCR Circuit.

Network theorems: Ideal Constant-voltage and Constant-current Sources, Network Theorems: Thevenin theorem, Norton theorem, Superposition theorem, Reciprocity theorem, Maximum Power Transfer theorem, Applications to DC and AC circuits. Transient Currents Growth and decay of current in RC and LR circuits.

Text Books:

- 1 Introduction to Electrodynamics – D.J. Griffiths (Pearson, 4th edition, 2015)
- 2 Foundations of Electromagnetic Theory-Ritz and Milford (Pearson) 4th Edition

Reference Books:

- 1 Classical Electrodynamics, J. D. Jackson (Wiley), 1998
- 2 Electricity and Magnetism D. C. Tayal (Himalaya Publishing house), 2014
- 3 Electricity, Magnetism and Electromagnetic Theory- S. Mahajan and Choudhury (Tata McGraw Hill)-2012
- 4 Feynman Lectures Vol.2, R. P. Feynman, R. B. Leighton, M. Sands (Pearson)-2008
- 5 Electricity and Magnetism, J. H. Fewkes and J. Yarwood. Vol. I (Oxford Univ. Press)

CORE PAPER-III

(minimum of 6 experiments are to be done)

Use a Multimeter for measuring (a) Resistances, (b) AC and DC Voltages, (c) DC Current, (d) Capacitances, and (e) Checking electrical fuses.

1. To study the characteristics of a series RC Circuit.
2. To determine an unknown Low Resistance using Potentiometer.
3. To determine an unknown Low Resistance using Carey Fosters Bridge.
4. And compare capacitances using DeSautys bridge.
5. Measurement of field strength B and its variation in a solenoid/ artificial coil (determine dB/dx)
6. To verify the Thevenin and Norton theorems.
7. To determine self inductance of a coil by Andersons bridge.
8. To study response curve of a Series LCR circuit and determine its (a) Resonant frequency, (b) Impedance at resonance, (c) Quality factor Q, and (d) Band width.
9. To study the response curve of a parallel LCR circuit and determine its (a) Antiresonance frequency and (b) Quality factor Q.

Reference Books:

- 1 Advanced Practical Physics for students, B.L. Flint and H.T. Worsnop, 1971, Asia Publishing House
- 2 A Text Book of Practical Physics, I. Prakash and Ramakrishna, 11th Ed., 2011, Kitab Mahal
- 3 Advanced level Physics Practicals, Michael Nelson and Jon M. Ogborn, 4th Edition, reprinted 1985, Heinemann Educational Publishers
- 4 A Laboratory Manual of Physics for undergraduate classes, D.P. Khandelwal, 1985, Vani Pub.

CORE PAPER-1V: WAVES AND OPTICS

UNIT - I

Geometrical Optics : Fermat's principle, reflection and refraction at plane interface, Matrix formulation of geometrical Optics, Cardinal points and Cardinal planes of an optical system, Idea of dispersion, Application to thick Lens and thin Lens, Ramsden and Huygens eyepiece. **Wave Optics** : Electromagnetic nature of light. Definition and properties of wave front Huygens Principle. Temporal and Spatial Coherence.

UNIT - II

Wave Motion : Plane and Spherical Waves, Longitudinal and Transverse Waves, Plane Progressive (Traveling) Waves, Wave Equation, Particle and Wave Velocities, Differential Equation, Pressure of a Longitudinal Wave, Energy Transport, Intensity of Wave. Superposition of two perpendicular Harmonic Oscillations : Graphical and Analytical Methods, Lissajous Figures (1:1 and 1:2) and their uses, Superposition of N harmonic waves.

UNIT- III

Interference : Division of amplitude and wave front, Young's double slit experiment, Lloyds Mirror and Fresnel's Bi-prism, Phase change on reflection: Stokes treatment, Interference in Thin Films: parallel and wedge-shaped films, Fringes of equal inclination (Haidinger Fringes), Fringes of equal thickness (Fizeau Fringes), Newton's

Rings: Measurement of wavelength and refractive index. Interferometer : Michelsons Interferometer-(1) Idea of form of fringes (No theory required), (2) Determination of Wavelength, (3) Wavelength Difference, (4) Refractive Index, and (5) Visibility of Fringes, Fabry-Perot interferometer.

UNIT - IV

Fraunhofer diffraction: Single slit, Circular aperture, Resolving Power of a telescope, Double slit, Multiple slits, Diffraction grating, Resolving power of grating. Fresnel Diffraction: Fresnel's Assumptions, Fresnel's Half-Period Zones for Plane Wave, Explanation of Rectilinear Propagation of Light, Theory of a Zone Plate: Multiple Foci of a Zone Plate, Fresnel's Integral, Fresnel diffraction pattern of a straight edge, as lit and a wire.

Text Books:

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- 1 Optics P.K.Chakrabarty, New Central Agency 3rd Edition 2012
- 2 Optics - Ajoy Ghatak (McGraw Hill)-2017

Reference Books:

- 2 Optics-E.Hecht (Pearson)-2008
- 3 Fundamentals of Optics- F.A. Jenkins and H.E.White (McGraw-Hill)-2017
- 4 Geometrical and Physical Optics R.S. Longhurst (Orient Black swan)-1986
- 5 A text book of Optics N. Subrahmanyam and Brij Lal (S.Chand Publishing), 2006
- 6 The Physics of Vibrations and Waves- H.J. Pain (JohnWiley)-2013
- 7 Principles of Optics- Max Born and Emil Wolf(Pergamon Press) 7th Edition 1999
- 8 The Physics of Waves and Oscillations-N.K.Bajaj (McGraw Hill)-1998

CORE PAPER-IV LAB

• **(minimum 5 experiments are to be done)**

1. To determine the frequency of an electric tuning fork by Melde's experiment and verify $2T$ law.
2. To plot the I-D curve and to determine the refractive index of a prism
3. To determine refractive index of the Material of a prism using sodium source.

4. To determine the dispersive power and Cauchy constants of the material of a prism using mercury source.
5. To determine wavelength of sodium light using Newton's Rings.
6. To determine wavelength of (1) Na source and (2) spectral lines of Hg source using plane diffraction grating.
7. To determine dispersive power and resolving power of a plane diffraction grating.

Reference Books:

1. Advanced Practical Physics for students, B.L. Flint and H.T. Worsnop, 1971, Asia Publishing House
2. A Text Book of Practical Physics, I. Prakash and Ramakrishna, 11th Ed., 2011, Kitab Mahal
3. Advanced level Physics Practicals, Michael Nelson and Jon M. Ogborn, 4th Edition, reprinted 1985, Heinemann Educational Publishers
4. A Laboratory Manual of Physics for undergraduate classes, D.P. Khandelwal, 1985, Vani

CORE PAPER-V

MATHEMATICAL PHYSICS-II

The emphasis of the course is on applications in solving problems of interest to physicists. Students are to be examined on the basis of problems, seen and unseen.

UNIT-I

Fourier Series-I: Periodic functions, Orthogonality of sine and cosine functions, Dirichlet Conditions (Statement only), Expansion of periodic functions in a series of sine and cosine functions and determination of Fourier coefficients, Complex representation of Fourier series, Expansion of functions with arbitrary period, Expansion of non-periodic functions over an interval, Even and odd functions and their Fourier expansions and Application, Summing of Infinite Series, Term-by-Term differentiation and integration of Fourier Series, Parseval Identity.

UNIT-II

Frobenius Method and Special Functions: Singular Points of Second Order Linear Differential Equations and their importance, Singularities of Bessel's and Laguerre Equations, Frobenius method and its applications to differential equations: Legendre and Hermite Differential Equations, Legendre and Hermite Polynomials: Rodrigue's Formula, Generating Function, Orthogonality.

UNIT-III

Polynomials: Simple recurrence relations of Legendre and Hermite Polynomials, Expansion of function in a series of Legendre Polynomials, Associated Legendre Differential Equation, Associated Legendre polynomials, Spherical Harmonics

Some Special Integrals: Beta and Gamma Functions and relation between them, Expression of Integrals in terms of Gamma Functions, Error Function (Probability Integral).

UNIT-IV

Partial Differential Equations: Solutions to partial differential equations using separation of variables: Laplace's Equation in problems of rectangular, cylindrical and spherical symmetry. Conducting and dielectric sphere in an external uniform electric field. Wave equation and its solution for vibrational modes of a stretched string

Text Books:

- 1 **Mathematical Methods for Physicists**, G.B. Arfken, H.J. Weber, F.E. Harris (2013, 7th Edn., Elsevier)
- 2 **Advanced Engineering Mathematics**, Erwin Kreyszig (Wiley India) 9th Edition 2011

Reference Books:

- 1 **Mathematical Physics and Special Relativity**, M. Das, P.K. Jena and B.K. Dash (Srikrishna Prakashan)-2009
- 2 **Mathematical Physics**—H. K. Dass, Dr. Rama Verma (S. Chand Publishing) -2011

- 3 Mathematical Physics C. Harper (Prentice Hall India)-1978
- 4 Schaum's Outlines Series M. Spiegel (2nd Edition, McGraw Hill Education)-2004
- 5 Complex variables and applications J.W.Brown and R.V.Churchill-2017
- 6 Mathematical Physics, Satya Prakash (Sultan Chand)-2014
- 7 Mathematical Physics B.D. Gupta (4th edition, Vikas Publication-2009

CORE PAPER-V LAB

The aim of this Lab is to use the computational methods to solve physical problems. Course will consist of lectures (both theory and practical) in the Lab. Evaluation done on the basis of formulating the problem but not on the programming

Topics

Introduction to Numerical computation software Scilab: Introduction to Scilab, Advantages and disadvantages, Scilab computation software Scilab environment, Command window, Figure window, Edit window, Variables and arrays, Initialising variables in Scilab, Multidimensional arrays, Subarray, Special values, Displaying output data, data file, Scalar and array operations, Hierarchy of operations, Built in Scilab functions, Introduction to plotting, 2D and 3D plotting (2), Branching Statements and program design, Relational and logical operators, the while loop, for loop, details of loop operations, break and continue statements, nested loops, logical arrays and vectorization (2) User defined functions, Introduction to Scilab functions, Variable passing in Scilab, optional arguments, preserving data between calls to a function, Complex and Character data, string function, Multidimensional arrays (2) an introduction to Scilab file processing, file opening and closing, Binary I/o functions, comparing binary and formatted functions, Numerical methods and developing the skills of writing a program(2).

Curve fitting, Least square fit Goodness of fit, standard constant Deviation:

Ohms law to calculate R, Hooke's law to calculate spring constant

Solution of Linear system of equations by Gauss elimination Solution

method and Gauss Seidal method. Diagonalization matrices, Inverse of a matrix, Eigen vectors, problems: Solution of mesh equations of electric circuits(3meshes),Solution of coupled spring mass systems (3masses)

Solution of ODE :

First order Differential equation Euler, modified Euler, Runge- Kutta methods, Second order differential equation. Fixed difference method: First order differential equations

- Radioactive decay
- Current in RC and LC circuits with DC source
- Newton's law of cooling
- Classical equations of motion

Second order Differential Equation

- Harmonic oscillator (no friction)
- Damped Harmonic oscillator
- Over damped
- Critical damped
- Oscillatory
- Forced Harmonic oscillator
- Transient and Steady state solution
- Apply above to LCR circuits also

Reference Books:

- 1 **Mathematical Methods for Physics and Engineers**, K.F.Riley, M.P.Hobson and S. J.20 Bence, 3rd ed., 2006, Cambridge University Press
- 2 **Complex Variables**, A.S. Fokas and M.J. Ablowitz, 8th Ed., 2011, Cambridge Univ. Press
- 3 **First course in complex analysis with applications**, D.G.Zill and P.D.Shanahan, 1940, Jones and Bartlett
- 4 **Simulation of ODE/PDE Models with MATLAB, OCTAVE and SCILAB: Scientific and Engineering Applications**: A.V. Wouwer, P. Saucez, C.V. Fernandez. 2014 Springer

- 5 Scilab by example: M. Affouf 2012, ISBN: 978-1479203444
- 6 Scilab (A free software to Matlab):
H.Ramchandran,A.S.Nair.2011S.Chand and Company
- 7 Scilab Image Processing: Lambert M. Surhone. 2010 Beta script Publishing

CORE PAPER-VI

THERMAL PHYSICS

UNIT-I

Introduction to Thermodynamics Recapitulation of Zeroth and First law of thermodynamics,

Second Law of Thermodynamics: Reversible and Irreversible process with examples, Kelvin-Planck and Clausius Statements and their Equivalence, Carnots Theorem, Applications of Second Law of Thermodynamics: Thermodynamic Scale of Temperature and its Equivalence to Perfect Gas Scale.

Entropy: Concept of Entropy, Clausius Theorem. Clausius Inequality, Second Law of Thermodynamics in terms of Entropy, Entropy of a perfect gas, Principle of increase of Entropy, Entropy Changes in Reversible and Irreversible processes with examples, Entropy of the Principle of Increase of Entropy, Temperature Entropy diagrams for Carnot's Cycle, Third Law of Thermodynamics, Unattainability of Absolute Zero.

UNIT-II

Thermodynamic Potentials: Extensive and Intensive Thermodynamic Variables,

Thermodynamic Potentials: Internal Energy, Enthalpy, Helmholtz Free Energy, Gibbs Free Energy, Their Definitions, Properties and Applications, Surface Films and Variation of Surface Tension with Temperature, Magnetic Work, Cooling due to adiabatic demagnetization

Phase Transitions: First and second order Phase Transitions with examples, Clausius Clapeyron Equation and Ehrenfest equations

Maxwell's Thermodynamic Relations: Derivations and applications of Maxwell's Relations, Maxwell's Relations: (1) Clausius Clapeyron equation (2) Relation

between C_p and C_v (3) TdS Equations, (4) Joule-Kelvin coefficient for Ideal and Van der Waal Gases (5) Energy equations (6) Change of Temperature during Adiabatic Process.

UNIT-III

Kinetic Theory of Gases

Distribution of Velocities: Maxwell-Boltzmann Law of Distribution of Velocities in an Ideal Gas and its Experimental Verification, Sterns Experiment, Mean, RMS and Most Probable Speeds, Degrees of Freedom, Law of Equipartition of Energy (No proof required), Specific heats of Gases.

Molecular Collisions: Mean Free Path, Collision Probability, Estimates of Mean Free Path,

Transport Phenomenon in Ideal Gases: (1) Viscosity, (2) Thermal Conductivity and (3) Diffusion. Brownian Motion and its Significance.

UNIT-IV

Real Gases: Behavior of Real Gases: Deviations from the Ideal Gas Equation, The Virial Equation, Andrews Experiments on CO_2 Gas. Critical Constants, Continuity of Liquid and Gaseous State. Vapour and Gas, Boyle Temperature, Van der Waals Equation of State for Real Gases, Values of Critical Constants, Law of Corresponding States, Comparison with Experimental Curves, P-V Diagrams, Joules Experiment, Free Adiabatic Expansion of a Perfect Gas, Joule-Thomson Porous Plug Experiment, Joule-Thomson Effect for Real and Van der Waal Gases, Temperature of Inversion, Joule-Thomson Cooling

Text Books:

- 1 Thermal Physics, A. B. Gupta (Books and allied Ltd)-2010
- 2 Heat and Thermodynamics, M.W. Zemansky, Richard Dittman (McGraw- Hill)-1981

Reference Books:

- 1 Theory and experiments on thermal Physics, P.K.Chakrabarty (New central book agency limited)-2017

- 2 Thermodynamics, Kinetic Theory and Statistical Thermodynamics-
Sears and Salinger(Narosa)-1988
- 3 A Treatise on Heat- Meghnad Saha and B.N.Srivastava (The Indian
Press) Heat, Thermodynamics and Statistical Physics, N.Subrahmanyam
and Brij Lal (S.Chand Publishing)-2008
- 4 Thermal and Statistical Physics M.Das, P.K. Jena, S. Mishra,
R.N.Mishra (Shri Krishna Publication)-2009

CORE PAPER-VI LAB

(minimum 5 experiments are to be done):

- 1 To determine Mechanical Equivalent of Heat, J, by Callender and Barnes
constant flow method.
- 2 To determine the Coefficient of Thermal Conductivity of a bad
conductor by Lee and Charltons disc method.
- 3 To determine the Temperature Coefficient of Resistance by Platinum
Resistance Thermometer (PRT).
- 4 To study the variation of Thermo-emf of a Thermocouple with Difference of
Temperature of its Two Junctions.
- 5 To determine the specific heat of liquid by the method of cooling
- 6 To determine the specific heat of solid by applying radiation correction.

Reference Books:

- 1 Advanced Practical Physics for students, B. L. Flint and H.T. Worsnop,
1971, Asia Publishing House
- 2 A Text Book of Practical Physics, I. Prakash and Ramakrishna, 11th
Ed., 2011, Kitab Mahal
- 3 Advanced level Physics Practicals, Michael Nelson and Jon M.Ogborn,
4th Edition, reprinted 1985, Heinemann Educational Publishers
- 4 A Laboratory Manual of Physics for undergraduate classes, D.P.Khandelwal,
1985, Vani Publications.

CORE PAPER-VII
ANALOG SYSTEMS AND APPLICATIONS

UNIT-I

Semiconductor Diodes: P and N type semiconductors, energy level diagram, conductivity and Mobility, Concept of Drift velocity, PN junction fabrication (simple idea), Barrier formation in PN Junction Diode, Static and Dynamic Resistance, Current flow mechanism in Forward and Reverse Biased Diode, Drift velocity, derivation for Barrier Potential, Barrier Width and current Step Junction.

Two terminal device and their applications: (1) Rectifier Diode: Half-wave Rectifiers, center-tapped and bridge type Full-wave Rectifiers, Calculation of Ripple Factor and Rectification Efficiency, L and C Filters (2) Zener Diode and Voltage Regulation, Principle and structure of LEDs, (2) Photo diode (3) Solar Cell.

UNIT II

Bipolar Junction Transistors: n-p-n and p-n-p transistors, Characteristics of CB, CE and CC Configurations, Current gains a and b , Relation between a and b , Load line analysis of Transistors, DC Load line and Q-point, Physical mechanism of current flow, Active, Cut-off and Saturation Regions.

Transistors Biasing: Transistor Biasing and Stabilization circuits, Fixed Bias and Voltage Divider Bias.

Amplifiers: Transistors as 2-port network h-parameter Equivalent Circuit, Analysis of a single stage CE amplifier using Hybrid Model, Input and Output impedance, Current, Voltage and Power Gains, Classification of class A, B and C amplifiers, Push-pull amplifier (class B)

UNIT-III

Coupled Amplifier: RC-coupled amplifier and its frequency response.

Feedback in Amplifiers: Effect of Positive and Negative Feedback on Input Impedance, Output Impedance, Gain Stability, Distortion and Noise. Sinusoidal Oscillations: Barkhausen's Criterion for self-sustained oscillations. RC Phase shift oscillator, determination of Frequency, Hartley and Colpitt's oscillators.

UNIT-IV

Operational Amplifiers (Black Box approach): Characteristics of an Ideal and Practical OP-AMP (IC741). Open-loop and Closed loop Gain. Frequency Response. CMRR, Slew Rate and concept of virtual ground.

Application of Op-Amps: (1) Inverting and non-inverting amplifiers (2) Adder (3) Subtractor (4) Differentiator, (5) Integrator (6) Log amplifier, (7) Zero crossing detector (8) Wein bridge oscillator.

Text Books:

1. Foundations of Electronics-Raskhit and Chattopadhyay (New age International Publication), 15th Edition-2018

2. Concept of Electronics- D.C.Tayal (Himalay Publication)-2018

Reference Books:

1. Electronic devices and circuits R.L.Boylstad (Pearson India)-2009
2. Electronic Principles- A.P.Malvino (Tata McGraw Hill)-2008
3. Electronic Devices and Circuits- S.Salivahar and NS Kumar -(Tata McGraw Hill) 3rd Edition-2012
4. OP-Amps and Linear Integrated Circuit-R. A. Gayakwad (Prentice Hall) 4th Edition, 2000
5. Physics of Semiconductor devices, Donald A Neamen (PrenticeHall)
- 6.

CORE PAPER-VII LAB

(minimum 5 experiments are to be done)

- 1 To study the V-I characteristics of a Zener diode and its use as voltage regulator.
- 2 Study of V-I and power curves of solar cells, and find maximum power point and efficiency.
- 3 To study the characteristics of a Bipolar Junction Transistor in CE configuration and draw load line
- 4 To study the various biasing configurations of BJT for normal class A operation.
- 5 To study the frequency response of voltage gain of a RC-coupled transistor amplifier.
- 6 To design and study OP Amp-IC (741/351) as inverting and non inverting amplifier
- 7 To design and study OP Amp-IC (741/351) as integrator and differentiation and study frequency response.
- 8 To design and study OP Amp-IC (741/351) as adder and subtractor.
- 9 To design a Wien bridge oscillator for given frequency using a non-amp.
- 0 To design a phase shift oscillator of given specifications using BJT.

- 1 To study the Colpitt's oscillator.

Reference Books:

- 1 Modern Digital Electronics, R.P. Jain, 4th Edition, 2010, Tata McGrawHill.
- 2 Basic Electronics: A text lab manual, P.B. Zbar, A.P. Malvino, M.A. Miller, 1994, Mc-Graw Hill.
- 3 Microprocessor Architecture Programming and applications with 8085, R.S. Goankar, 2002, Prentice Hall.
- 4 Microprocessor 8085:Architecture, Programming and interfacing, A. Wadhwa, 2010, PHI Learning.

CORE PAPER-VIII

MATHEMATICAL PHYSICS-III

The emphasis of the course is on applications in solving problems of interest to physicists. Students are to be examined on the basis of problems; known or unknown.

UNIT-I

Complex Analysis: Brief Revision of Complex Numbers and their Graphical Representation Eulers formula, De Moivre's theorem, Roots of complex Numbers, Functions of Complex Variables, Analyticity and Cauchy-Riemann Conditions, Examples of analytic functions, Singular functions: poles and branch points, order of singularity, branch cuts, Integration of a function of a complex variable, Cauchys Inequality, Cauchys Integral formula, Simply and multiply connected region, Laurent and Taylors expansion, Residues and Residue Theorem, Application in solving simple Definite Integrals.

UNIT-II

Integral Transforms-I: Fourier Transforms: Fourier Integral theorem, Fourier Transform, Examples, Fourier Transform of trigonometric, Gaussian, finite wave train and other functions, Representation of Dirac delta function as a Fourier Integral,

Fourier transform of derivatives, Inverse Fourier Transform.

UNIT-III

Integral Transforms-II : Convolution theorem, Properties of Fourier Transforms (translation, change of scale, complex conjugation), Three dimensional Fourier transforms with examples, Application of Fourier Transforms to differential equations: One dimensional Wave and Diffusion/Heat flow Equations.

UNIT-IV

Laplace Transforms: Laplace Transforms (LT) of Elementary functions,

Properties of Laplace Transforms: Change of Scale Theorem, Shifting Theorem, LTs of Derivatives and Integrals of Functions, Derivatives and Integrals of Functions, Derivatives and Integrals of LTs. LT of Unit Step function, Dirac Delta function, Periodic Functions, Inverse LT, Application of Laplace Transforms to Differential Equations: Damped Harmonic Oscillator, Simple Electrical Circuits.

Text Books:

- 1 Mathematical Methods for Physicists, G.B.Arken, H.J.Weber, F.E.Harris (2013,7th Edn., Elsevier)
- 2 Advanced Engineering Mathematics, Erwin Kreyszig (Wiley India) 10th Edition 2014

Reference Books:

- 1 Mathematical Physics and Special Relativity–M.Das, P.K. Jena and B.K. Dash (Srikrishna Prakashan)-2009
- 2 Mathematical Physics–H. K. Das, Dr. Rama Verma (S. Chand Publishing) 2011
- 3 Complex Variable: Schaum's Outlines Series M. Spiegel (2nd Edition , Mc-Graw Hill Education)-2004
- 4 Complex variables and applications J.W.Brown and R.V.Churchill 7th Edition 2003
- 5 Mathematical Physics, Satya Prakash (Sultan Chand)-2014
- 6 Mathematical Physics B.D.Gupta (4th edition, Vikas Publication)-2009

CORE PAPER-VIII LAB

20 classes (2 hrs. duration each)

Scilab based simulations (XCos) experiments based on Mathematical Physics problems like

- Solve Simple Differential Equations like

$$\frac{dy}{dx} = e^x, \text{ with } y(x=0) = 0$$

$$\frac{dy}{dx} = x^2$$

$$\frac{d^2 y}{dx^2} + e^x = x, \text{ with } y(x=0) = 0$$

$$\frac{d^2 y}{dx^2} + 2 \frac{dy}{dx} = -y, \text{ with } y(x=0) = 0, y'(x=0) = 1$$

$$y'' - x y' = 0$$

$$y'' + e^x = -y, \text{ with } y(x=0) = 0, y'(x=0) = 1$$

- Direct Delta Function

Evaluate $\int_{-3}^3 dx \frac{(x+3)}{\sqrt{2\pi\sigma^2}} e^{-\frac{(x-2)^2}{2\sigma^2}}$, for $\sigma = 0.1, 0.01, 0.001$ and show that it tends to 5.

• **Fourier Series:**

Program to sum

Evaluate the Fourier coefficients of a given periodic function (square wave)

• **Frobenius method and Special functions:**

$$\int_{-1}^1 d\mu P_n(\mu) P_m(\mu) = \frac{2}{2n+1} \delta_{m,n}$$

Plot $P_n(x)$, Legendre polynomial of degree n , and $J_n(x)$, Bessel function of first kind.

Show recursion relation

- Calculation of error for each data point of observations recorded in experiments done in previous semesters (choose any two).

- Calculation of least square fitting manually without giving weightage to error. Confirmation of least square fitting of data through computer program.

- Evaluation of trigonometric functions e.g. $\sin \theta$, Given Bessels function at N points find its value at an intermediate point.

Complex analysis: Calculate $\int \frac{dx}{(x^2+2)}$ and check it with computer integration.

- Integral transform: FFT of e^{-x^2}

Reference Books:

- 1 Mathematical Methods for Physics and Engineers, K.F Riley, M.P.Hobson and S. J. Bence, 3rd ed., 2006, Cambridge University Press
- 2 Mathematics for Physicists, P.Dennery and.Krzywicki,1967,Dover Publications
- 3 Simulation of ODE/PDE Models with MATLAB, OCTAVE and SCILAB: Scientific and Engineering Applications: A. Vande Wouwer, P. Saucez, C. V. Fernandez. 2014 Springer ISBN: 978-3319067896
- 4 Scilab by example: M. Affouf, 2012. ISBN: 978-1479203444
- 5 Scilab(A free software to matlab):H.Ramchandran, A.S.Nair. 2011 S. Chand and Company
- 6 Scilab Image Processing: Lambert M. Surhone. 2010 Beta script Publishing

CORE PAPER-IX

ELEMENTS OF MODERN PHYSICS

UNIT- I

Atomic Spectra and Models: Inadequacy of classical physics, Brief Review of Black body Radiation, Photoelectric effect, Compton Effect, dual nature of radiation wave nature of particles, Atomic spectra, Line spectra of hydrogen atom, Ritz Rydberg combination principle, Alpha Particle Scattering, Rutherford Scattering Formula, Rutherford Model of atom and its limitations.

Atomic Model: Bohrs Model of Hydrogen atom, explanation of atomic spectra, correction for finite mass of the nucleus, Bohr correspondence principle, limitations of Bohr model, discrete energy exchange by atom, Frank Hertz Experiment, Sommerfelds modification of Bohr's Theory.

UNIT- II

Wave Packet: superposition of two waves, phase velocity and group velocity, wave packets, Gaussian Wave Packet, spatial distribution of wave packet, Localization of wave packet in time, Time development of a wave packet, Wave Particle Duality, Complementarity.

Wave Particle Duality: de Broglie hypothesis, Experimental confirmation of matter wave, Davisson Germer Experiment, velocity of deBroglie wave, wave particle duality, Complementarity.

Uncertainty Principle: Heisenberg Uncertainty Principle, Illustration of the Principle through thought Experiments of Gamma ray microscope and electron diffraction through a slit, Estimation of ground state energy of harmonic oscillator and hydrogen atom, non existence of electron in the nucleus, Uncertainty and complementarities.

UNIT- III

Nuclear Physics- I: Size and structure of atomic nucleus and its relation with atomic weight, Impossibility of an electron being in the nucleus as a consequence of the uncertainty principle, Nature of the nuclear force, NZ graph, Liquid Drop model: semi empirical mass formula and binding energy, Nuclear Shell Model and magic numbers.

UNIT- IV

Nuclear Physics- II: Radioactivity, stability of the nucleus, Law of radioactive decay, Mean life and Half life Alpha decay, Beta decay-energy released, spectrum and Paulis prediction of neutrino, Gamma ray emission energy-momentum conservation: electron-positron pair creation by gamma photons in the vicinity of a nucleus, Fission and fusion mass deficit, relativity and generation of energy, Fission- nature of fragments and emission of neutrons, Nuclear reactor: slow neutron interacting with Uranium 235, Fusion and thermo nuclear reactions driving stellar energy (brief qualitative discussion).

Text Books:

1. Concepts of Modern Physics Arthur Beiser (McGraw Hill)-2002
2. Modern Physics Murugesan and Sivaprasad (S.Chand) 18th Edition 2016

Reference Books:

1. QuantumMechanics:TheoryandApplications,A.K.GhatakandS.Lokanathan, (Macmillan)-2004
2. Introduction to Quantum Theory, David Park (Dover Publications)-1974
3. Theory and Problems of Modern Physics, Schaum's outline, R.Gautreau and W.Savin- (Tata McGraw-Hill) 2nd Edition
4. Physics for scientists and engineer with Modern Physics-Jewell and Serway- (CENGAGE Learnings) 2010.
5. Modern Physics of Atoms and Molecules Bransden and Joachim (Pearson India)-2003
6. Atomic and Nuclear Physics-A.B.Gupta (New Central)-2009
7. Theoretical Nuclear Physics , J.M.Blatt and V.F. Weisskof (Springer)-2003

CORE PAPER-IX LAB

(minimum 4 experiments are to be done):

1. To show the tunneling effect in tunnel diode using I-V characteristics.
2. To determine the wavelength of laser source using diffraction of single slit.

3. To determine the wavelength of laser source using diffraction of double slits.
4. To determine (1) wavelength and (2) angular spread of He-Ne laser using plane diffraction grating.
5. To determine the Plancks constant using LEDs of at least 4 different colours.
6. To determine the value of e/m by (a) Magnetic focusing or (b) Bar magnet.
7. To setup the Millikan oil drop apparatus and determine the charge of an electron.

Reference Books:

- 1 Advanced Practical Physics for students, B.L. Flint and H.T. Worsnop, 1971, Asia Publishing House
- 2 Advanced level Physics Practicals, Michael Nelson and Jon M. Ogborn, 4th Edition, reprinted 1985, Heinemann Educational Publishers
- 3 A Text Books Book of Practical Physics, I. Prakashand Ramakrishna, 11th Edn, 2011, Kitab Mahal

CORE PAPER-X

DIGITAL SYSTEMS AND APPLICATIONS

UNIT-I

Integrated Circuits (Qualitative treatment only): Active and Passive Components, Discrete components, Wafer Chip, Advantages and Drawbacks of ICs, Scale of

Integration: SSI, MSI, LSI and VLSI (basic idea and definitions only), Classification of ICs, Examples of Linear and Digital ICs.

Digital Circuits: Difference between Analog and Digital Circuits, Binary Numbers, Decimal to Binary and Binary to Decimal Conversation, BCD, Octal and Hexadecimal numbers, AND, OR and NOT. Gates (realization using Diodes and Transistor), NAND and NOR Gates as Universal Gates, XOR and XNOR Gates and application as Parity Checkers.

UNIT-II

Boolean algebra: De Morgans Theorems: Boolean Laws, Simplification of Logic

Circuit using Boolean Algebra, Fundamental Products, Idea of Minterms and Maxterms, Conversion of a Truth table into Equivalent Logic Circuit by

(1) Sum of Products Method and (2) Karnaugh Map.

Introduction to CRO: Block Diagram of CRO, Electron Gun, Deflection system and Time Base, Deflection Sensitivity,

Applications of CRO: (1) Study of Wave Form, (2) Measurement of Voltage, Current, Frequency and Phase Difference.

UNIT-III

Data Processing Circuits: Basic Idea of Multiplexers, De-multiplexers, Decoders, Encoders.

Arithmetic Circuits: Binary Addition. Binary Subtraction using 2s complement. Half and Full Adders. Half and Full Subtractors, 4 bit binary Adder/ Subtractor.

Timers: IC 555: block diagram and application is Astable multivibrator and Monostable multivibrator.

UNIT-IV

Introduction to Computer Organization: Input/output Devices, Data storage (idea of RAM and ROM), Computer memory, Memory organization and addressing, Memory Interfacing, Memory Map.

Shift registers: Serial-in-serial-out, Serial-in-Parallel-out, Parallel-in-Serial- out and Parallel-in-Parallel-out. Shift Registers (only up to 4 bits)

Counters (4 bits): Ring Counter, Asynchronous counters, Decade Counter. Synchronous Counter.

Text Books:

1. Foundation of Electronics-Rakshit Chattopadhyaya (New Age) -2015
2. Digital Circuits and Logic design: Samuel C. Lee(Printice Hall)-1976
3. Digital Principles and Applications - A.P. Malvino, D.P.Leach and Saha (Tata McGraw)- 7th Edition 2011

Reference Books:

1. The Art of Electronics by Paul Horowitz and Wilfield Hill ,Cambridge University -2006
2. Electronics by Allan R. Hambley, Prentice Hall - 1994
3. Digital Logic and Computer design M. Morris Mano (Pearson) -2016
4. Concepts of Electronics D.C.Tayal (Himalaya Publishing house) -2018

CORE PAPER--X LAB

(minimum 6 experiments are to be done):

1. Student should know how to measure (a) Voltage, and (b) Time period of a periodic waveform using CRO and to test a Diode and Transistor using a Millimeter.
2. To design a switch (NOT gate) using a transistor.
3. To verify and design AND, OR, NOT and XOR gates using NAND gates.
4. Half Adder, Full Adder and 4-bit binary Adder.
5. Half Subtractor, Full Subtractor, Adder- Subtractor using Full Adder I.C.
6. To build Flip-Flop(RS,Clocked RS,D- type and JK) circuits using NAND gates.
7. To design an stable multivibrator of given specifications using 555 Timer.
8. To design a monostable multivibrator of given specifications using 555 Timer.

Reference Books:

- 1 Basic Electronics: A Text Books lab manual, P.B. Zbar, A.P. Malvino,
- 2 M.A. Miller, 1994, Mc-Graw Hill.
- 3 OP-Amps and Linear Integrated Circuit, R. A. Gayakwad, 4th edition, 2000, Prentice Hall.
- 4 Electronic Principle, Albert Malvino, 2008, Tata Mc-Graw Hill.
Electronic Devices and circuit Theory, R.L.Boylestad and L.D. Nashelsky, 2009, Pearson

CORE PAPER-XI

QUANTUM MECHANICS AND APPLICATIONS

UNIT-I

Schrodinger equation : Time dependent Schrodinger equation , Properties of Wave Function, Interpretation of wave function, Probability and probability current densities in three dimensions, Conditions for Physical Acceptability of Wave Function, Normalization, Linearity and Superposition Principles. Wave function of a free particle ,Wave Packet, Fourier Transform and momentum space Wave function ,Spread of Gaussian Wave packet, Evolution with time, Position and Momentum Uncertainty.

UNIT-II

Operators: Operators, Commutator Algebra, Position, Momentum Angular Momentum and Energy operators, Hermitian Operators, Expectation values of position and momentum, Ehrenfest Theorem, Eigenvalues and Eigen functions of Hermitian Operator, Energy Eigen Spectrum, Degeneracy, Orthonormality of Eigen functions, Linear Dependence. Orthogonalisation.

UNIT-III

Time Independent Schrodinger equation in one dimension (1d), 2d and 3d, Hamiltonian, stationary states and energy eigen values, expansion of an arbitrary wave function as a linear combination of energy eigen functions, General solution of the time dependent Schrodinger equation in terms of linear combinations of stationary states. General Discussion of Bound states in an arbitrary potential: Continuity of wave function, Boundary condition and emergence of discrete energy levels, Application to one dimensional problem-Square well potential, Quantum mechanics of simple Harmonic Oscillator-Energy Levels and energy eigen functions, ground state, zero point energy and uncertainty principle, One dimensional infinitely rigid box energy eigen values and eigen functions, normalization, quantum dot as example, Quantum mechanical scattering and tunnelling in one dimension across a step potential and rectangular potential barrier.

UNIT-IV

Atoms in Electric and Magnetic Fields: Electron angular momentum. Space quantization, Electron Spin and Spin Angular Momentum, Larmors Theorem, Spin Magnetic Moment, Stern Gerlach Experiment, Vector Atom Model, L-S and J-J coupling, Zeeman Effect, Electron Magnetic Moment and Magnetic Energy, Gyro magnetic Ratio and Bohr Magnet on Atoms in External Magnetic Fields:- Normal and Anomalous Zeeman Effect, Paschenback and Stark Effect (qualitative Discussion only)

Text Books:

1. Introduction to Quantum Theory, D. J. Griffiths(Pearson)-2015
2. Introduction to Quantum Theory David Park (Dover Publications)-1974

Reference Books :

1. Quantum Mechanics, Theory and applications A. Ghatak and S. Lokanathan (McMillan India)-2004
2. Quantum Mechanics-G.Aruldas (Printice Hall of India)-2008
3. Quantum Physics–S. Gasiorowicz (Wiley)-2007
4. Quantum Mechanics -J.L. Powell and B. Craseman (Narosa)-1998
5. Introduction to Quantum Mechanics M.Das and P.K.Jena (Shri Krishna Publication)-2006

CORE PAPER- XI LAB

Mechanics like (Use finite difference method, matrix method, ODE Solver method

1. Solva the s-nave 8elmqliqgar equation for the ground state and the first excited state of the hydrogen atom:

$$\frac{d^2y}{dr^2} = A(r)u(r), \quad A(r) = \frac{2m}{\hbar^2}[V(r) - E], \quad V(r) = -\frac{e^2}{r},$$

whera m é the reduced mass of the electron. Obtain the energy eigenvalues and pbt theorr«spoadiag mive tiln«nioas. Raneaber that thegroud ask e«portbe b@oga atoa b

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2. Solw the radial \$thmdiager Ignition & an stm:

3.9. Solve the radial Schrödinger equation for a particle of mass m in a potential $V(r) = -\frac{A}{r} + \frac{B}{r^2}$, where $A = 1.0 \text{ eV} \cdot \text{Å}$ and $B = 0.5 \text{ eV} \cdot \text{Å}^2$. Find the lowest energy level (in eV) of the particle to an accuracy of three significant digits. Also plot the corresponding wave function.

3.10. Solve the radial Schrödinger equation for a particle of mass m in a potential $V(r) = -\frac{A}{r} + \frac{B}{r^2}$, where $A = 1.0 \text{ eV} \cdot \text{Å}$ and $B = 0.5 \text{ eV} \cdot \text{Å}^2$. Find the lowest energy level (in eV) of the particle to an accuracy of three significant digits. Also plot the corresponding wave function.

3.11. Solve the radial Schrödinger equation for a particle of mass m in a potential $V(r) = -\frac{A}{r} + \frac{B}{r^2}$, where $A = 1.0 \text{ eV} \cdot \text{Å}$ and $B = 0.5 \text{ eV} \cdot \text{Å}^2$. Find the lowest energy level (in eV) of the particle to an accuracy of three significant digits. Also plot the corresponding wave function.

The ground state energy is expected to be above -12 eV in all three cases.

3.12. Solve the radial Schrödinger equation for a particle of mass m in a potential $V(r) = -\frac{A}{r} + \frac{B}{r^2}$, where $A = 1.0 \text{ eV} \cdot \text{Å}$ and $B = 0.5 \text{ eV} \cdot \text{Å}^2$. Find the lowest energy level (in eV) of the particle to an accuracy of three significant digits. Also plot the corresponding wave function.

The ground state energy is expected to be above -12 eV in all three cases.

3.13. Solve the radial Schrödinger equation for a particle of mass m in a potential $V(r) = -\frac{A}{r} + \frac{B}{r^2}$, where $A = 1.0 \text{ eV} \cdot \text{Å}$ and $B = 0.5 \text{ eV} \cdot \text{Å}^2$. Find the lowest energy level (in eV) of the particle to an accuracy of three significant digits. Also plot the corresponding wave function.

The ground state energy is expected to be above -12 eV in all three cases.

4. Solve the s-wave radial Schrödinger equation for the vibrations of hydrogen molecule: $\frac{d^2 u}{dr^2} = A(r)u(r)$, $A(r) = \frac{2m}{\hbar^2} [V(r) - E]$, where m is the reduced mass of the two-atom system for the Morse potential $V(r) = D(e^{-2\alpha r} - e^{-\alpha r})^2$, where $r = r - r_0$. Find the lowest vibrational energy (in MeV) of the molecule to an accuracy of three significant digits. Also plot the corresponding wave functions for the choices given below:

a) $m = 940 \times 10^6 \text{ eV}/c^2$, $D = 0.755501 \text{ eV}$, $\alpha = 1.44$, $r_0 = 0.131349 \text{ Å}$

b) $m = 940 \times 106 \text{ eV}/c^2$, $D = 0.755501 \text{ eV}$, $\alpha = 1.44$, $r_0 = 0.131349 \text{ Å}$

Laboratory Based Experiments : (to be taken up depending on availability of equipment)

1. Study of Electron spin resonance- determine magnetic field as a function of the resonance frequency
2. Study of Zeeman effect: with external magnetic field; Hyper fine splitting
3. To show the tunneling effect in tunnel diode using I-V characteristics.
4. Quantum efficiency of CCDs

Reference Books:

1. Schaum's outline of Programming with C++. J. Hubbard, 2000, McGraw-Hill Publication
2. Numerical Recipes in C: The Art of Scientific Computing, W.H. Press et al., 3rd Edition., 2007, Cambridge University Press.

- 3 An introduction to computational Physics, T. Pang, 2nd Edn.,2006, Cambridge Univ. Press
- 4 Simulation of ODE/PDE Models with MATLAB, OCTAVE and SCILAB: Scientific and Engineering Applications: A. Vande Wouwer, P. Saucez, C. V. Fernandez.2014 Springer.
- 5 Scilab(A Free Software to Matlab): H. Ramchandran, A.S. Nair. 2011S. Chand and Co.
- 6 Scilab Image Processing: L.M.Surhone.2010 Beta script Publishing ISBN:9786133459274

CORE PAPER-XII

SOLID STATE PHYSICS

UNIT-I

Crystal Structure: Solids, Amorphous and Crystalline Materials, Lattice translation Vectors, Lattice with a Basis. Central and Non-Central Elements. Unit Cell, Miller Indices, Types of Lattices, Reciprocal Lattice, Brillouin zones, Diffraction of X-rays by crystals, Bragg Law, Atomic and Geometrical Factor

UNIT-II

Elementary Lattice Dynamics: Lattice Vibrations and Phonons: Linear, Monatomic and Diatomic Chains, Acoustical and Optical Phonons, Qualitative Description of the phonon spectrum in solids, Dulong and Petits Law, Einstein and Debye theories of specific heat of solids, T^3 Law

Magnetic Properties of Matter: Dia-, Para-, Ferri- and Ferromagnetic Materials, Classical Langevins theory of dia and Paramagnetic Domains, Curies law, Weiss Theory of Ferro magnetism and Ferro magnetic Domains, Discussion of B-H Curve, Hysteresis and Energy Loss.

UNIT-III

Dielectric Properties of Materials: Polarization Local Electrical Field at an Atom, Depolarization Field, Electric Susceptibility, Polarizability, Clausius

Mosotti Equation, Classical theory of Electronic Polarizability.

Lasers: Einsteins A and B coefficients, Meta stable States, Spontaneous and Stimulated emissions, Optical Pumping and population Inversion, Three Level and Four Level Lasers, Ruby Laser and He-Ne Laser.

UNIT-IV

Elementary band theory: Kronig-Penny model of band Gap, Conductor, Semiconductor (P and N type) and insulator, Conductivity of Semiconductor, mobility, Hall Effect, Measurement of conductivity (04 problem method) and Hall Coefficient.

Superconductivity: Experimental Results, Critical Temperature, Critical magnetic field, Meissner effect, Type I and type II Superconductors, Londons Equation and Penetration Depth, Isotope effect, Idea of BCS theory (No derivation)

Text Books:

1. Introduction to Solid State Physics- Charles Kittel (Wiley India) 8th Edition 2012
2. LASERS: Fundamentals and Applications-Thyagarajan and Ghatak (McMillan India)-2011

Reference Books:

1. Solid State Physics-N. W. Ashcroft and N.D. Mermin(Cengage)-2003
2. Solid State Physics- R.K.Puri and V.K. Babbar (S.Chand Publication)-2010
3. Solid State Physics S. O. Pillai (New Age Publication)-2008
4. Lasers and Non linear Optics B.B.Laud (Wiley Eastern)-2011
5. Elements of Solid State Physics-J.P. Srivastava (Prentice Hall of India)-2014
6. Elementary Solid State Physics-Ali Omar (Addison Wiley)-2002

CORE PAPER-XII LAB

(**minimum 4 experiments are to be done**)

1. Measurement of susceptibility of paramagnetic solution (Quinck's Tube-Method)

2. To measure the Magnetic susceptibility of Solids.
3. To measure the Dielectric Constant of a dielectric Materials and variation with frequency
4. To determine the Hall coefficient of a semiconductor sample.
5. To draw the BH curve of Fe using solenoid and to determine the energy loss from Hysteresis
6. To measure the resistivity and band gap of a given semiconductor by four-probe method.
7. To study PE hysteresis loop of a ferroelectric crystal

Reference Books:

- 1 Advanced Practical Physics for students, B.L. Flint and H.T. Worsnop, 1971, Asia Publishing House.
- 2 Advanced level Physics Practicals, Michael Nelson and Jon M. Ogborn, 4th Edition, reprinted 1985, Heinemann Educational Publishers.
- 3 A Text Books Book of Practical Physics, I. Prakash and Ramakrishna, 11 Ed., 2011, Kitab Mahal
- 4 Elements of Solid State Physics, J.P. Srivastava, 2nd Ed., 2006, Prentice- Hall of India.

CORE PAPER-XIII

ELECTROMAGNETIC THEORY

Maxwell Equations: Maxwell's equations, Displacement Current, Vector and Scalar Potentials, Gauge Transformations: Lorentz and Coulomb Gauge, Boundary Conditions at Interface between Different Media, Wave Equations, Plane Waves in Dielectric Media, Poynting Theorem and Poynting Vector, Electro- magnetic (EM) Energy Density, Physical Concept of Electromagnetic Field Energy Density

UNIT-II

EM Wave Propagation in Unbounded Media: Plane EM waves through vacuum and isotropic dielectric medium, transverse nature of plane EM waves,

refractive index and dielectric constant, wave impedance, Propagation through conducting media, relaxation time, skin depth, Electrical conductivity of ionized gases, plasma frequency, refractive index, skin depth, application to propagation through ionosphere.

UNIT-III

EM Wave in Bounded Media: Boundary conditions at a plane interface between two media, Reflection and Refraction of plane waves at plane interface between two dielectric media, Laws of Reflection and Refraction, Fresnel's Formulae for perpendicular and parallel polarization cases, Brewster's law, Reflection and Transmission coefficients, Total internal reflection, evanescent waves, Metallic reflection (normal Incidence)

UNIT IV

Polarization of Electromagnetic Waves: Description of Linear, Circular and Elliptical Polarization, Uniaxial and Biaxial Crystals, Light Propagation in Uniaxial Crystal, Double Refraction, Polarization by Double Refraction, Nicol Prism, Ordinary and extraordinary refractive indices, Production and detection of Plane, Circularly and Elliptically Polarized Light,

Phase Retardation Plates: Quarter-Wave and Half- Wave Plates. Babinet's Compensator and its Uses, Analysis of Polarized Light.

Rotatory Polarization: Optical Rotation, Biot's Laws for Rotatory Polarization, Fresnel's Theory of optical rotation, Calculation of angle of rotation, Experimental verification of Fresnel's theory, Specific rotation, Laurent's half-shade polarimeter.

Text Books:

1. Introduction to Electrodynamics, D.J. Griffiths (Pearson)-2015
2. Principles of Optics- Max Born and E. Wolf- Cambridge University Press-1999

Reference Books:

1. Classical Electrodynamics by J.D. Jackson (Willey)-2007
2. Foundation of electromagnetic theory: Ritz and Milford(Pearson)-2008
3. Electricity and Magnetism : D C Tayal (Himalaya Publication)-2014
4. Optics : A.K.Ghatak (McGraw Hill Education)- 2017
5. Electricity and Magnetism: Chattopadhyaya, Rakhit (New Central)-2018

CORE PAPER XIII LAB

(minimum 4 experiments are to be done):

1. To verify the law of Malus for plane polarized light.
2. To determine the specific rotation of sugar solution using Polarimeter.
3. To analyze elliptically polarized Light by using a Babinet's compensator.
4. To determine the refractive index of liquid by total internal reflection using Wollaston's film.
5. To determine the refractive Index of (1) glass and (2) a liquid by total internal reflection using a Gaussian eye piece.
6. To study the polarization of light by reflection and determine the polarizing angle for air-glass interface.
7. To verify the Stefan's law of radiation and to determine Stefan's constant.
8. To determine the Boltzmann constant using V-I characteristics of PN junction diode.
9. To determine wavelength and velocity of ultrasonic wave in liquid.

Reference Books:

1. Advanced Practical Physics for students, B.L. Flint and H.T. Worsnop, 1971, Asia Publishing House.
2. Advanced level Physics Practicals, Michael Nelson and Jon M. Ogborn, 4th Edition, reprinted 1985, Heinemann Educational Publishers
3. A Text Books Book of Practical Physics, I. Prakash and Ramakrishna, 11 Ed., 2011, Kitab Mahal Electromagnetic Field Theory for Engineers and Physicists, G. Lehner, 2010, Springer

CORE PAPER-XIV

STATISTICAL MECHANICS

UNIT- I

Classical Statistics-I: Macrostate and Microstate, Elementary Concept of Ensemble, Micro canonical, Canonical and Grand Canonical ensemble, Phase Space, Entropy and Thermodynamic Probability, Maxwell-Boltzmann Distribution Law, Partition Function.

UNIT- II

Classical Statistics-II : Thermodynamic Functions of an Ideal Gas, classical Entropy Expression, Gibbs Paradox, Sackur Tetrode equation, Law of equi partition of Energy (with proof)- Applications to Specific Heat and its Limitations, Thermodynamic Functions of a two energy levels system, Negative Temperature.

UNIT-III

Quantum Statistics: Identical particles, macrostates and microstates, Fermions and Bosons, Bose Einstein distribution function and Fermi- Dirac distribution function. Bose- Einstein Condensation, Bose deviation from Plancks law, Effect of temperature on Fermi-Dirac distribution function, degenerate Fermi gas, Density of States Fermi energy.

UNIT-IV

Radiation: Properties of Thermal Radiation, Blackbody Radiation, Pure Temperature dependence, Kirchhoffs law, Stefan Boltzmann law: Thermodynamic proof, Radiation Pressure, Weins Displacement law, Wiens distribution Law, Sahas Ionization Formula, Rayleigh Jeans Law, Ultra Violet catastrophe.

Plancks Law of Black body Radiation: Experimental verification, Deduction of (1) Wiens Distribution Law, (2) Rayleigh Jeans Law, (3) Stefan Boltzmann Law, (4) Weins Displacement Law from Plancks Law.

Text Books:

1. Introduction to Statistical Physics by Kerson Huang(Wiley).-2008
2. Statistical Physics ,Berkeley Physics Course, F.Reif (Tata McGraw-Hill)-2017

ReferenceBooks:

1. Statistical Mechanics, B.K.Agarwal and Melvin Eisner (New Age International)-2013
2. Thermodynamics, Kinetic Theory and Statistical Thermodynamics: Francis W.Sears and Gerhard L. Salinger (Narosa) 1998
3. Statistical Mechanics: R.K.Pathria and Paul D. Beale (Academic Press)-2011

CORE PAPER-XIV LAB

Use C/C++/ Sci lab for solving the problems based on Statistical Mechanics like

1. Plot Plancks law for Black Body radiation and compare it with Weins law and find Wein's constant and Stefanconstant
2. plot Raleigh-Jeans Law at high temperature (room temperature) and low temperature.
3. Plot Specific Heat of Solids by comparing (a) Dulong-Petit law, (b) Einstein distribution function, (c) Debye distribution function for high temperature (room temperature) and low temperature and compare them for these two cases
4. Plot Maxwell-Boltzmann distribution function
5. Plot Fermi-Dirac distribution function
6. Plot Bose-Einstein distribution function.

Reference Books:

1. Elem•entary Numerical Analysis, K.E. Atkinson, 3rdEdn. 2007, Wiley India Edition
2. Statis•tical Mechanics, R.K. Pathria, Butterworth Heinemann: 2nd Edition,

- 1996, Oxford University Press.
3. Thermodynamics, Kinetic Theory and Statistical Thermodynamics, Francis W. Sears and Gerhard L. Salinger, 1986, Narosa.
 4. Modern Thermodynamics with Statistical Mechanics, Carl S. Helrich, 2009, Springer
 5. Simulation of ODE/PDE Models with MATLAB, OCTAVE and SCILAB: Scientific and Engineering Applications: A. Vande Wouwer, P. Saucez, C. V. Fernandez. 2014 Springer ISBN: 978-3319067896
 6. Scilab by example: M. Affouf, 2012. ISBN:978-1479203444
 7. Scilab Image Processing:L. M.Surhone. 2010, Betascript Pub., ISBN: 978-6133459274

Discipline Specific Elective Paper-1

CLASSICAL DYNAMICS

The emphasis of the course is on applications in solving problems of interest to physicists. Students are to be examined on the basis of problems, seen and unseen.

UNIT-I

Generalised co-ordinates and Velocities, Generalised Force, Principle of virtual work Derivation of Lagranges equation of motion from D Alemberts Principles, Lagrangian and its Application to Simple, Compound and Double Pendulums, Single Particle in Space, At woods Machine, Dumbbell, Linear harmonic oscillator.

UNIT-II

Hamiltons Principle, Calculus of Variation and derivation of Euler-Lagranges equation, Langranges Equations derived from Hamiltons Principles, Hamiltoian and its applications to Shortest Distance between two points in a plane, Geodesic

Problem, minimum surface of revolution, Brachistochrone problem, The Equations of motion and first integrals, The equivalent one-dimensional problem and classification of orbits, canonical momenta, Hamilton's equations of motion, Motion of charged particles in external electric and magnetic fields, Applications to central force motion and coupled oscillators.

UNIT- III

Special theory of Relativity (Postulates of special theory of relativity), Lorentz transformations, Minkowski space, The invariant interval, light cone and world lines, space time diagrams, Time-dilation, length contraction and Twin paradox, Variation of mass with velocity mass energy relation

UNIT- IV

Four Vectors: Space Like, Time-like and light-like. Four velocity and acceleration, Four momentum and energy-momentum relation. Doppler effects from a four vector perspective, Concept of four-force, Conservation of four momentum, Application to two body decay of an unstable particle

Text Books:

1. Classical Mechanics, H. Goldstein, C.P. Poole, J.L. Safko (Pearson) - 2012.
2. Classical Mechanics N C Rana and P S Joag.-2017

Reference Books:

1. Mechanics-D.S.Mathur (Sultan Chand)-2000
2. Solved problems in Classical Mechanics, O.L. Delange and J.Pierrus (Oxford Press)(2010)
3. Classical Mechanics-M. Das, P.K. Jena, M. Bhuyan, R.N. Mishra(Srikrishna Prakashan)-2009
4. Mathematical Physics with Classical Mechanics-Satya Prakash (Sultan Chand and sons)-2014

5. Introduction to classical dynamics R.K.Takwale and S.Puranik (Tata McGraw Hill)-2017
6. Classical Mechanics J.C. Upadhyay (Himalayan Publisher)-2017
7. Classical Dynamics of particles and systems -S.T.Thorton and Marion (Cengage publication)-2012

Discipline Specific Elective Paper-II
Nuclear and Particle Physics

UNIT-I

General properties of Nuclei: Constituents of nucleus and their intrinsic properties, Quantitative facts about mass, radius, charge density (matter density), binding energy, average binding energy and its variation with mass number, main features of binding energy versus mass number curve, N/A plot, angular momentum, parity, magnetic moment electric moments, nuclear excited states.

Radioactivity decays: (a) Alpha decay: basics of alpha- decay processes, theory of alpha-emission, Gamow factor, Geiger Nuttall law (b) beta-decay: energy kinematics for beta-decay, positron emission, electron capture, neutrino hypothesis.

(c) Elementary idea of Gamma decay.

UNIT-II

Nuclear Models: Liquid drop model approach, semi empirical mass formula and significance of its various terms, conditions of nuclear stability, two nucleon separation energies, evidence for nuclear shell structure, nuclear magic number, basic assumption of shell models.

UNIT-III

Detector for nuclear radiations: Detector for nuclear radiations: Gas detectors: estimation of electric field, mobility of particle, for ionization chamber and GM Counter. Basic Principle of Scintillation Detectors and Construction of photo-

multiplier tube (PMT). Semiconductor Detectors (Si and Ge) for charge Particle and photo detection (Concept of charge carrier and mobility), neutron detector.

Particle Accelerators: Van-de Graff generator (Tandem Accelerator), Linear accelerator, Cyclotron, Synchrotrons

UNIT-IV

Particle Physics: Particle interactions, basic features, types of particles and its families,

Symmetries and conservation laws: Energy and momentum, angular momentum, parity, baryon number, Lepton number, Isospin, strangeness and charm, Elementary ideas of quarks and gluons.

Text Books:

1. Introduction to Nuclear Physics By Roy and Nigam-2014
2. Atomic and Nuclear Physics- N.Subramanyam, Brij Lal and Jivan Seshan (S. Chand Publishing)-2007

Reference Books:

1. Introduction to Modern Physics- H.S.Mani and G.K. Mehta(Affiliated east and west) -2018
2. Introductory nuclear Physics-Kenneth S. Krane (Wiley India Pvt. Ltd)-1987
3. Introduction to Elementary Particles-D. Griffith (John Wiley and Sons)-2008
4. Concepts of Nuclear Physics - Bernard L. Cohen. (Tata Mcgraw Hill). -2017
5. Concepts of Modern Physics-Arthur Beiser (McGraw Hill)-2017

Discipline Specific Elective Paper- III **Nano Materials and Applications**

UNIT-I

Nanoscale Systems: Length scales in physics, Nanostructures: 1D, 2D and 3D

nanostructures (nanodots, thin films, nanowires, nanorods), Band structure and density of states of materials at nanoscale, size effects in nano systems, Quantum confinement Applications of Schrodinger equation-infinite potential well, potential step, potential box, quantum confinement of carriers in 3D, 2D, 1D nanostructure and its consequences.

UNIT-II

Synthesis of Nanostructure Materials: Top down and bottoms up approach, Photo lithography Ball milling. Gas phase condensation, Vacuum deposition, Physical vapour deposition (PVT): Thermal evaporation, E-beam evaporation, Pulsed Laser deposition, Chemical vapour deposition (CVD), Sol-Gel Electrodeposition, Spraypyrolysis, Hydrothermal synthesis, Preparation through colloidal methods, MBE growth of quantum dots.

UNIT-III

Characterization: X-Ray Diffraction, Optical Microscopy, Scanning Electron Microscopy, Transmission Electron Microscopy, Atomic Force Microscopy, Scanning Tunneling Microscopy

UNIT-IV

Applications: Applications of nano particles, quantum dots, nanowires and thin films for photonic devices (LED, solar cells). Single electron devices (no derivation). CNT based transistors. Nonmaterial Devices: Quantum dots hetero structure lasers, optical switching and optical data storage. Magnetic quantum well; magnetic dots- magnetic data storage. Micro Electromechanical Systems (MEMS), Nano Electromechanical Systems (NEMS)

Text Books:

1. S.K. Kulkarni, Nanotechnology: Principles and Practices (Capital Publishing Company)-3rd Edition 2014

2. Nano science and nano technology, K.K. Choudhary (Narosa)-2016

Reference Books:

1. Nano Science and nano technology, Sundar Singh (Pragati Prakashan)-2017
2. C.P. Poole, Jr. Frank J. Owens, Introduction to Nanotechnology (Wiley India Pvt. Ltd.)-2007
3. Richard Booker, Earl Boysen, Nanotechnology(John Wiley and Sons)-2005
4. M. Hosokawa, K. Nogi, M. Naita, T. Yokoyama, Nanoparticle Technology Handbook (Elsevier, 2007)
5. K.K. Chattopadhyaya and A. N. Banerjee, Introduction to Nanoscience and Technology (PHI Learning Private Limited)-2009

Discipline Specific Elective Paper-1V

Project

OR

Basic Instrumentation

Basic Instrumentation

UNIT-I

Basic of Measurement: Instruments accuracy, precision, sensitivity, resolution range etc. Errors in measurements and loading effects.

Multimeter: Principles of measurement of dc voltage and dc current, ac voltage, ac current and resistance. Specifications of a multimeter and their significance.

Electronic Voltmeter: Advantage over conventional multimeter for voltage measurement with respect to input impedance and sensitivity. Principles of voltage measurement (block diagram only). Specifications of an electronic Voltmeter/ Multimeter and their significance.

AC mill voltmeter: Type of AC mill voltmeters: Amplifier- rectifier, and rectifier-amplifier. Block diagram ac mill voltmeter, specifications and their significance.

UNIT-II

Cathode Ray Oscilloscope: Block diagram of basic CRO. Construction of CRT, Electron gun, electrostatic focusing and acceleration (Explanation only no mathematical treatment), brief discussion on screen phosphor, visual persistence and chemical composition. Time base operation, synchronization. Front panel controls. Specifications of a CRO and their significance.

Use of CRO for the measurement of voltage (dc and ac frequency, time period. Special features of dual trace, introduction to digital oscilloscope, probes. Digital storage Oscilloscope: Block diagram and principle of working.

UNIT-III

Signal Generators and Analytical Instruments: Block diagram, explanation and specifications of low frequency signal generators, pulse generator, and function generator, Brief idea for testing, specifications, Distortion factor meter, wave analysis.

UNIT-IV

Digital Instruments: Principle and working of digital meters, Comparison of analog and digital instruments, Characteristics of a digital meter, Working principles of digital voltmeter.

Digital Multimeter: Block diagram and working of a digital multimeter, Working principle of time interval, frequency and period measurement using universal counter/frequency counter, time-base stability, accuracy and resolution.

The test of lab skills will be of the following test items:

1. Use of an oscilloscope.
2. CRO as a versatile measuring device.
3. Circuit tracing of Laboratory electronic equipment,
4. Use of Digital multimeter /VTVM for measuring voltages
5. Circuit tracing of Laboratory electronic equipment,
6. Winding a coil /transformer.

7. Study the layout of receiver circuit.
8. Trouble shooting a circuit
9. Balancing of bridges

Laboratory Exercises:

1. To observe the loading effect of a multimeter while measuring voltage across a low resistance and high resistance.
2. To observe the limitations of a multimeter for measuring high frequency voltage and currents.
3. To measure Q of a coil and its dependence on frequency, using a Q-meter.
4. Measurement of voltage, frequency, time period and phase angle using CRO.
5. Measurement of time period, frequency, average period using universal counter/ frequency counter.
6. Measurement of rise, fall and delay times using a CRO.
7. Measurement of distortion of a RF signal generator using distortion factor meter.
8. Measurement of R, L and C using a LCR bridge/universal bridge.

Open Ended Experiments:

1. Using a Dual Trace Oscilloscope
 2. Converting the range of a given measuring instrument (voltmeter, ammeter)
- More emphasis should be given on hands-on experiments.

Text Books:

1. A Text Books book of electrical technology-B.L.Theraja and A.K. Theraja (S. Chand Publishing)-2014
2. Digital circuits and systems Venugopal (Tata McGraw Hill)-2011

Reference Books :

1. Digital Electronics-Subrata Ghoshal (Cengage Learning)-2017
2. Electronic Devices and circuits - S. Salivahanan and N. S.Kumar (Tata Mc-Graw Hill)-2012
3. Electronic Devices-Thomas L. Floyd (Pearson)-2015

Additional Reference Books for Practical papers:

1. An advanced course in Practical Physics- Chattopadhyay, Rakshit-

Central-2013

2. Practical Physics-B.B.Swain (Kitab Mahal)-2014
3. Advanced practical Physics-B.Ghosh and KG Majumdar (Vol. I and II)-Shreedhar Publication-2004
4. A Laboratory Manual of Physics for Undergraduate Classes, D.P. Khandelwal (Vani Publication)-1985
5. B.Sc. Practical Physics- C.L.Arora (S.Chand Publishing)-2010
6. B.Sc. Practical Physics H. Singh and P.S. Hemne (S. Chand Publishing)-2002

GENERIC ELECTIVE (GE)

Generic Elective Paper I

(Mechanics and Properties of matter, Oscillation and Waves, Thermal Physics, Electricity and Magnetism and Electronics

UNIT-I

Mechanics and Properties of Matter

Moment of Inertia Parallel axis and perpendicular axis theorem, M.I. of a Solid sphere and Solid cylinder, Gravitational potential and field due to a thin spherical shell and a solid sphere at external points and internal points, Relation among elastic constants, depression at free end of a light cantilever, Surface tension, pressure, difference across a curved membrane, viscous flow, Poiseuille's formula.

UNIT-II

Oscillation and Waves

Simple harmonic motion, damped harmonic motion, under damped, over damped and critically damped motion, Forced vibration, Resonance, Wave equation in a medium, Velocity of Longitudinal waves in an elastic medium and velocity of transverse wave in a stretched string, Composition of SHM, Lissajous figures for

superposition of two orthogonal simple harmonic vibrations (a) with same frequency, (b) frequency with 2:1.

UNIT-III

Thermal Physics

Entropy, change in entropy in reversible and irreversible process, Carnot engine and its efficiency. Carnot Theorem, Second law of thermodynamics, Kelvin-Planck, Clausius formula. Thermal conductivity, differential equation for heat flow in one dimension, Maxwell thermodynamic relation (statement only), Clausius Clapeyron equation, Black body radiation, Planck radiation formula (No derivation).

UNIT-IV

Electricity and Magnetism

Gauss law of electrostatics, use of Gauss law to compute electrostatic field due to a linear charge distribution, Magnetic induction B, Lorentz force law, Biot Savarts law, Magnetic induction due to long straight current carrying conductor, and in the axis of a current carrying circular coil, Amperes Circuital law, its differential form, The law of electromagnetic equations, its differential and integral form, Maxwells electro-magnetic equations and their physical significance, Growth and decay of currents in LR and RC circuits, time constant, alternating currents in RC, RL and LCR circuits, impedance, power factor, resonance.

P-type and N-type semiconductors, PN-Junction as rectifier, Half wave and Full wave rectifiers (Bridge type), efficiency, ripple factor, use of RC, LC, and filters, working of PNP and NPN transistors, transistor configurations in CE and CB circuits and relation between α and β . JFET, its operation and characteristics of V-I curve.

Text Books:

1. Elements of Properties of Matter D.S. Mathur (S. Chand Publication)-2010
2. Heat and Thermodynamics A.B. Gupta and H.B. Ray (New Central

Book Agency)-2010

3. A Text Books book of oscillations, waves and acoustics(5thed.)M. Ghosh and D. Bhattacharya (S. Chand Publication)-2018
4. Electricity and magnetism- R. Murugesan (S.Chand publishing)-2017
5. Fundamentals of Electronics-Raskhit and Chattopadhyay (New age International Publication)-2018

Reference Books:

1. Physics of Degree students Vol.I M. Das, P.K. Jena etal (Sri krishna Prakashan)-2006
2. Physics of Degree students Vol.II M. Das, P.K. Jena etal (Sri krishna Prakashan)-2006
3. Waves and Oscillations (2nd ed) N. Subramaniam and Brij Lal (Vikas Publications)-1994
4. A Text Books book of Sound (2nd ed) - N. Subramaniam and Brij Lal (S. Chand Publications)-1999

Generic Elective Paper I Lab-

(minimum 6 experiments are to be done)

1. To determine the moment of inertia of a fly wheel.
2. To determine the Young's modulus Y of a wire by Searl's method.
3. To determine the modulus of rigidity of a wire by Maxwell's needle/Torsion Pendulum (Dynamic method).
4. To determine g by bar pendulum.
5. To determine the value of Y of a rubber by using travelling microscope.
6. To determine the Rigidity of modulus by static method.
7. To determine the frequency of a telescope by using Sonometer.
8. Verification of Laws of Vibration of a string by using Sonometer.
9. To compare capacitances using De Sauty bridge.
10. To determine the Law of resistance by using Foster bridge.
11. Compare the specific heat of two liquids by method of Cooling.

Reference Books:

1. Advanced Practical Physics for students, B.L. Flint and H.T. Worsnop, 1971, Asia Publishing House
2. A Laboratory Manual of Physics for Undergraduate Classes, D.P. Khandelwal (1985), Vani Publication
3. A Text Books of Practical Physics, Indu Prakash and Ramakrishna, 11th Edition (2011), Kitab Mahal, New Delhi

Generic Elective Paper -II

(Optics, Special Theory of Relativity, Atomic Physics, Quantum Mechanics and Nuclear Physics)

UNIT-I

Optics-I: Elementary ideas of monochromatic aberrations and their minimization, chromatic aberration, achromatic combination, Theory of formation of primary and secondary rainbow, condition of interference, coherent sources, Young's double slit experiment, biprism and measurement of wave length of light by it, color of thin films and Newton's rings, Fresnel and Fraunhofer diffraction, diffraction by single slit plane transmission grating.

Optics-II : Electromagnetic nature of light, polarized and unpolarized light, polarization by reflection and refraction, Brewster's Law, Malus Law, Double refraction, Ordinary and extraordinary rays.

UNIT-II Atomic Physics

Inadequacy of classical physics, brief outline of Rayleigh Jeans theory and Planck's quantum theory of radiation, particle nature of electromagnetic radiation photo electric effect, Compton effect, dual nature of radiation, wave nature of particles, de- Broglie hypothesis, matter wave, wave-particle duality, Davisson- Germer experiment. Bohr's theory of Hydrogen atom, explanation of Hydrogen Spectra, correction for finite mass of the nucleus, Bohr's correspondence principle, limitations of Bohr's

theory, Discrete energy, exchange by atom Frank Hertz experiment.

UNIT-III

Quantum Mechanics : Heisenberg's Uncertainty relation, Time dependent Schrodinger's wave equation in one dimension and three dimensions, The physical interpretation of the wave function, Probability density and probability current density, Equation of continuity, Normalization of the Wave function, Expectation value of an observable, Ehrenfest's theorem. Time independent Schrodinger's wave equation in one dimension particle in a box, energy eigen values and eigen functions.

UNIT-IV

Nuclear Physics : Properties of the nucleus Charge, Size, Spin, Magnetic Moment, Mass, Mass defect, Binding energy, Packing fraction, Nuclear force and its characteristics features, Radioactive decay laws, average life, half life, nuclear fission, nuclear fusion, Linear accelerators, and cyclotron.

Relativity: Galilean transformation, Newtonian relativity and its limitation, Michelson Morley experiment and its consequence, postulates of special theory of relativity. Lorentz transformation, length contraction, time dilation, relativistic mass and momentum, mass energy relation.

Text Books:

1. University Physics, H. D. Young, R. A. Freedman (Person)-2017
2. Fundamentals of Physics, Resnick, Halliday, Walker (Wiley)-2015

Reference Books:

1. A Text Books book of Optics N. Subrahmanyam and Brij Lal (S.Chand Publishing)-2006
2. Introduction to Special Relativity-R. Resnick (John Wiley)-2007
3. Concepts of Modern Physics Arthur Beiser (McGraw Hill)-2017
4. Modern Physics H.S. Mani and G.K.Mehta-2018.

Generic Elective Paper II LAB (minimum
6 experiments are to be done):

1. Determination of E.C.E. of a Copper by taking 3 readings.
2. Determination of Refractive index of the material of a prism using Sodium light.
3. To determine the wavelength of light using plane diffraction grating.
4. To determine the wavelength of light using Newton's ring.
5. Determination of refractive index of (a) glass and (b) liquid by using travelling microscope.
6. To plot the I-D curve and to determine the refractive index of a prism
7. Determination of radius of curvature of a convex/concave mirror by using Kohlrausch's method.
8. To determine the magnifying power of a given telescope.
9. To Obtain the static characteristics of a P-N-P/N-P-N transistor/ Triode Valve.
10. To determine the reduction factor of a tangent Galvanometer.
11. To study the Variation of magnetic field along the axis of a circular coil carrying current.

Reference Books:

1. Advanced Practical Physics for students, B.L.Flint and H.T. Worsnop, (1971), Asia Publishing House
2. A Laboratory Manual of Physics for Undergraduate Classes, D.P.Khandelwal (1985), Vani Publication
3. A Text Books of Practical Physics, Indu Prakash and Ramakrishna, 11th Edition (2011), Kitab Mahal, New Delhi

Faculty Training to be imparted in the following Topics

Computational Physics Lab—C, C++,

Scilab Programming for Core I,C-V,C-VIII,C-XI and C-XIII Practicals.

2. Digital Electronics. Theory and Practicals.
3. Quantum Mechanics Problem Solving
4. Solid State Physics- Elementary Band Theory and Superconductivity
5. Statistical Mechanics.-Quantum Distribution
6. Nanotechnology.

ESSENTIAL LABORATORY EQUIPMENT RECOMMENDED :

Every college must have CRO, Function generator, Laser and Logic Gate packages.

Course Structure of U.G. Zoology Honours				
Semester	Course	Course Name	Credit	Total marks
Semester-I	AECC I	AECC I	4	100
	Core I (Theory)	Non-chordates I: Protista to Pseudocoelomates	4	75
	Core I (Practical)	Non-chordates I: Protista to Pseudocoelomates	2	25
	Core II (Theory)	Principles of Ecology	4	75
	Core II (Practical)	Principles of Ecology	2	25
	GE 1 (Theory)	GE 1 (Theory)	4	75
	GE I (Practical)	GE I (Practical)	2	25
Semester-II	AECC 2	AECC 2	4	100
	Core III (Theory)	Non chordates II: Coelomates	4	75
	Core III (Practical)	Non chordates II: Coelomates	2	25
	Core IV (Theory)	Cell biology	4	75
	Core IV (Practical)	Cell biology	2	25
	GE II (Theory)	GE II (Theory)	4	75
	GE II (Practical)	GE II (Practical)	2	25
Semester-III	Core V (Theory)	Diversity of Chordates	4	75
	Core V (Practical)	Diversity of Chordates	2	25
	Core VI (Theory)	Physiology: Controlling and Coordinating systems	4	75
	Core VI (Practical)	Physiology: Controlling and Coordinating systems	2	25
	Core VII (Theory)	Fundamentals of Biochemistry and microbiology	4	75
	Core VII (Practical)	Fundamentals of Biochemistry and microbiology	2	25
	SEC 1	SEC 1	4	100
	GE III (Theory)	GE III (Theory)	4	75
	GE III (Practical)	GE III (Practical)	2	25
Semester-IV	Core VIII (Theory)	Comparative anatomy of Vertebrates	4	75

	Core VIII (Practical)	Comparative anatomy of Vertebrates	2	25
	Core IX (Theory)	Physiology: Life Sustaining Systems	4	75
	Core IX (Practical)	Physiology: Life Sustaining Systems	2	25
	Core X (Theory)	Biochemistry of Metabolic Processes	4	75
	Core X (Practical)	Biochemistry of Metabolic Processes	2	25
	SEC 2	SEC 2	4	100
	GE IV (Theory)	GE IV (Theory)	4	75
	GE IV (Practical)	GE IV (Practical)	2	25
Semester-V	Core XI (Theory)	Molecular Biology	4	75
	Core XI (Practical)	Molecular Biology	2	25
	Core XII (Theory)	Principles of Genetics	4	75
	Core XII (Practical)	Principles of Genetics	2	25
	DSE I (Theory)	DSE 1	4	75
	DSE I (Practical)	DSE 1	2	25
	DSE II (Theory)	DSE II	4	75
	DSE II (Practical)	DSE II	2	25
Semester-VI	Core XIII (Theory)	Developmental Biology	4	75
	Core XIII (Practical)	Developmental Biology	2	25
	Core XIV (Theory)	Evolutionary Biology	4	75
	Core XIV (Practical)	Evolutionary Biology	2	25
	DSE III (Theory)	DSE III	4	75
	DSE III (Practical)	DSE III	2	25
	DSE IV (Theory with Practical /Project)	Project/ Economic Zoology	6	100
Total			148	2600

ZOOLOGY

HONOURS PAPERS:

Core course – 14 papers

Discipline Specific Elective – 4 papers (Out of 9 suggested papers)

Generic Elective for Non Zoology students – 4 papers. In case University offers 2 subjects as GE, then papers 1 and 2 will be the GE paper.

Marks per paper - Midterm: 15 marks, End term: 60 marks (Theory) + 25 marks (Practical), Total – 100 marks

Credit per paper – 6

Teaching hours per paper – 40 hours (theory) + 10 hours (practical)

Core Paper I

Non-Chordates I: Protista to Pseudocoelomates

Unit 1: Protista, Parazoa, Metazoa and Porifera

General characteristics and Classification up to classes. Study of *Euglena*, *Amoeba*. Life cycle and pathogenicity of *Plasmodium vivax* and *Entamoeba histolytica*. Locomotion and Reproduction in Protista. General characteristics and Classification up to classes, Canal system and spicules in sponges.

Unit 2: Cnidaria & Ctenophora

General characteristics and Classification up to classes, Metagenesis in *Obelia*, Polymorphism in Cnidaria, Corals and coral reefs. General characteristics and Evolutionary significance of Ctenophora.

Unit 3: Platyhelminthes

General characteristics and Classification up to classes. Life cycle and pathogenicity of *Fasciola hepatica* and *Taenia solium*.

Unit 4: Nematelminthes

General characteristics and Classification up to classes. Life cycle, and pathogenicity of *Ascaris lumbricoides* and *Wuchereria bancrofti*. Parasitic adaptations in helminthes.

Note: Classification to be followed from “Barnes, R.D. (1982). Invertebrate Zoology, V Edition”

PRACTICAL

1. Study of whole mount of *Euglena*, *Amoeba* and *Paramecium*, Binary fission and Conjugation in *Paramecium*.
2. Examination of pond water collected from different places for diversity in protista.
3. Study of *Sycon* (T.S. and L.S.), *Hyalonema*, *Euplectella*, *Spongilla*.
4. Study of *Obelia*, *Physalia*, *Millepora*, *Aurelia*, *Tubipora*, *Corallium*, *Alcyonium*, *Gorgonia*.

Metridium, Pennatula, Fungia, Meandrina, Madrepora.

5. One specimen/slide of any ctenophore.

6. Study of adult *Fasciola hepatica*, *Taenia solium* and their life cycles (Slides/microphotographs).

7. Study of adult *Ascaris lumbricoides* and its life stages (Slides/micro-photographs).

8. To submit a Project Report on any related topic on life cycles/coral/ coral reefs.

Note: Classification to be followed from “Ruppert and Barnes (2006) Invertebrate Zoology, 8th edition, Holt Saunders International Edition”

TEXT BOOKS

1. Kotpal RL; Modern Textbook of Zoology – Invertebrates; Rastogi Publications - Meerut; 2016 edition
2. Richard Busca, W. Moore, Stephen M. Shuster. Invertebrates; OUP USA; 3rd edition (19 January 2016)

SUGGESTED READINGS

1. Richard Fox , Robert D. Barnes, Edward E. Ruppert, Invertebrate Zoology: A Functional Evolutionary Approach, Brooks/Cole; 7th edition 2003
2. Barrington, E.J.W. Invertebrate Structure and Functions. II Edition, E.L.B.S. and Nelson.
3. Hyman, L.H. Invertebrate Series (Recent edition)
4. Verma P. S. A Manual of Practical Zoology: Invertebrates. S Chand Publication
5. Parker JJ and WA Haswel Textbook of Zoology. Vol I and II

Core Paper II Principles of Ecology

Unit 1: Ecosystem and Applied Ecology

Ecology: Autecology and synecology, Types of ecosystems with one example in detail, Food chain: Detritus and grazing food chains, Linear and Y-shaped food chains, Food web, Energy flow through the ecosystem, Ecological pyramids Nutrient and biogeochemical cycle with one example of Nitrogen cycle. Ecology in Wildlife Conservation and Management. Laws of limiting factors, Study of physical factors- (Light, temperature).

Unit 2: Population

Attributes of population: Density, natality, mortality, life tables, fecundity tables, survivorship curves, age ratio, sex ratio, dispersal and dispersion Exponential and logistic growth, equation and patterns, r and K strategies. Population regulation - density-dependent and independent factors, Population interactions, Gause's Principle with laboratory and field examples.

Unit 3: Community

Community characteristics: species richness, dominance, diversity, abundance, vertical stratification, Ecotone and edge effect; Ecological succession with one example. Theories pertaining to climax community.

Unit – 4: Biometry

Biological data, graphical representation of data (frequency polygon and histogram), sampling techniques, measures of central tendency (Mean, median and mode), Measures of dispersion (range, quartile deviation, mean deviation and standard deviation), Hypothesis and hypothesis testing (Chi-square test, t- test)

PRACTICAL

1. Study of life tables and plotting of survivorship curves of different types from the hypothetical/real data provided.
2. Determination of population density in a natural/hypothetical community by quadrat method and calculation of Shannon-Weiner diversity index for the same community.
3. Study of an aquatic ecosystem: Phytoplankton and zooplankton collection, preservation and mounting, Measurement of temperature, turbidity/penetration of light, determination of pH, Dissolved Oxygen content (Winkler's method), BOD, COD, Free CO₂, Hardness, TDS.
4. Report on a visit to National Park/Biodiversity Park/Wild life sanctuary.
5. Chi-square analysis using seeds/beads/*Drosophila*.
6. Problems on standard deviation.
7. Graphical representation of data (Frequency polygon and Histogram).

Text Book

1. Odum, E.P. and Barrett, G.W., (2018). Fundamentals of Ecology, 5th Edition
2. Smith and Smith, Elements of Ecology, Global Edition; Pearson Education India; ninth edition (14 May 2015)
3. Myra Samuels, J. Witmer, A. Schaffner, Statistics for the life sciences, Prentice Halls, Boston, 4th edition, 2012

Suggested Readings

1. Kormondy, (2017). Concepts of Ecology, Updated 4/e, Pearson
2. Colinvaux, P. A. (1993). Ecology. II Edition. Wiley, John and Sons, Inc. Krebs, C. J. (2001). Ecology. VI Edition. Benjamin Cummings.
3. Ricklefs, R.E., (2000). Ecology. 5th Edition. Chiron Press
4. Dash M.C., Fundamentals of Ecology. Mc GrawHill
5. Smith TM and Smith RL, Elements of Ecology, 8th Edition, Pearson education INC, USA
6. Miller, G.T. and Spoolman, S.E. (2017) Environmental Science, 14th Edition. Cengage Publication, New Delhi.
7. Baneerjee Pranab Kumar, Introduction to biostatistics, S Chand & Company; 3rd Rev. Edn. 2006 edition
8. Chainy GBN, Mishra G, Mohanty PK, 2016, Basic Biostatistics, Kalyani Publisher 3rd edition

Core Paper III

Non- Chordates II: Coelomates

Unit 1: Coelomates and Annelids

Evolution of coelom and metamerism. General characteristics and Classification up to classes; Excretion in Annelida.

Unit 2: Arthropoda and Onychophora

General characteristics and Classification up to classes. Vision and Respiration in

Arthropoda. Metamorphosis in Insects. Social life in bees and termites. Onychophora: General characteristics and Evolutionary significance.

Unit 3: Mollusca

General characteristics and Classification up to classes. Respiration in Mollusca. Torsion and detorsion in Gastropoda. Evolutionary significance of trochophore larva.

Unit 4: Echinodermata

General characteristics and Classification up to classes. Water-vascular system in Asterozoa, Larval forms in Echinodermata, Affinities with Chordates.

Note: Classification to be followed from “Ruppert and Barnes (2006) Invertebrate Zoology, 8th edition, Holt Saunders International Edition”

PRACTICAL

1. Study of following specimens:
2. Annelids - *Aphrodite*, *Nereis*, *Heteronereis*, *Sabella*, *Serpula*, *Chaetopterus*, *Pheretima*, *Hirudinaria*
3. Arthropods – *Tachypleus*, *Carcinoscorpius*, *Palamnaeus*, *Palaemon*, *Daphnia*, *Balanus*, *Sacculina*, *Cancer*, *Eupagurus*, *Scolopendra*, *Julus*, *Bombyx*, *Periplaneta*, termites and honey bees
4. Onychophora – *Peripatus*
5. Molluscs - *Chiton*, *Dentalium*, *Pila*, *Doris*, *Helix*, *Unio*, *Ostrea*, *Pinctada*, *Sepia*, *Octopus*, *Nautilus*
6. Echinoderms - *Pentaceros/Asterias*, *Ophiura*, *Clypeaster*, *Echinus*, *Cucumaria* and *Antedon*
7. Study of digestive system, nephridia of earthworm (Virtual).
8. T.S. through pharynx, gizzard, and typhlosolar intestine of earthworm.
9. Mount of mouth parts and dissection of digestive system and nervous system of *Periplaneta*.
10. To submit a Project Report on any related topic to larval forms (crustacean, mollusc and echinoderm)

Text Books

1. Kotpal RL (2014) Text book of Zoology, Invertebrate, Rastogi Publication
2. Jordan and Verma PS (2009) Invertebrate Zoology. S Chand publication.

Suggested Readings

1. Barrington, E.J.W. (1979). Invertebrate Structure and Functions. II Edition, E.L.B.S. and Nelson.
2. Barnes, R.S.K., Calow, P., Olive, P. J. W., Golding, D.W. and Spicer, J.I. (2002). The Invertebrates: A New Synthesis, III Edition, Blackwell Science
3. Verma P S. (2010) A Manual of Practical Zoology: Non-chordates. S Chand Publication

Core Paper IV Cell biology

Unit 1: Overview of cells and plasma membrane

Prokaryotic and Eukaryotic cells, Virus, Viroids, Mycoplasma, Prions, Various models of plasma membrane structure. Transport across membranes: Active and Passive transport, Facilitated transport. Cell junctions: Tight junctions, Desmosomes, Gap

junctions.

Unit 2: Cytoskeleton & Endomembrane System

Structure and Functions: Microtubules, Microfilaments and Intermediate filaments;
Structure and Functions: Endoplasmic Reticulum, Golgi apparatus, Lysosomes.

Unit 3: Mitochondria and Peroxisomes

Mitochondria: Structure, Semi-autonomous nature, Endosymbiotic hypothesis;
Mitochondrial Respiratory Chain, Chemi-osmotic hypothesis. Peroxisomes.

Unit 4: Nucleus, Cell Division and Cell signalling

Structure of Nucleus: Nuclear envelope, Nuclear pore complex, Nucleolus; Chromatin:
Euchromatin and Hetrochromatin and packaging (nucleosome); Mitosis, Meiosis, Cell
cycle and its regulation; GPCR and Role of second messenger (cAMP)

Practical

1. Preparation of temporary stained squash of onion root tip to study various stages of mitosis.
2. Study of various stages of meiosis.
3. Preparation of permanent slide to show the presence of Barr body in human female blood cells/cheek cells.
4. Preparation of permanent slide to demonstrate:
 - i. DNA by Feulgen reaction
 - ii. DNA and RNA by MGP
 - iii. Mucopolysaccharides by PAS reaction
 - iv. Proteins by Mercuric bromophenol blue/Fast Green
5. Demonstration of osmosis (RBC/ Egg etc.).

Text Books

1. Karp, G. (2010). Cell and Molecular Biology: Concepts and Experiments. VI Edition. John Wiley and Sons. Inc.
2. De Robertis, E.D.P. and De Robertis, E.M.F. (2006). Cell and Molecular Biology. VIII Edition. Lippincott Williams and Wilkins, Philadelphia.
3. S Harisha (2007) Biotechnology procedures and experiments handbook., Infinity Science Press, Hingham

Suggested Readings

1. Bruce Albert, Bray Dennis, Levis Julian, Raff Martin, Roberts Keith and Watson James (2008). MolecularBiology of the Cell, V Edition, Garland publishing Inc., New York and London.
2. Becker, W.M., Kleinsmith, L.J., Hardin. J. and Bertoni, G. P. (2009). The World of the Cell. VII Edition. Pearson Benjamin Cummings Publishing, San Francisco.
3. Suvarna S, Lyton C, Bancroft JD (2013) Theory and practice of histological techniques, Churchill Livingstone, Elsevier, UK
4. Cooper, G.M. and Hausman, R.E. (2009). The Cell: A Molecular Approach. V Edition. ASM Press and Sunderland, Washington, D.C.; Sinauer Associates, MA.

Core Paper V

Diversity and distribution of Chordates

Unit 1: Protochordates and Origin of Chordates

Protochordata: General characteristics of Hemichordata, Urochordata and Cephalochordata;

Study of larval forms in protochordates; Retrogressive metamorphosis in Urochordata. General characteristics and outline classification Chordata. Dipleurula concept and the Echinoderm theory of origin of chordates.

Unit 2: Agnatha, Pisces & Amphibia

General characteristics of Agnatha: General characteristics and classification of cyclostomes up to class Chondrichthyes and Osteichthyes: classification up to order, Migration, Parental care in fishes, Accessory respiratory organs in pisces, Evolutionary significance of Dipnoi.

Amphibian: Origin of Tetrapoda (Evolution of terrestrial ectotherms); General characteristics and classification up to order. Parental care in Amphibia.

Unit 3: Reptilia & Aves

General characteristics and classification up to order in reptiles; Affinities of *Sphenodon*; Poison apparatus and Biting mechanism in snakes. General characteristics and classification up to order in Aves *Archaeopteryx* - a connecting link; Flight adaptations and Migration in birds.

Unit 4: Mammals & Zoogeography

General characters and classification up to order; Affinities of Prototheria; Adaptive radiation with reference to locomotory appendages. Zoogeographical realms, Theories pertaining to distribution of animals, Plate tectonic and Continental drift theory, distribution of vertebrates in different realms.

PRACTICAL

1. Protochordata: *Balanoglossus*, *Herdmania*, *Branchiostoma*, Colonial Urochordata, Sections of *Balanoglossus* through proboscis and branchio-genital regions, Sections of *Amphioxus* through pharyngeal, intestinal and caudal regions. Permanent slides of *Herdmania* spicules.
2. Agnatha: *Petromyzon* and *Myxine*.
3. Fishes: *Scoliodon*, *Sphyrna*, *Pristis*, *Torpedo*, *Chimaera*, *Mystus*, *Heteropneustes*, *Labeo*, *Exocoetus*, *Echeneis*, *Anguilla*, *Hippocampus*, *Tetrodon/Diodon*, *Anabas*, Flat fish.
4. Amphibia: *Ichthyophis/Ureotyphlus*, *Necturus*, *Bufo*, *Hyla*, *Alytes*, *Salamander*.
5. Reptilia: *Chelone*, *Trionyx*, *Hemidactylus*, *Varanus*, *Uromastix*, *Chamaeleon*, *Ophiosaurus*, *Draco*, *Bungarus*, *Vipera*, *Naja*, *Hydrophis*, *Zamenis*, *Crocodylus*. Key for Identification of poisonous and non-poisonous snakes
6. Aves: Study of six common birds from different orders. Types of beaks and claws. Study of feathers.
7. Mammalia: *Sorex*, Bat (Insectivorous and Frugivorous), *Funambulus*, *Loris*, *Herpestes*, *Erinaceous*.
8. Power point presentation on study of any two animals from two different classes by students. Submission of album of local species.

TEXT BOOKS

1. Kotpal RL; Modern Textbook of Zoology –Vertebrates; Rastogi Publications - Meerut; 2016 edition
2. Young, J. Z. (2004). The Life of Vertebrates. III Edition. Oxford University Press.
3. Tiwari SK (2006) Fundamentals of World Zoogeography, Sarup & Sons

SUGGESTED READINGS

1. Pough H. Vertebrate life, VIII Edition, 2007 Pearson International.
2. Hall B.K. and Hallgrimsson B. (2008). Strickberger's Evolution. IV Edition. Jones and Bartlett Publishers Inc.
3. Hickman CP, Roberts LS, Keen S, Larson A, I'AnsonH, Isenhour DJIntegrated Principle of Zoology, 14th edition, 2008, McGrawHill publication
4. Verma PS and Srivastava PC. (2011)Advanced Practical Zoology. S Chand Publication.

Core Paper VI

Physiology: Controlling and Coordinating Systems

Unit 1: Tissues & Tissue system

Structure, location, classification and functions of epithelial tissue, connective tissue, muscular tissue and nervous tissue. Structure and types of bones and cartilages, Ossification, bone growth and resorption.

Unit 2: Muscle & Nervous System

Histology of different types of muscle; Ultra structure of skeletal muscle; Molecular and chemical basis of muscle contraction. Structure of neuron, resting membrane potential, Origin of action potential and its propagation across the myelinated and unmyelinated nerve fibers; Types of synapse, Synaptic transmission and, Neuromuscular junction; Reflex action and its types - reflex arc; Physiology of hearing and vision.

Unit 3: Reproductive System

Histology of testis and ovary; Physiology of male and female reproduction; Hypothalamus-Pituitary & Gonadal axis. Puberty, Ovarian Cycle, Methods of contraception in male and female, Placental hormones.

Unit 4: Endocrine System

Histology of endocrine glands – Hypothalamus (Neuroendocrine gland) pineal, pituitary, thyroid, parathyroid, pancreas, adrenal; hormones secreted by them and their mechanism of action; Classification of hormones and mechanism of hormone action, (steroidal and non-steroidal hormones).

PRACTICAL

1. Demonstration of the unconditioned reflex action (Deep tendon reflex such as knee jerk reflex).
2. Study of permanent slides- Squamous epithelium, Striated muscle fibres and nerve cells.
3. Study of permanent slides-Pancreas, Testis, Ovary, Adrenal, Thyroid and Parathyroid.
4. Microtomy: Preparation of permanent slides/photographs/computer models of any five types of mammalian (Goat/rat,etc) tissues

TEXT BOOKS

1. Marieb EN and Hoehn K, Human Physiology,(2013), 9th edition, Pearson Education,

USA.

2. Endocrinology, Hadley ME and Levine JE (2009), Pearson Education India; 6 edition
3. Textbook of Medical Physiology, Guyton & Hall, Elsevier, 12th edition, 2016

SUGGESTED BOOKS

1. Victor P. Eroschenko. (2008). diFiore's Atlas of Histology with Functional correlations. XII Edition., Lippincott W. & Wilkins
2. Martini F H, Nath J L and Bartholomew E F.(2015) Fundamentals of Anatomy and Physiology. Pearson Education Publication,
3. Guyton, A.C. & Hall, J.E. (2006). Textbook of Medical Physiology. XI Edition. Hercourt Asia PTE Ltd. /W.B.Saunders Company.
4. Tortora, G.J. & Grabowski, S. (2006). Principles of Anatomy & Physiology. XI Edition John Wiley & sons.

Core Paper VII

Fundamentals of Biochemistry and microbiology

Unit 1: Carbohydrates & Lipids

Structure and Biological importance: Monosaccharides, Disaccharides, Polysaccharides and Glycoconjugates; Structure and Significance: Physiologically important saturated and unsaturated fatty acids, Tri-acylglycerols, Phospholipids, Glycolipids, Steroids.

Unit 2: Proteins

Amino acids: Structure, Classification and General properties of α -amino acids; Physiological importance of essential and non-essential α -amino acids.
Proteins: Bonds stabilizing protein structure; Levels of organization in proteins; Renaturation, Denaturation; Introduction to simple and conjugate proteins
Immunoglobulins: Basic Structure, Classes and Function, Antigenic Determinants.

Unit 3: Enzymes

Nomenclature and classification; Cofactors; Specificity of enzyme action; Isozymes; Mechanism of enzyme action; Enzyme kinetics; Factors affecting rate of enzyme-catalyzed reactions; Derivation of Michaelis-Menten equation, Concept of K_m and V_{max} , Lineweaver- Burk plot; Multi-substrate reactions; Enzyme inhibition; Allosteric enzymes and their kinetics; Regulation of enzyme action.

Unit 4: Microbiology

Bacteria: Classification, structure and reproduction

Virus: classification, structure and reproduction, bacteriophages, viroids, prions, microbes of food, agriculture and industry

Bacterial (typhoid, cholera and tuberculosis) and viral (swine flu, zika fever and AIDS) diseases of human

PRACTICAL

1. Qualitative tests of functional groups in carbohydrates, proteins and lipids.
2. Paper chromatography of amino acids.
3. Action of salivary amylase under optimum conditions.
4. Effect of pH, temperature and inhibitors on the action of salivary amylase./Urease/acid or

alkaline phosphatase

5. Demonstration of proteins separation by SDS-PAGE.
6. Identification of different bacteria and viruses through slide/photographs

TEXT BOOKS

1. Satyanarayan and Chakrapani , (2017) Biochemistry, Elsevier; Fifth edition
2. Cox, M.M and Nelson, D.L. (2008). Lehninger's Principles of Biochemistry, V Edition, W.H. Freeman and Co., New York.
3. Jeremy M. Berg, Lubert Stryer, John L. Tymoczko, Gregory J. Gatto, Biochemistry, 8th edition, 2015.
4. Victor W., Rodwell, David A., Bender, Kathleen M., Botham, Peter J., Kennelly, P. Anthony, Harper's Illustrated Biochemistry, 31st edition.
5. Tortora GJ, Funke BR and Case CL (2016) Microbiology: An introduction, Pearson India Education Services Pvt.Ltd.11th edition

SUGGESTED READING

1. Murray, R.K., Bender, D.A., Botham, K.M., Kennelly, P.J., Rodwell, V.W. and Well, P.A. (2009). Harper's Illustrated Biochemistry, XXVIII Edition, International Edition, The McGraw- Hill Companies Inc.
2. Watson, J.D., Baker, T.A., Bell, S.P., Gann, A., Levine, M. and Losick, R. (2008). Molecular Biology of the Gene, VI Edition, Cold Spring Harbor Lab. Press, Pearson Publication.
3. Hames, B.D. and Hooper, N.M. (2000). Instant Notes in Biochemistry, II Edition, BIOS Scientific Publishers Ltd., U.K.
4. Devasena T. (2010). Enzymology Oxford University Press; 1 edition
5. Berg, J.M., Tymoczko, J.L. and Stryer, L. (2007). Biochemistry, VI Edition, W.H. Freeman and Co., New York.
6. Pelezar Jr.MJ, Chan E.C.S. and Krieg NR (2001) Microbiology, Mc-Graw Hill Education

Core Paper VIII Comparative Anatomy of Vertebrates

Unit 1: Integumentary & Skeletal System

Structure, functions and derivatives of integument (Scale, claw, nail, hair, feather and dentition). Axial and appendicular skeleton, Jaw suspensorium, Visceral arches.

Unit 2: Digestive & Respiratory System

Alimentary canal and associated glands; Respiration through skin, gills, lungs and air sacs; Accessory respiratory organs.

Unit 3: Circulatory and Urinogenital system

General plan of circulation, evolution of heart and aortic arches; Succession of kidney, Evolution of urinogenital ducts, Types of mammalian uteri.

Unit 4: Nervous System & Sense Organs

Comparative account of brain; Nervous system, Spinal cord, Cranial nerves in mammals. Classification of receptors: Brief account of visual and auditory receptors in man. Chemo and mechano receptors

PRACTICAL

1. Study of placoid, cycloid and ctenoid scales through permanent slides/photographs

2. Disarticulated skeleton of Frog, *Varanus*, Fowl, Rabbit.
3. Carapace and plastron of turtle /tortoise (Photographs, charts etc).
4. Mammalian skulls: One herbivorous and one carnivorous animal.
5. Study of structure of any two organs (heart, lung, kidney, eye and ear) from video recording (may be included if dissection not permitted).
6. Project on skeletal modifications in vertebrates (may be included if dissection not permitted).

TEXT BOOKS

1. Kardong, K.V. (2005) Vertebrates' Comparative Anatomy, Function and Evolution. IV Edition. McGraw-Hill Higher Education
2. Kent, G.C. and Carr R.K. (2000). Comparative Anatomy of the Vertebrates. IX Edition. The McGraw-Hill Companies
3. R. K. Saxena and Sumitra Saxena (2016). Comparative Anatomy of Vertebrates 2nd edition.

SUGGESTED READINGS

1. Hilderbrand, M and Gaslow G.E. Analysis of Vertebrate structure, John Wiley and Sons
2. Walter, H.E. and Sayles, L.P; Biology of Vertebrates, Khosla Publishing House

Core Paper IX Physiology: LifeSustaining Systems

Unit 1: Physiology of Digestion

Structural organization and functions of gastrointestinal tract and associated glands; Mechanical and chemical digestion of food; Absorptions of carbohydrates, lipids, proteins, water, minerals and vitamins; Hormonal control of secretion of enzymes in gastrointestinal tract.

Unit 2: Physiology of Respiration

Histology of trachea and lung; Mechanism of respiration, Pulmonary ventilation; Respiratory volumes and capacities; Transport of oxygen and carbon dioxide in blood; Respiratory pigments, Dissociation curves and the factors influencing it; Carbon monoxide poisoning; Control of respiration.

Unit 3: Renal Physiology and Blood

Structure of kidney and its functional unit; Mechanism of urine formation; Regulation of water balance; Regulation of acid-base balance. Components of blood and their functions; Structure and functions of haemoglobin haemostasis: Haemopoiesis, Blood clotting system, Blood groups: Rh factor, ABO and MN.

Unit 4: Physiology of Heart

Structure of mammalian heart; Coronary circulation; Structure and working of conducting myocardial fibers. Origin and conduction of cardiac impulses Cardiac cycle; Cardiac output and its regulation, Frank-Starling Law of the heart, nervous and chemical regulation of heart rate. Electrocardiogram, Blood pressure and its regulation.

PRACTICAL

1. Determination of ABO Blood group
2. Enumeration of red blood cells and white blood cells using haemocytometer
3. Estimation of haemoglobin using Sahli's haemoglobinometer

4. Preparation of haemin and haemochromogen crystals
5. Recording of blood pressure using a sphygmomanometer
6. Examination of sections of mammalian slides: oesophagus, stomach, duodenum, ileum, rectum liver, trachea, lung, kidney.

TEXT BOOKS

1. Marieb E.N. and Hoehn K.N. (2009) Human Physiology. Pearson Education Publication , 9th edition
2. Tortora, G.J. & Grabowski, S. (2006). Principles of Anatomy & Physiology. XI Edition John Wiley & sons.
3. Guyton & Hall, (2016) Textbook of Medical Physiology. Elsevier, 12th edition,

SUGGESTED READINGS

1. Victor P. Eroschenko. (2008). diFiore's Atlas of Histology with Functional correlations. XII Edition. Lippincott W. & Wilkins.
2. Vander A, Sherman J. and Luciano D. (2014). Vander's Human Physiology: The Mechanism of Body Function. XIII Edition, McGraw Hills.
3. Moyes C.D., Schulte PM (2016), Principles of physiology, 2nd edition, Pearson education, 3rd.
4. Guyton, A.C. & Hall, J.E. (2006). Textbook of Medical Physiology. XI Edition. Hercourt Asia PTE Ltd. W.B. Saunders Company.

Core Paper X Biochemistry of Metabolic Processes

Unit 1: Overview of Metabolism

Catabolism vs Anabolism, Stages of catabolism, Compartmentalization of metabolic pathways, Shuttle systems and membrane transporters; ATP as "Energy Currency of cell"; coupled reactions; Use of reducing equivalents and cofactors; Intermediary metabolism and regulatory mechanisms.

Unit 2: Carbohydrate Metabolism

Sequence of reactions and regulation of glycolysis, Citric acid cycle, Phosphate pentose pathway, Gluconeogenesis, Glycogenolysis and Glycogenesis.

Unit 3: Lipid and protein Metabolism

β -oxidation and omega -oxidation of saturated fatty acids with even and odd number of carbon atoms; Biosynthesis of palmitic acid; Ketogenesis
Catabolism of amino acids: Transamination, Deamination, Urea cycle; Fate of C-skeleton of Glucogenic and Ketogenic amino acids.

Unit 4: Oxidative Phosphorylation

Redox systems; Review of mitochondrial respiratory chain, Inhibitors and un-couplers of Electron Transport System

PRACTICAL

1. Estimation of total protein in given solutions
2. Detection of SGOT and SGPT or GST and GSH in serum/ tissue
3. To study the enzymatic activity of Trypsin/ Lipase.
4. To perform the Acid and Alkaline phosphatase assay from serum/ tissue.
5. Dry Lab (Virtual): To trace the labelled C atoms of Acetyl-CoA till they evolve as CO₂ in the TCA cycle.

TEXT BOOKS

1. Satyanarayan and Chakrapani , (2017) Biochemistry, Elsevier; Fifth edition.
2. Cox, M.M and Nelson, D.L. (2008). Lehninger Principles of Biochemistry, V Edition, W.H. Freeman and Co., New York.

SUGGESTED READINGS

1. Murray, R.K., Bender, D.A., Botham, K.M., Kennelly, P.J., Rodwell, V.W. and Well, P.A. (2009). Harper's Illustrated Biochemistry, XXVIII Edition, International Edition, The McGraw-Hill Companies Inc.
2. Berg, J.M., Tymoczko, J.L. and Stryer, L. (2007). Biochemistry, VI Edition, W.H. Freeman and Co., New York.
3. Hames, B.D. and Hooper, N.M. (2000). Instant Notes in Biochemistry, II Edition, BIOS Scientific Publishers Ltd., U.K.

Core Paper XI Molecular Biology

Unit 1: Nucleic Acids, DNA Replication & Repair

Salient features of DNA and RNA, Watson and Crick model of DNA., Nucleic acids cot curves, denaturation and renaturation of DNA, DNA Replication in prokaryotes and eukaryotes, mechanism of DNA replication, Semi-conservative, bidirectional and semi-discontinuous replication, RNA priming, Replication of circular and linear ds-DNA, replication of telomeres, Pyrimidine dimerization and mismatch repair.

Unit 2: Transcription & Translation

RNA polymerase and transcription Unit, mechanism of transcription in prokaryotes and eukaryotes, synthesis of rRNA and mRNA, transcription factors and regulation of transcription.

Genetic code, Degeneracy of the genetic code and Wobble Hypothesis; Process of protein synthesis in prokaryotes: Ribosome structure and assembly in prokaryotes, fidelity of protein synthesis, aminoacyl tRNA synthetases and charging of tRNA; Proteins involved in initiation, elongation and termination of polypeptide chain; Inhibitors of protein synthesis; Difference between prokaryotic and eukaryotic translation.

Unit 3: Post Transcriptional Modifications and Processing of Eukaryotic RNA

Structure of globin mRNA; Split genes: concept of introns and exons, splicing mechanism, alternative splicing, exon shuffling, and RNA editing, Processing of tRNA.

Unit 4: Gene Regulation & Regulatory RNAs

Transcription regulation in prokaryotes: Principles of transcriptional regulation with examples from lac operon and trp operon; Transcription regulation in eukaryotes: Activators, repressors, enhancers, silencer elements; Gene silencing, RNA interference, miRNA, siRNA.

PRACTICAL

1. Study of Polytene chromosomes from *Chironomous / Drosophila* larvae
2. Preparation of liquid culture medium (LB) and raise culture of *E. coli*
3. Estimation of the growth kinetics of *E. coli* by turbidity method
4. Preparation of solid culture medium (LB) and growth of *E. coli* by spreading and streaking
5. Quantitative estimation of Salmon sperm/calf thymus DNA using colorimeter (Diphenylamine reagent) or spectrophotometer ($A_{260\text{nm}}$ measurement)

6. Quantitative estimation of RNA using Orcinol reaction
7. Study and interpretation of electron micrographs/ photograph showing
(a) DNA replication, (b) Transcription and (c) Split genes.

TEXT BOOKS

1. Karp, G. (2010) Cell and Molecular Biology: Concepts and Experiments. VI Edition. John Wiley and Sons. Inc.
2. Lewin B. (2013). Gene XI, Jones and Bartlett.
3. De Robertis E.D.P. (2017) Cell and Molecular Biology 8Ed.
4. Arnold Berk, Chris A. Kaiser, Harvey Lodish, Angelika Amon, Hidde Ploegh, Anthony Bretscher, Monty Krieger Kelsey C. Martin (2016) Molecular Cell Biology. 8th edition.

SUGGESTED READINGS

1. Becker, W.M., Kleinsmith, L.J., Hardin. J. and Bertoni, G. P. (2009). The World of the Cell. VII Edition. Pearson Benjamin Cummings Publishing, San Francisco.
2. Bruce Alberts, Alexander Johnson, Julian Lewis, Martin Raff, Keith Roberts, Peter Walter: Molecular Biology of the Cell, IV Edition.
3. Cooper G. M. and Robert E. Hausman R. E. The Cell: A Molecular Approach, V Edition, ASM Press and Sinauer Associates.
4. McLennan A., Bates A., Turner, P. and White M. (2015). Molecular Biology IV Edition. GS, Taylor and Francis Group, New York and London.

Core Paper XII

Principles of Genetics

Unit 1: Mendelian Genetics, Linkage, Crossing Over and Chromosomal Mapping Principles of inheritance, Incomplete dominance and co-dominance, Multiple alleles, Lethal alleles, Epistasis, Pleiotropy, Sex-linked, sex-influenced and sex-limited characters inheritance. Polygenic inheritance with suitable examples; simple numericals based on it.

Linkage and crossing over, Cytological basis of crossing over, Molecular mechanisms of crossing over including models of recombination, Recombination frequency as a measure of linkage intensity, Two factor and three factor crosses, Interference and coincidence, Somatic cell hybridization.

Unit 2: Mutations

Types of gene mutations (Classification), Types of chromosomal aberrations (Classification, figures and with one suitable example of each), Molecular basis of mutations in relation to UV light and chemical mutagens; Detection of mutations: CLB method, attached X method.

Unit 3: Sex Determination & Extra-chromosomal Inheritance

Chromosomal mechanisms of sex determination in *Drosophila* and Man; Criteria for extra-chromosomal inheritance, Antibiotic resistance in *Chlamydomonas*, Mitochondrial mutations in *Saccharomyces*, Infective heredity in *Paramecium* and Maternal effects.

Unit 4: Recombination in Bacteria and Viruses & Transposable Genetic Elements

Conjugation, Transformation, Transduction, Complementation test in Bacteriophage.
Transposons in bacteria, Ac-Ds elements in maize and P elements in Drosophila,
Transposons in human.

PRACTICAL

1. Study of Mendelian laws and gene interactions.
2. Linkage maps based on data from conjugation, transformation and transduction.
3. Linkage maps based on data from *Drosophila* crosses.
4. Study of human karyotype (normal and abnormal).
5. Pedigree analysis of some human inherited traits.

TEXT BOOKS

1. Benjamin Pierce, (2015) Genetics- A Conceptual Approach, 5th edition, WH Freeman publication
2. Klug, W.S., Cummings, M.R., Spencer, C.A. (2012). Concepts of Genetics. X Edition.

SUGGESTED READINGS

1. Benjamin Cummings. Russell, P. J. (2009). Genetics- A Molecular Approach. III Edition.
2. Snustad, D.P., Simmons, M.J. (2009). Principles of Genetics. V Edition. John Wiley and Sons Inc.
3. Griffiths, A.J.F., Wessler, S.R., Lewontin, R.C. and Carroll, S.B. Introduction to Genetic Analysis. IX Edition. W. H. Freeman and Co.
4. Fletcher H. and Hickey I. (2015). Genetics. IV Edition. GS, Taylor and Francis Group, New York and London.

Core Paper XIII

Developmental Biology

Unit 1: Introduction to Developmental Biology, Gametogenesis & Fertilization

Historical perspective and basic concepts: Phases of development, Cell-Cell interaction, Pattern formation, Differentiation and growth, Differential gene expression, Cytoplasmic determinants and asymmetric cell division. Gametogenesis, Spermatogenesis, Oogenesis; Types of eggs, Egg membranes; Fertilization (External and Internal): Changes in gametes, Blocks to polyspermy.

Unit 2: Early Embryonic Development

Cleavage: Planes and patterns of cleavage; Types of Blastula; Fate maps (including Techniques); Early development of frog and chick up to gastrulation; Embryonic induction and organizers.

Unit 3: Late Embryonic Development

Fate of Germ Layers; Extra-embryonic membranes in birds; Implantation of embryo in humans, Placenta (Structure, types and functions of placenta).

Unit 4: Post Embryonic Development & Implications of Developmental Biology

Metamorphosis: Changes, hormonal regulations in amphibians and insects; Regeneration: Modes of regeneration, epimorphosis, morphallaxis and compensatory regeneration (with one example each); Ageing: Concepts and Theories. Teratogenesis: Teratogenic agents and their effects on embryonic development; In vitro fertilization, Stem cell (ESC), Amniocentesis.

PRACTICAL

1. Study of whole mounts and sections of developmental stages of frog through permanent slides: Cleavage stages, blastula, gastrula, neurula, tail-bud stage, tadpole (external and internal gill stages).
2. Study of whole mounts of developmental stages of chick through permanent slides: Primitive streak (13 and 18 hours), 21, 24, 28, 33, 36, 48, 72, and 96 hours of incubation (Hamilton and Hamburger stages).
3. Study of the developmental stages and life cycle of *Drosophila* from stock culture.
4. Study of different sections of placenta (photomicrograph/ slides).
5. Project report on *Drosophila* culture/chick embryo development.
6. Study of developmental stages by raising chick embryo in the laboratory

TEXT BOOKS

1. Lewis Wolpert (2010). Principles of Development. II Edition, Oxford University Press.
2. Gilbert, S. F. (2017). Developmental Biology, XI Edition, Sinauer Associates, Inc., Publishers, Sunderland, Massachusetts, USA.

SUGGESTED READINGS

1. Carlson, R. F. Patten's Foundations of Embryology.
2. Kalthoff (2008). Analysis of Biological Development, II Edition, McGraw-Hill Publishers.
3. Verma PS and Agrawal VK, Chordata Embryology (2010) (S Chand Publication).

Core Paper XIV

Evolutionary Biology

Unit 1: Theories, Evidences of Evolution and Extinction

Life's Beginnings: Chemogeny, RNA world, Biogeny, Origin of photosynthesis, Evolution of eukaryotes. Historical review of evolutionary concept: Lamarckism, Darwinism, Neo- Darwinism. Evidences of Evolution: Fossil record (types of fossils, transitional forms, geological time scale, evolution of horse, Sources of variations: Heritable variations and their role in evolution. Extinctions, Back ground and mass extinctions (causes and effects), detailed example of K-T extinction.

Unit 2: Process of Evolutionary changes

Population genetics: Hardy-Weinberg Law (statement and derivation of equation, application of law to human Population); Evolutionary forces upsetting H-W equilibrium; Natural selection (concept of fitness, selection coefficient, derivation of one unit of selection for a dominant allele, genetic load, mechanism of working, types of selection, density-dependent selection, heterozygous superiority, kin selection, adaptive resemblances, sexual selection). Genetic Drift (mechanism, founder's effect, bottleneck phenomenon); Role of Migration and Mutation in changing allele frequencies.

Unit 3: Species concept and Speciation

Product of evolution: Micro evolutionary changes (inter-population variations, clines, races, Species concept, Isolating mechanisms, modes of speciation—allopatric, sympatric, Parapatric. Adaptive radiation / macroevolution (exemplified by Galapagos finches);

Unit 4: Concept of Origin and Evolution of man

Origin and evolution of man, Unique hominin characteristics contrasted with primate characteristics, primate phylogeny from *Dryopithecus* leading to *Homo sapiens*, molecular analysis of human origin. Phylogenetic trees, Multiple sequence alignment, construction and interpretation of phylogenetic trees.

PRACTICAL

1. Study of fossils from models/ pictures
2. Study of homology and analogy from suitable specimens
3. Study and verification of Hardy-Weinberg Law by chi square analysis
4. Demonstration of role of natural selection and genetic drift in changing allele frequencies using simulation studies
5. Graphical representation and interpretation of data of height/ weight of a sample of 100 humans in relation to their age and sex.
6. Construction of phylogenetic trees with the help of bioinformatics tools (Clustal X, Phylip, NJ) and its interpretation.

TEXT BOOKS

1. Campbell, N.A. and Reece J.B (2011). Biology. IX Edition. Pearson, Benjamin, Cummings.
2. Rastogi B.B., (2018). Organic Evolution, MedTech; 3rd edition

SUGGESTED READINGS

1. B.K. and Hallgrimson, B. (2008). Evolution IV Edition. Jones and Barlett Publishers.
2. Douglas, J. Futuyma (1997). Evolutionary Biology. Sinauer Associates. Snustad. S Principles of Genetics.
3. Ridley, M (2004) Evolution III Edition Blackwell publishing Hall.

Discipline Specific Elective Paper-1 Animal

Behaviour and Chronobiology

Unit 1: Animal Behaviour

Origin and history of Ethology; Brief profiles of Karl von Frisch, Ivan Pavlov, Konrad Lorenz, Niko Tinbergen; Proximate and ultimate behavior; Objective of behaviour, Behaviour as a basis of evolution; Behaviour as a discipline of science; Innate behaviour, Instinct, Stimulus filtering, Sign stimuli and Code breakers.

Unit 2: Patterns of Behaviour

Stereotyped Behaviours (Orientation, Reflexes); Individual behavioural patterns; Instinct vs. Learnt Behaviour; Associative learning, classical and operant conditioning, Habituation, Imprinting.

Unit 3: Social and Sexual Behaviour

Social Behaviour: Concept of Society; Communication and the senses; Altruism; Insects' society with Honey bee as example; Foraging in honey bee and advantages of the waggle dance.

Sexual Behaviour: Asymmetry of sex, Sexual dimorphism, Mate choice, Intra-sexual selection (male rivalry), Inter-sexual selection (female choice), Sexual conflict in

parental care.

Unit 4: Chronobiology

Historical developments in chronobiology; Biological oscillation: the concept of Average, amplitude, phase and period. Adaptive significance of biological clocks, Relevance of biological clocks, Types and characteristics of biological rhythms: Short- and Long-term rhythms; Circadian rhythms; Tidal rhythms and Lunar rhythms; Concept of synchronization and masking; Photic and non-photic zeitgebers; Circannual rhythms; Photoperiod and regulation seasonal reproduction of vertebrates; Role of melatonin.

PRACTICAL

1. To study nests and nesting habits of the birds and social insects.
2. To study the behavioural responses of wood lice in dry and humid condition.
3. To study geotaxis behaviour in earthworm.
4. To study the phototaxis behaviour in insect larvae.
5. Study and actogram construction of locomotor activity of suitable animal models.
6. Study of circadian functions in humans (daily eating, sleep and temperature patterns).
7. Visit to Forest/ Wild life Sanctuary/Biodiversity Park/Zoological Park to study behavioral activities of animals and prepare a short report.

TEXT BOOKS

1. John A (2009) Animal Behaviour. 9th edition, Sinauer Associate Inc., USA.
2. Vinod Kumar (2002) Biological Rhythms: Narosa Publishing House, Delhi/ Springer-Verlag, Germany.

SUGGESTED READINGS

1. AK Pati. Chronobiology: The Dimension of Time in Biology and Medicine. PINSA (Biological Sciences). Part B 67 (6). 323-372, Dec., 2001.
2. David McF. Animal Behaviour. Pitman Publishing Limited, London, UK.
3. Manning A and Dawkins MS. An Introduction to Animal Behaviour. Cambridge University Press, USA.
4. Paul WS and John A (2013) Exploring Animal Behaviour. 6th Edition. Sinauer Associate Inc., Massachusetts, USA.
5. Jay. C. Dunlap, Jennifer. J. Loros, Patricia J. DeCoursey (ed). 2004, Chronobiology Biological Timekeeping: J, Sinauer Associates, Inc. Publishers, Sunderland, MA, USA.

OR

Animal Biotechnology

Unit 1. Introduction to Animal Biotechnology

Concept and scope of biotechnology, Cloning vectors: Plasmids, Cosmids, Phagemids, Lambda Bacteriophage, M13, BAC, YAC and Expression vectors (characteristics). Restriction enzymes: Nomenclature, detailed study of Type II, Construction of genomic and cDNA libraries and screening by colony and plaque hybridization Transformation techniques: Calcium chloride method and electroporation

Unit 2. Molecular Techniques

Southern, Northern and Western blotting, DNA sequencing: Sanger method Polymerase Chain Reaction, DNA Finger Printing and DNA microarray

Unit 3. Genetically Modified Organisms

Production of cloned and transgenic animals: Nuclear Transplantation, Retroviral Method, DNA microinjection, Applications of transgenic animals: Production of pharmaceuticals, production of donor organs, knock-out mice.

Unit 4. Culture Techniques and Applications

Animal cell culture, Expressing cloned genes in mammalian cells, Molecular diagnosis of genetic diseases (Cystic fibrosis, Thalassaemia, Haemophilia and Sickle cell anemia), Recombinant DNA in medicines: Recombinant insulin and human growth hormone, Gene therapy.

PRACTICAL

1. Genomic DNA isolation from *E. coli* / Animal tissue
2. Plasmid DNA isolation (pUC 18/19) from *E. coli*
3. Restriction digestion of plasmid DNA / Lambda Phage DNA
4. Construction of circular and linear restriction map from the data provided.
5. Calculation of transformation efficiency from the data provided.
6. To study following techniques through photographs
 - a. Southern Blotting
 - b. Northern Blotting
 - c. Western Blotting
 - d. DNA Sequencing (Sanger's Method)
 - e. PCR
 - f. DNA fingerprinting

TEXT BOOKS

1. BD Singh, (2014) Biotechnology: Expanding Horizons, Kalyani Publishers
2. U.Satyanarayan and U Chakrapani, (2014) Biotechnology, Books & Allied Ltd

SUGGESTED READINGS

1. Griffiths, A.J.F., J.H. Miller, Suzuki, D.T., Lewontin, R.C. and Gelbart, W.M. (2009). An Introduction to Genetic Analysis. IX Edition. Freeman and Co., N.Y., USA.
2. Watson, J.D., Myers, R.M., Caudy, A. and Witkowski, J.K. (2007). Recombinant DNA- Genes and Genomes- A Short Course. III Edition, Freeman and Co., N.Y., USA.
3. Brown, T.A. (2015). Gene Cloning and DNA Analysis. 7th Edition, Academic Press, California, USA.

OR

ENDOCRINOLOGY

Unit 1: Introduction to Endocrinology

History of endocrinology, Types of endocrine glands and hormones, Characteristic and Transport of Hormones, Neurosecretions and Neurohormones.

Unit 2: Epiphysis, Hypothalamo-hypophysial Axis

Structure of pineal gland, Secretions and their functions in biological rhythms and reproduction. Structure of hypothalamus, Hypothalamic nuclei and their functions, Regulation of neuroendocrine glands, Feedback mechanisms Structure of pituitary gland, Hormones and their functions, Hypothalamohypophysial portal system, Disorders of pituitary gland.

Unit 3: Peripheral Endocrine Glands

Structure, Hormones, Functions and Regulation of Thyroid gland, Parathyroid, Adrenal, Pancreas. Structure, Hormones, Functions and Regulation of Ovary and Testis. Hormones in homeostasis, Disorders of endocrine glands.

Unit 4: Regulation of Hormone Action

Hormone action at Cellular level: Hormone receptors, transduction and regulation
Hormone action at Molecular level: Molecular mediators, Genetic control of hormone action.

PRACTICAL

1. Dissect and display of Endocrine glands in laboratory bred rat*
 2. Study of the permanent slides of all the endocrine glands
 3. Compensatory ovarian/ adrenal hypertrophy in vivo bioassay in laboratory bred rat*
 4. Demonstration of Castration/ ovariectomy in laboratory bred rat*
 5. Estimation of plasma level of any hormone using ELISA
 6. Designing of primers of any hormone
 7. Report on endocrine disorders in human
- (*Subject to UGC guidelines)

TEXT BOOKS

1. C. Donnell Turner (2012) General Endocrinology Pub- Affiliated East-West press Pvt. Ltd.-New Delhi; 6th Edition
2. Hadley, M.E. and Levine J.E. (2007). Endocrinology, 6th Edition. Pearson Prentice-Hall, Pearson Education Inc., New Jersey

SUGGESTED READINGS

1. Stephen Nussey and Saffron Whitehead (2001). Endocrinology: An Integrated Approach; Oxford: BIOS Scientific Publishers

Discipline Specific Elective Paper-

1I Basics of Neuroscience

Unit 1: Introduction to Neuroscience & Nervous System

Origins of Neuroscience; Neuroanatomy, Neurophysiology, and Systems Neurobiology. Introduction to the structure and function of the nervous system: Cellular components: Neurons; Neuroglia; Neuron doctrine; The prototypical neuron – axons and dendrites as unique structural components of neurons.

UNIT 2: Cellular and Molecular Neurobiology

Molecular and cellular approaches used to study the CNS at the level of single molecules, The ionic bases of resting membrane potential; The action potential- its generation and properties; The action potential conduction. Synapse: Synaptic transmission, Types of synapses; synaptic function; Principles of chemical synaptic transmission; Principles of synaptic integration; EPSPs and IPSPs. Ion channels, Neural transmission.

Unit 3. Neurotransmitters

Different types of neurotransmitters– catecholamines, amino acidergic and peptidergic neurotransmitters; Transmitter gated channels; G-protein coupled receptors and effectors,

neurotransmitter receptors; Ionotropic and metabotropic receptors.

UNIT 4: Neurobiology and Neuropharmacology of Behaviour

The principles of signal transduction and information processing in the vertebrate central nervous system, and the relationship of functional properties of neural systems with perception and behavior; sensory systems, molecular basis of behavior including learning and memory. Molecular pathogenesis of pain and neurodegenerative diseases such as Parkinson's, Alzheimer's, psychological disorders, Addiction.

PRACTICAL

1. Dissection and study of *Drosophila* nervous system using GFP reporter.
2. Observation and quantitation of *Drosophila* photoreceptor neurons in healthy and diseased condition.
3. Nerve Cell preparation from the spinal cord.
4. Study of neurons and/ or myelin by Nissl, Giemsa or Luxol Fast Blue staining.
5. Study of olfaction in *Drosophila*.
6. Study of novelty, anxiety and spatial learning in mice.

TEXT BOOKS

1. Kandel, Schwartz and Jessell (2000) Principles of Neural Science-4th Edn-Eds. - McGraw- Hill Companies
2. Mark F. Baer; Barry W. Connors,(2015) Neuroscience: Exploring the brain . Lippincott Williams and Wilkins

SUGGESTED READINGS

1. From Molecules to Networks: An Introduction to Cellular and Molecular Neuroscience by John H. Byrne. Ruth Heidelberg and M. Neal Waxham.
2. Neuroscience-Eds. Dale Purves (3rd Edn)-Sinauer Associates, Inc.-2004.
3. Nerve Cells and Animal Behaviour-2nd Edn-Peter J Simmons and David Young-CUP-2003.
4. Essential Psychopharmacology- Neuroscientific Basis and Practical Applications- 2nd Edn.-Stephan M. Stahl-CUP-2000.
5. Phantoms in the Brain - Vilayanur S. Ramachandran and Sandra Blakeslee-1998 The Human Brain Book - Rita Carter-2009

OR

Reproductive Biology

Unit 1: Reproductive System and Endocrinology

Reproductive System: Development and differentiation of gonads, genital ducts, external genitalia, mechanism of sex differentiation.

Gonadal hormones and mechanism of hormone action, steroids, glycoprotein hormones, and prostaglandins, hypothalamo – hypophyseal – gonadal axis, regulation of gonadotrophin secretion in male and female.

Unit 2: Functional anatomy of male reproduction

Outline and histology of male reproductive system in rat and human; Testis: Cellular functions, germ cell, system cell renewal; Spermatogenesis: kinetics and hormonal regulation; Androgen synthesis and metabolism; Epididymal function and sperm maturation; Accessory glands functions; Sperm transportation in male tract

Unit 3: Functional anatomy of female reproduction

Outline and histology of female reproductive system in rat and human; Ovary: folliculogenesis, ovulation, corpus luteum formation and regression; Steroidogenesis and secretion of ovarian hormones; Reproductive cycles (rat and human) and their regulation, changes in the female tract; Ovum transport in the fallopian tubes; Sperm transport in the female tract, fertilization, prevention of polyspermy; Hormonal control of implantation; Hormonal regulation of gestation, pregnancy diagnosis, foeto- maternal relationship; Mechanism of parturition and its hormonal regulation; Lactation and its regulation

Unit 4: Reproductive Health

Infertility in male and female: causes, diagnosis and management; Assisted Reproductive Technology: sex selection, sperm banks, frozen embryos, in vitro fertilization, ET, EFT, IUT, ZIFT, GIFT, ICSI, PROST; Modern contraceptive technologies; Demographic terminology used in family planning.

PRACTICAL

Study of animal house: set up and maintenance of animal house, breeding techniques, care of normal and experimental animals.

1. Examination of vaginal smear rats from live animals.
2. Surgical techniques: principles of surgery in endocrinology. Ovariectomy, hysterectomy, castration and vasectomy in rats.
3. Examination of histological sections from photomicrographs/ permanent slides of rat/human: testis, epididymis and accessory glands of male reproductive systems; Sections of ovary, fallopian tube, uterus (proliferative and secretory stages), cervix and vagina.
4. Human vaginal exfoliate cytology.
5. Sperm count and sperm motility in rat
6. Study of modern contraceptive devices.

TEXT BOOKS

1. Austin, C.R. and Short, R.V. (1982) Reproduction in Mammals. Cambridge University Press.
2. C. Donnell Turner (2012) General Endocrinology Pub- Affiliated East-West press Pvt. Ltd.-New Delhi; 6th Edition
3. Tandulwadkar Sunita R (2015) The Art & Science of Assisted Reproductive Technology, Jaypee Brothers Medical Publishers

SUGGESTED READINGS

1. Tony M. Plant and Anthony J. Zeleznik (2015) Knobil and Neill's Physiology of Reproduction, Academic Press

OR

Immunology

Unit 1: Innate and Adaptive Immunity

Historical perspective of Immunology, Early theories of Immunology, Cells and organs of the Immune system. Anatomical barriers, Inflammation, Cell and molecules involved in innate immunity, Adaptive immunity (Cell mediated and humoral), Passive: Artificial and natural Immunity, Active: Artificial and natural Immunity, Immune dysfunctions (brief account of autoimmunity with reference to Rheumatoid Arthritis and tolerance, AIDS).

Unit 2: Antigens and Immunoglobulins

Antigenicity and immunogenicity, Immunogens, Adjuvants and haptens, Factors influencing immunogenicity, B and T-Cell epitopes, Immunoglobulins: Structure and functions of different classes of immunoglobulins, Antigen antibody interactions, Immunoassays (ELISA- Direct, Indirect, Competitive, Sandwich and RIA)

Unit 3: Major Histocompatibility Complex, Cytokines and Complement system

Structure and functions of MHC molecules. Endogenous and exogenous pathways of antigen processing and presentation; Cytokines -Properties and functions of cytokines, Therapeutics Cytokines Complement System -Components and pathways of complement activation.

Unit 4: Hypersensitivity and Vaccines

Gell and Coombs' classification and brief description of various types of hypersensitivities Vaccines -various types of vaccines, Advances in vaccine production.

PRACTICAL

1. Study of lymphoid organs.
2. Histological study of spleen, thymus and lymph nodes through slides/ photographs
3. Preparation of stained blood film to study various types of White blood cells.
4. ABO blood group determination.
5. Total WBC counting.
6. Demonstration of ELISA.
7. Demonstration of Bone marrow smears to study Immune cells.

TEXT BOOKS

2. Abbas K. Abul and Lichtman H. Andrew (2017) Cellular and Molecular Immunology. V Edition. Saunders Publication.
3. Kindt, T. J., Goldsby, R.A., Osborne, B. A. and Kuby, J (2017). Immunology, VI Edition. W.H. Freeman and Company.

SUGGESTED READINGS

1. Peter J. Delves and Seamus J. Martin (2017) Roitt's Essential Immunology, Wiley-Blackwell; 13th edition

Discipline Specific Elective Paper-

III Fish and Fisheries

Unit 1: Systematics, Morphology and Physiology

Systematic classification of native/exotic fishes (upto classes), Types of fins and their modification; Locomotion in fishes; Hydrodynamics; Types of scales, Use of scales in classification and determination of age of fish; Gills and gas exchange; Swim bladder; Reproductive strategies (Special reference to Indian fishes); Electric organs; Bioluminescence; Mechanoreceptors; Schooling; Migration

Unit 2: Fisheries

Inland fisheries; Marine fisheries; Environmental factors influencing the seasonal variation in fish; Fishing crafts and Gears; Depletion of Fisheries resources; Fisheries laws and regulations.

Unit 3: Aquaculture

Sustainable aquaculture; Extensive, semi-intensive and intensive culture of fish; Polyculture; Composite fish culture; brood stock management; Induced breeding of fish; Management of fin fish hatcheries; Preparation and maintenance of fish aquarium. Factors affecting aquaculture.

Unit 4: Fish Pathology and Transgenesis

Fish diseases: bacterial, viral and parasites; Preservation, diagnosis and treatment, Processing of harvested fish, Fishery byproducts; Transgenic fish, zebrafish as a model organism in research.

PRACTICAL

1. Study of *Petromyzon*, *Myxine*, *Pristis*, *Chimaera*, *Exocoetus*, *Hippocampus*, *Gambusia*, *Labeo*, *Heteropneustes*, *Anabas*
2. Study of different types of scales (Through permanent slides and photographs)
3. Study of crafts and gears used in fisheries.
4. Water quality criteria for aquaculture: assessment of pH, conductivity, total solids and total dissolve solids.
5. Study of air breathing organs in *Channa*, *Heteropneustes*, *Anabas* and *Clarias*.
6. Demonstration of induced breeding in fishes (Virtual).
7. Demonstration of parental care in fishes (Virtual).
8. Project report on a visit to any fish farm/ pisciculture unit/ zebra fish rearing lab

TEXT BOOKS

1. Q Bone and R Moore (2008), Biology of fishes, Taylor and Francis group, CRC Press, UK
2. S.S. Khanna and H.R. Singh (2014) A textbook of fish biology and fisheries, Narendra Publishing House, 3rd edition.

SUGGESTED READINGS

1. D H Evans and J D Claiborne, The Physiology of fishes, Taylor and Francis group, CRC, UK
2. R J Mogdans and B G Kapoor, The senses of fish: Adaptations for the reception of natural stimuli, Springer, Natherland
3. C B L Srivastava, Fish biology, Narendra Publishing House
4. J R Norman, A History of fishes, Hill and Wang Publishers.

OR

Wildlife Conservation And Management

Unit 1:

Wildlife

Values of wild life - positive and negative; Conservation ethics; Importance of conservation; Causes of depletion; World conservation strategies, Conservation and protection Laws, wild animal of India and Odisha.

Habitat analysis, Physical parameters: Topography, Geology, Soil and water; Biological Parameters: food, cover, forage, browse and cover estimation; Standard evaluation procedures: remote sensing and GIS.

Unit 2: Management of habitats

Setting back succession; Grazing logging; Mechanical treatment; Advancing the successional process; Cover construction; Preservation of general genetic diversity; Restoration of degraded habitats, In situ and Ex situ conservation, Wild life Protection act, wildlife trade and related laws.

Unit 3: Population estimation

Population density, Natality, Birth rate, Mortality, fertility schedules and sex ratio computation; Faecal analysis of ungulates and carnivores: Faecal samples, slide preparation, Hair identification, Census methods; Bio- telemetry; Care of injured and diseased animal; Quarantine; Common diseases of wild animals.

Unit 4: Management planning of wildlife in protected areas

Estimation of carrying capacity; Eco tourism / wild life tourism in forests; Concept of climax persistence; Ecology of perturbation, National parks & sanctuaries, Community reserve; Important features of protected areas in India; Tiger conservation - Tiger reserves in India; Management challenges in Tiger reserve.

PRACTICAL

1. Identification of flora, mammalian fauna, avian fauna, herpeto-fauna India and Odisha.
2. Demonstration of basic equipment needed in wildlife studies use, care and maintenance (Compass, Binoculars, Spotting scope, Range Finders, Global Positioning System, Various types of Cameras and lenses).
3. Familiarization and study of animal evidences in the field; Identification of animals through pug marks, hoof marks, scats, pellet groups, nest, antlers, animal sounds.
4. Demonstration of different field techniques for flora and fauna.
5. Trail / transect monitoring for abundance and diversity estimation of mammals and bird (direct and indirect evidences)
6. Submission of field study report (national park/ reserve forest/ sanctuary)

TEXT BOOKS

1. Gopal Rajesh (2011) Fundamentals of Wildlife Management, Natraj Publishers.
2. Caughley, G., and Sinclair, A.R.E. (1994). Wildlife Ecology and Management. Blackwell Science.

SUGGESTED READINGS

1. Woodroffe R., Thirgood, S. and Rabinowitz, A. (2005). *People and Wildlife, Conflict or Co-existence?* Cambridge University.
2. Bookhout, T.A. (1996). *Research and Management Techniques for Wildlife and Habitats*, 5 th edition. The Wildlife Society, Allen Press.
3. Sutherland, W.J. (2000). *The Conservation Handbook: Research, Management and Policy*. Blackwell Sciences.
4. Hunter M.L., Gibbs, J.B. and Sterling, E.J. (2008). *Problem-Solving in Conservation Biology and Wildlife Management: Exercises for Class, Field, and Laboratory*. Blackwell Publishing.

Discipline Specific Elective Paper-

IV Economic Zoology

Unit 1: Bee-keeping and Bee Economy (Apiculture)

Varieties of honey bees and Bee pasturage; Setting up an apiary: Langstroth's/Newton's hive, bee veil, brood and storage chambers, iron frames and comb sheets, drone excluder, rearing equipments, handling of bees, artificial diet; Honey extraction techniques; Physico-chemical analysis of honey; Other beneficial products from bee.

Unit 2: Silk and Silk Production (Sericulture)

Different types of silk and silk worms in India; Rearing of *Bombyx mori*, Rearing racks and trays, disinfectants, rearing appliances, black boxing, Chawki rearing, bed cleaning, mountages, harvesting of cocoons; Silkworm diseases: Pebrine, Flacherie, Grasserie, Muscardine and Aspergillosis, and their management; Silkworm pests and parasites: Uzi fly, Dermestid beetles and their management; Silk reeling techniques and Quality assessment of silk fibre.

Unit 3: Aquaculture

Induced breeding of fish; Management of hatchery of fish; Management of nursery, rearing and stocking ponds; Preparation and maintenance of fish aquarium; Preparation of compound diets for fish; Role of water quality in aquaculture; Fish diseases: Bacterial, viral and parasitic; Preservation and processing of harvested fish; Fishery by-products. Prawn farming; Culture of crab; Pearl culture.

Unit 4: Dairy and Poultry Farming

Introduction; Indigenous and exotic breeds; Rearing, housing, feed and rationing; Commercial importance of dairy and poultry farming; Varietal improvement techniques; Diseases and their management; Dairy or poultry farm management and business plan; Visit to any dairy farm or Poultry farm.

PRACTICAL

1. Submission of report on anyone field visits related to Aquaculture/Apiculture/Sericulture/Poultry/ Dairy farm.
2. Study of different types of bees (Queens, Drones and Worker bees).
3. Study of different types of silk moths.
4. Study of different types of pearls.
5. Study of different types of fish diseases.

6. Identification of different types of scales in fishes.
7. Study of different types of fins.
8. Study of different modified structures of fishes (Saw of sawfish, Hammer of hammer head fish, tail of sharks etc.)
9. Identification of various types of natural silks.

TEXT BOOKS

1. Sarkar, Kundu and Chaki. (2014) Introduction to Economic Zoology. NCBA Publisher.
2. T.V.R. Pillay (Author), M.N. Kutty (2011) Aquaculture: Principles and Practices, Wiley India Pvt Ltd; Second edition

SUGGESTED READINGS

1. Dhyam Singh Bisht, Apiculture, ICAR Publication.
2. Dunham RA (2004) Aquaculture and Fisheries Biotechnology – Genetic Approaches. CABI publications, U.K.
3. Hafez ESE (1962) Reproduction in Farm Animals. Lea and Fabiger Publishers.
4. Knobil E and Neill JD (2006) The Physiology of Reproduction. Vol.2. Elsevier Publishers, USA.
5. Prost PJ (1962) Apiculture. Oxford and IBH, New Delhi.
6. Singh S. Beekeeping in India, Indian council of Agricultural Research, New Delhi.
7. Srivastava CBL (1999) Fishery Science and Indian Fisheries. Kitab Mahal publications, India.

OR

Project Work

Each student has to undertake a project work under the guidance of a teacher and submit the project report in the form of a thesis. There will be a presentation of the project work before an external examiner.

Generic Elective Paper

I Animal Diversity

Unit 1: Protista, Porifera, Radiata, Aceolomates and Pseudocoelomates

General characters of Protozoa; Life cycle of *Plasmodium*, General characters and canal system in Porifera, General characters of Cnidarians and polymorphism, General characters of Helminthes; Life cycle of *Taenia solium*, General characters of Nemethelminthes; Parasitic adaptations

Unit 2: Coelomate Protostomes, Arthropoda, Mollusca and Coelomate Deuterostomes

General characters of Annelida, Metamerism, General characters, Social life in insects, General characters of mollusca, torsion in gastropod, pearl formation, General characters of Echinodermata, larval form in Echinodermata.

Unit 3: Protochordata , Pisces, Amphibia

Salient features, Osmoregulation, Migration of Fishes, General characters, Adaptations for terrestrial life, Parental care in Amphibia.

Unit 4: Reptiles, Aves and Mammals

Amniotes, Origin of reptiles, Terrestrial adaptations in reptiles, Origin of birds; Flight adaptations, early evolution of mammals; Primates; Dentition in mammals.

PRACTICAL

1. Study of following specimens:

Non Chordates: *Euglena, Noctiluca, Paramecium, Sycon, Physalia, Tubipora,*

Metridium, Taenia, Ascaris, Nereis, Aphrodite, Leech, Peripatus, T. gigas, Limulus, Hermitcrab, Daphnia, Millipede, Centipede, Beetle, Chiton, Dentalium, Octopus, Asterias and Antedon.

Chordates: *Balanoglossus, Amphioxus, Petromyzon, Pristis, Hippocampus, Labeo, Ichthyophis/Uraeotyphlus, Salamander, Rhacophorus Draco, Uromastix, Naja, Viper, model of Archaeopteryx, any three common birds-(Crow, duck, Owl), Squirrel and Bat.*

2. Study of following Permanent Slides:

Cross section of *Sycon*, Sea anemone and *Ascaris* (male and female). T. S. of Earthworm passing through pharynx, gizzard, and typhlosolar intestine. Bipinnaria and Pluteus larva

3. Temporary mounts of Septal & pharyngeal nephridia of earthworm.

Unstained mounts of Placoid, cycloid and ctenoid scales.

TEXT BOOKS

1. Kotpal RL. (2016) Modern Textbook of Zoology –Vertebrates; Rastogi Publications – Meerut.
2. Kotpal RL.(2016) Modern Textbook of Zoology –Invertebrates; Rastogi Publications – Meerut.

SUGGESTED READINGS

1. Barnes, R.D. (1992). Invertebrate Zoology. Saunders College Pub. USA.
2. Campbell & Reece (2005). Biology, Pearson Education, (Singapore) Pvt. Ltd.
3. Raven, P.H. and Johnson, G. B. (2004). Biology, 6th edition, Tata McGraw Hill Publications, New Delhi.
4. Kardong, K.V. (2002). Vertebrates Comparative Anatomy. Function and Evolution. Tata McGraw Hill Publishing Company. New Delhi.

OR

Insect Vectors and Diseases

Unit 1: Insects, Concept of Vectors, Insects as Vectors

General Features of Insects, Morphological features, Head – Eyes, Types of antennae, Mouth parts with reference to feeding habits, Brief introduction of Carrier and Vectors (mechanical and biological vector), Reservoirs, Host-vector relationship, Vectorial capacity, Adaptations as vectors, Host Specificity, Classification of insects up to orders, detailed features of orders with insects as vectors – Diptera, Siphonaptera, Siphunculata, Hemiptera

Unit 2: Dipteran as Disease Vectors

Dipterans as important insect vectors – Mosquitoes, Sand fly, Houseflies; Study of mosquito-borne diseases – Malaria, Dengue, Chikungunya, Viral encephalitis, Filariasis; Control of mosquitoes Study of sand fly-borne diseases – Visceral Leishmaniasis, Cutaneous Leishmaniasis, Phlebotomus fever; Control of Sand fly, Study of house fly as important mechanical vector, Myiasis, Control of house fly

Unit 3: Siphonaptera and Siphunculata as Disease Vectors

Fleas as important insect vectors; Host-specificity, Study of Flea-borne diseases – Plague, Typhus fever; Control of fleas, Human louse (Head, Body and Pubic louse) as important insect vectors; Study of louse-borne diseases – Typhus fever, Relapsing fever, Trench fever, Vagabond's disease, Phthiriasis; Control of human louse

Unit 4: Hemiptera as Disease Vectors

Bugs as insect vectors; Blood-sucking bugs; Chagas disease, Bed bugs as mechanical vectors, Control and prevention measures

PRACTICAL

1. Study of different kinds of mouth parts of insects
2. Study of following insect vectors through permanent slides/ photographs: *Aedes*, *Culex*, *Anopheles*, *Pediculus humanus corporis*, *Phthirus pubis*, *Xenopsylla cheopis*, *Cimex lectularius*, *Phlebotomus argentipes*, *Musca domestica* through permanent slides/ photographs
3. Study of different diseases transmitted by above insect vectors.
4. Submission of a project report on any one of the insect vectors and disease transmitted.

TEXT BOOKS

1. Mathews, G. (2011). Integrated Vector Management: Controlling Vectors of Malaria and Other Insect Vector Borne Diseases. Wiley-Blackwell
2. Chapman, R.F. (1998). The Insects: Structure and Function. IV Edition, Cambridge University Press, UK

SUGGESTED READINGS

1. Mike Service (2012) Medical Entomology for Students Cambridge University Press; 5th edition.
2. Pedigo L.P. (2002). Entomology and Pest Management. Prentice Hall Publication

Brief introduction of the aquatic biomes: Freshwater ecosystem (lakes, wetlands, Streams and rivers), estuaries, intertidal zones, oceanic pelagic zone, marine benthic zone and coral reefs

UNIT 2: Freshwater Biology

Lakes: Origin and classification, Lake as an Ecosystem, Lake morphometry, Physico-chemical Characteristics: Light, Temperature, Thermal stratification,

Dissolved Solids, Carbonate, Bicarbonates, Phosphates and Nitrates, Turbidity; dissolved gases (Oxygen, Carbon dioxide). Nutrient Cycles in Lakes-Nitrogen, Sulphur and Phosphorous

Streams: Different stages of stream development, Physico-chemical, environment, Adaptation of hill-stream fishes.

UNIT 3: Marine Biology

Salinity and density of Sea water, Continental shelf, Adaptations of deep sea organisms, Coral reefs, Sea weeds.

UNIT 4: Management of Aquatic Resources

Causes of pollution: Agricultural, Industrial, Sewage, Thermal and Oil spills, Eutrophication, Management and conservation (legislations), Sewage treatment Water quality assessment- BOD and COD.

015

PRACTICAL

1. Determine the area of a lake using graphimetric and gravimetric method.
2. Identify the important macrophytes, phytoplanktons and zooplanktons present in a lake ecosystem.
3. Determine the amount of Turbidity/transparency, Dissolved Oxygen, Free, Carbon dioxide, Alkalinity (carbonates & bicarbonates) in water collected from nearby lake/ water body.
4. Instruments used in limnology (Secchi disc, Van Dorn Bottle, Conductivity meter, Turbidity meter, PONAR grab sampler) and their significance.
5. A Project Report on a visit to a Sewage treatment plant/Marine bioreserve/ Fisheries Institutes.

TEXT BOOKS

1. Wetzel RG (2001) Limnology: Lake and River Ecosystems, Academic Press; 3rd edition

SUGGESTED READINGS

1. Anathakrishnan : Bioresources Ecology 3rd Edition
2. Odum and Barrett : Fundamentals of Ecology, 5th Edition
3. Pawlowski: Physicochemical Methods for Water and Wastewater Treatment, 1st Edition
4. Trivedi and Goyal : Chemical and biological methods for water pollution studies
5. Welch : Limnology Vols. I-II

OR

Food, Nutrition And Health

Unit 1: Basic concept of food and nutrition

Food Components and food-nutrients, Concept of a balanced diet, nutrient needs and dietary

pattern for various groups, adults, pregnant and nursing mothers, infants, school children, adolescents and elderly

Unit 2: Nutritional Biochemistry:

Carbohydrates, Lipids, Proteins- Definition, Classification, their dietary source and role
Vitamins- Fat-soluble and Water-soluble vitamins- their dietary source and importance
Minerals- Iron, calcium, phosphorus, iodine, selenium and zinc: their biological functions

Unit 3: Health

Introduction to health- Definition and concept of health, Major nutritional Deficiency diseases- Protein Energy Malnutrition (kwashiorkor and marasmus), Vitamin A deficiency disorders, Iron deficiency disorders, Iodine deficiency disorders- their causes, symptoms, treatment, prevention and government programmes, if any. Life style related diseases- hypertension, diabetes mellitus, and obesity- their causes and prevention through dietary and lifestyle modifications, Social health problems- smoking, alcoholism, drug dependence and Acquired Immuno Deficiency Syndrome (AIDS) - their causes, treatment and prevention, Common ailments- cold, cough, and fevers, their causes and treatment

Unit 4: Food hygiene:

Potable water- sources and methods of purification at domestic level Food and Water borne infections: **Bacterial infection:** Cholera, typhoid fever, dysentery; **Viral infection:** Hepatitis, Poliomyelitis, **Protozoan infection:** amoebiasis, giardiasis; **Parasitic infection:** taeniasis and ascariasis their transmission, causative agent, sources of infection, symptoms and prevention. Brief account of food spoilage: Causes of food spoilage and their preventive measures

01

PRACTICAL

1. To detect adulteration in a) Ghee b) Sugars c) Tea leaves and d) Turmeric
3. Estimation of Lactose in milk
4. Ascorbic acid estimation in food by titrimetry
5. Estimation of Calcium in foods by titrimetry
6. Study of the stored grain pests from slides/ photograph (*Sitophilus oryzae*, *Trogoderma granarium*, *Callosobruchus chinensis* and *Tribolium castaneum*): their identification, habitat and food sources, damage caused and control. Preparation of temporary mounts of the above stored grain pests.
7. Project- Undertake computer aided diet analysis and nutrition counseling for different age groups. OR Identify nutrient rich sources of foods (**fruits and vegetables**), their seasonal availability and price OR Study of nutrition labeling on selected foods

TEXT BOOKS

1. Mudambi, SR and Rajagopal, MV (2018). Fundamentals of Foods, Nutrition and Diet Therapy; Sixth Ed; New Age International Publishers.
2. Bamji MS, Rao NP, and Reddy V.(2017) Text Book of Human Nutrition; Oxford &

SUGGESTED READINGS

1. Srilakshmi B. Nutrition Science; 2002; New Age International (P) Ltd.
2. Srilakshmi B. Food Science; Fourth Ed; 2007; New Age International (P) Ltd.
3. Swaminathan M. Handbook of Foods and Nutrition; Fifth Ed; 1986; BAPPCO

Generic Elective Paper III Human Physiology

Unit 1: Digestion and Respiratory Physiology

Structure and function of digestive glands; Digestion and absorption of carbohydrates, fats and proteins; Nervous and hormonal control of digestion (in brief), Ventilation, External and internal Respiration, Transport of oxygen and carbon dioxide in blood, Factors affecting transport of gases.

Unit 2: Functioning of Excitable Tissue (Nerve and Muscle)

Structure of neuron, Propagation of nerve impulse (myelinated and non-myelinated nerve fiber); Structure of skeletal muscle, Mechanism of muscle contraction (Sliding filament theory), Neuromuscular junction

Unit 3: Renal Physiology and Cardiovascular Physiology

Functional anatomy of kidney, Mechanism and regulation of urine formation, Structure of heart, Coordination of heartbeat, Cardiac cycle, ECG

Unit 4: Endocrine and Reproductive Physiology

Structure and function of endocrine glands (pituitary, thyroid, parathyroid, pancreas, adrenal, ovaries, and testes), Brief account of spermatogenesis and oogenesis, Menstrual cycle.

PRACTICAL

1. Preparation of temporary mounts: Neurons and Blood film.
2. Preparation of haemin and haemochromogen crystals.
3. Estimation of haemoglobin using Sahli's haemoglobinometer.
4. Examination of permanent histological sections of mammalian oesophagus, stomach, duodenum, rectum, lung, kidney, thyroid, pancreas, adrenal, testis, ovary.

TEXT BOOKS

1. Marieb EN and Hoehn K, (2015) Human Physiology, 10th global edition, Pearson Education, USA.
2. Guyton, A.C. and Hall, J.E. (2011). Textbook of Medical Physiology, XII Edition, Harcourt Asia Pvt. Ltd/ W.B. Saunders Company.

SUGGESTED READINGS

1. Widmaier, E.P., Raff, H. and Strang, K.T. (2008). Vander's Human Physiology, XI Edition, McGraw Hill.
2. Kesar, S. and Vashisht, N. (2007). Experimental Physiology, Heritage Publishers.
3. Prakash, G. (2012). Lab Manual on Blood Analysis and Medical Diagnostics, S. Chand and Company Ltd.

4. Tortora, G.J. and Derrickson, B.H. (2009). Principles of Anatomy and Physiology,

OR

Environment and Public Health

UNIT 1: Environmental hazards

Sources of Environmental hazards, hazard identification and accounting, fate of toxic and persistent substances in the environment, dose Response Evaluation, exposure Assessment.

UNIT 2: Pollution

Air, water, noise pollution sources and effects, Pollution control; Greenhouse gases and global warming, Acid rain, Ozone layer destruction, Effect of climate change on public health

Unit 3: Waste Management Technologies

Sources of waste, types and characteristics, Sewage disposal and its management, Solid waste disposal, biomedical waste handling and disposal, nuclear waste handling and disposal, Waste from thermal power plants, Case histories on Bhopal gas tragedy, Chernobyl disaster, Seveso disaster and Three Mile Island accident and their aftermath

Unit 4 Diseases

Causes, symptoms and control of: Tuberculosis, Asthma, Cholera, Typhoid, Malaria and AIDS

PRACTICAL (Credits 2)

1. To determine pH, Cl, SO₄, NO₃ in soil and water samples from different locations.

TEXT BOOKS

1. Cutter, S.L. (1999) Environmental Risk and Hazards, Prentice-Hall of India Pvt. Ltd., New Delhi.
2. Park K (2017) Parks Text Book Of Preventive & Social Medicine, Banarsidas Bhanot Publishers

SUGGESTED BOOKS

1. Kolluru Rao, Bartell Steven, Pitblado R and Stricoff 1996. "Risk Assessment and Management Handbook", McGraw Hill Inc., New York.
2. Kofi Asante Duah 1998 "Risk Assessment in Environmental management", John Wiley and sons, Singapore.
3. Kasperson, J.X. and Kasperson, R.E. and Kasperson,R.E., 2003. Global Environmental Risks, V.N.University Press, New York,
4. Joseph F Louvar and B Diane Louver 1997 Health and Environmental Risk Analysis fundamentals with applications, Prentice Hall, New Jersey.
5. Wardlaw GM, Hampl JS. Perspectives in Nutrition; Seventh Ed; 2007; McGraw Hill.
6. Lakra P, Singh MD. Textbook of Nutrition and Health; First Ed; 2008; Academic Excellence.
7. Manay MS, Shadaksharaswamy. Food-Facts and Principles; 1998; New Age International (P) Ltd.

Generic Elective Paper IV Animal Biotechnology

UNIT 1: Introduction and Techniques in Gene manipulation

Concept and Scope of Biotechnology, Outline process of genetic engineering and recombinant DNA technology, Isolation of genes, Concept of restriction and modification: Restriction endonucleases, DNA modifying enzymes, Cloning Vectors: Plasmids, Phage vectors, Cosmids, Phagemids, BAC, YAC, HAC. Shuttle and Expression Vectors, Construction of Genomic libraries and cDNA libraries, Transformation techniques: microbial, plants and animals: Cloning in mammalian cells, Integration of DNA into mammalian genome- Electroporation and Calcium, Phosphate Precipitation method.

UNIT2: Animal cell Culture

Basic techniques in animal cell culture and organ culture, Primary Culture and Cell lines, Culture media- Natural and Synthetic, Stem cells, Cryopreservation of cultures. Agarose and Polyacrylamide Gel Electrophoresis, Southern, Northern and Western blotting, DNA sequencing: Sanger method, Polymerase chain reaction, DNA Fingerprinting and DNA microarrays

UNIT 3: Fermentation

Different types of Fermentation: Submerged & Solid state; batch, Fed batch & Continuous; Stirred tank, Air Lift, Fixed Bed and Fluidized, Downstream Processing: Filtration, centrifugation, extraction, chromatography, spray drying and lyophilization

UNIT 4: Transgenic Animal Technology and Application in Health

Production of transgenic animals: nuclear transplantation, retroviral method, DNA microinjection method, Dolly and Polly, Development of recombinant Vaccines, Hybridoma technology, Gene Therapy, Production of recombinant Proteins: Insulin and growth hormones.

PRACTICAL

1. Packing and sterilization of glass and plastic wares for cell culture.
2. Preparation of culture media.
3. Preparation of genomic DNA from *E. coli*/animals/ human.
4. Plasmid DNA isolation (pUC 18/19) and DNA quantitation using agarose gel electrophoresis (by using lambda DNA as standard).
5. Restriction digestion of lambda (λ) DNA using EcoR1 and Hind III.
6. Preparation of competent cells and Transformation of *E. coli* with plasmid DNA using CaCl₂, Selection of transformants on X-gal and IPTG (Optional).
7. Techniques: Western Blot, Southern Hybridization, DNA Fingerprinting, PCR, DNA Microarrays.

TEXTBOOKS

1. BD Singh, (2014) Biotechnology: Expanding Horizons, Kalyani Publishers
2. U.Satyanarayan and U Chakrapani, (2014) Biotechnology, Books & Allied Ltd

SUGGESTED READINGS

1. T.A. Brown (2008): Gene cloning and DNA analysis: An Introduction, Blackwell Science.
2. Animal Cell Culture Methods Academic Press
3. P.K. Gupta: Biotechnology and Genomics, Rastogi publishers (2017).

4. B.D. Singh: Biotechnology, Kalyani publishers, 1998 (Reprint 2001).
5. Griffiths, A.J.F., J.H. Miller, Suzuki, D.T., Lewontin, R.C. and Gelbart, W.M. (2009). An introduction to genetic analysis, IX Edition, Freeman & Co., N.Y., USA
6. Verma S A, Das S and Singh (2014) A. Laboratory Manual for Biotechnology. S Chand Publication.

OR

Cell and Molecular Biology

Unit 1: Cells and Plasma Membrane

Prokaryotic and Eukaryotic cells, Various models of plasma membrane; Transport across membranes, The Endoplasmic Reticulum; Golgi apparatus; Lysosomes; Structure and function of mitochondria

Unit 2: Nucleus, cell division

Ultra structure of nucleus; Mitosis, Meiosis, Cell cycle and its regulation

Unit 3: Nucleic Acids and DNA Replication

Salient features of DNA double helix; Watson and Crick model of DNA, Structure of RNA, tRNA, DNA Replication in prokaryotes and eukaryotes; Mechanism of DNA replication

Unit 4: Transcription and Translation

Mechanism of transcription in prokaryotes and Eukaryotes, Process of protein synthesis in prokaryotes and translation

PRACTICAL

1. Study of prokaryotic and eukaryotic cell types through permanent slides.
2. Study of mitosis and meiosis through squashing in Grasshopper.
3. Demonstration of transport through cell membrane.
4. Preparation of DNA and RNA models.
5. Demonstration of protein synthesis through models.

TEXT BOOKS

1. Karp, G. (2010). Cell and Molecular Biology: Concepts and Experiments. VI Edition. John Wiley and Sons. Inc.
2. De Robertis, E.D.P. and De Robertis, E.M.F. (2006). Cell and Molecular Biology. VIII Edition. Lippincott Williams and Wilkins, Philadelphia.

SUGGESTED READINGS

1. Bruce Albert, Bray Dennis, Levis Julian, Raff Martin, Roberts Keith and Watson James (2008) Molecular Biology of the Cell. 5th Edition. Garland publishing Inc., New York.
2. Becker WM, Kleinsmith LJ, Hardin J and Bertoni G P (2009) The World of the Cell. 7th Edition. Pearson Benjamin Cummings Publishing, San Francisco.
3. Cooper GM and Hausman RE (2009) The Cell: A Molecular Approach. 5th Edition. ASM Press, Washington D.C.
4. S Harisha (2007) Biotechnology procedures and experiments handbook., Infinity Science Press, Hingham

**Part of syllabus (ZOOLOGY B.Sc.) to be covered in
Refresher Course**

Theory

1. Linear and Y-shaped food chains
2. Energy flow through the ecosystem
3. Ecology in Wildlife Conservation and Management.
4. Laws of limiting factors
5. Gause's Principle with laboratory and field examples
6. Hypothesis and hypothesis testing (Chi-square test, t-test)
7. Global warming and Climate change
8. Impacts of environmental disturbances
9. Biodiversity patterns and global biodiversity hot spots; India as a mega-biodiversity nation
10. Solid waste management: Control measures of urban and industrial wastes
11. Convention on Biological Diversity (CBD)
12. Mitochondrial Respiratory Chain
13. Chemi-osmotic hypothesis
14. Cell signaling
15. Origin of chordates and Tetrapoda (Evolution of terrestrial ectotherms)
16. Adaptive radiation in mammals
17. Plate tectonic and Continental drift theory
18. Distribution of vertebrates in different realms
19. Ossification, bone growth and resorption
20. Neural receptors and transmission
21. Hypothalamus-Pituitary & Gonadal axis
22. Mechanism of hormone action
23. Structural organization of Proteins
24. Hypo-Hyperchromaticity of DNA
25. Enzyme kinetics
26. Respiratory pigments
27. Regulation of water and acid-base balance
28. Haemoglobin and haemopoiesis
29. Cardiac cycle
30. Biological oxidation reduction reactions
31. Oxidative Phosphorylation
32. Electron Transport System
33. DNA Damage & Repair
34. Regulation of transcription and translation
35. RNA editing
36. Operon concept
37. Gene silencing
38. RNA interference
39. Polygenic inheritance
40. Chromosome mapping

41. Molecular mechanisms of recombination
42. Detection of mutations
43. Molecular mechanism of sex determination in *Drosophila* and Man
44. Transposons
45. Cell-Cell interaction
46. Pattern formation
47. Differential gene expression
48. Metamorphosis and Regeneration
49. Teratogenesis
50. *In vitro* fertilization
51. Stem cell
52. Natural selection
53. Genetic drift
54. Species concept and Speciation
55. Phylogenetic trees
56. Insect vectors borne diseases and their control
57. RNA world & origin of life
58. Extinctions
59. Hardy-Weinberg Law
60. Coral reefs diversity and their role in ecosystem
61. Origin and morphometry of lakes
62. Adaptation of hill-stream fishes.
63. Eutrophication and management of aquatic resources and conservation (legislations),
Sewage
64. Nutritional Biochemistry
65. Life style related diseases
66. Social health problems
67. Food spoilage and their preventive measures
68. Environmental hazards
69. Effect of climate change on public health
70. Biomedical waste handling and disposal
71. Nuclear waste handling and disposal
72. Waste from thermal power plants
73. Cloning Vectors
74. Genomic libraries and cDNA libraries
75. Cloning in mammalian cells, Integration
76. Animal cell culture and organ culture
77. DNA sequencing
78. DNA Fingerprinting and DNA microarrays
79. Transgenic animals
80. Development of recombinant Vaccines
81. Gene Therapy
82. Artificial beehives and cross pollination
83. Aquarium Fish Industry
84. Hypertension

85. Commercial diagnostic kits
86. Research Design
87. Technical Reports and Thesis writing
88. Intellectual property Rights and Patent law
89. Plagiarism
90. Entrepreneurship in Sericulture
91. Behaviour as a basis of evolution
92. Social Behaviour in Honey bee
93. Biological clocks, and Circadian rhythms
94. Restriction enzymes
95. DNA Finger Printing
96. Transgenic animals
97. Molecular diagnosis of genetic diseases
98. Cells of the Nervous system
99. Neurotransmitters
100. Neurodegenerative diseases
101. Psychological disorders
102. MHC molecules
103. Therapeutics Cytokines
104. Complement System
105. Hypersensitivity
106. Advances in vaccine production
107. Sustainable aquaculture
108. Census methods in wildlife
109. Common diseases of wild animals
110. Eco tourism
111. Bee Economy
112. Dairy or poultry farm management and business plan
113. Developing Projects for students

Practical

1. Examination of pond water collected from different places for diversity in protista.
2. Study of life tables and plotting of survivorship curves of different types from the hypothetical/real data provided.
3. Determination of population density in a natural/hypothetical community by quadrat method and calculation of Shannon-Weiner diversity index for the same community.
4. Preparation of permanent slide to show the presence of Barr body in human female blood cells/cheek cells.
5. Preparation of permanent slide to demonstrate: DNA by Feulgen reaction; DNA and RNA by MGP; Mucopolysaccharides by PAS reaction; Proteins by Mercuric bromophenol blue/Fast Green
6. Microtomy: Preparation of permanent slides/photographs/computer models of any five types of mammalian (Goat/rat, etc) tissues
7. Paper chromatography of amino acids.
8. Effect of pH, temperature and inhibitors on the action of salivary amylase./Urease /acid or alkaline phosphatases
9. Demonstration of proteins separation by SDS-PAGE.

10. Determination of ABO Blood group
11. Estimation of total protein in given solutions
12. Detection of SGOT and SGPT or GST and GSH in serum/ tissue
13. To study the enzymatic activity of Trypsin / Lipase.
14. To perform the Acid and Alkaline phosphatase assay from serum/tissue.
15. Study of Polytene chromosomes from *Chironomous* / *Drosophilalarvae*
16. Preparation of liquid culture medium (LB) and raise culture of *E. coli*
17. Study of Mendelian laws and geneinteractions.
18. Linkage maps based on data from conjugation, transformation andtransduction.
19. Linkage maps based on data from *Drosophila* crosses.
20. Study of human karyotype (normal and abnormal).
21. Pedigree analysis of some human inherited traits.
22. Study of homology and analogy from suitable specimens
23. Study and verification of Hardy-Weinberg Law by chi square analysis
24. Demonstration of role of natural selection and genetic drift in changing allele frequencies using simulation studies
25. Determine the area of a lake using graphimetric and gravimetric method.
26. Identify the important macrophytes, phytoplanktons and zooplanktons present in a lake ecosystem.
27. Estimation of Lactose in milk
28. Ascorbic acid estimation in food by titrimetry
29. Estimation of Calcium in foods by titrimetry
30. Preparation of temporary mounts: Neurons and Blood film.
31. Preparation of genomic DNA from *E. coli*/animals/ human.
32. Techniques: Western Blot, Southern Hybridization, DNA Fingerprinting, PCR, DNA Microarrays.
33. Study of mitosis and meiosis through squashing in Grasshopper.
34. Plasmid DNA isolation (pUC 18/19) from *E. coli*
35. Restriction digestion of plasmid DNA / Lambda Phage DNA
36. Construction of circular and linear restriction map from the data provided.
37. Estimation of plasma level of any hormone using ELISA
38. Observation and quantitation of *Drosophila* photoreceptor neurons in healthy and diseased condition.
39. Nerve Cell preparation from the spinal cord.
40. Study of neurons and/ or myelin by Nissl, Giemsa or Luxol Fast Blue staining.
41. Human vaginal exfoliate cytology.
42. Sperm count and sperm motility in rat
43. Demonstration of ELISA.
44. Demonstration of Bone marrow smears to study Immune cells.
45. Demonstration of different field techniques for flora and fauna.
46. Trail / transect monitoring for abundance and diversity estimation of mammals and bird (direct and indirect evidences)

List of instruments/equipments

SL No	Name of the equipment
1	Students' Compound Microscope
2	Stereo Microscope
3	Haemocytometer
4	pH Meter
5	UV-Visible Spectrometer
6	Bench Top Centrifuge
8	Paper Chromatography Unit
9	Digital Weighing balance
10	Laminar Airflow
11	BOD Incubator
12	Refrigerator
13	Hot Air Oven
14	Autoclave
15	Magnetic Stirrer with Hot Plate
16	Microtome
17	Gel electrophoresis unit with accessories
18	Trans illuminator
19	Water bath

STATE MODEL SYLLABUS FOR UNDERGRADUATE COURSES IN COMMERCE (2019-2020)

UNDER CHOICE BASED CREDIT SYSTEM

	Skill Development
	Employability
	Entrepreneurship
	All the three
	Skill Development and Employability
	Skill Development and Entrepreneurship
	Employability and Entrepreneurship

U.G. Commerce Common Syllabus, Odisha

Paper	Subject	Paper Code	Full Marks	End-term Marks	Mid-term Marks	Credit Points
Semester I						
1.1	Environmental Science	AECC -1	100	80	20	4
1.2	Financial Accounting	CORE-1	100	80	20	6
1.3	Business Law	CORE-2	100	80	20	6
1.4	Micro Economics	GE-1	100	80	20	6
	Total		400			22
Semester II						
2.1	Communicative English/MIL	AECC-2	100	80	20	4
2.2	Cost Accounting	CORE-3	100	80	20	6
2.3	Corporate Law	CORE-4	100	80	20	6
2.4	Macro & Indian Economy	GE-2	100	80	20	6
	Total		400			22
Semester III						
3.1	Corporate Accounting	CORE-5	100	80	20	6
3.2	Income-tax Law and Practice	CORE-6	100	80	20	6

3.3	Management Principles and Application	CORE-7	100	80	20	6
3.4	Business Statistics	GE-3	100	80	20	6
3.5	E-Commerce	SEC-1	100	80	20	4
	Total		500			28
	Semester IV					
4.1	GST and Indirect Taxes	CORE-8	100	80	20	6
4.2	Fundamentals of Data Management (End Term Exam = 60, Practical = 25, Mid-term = 15)	CORE-9	100	60+25	15	6
4.3	Management Accounting	CORE-10	100	80	20	6
4.4	Principles of Marketing	GE-4	100	80	20	6
4.5	Entrepreneurship Development and Business Ethics	SEC-2	100	80	20	4
	Total		500			28
	Semester V					
5.1	Computerized Accounting & E-filing of Tax Returns (End Term Exam = 60, Practical = 25, Mid-term = 15)	CORE-11	100	60+25	15	6
5.2	Fundamentals of Financial Management	CORE-12	100	80	20	6
5.3	Elective I (Any <i>one</i> of the following)	DSE-1	100	80	20	6
	A.	Financial				

	Accounting and Finance	Markets, Institutions & Services					
	B. Banking and Insurance	Indian Banking and Insurance System					
	C. Management	Human Resource Management					
5.4	Elective II (Any one of the following)		DSE-2	100	80	20	6
	A. Accounting and Finance	Financial Statement Analysis and Reporting					
	B. Banking and Insurance	Merchant Banking and Financial Services					
	C. Management	International Business					
	Total			400			24
Semester VI							
6.1	Auditing and Corporate Governance		CORE-13	100	80	20	6
6.2	Business Mathematics		CORE-14	100	80	20	6
6.3	Elective III (Any one of the following)		DSE-3	100	80	20	6
	A. Accounting and Finance	Fundamentals of Corporate Tax Planning					
	B. Banking and Insurance	Fundamentals of Investment					
	C. Management	Consumer Affairs and Customer Care					
6.4	Business Research Methods and Project work	End Term Exam = 50 Project = 30 Viva-voce = 20	DSE-4	100	50 30 Project 20 Viva-voce		6
	Total			400			24
Grand Total				2600			148

COMMERCE

HONOURS PAPERS:

Core course – 14 papers

Discipline Specific Elective – 4 papers

Generic Elective for non commerce students– 4 papers.

(Universities can exercise option of prescribing 2 GE in which case from the list of GEs given in the syllabus GE1 and GE2 only are to be taken.

Marks per paper - Midterm: 20 marks, End term : 80 marks, Total – 100 marks for papers without practical; For papers with Practicals the mark distribution would be 60+25+15

Credit per paper – 6

Teaching hours per paper – 50 hours + 10 hours tutorial

(CORE – 1) FINANCIAL ACCOUNTING

Objectives: The objective of this paper is to help students to acquire conceptual knowledge of financial accounting and to impart skills for recording various kinds of business transactions.

Unit - I. (a) Basics of Accounting

i. Accounting as the language of business and an information system, the users of financial accounting information and their needs. Qualitative characteristics of accounting information, Functions, advantages and limitations of accounting. Branches of accounting. Bases of accounting: cash basis and accrual basis.

ii. The nature of financial accounting principles – Basic concepts and conventions: entity, money measurement, going concern, cost, realization, accruals, periodicity, consistency, prudence (conservatism), materiality and full disclosures and Accounting Equation.

(a) Accounting Process

From recording of business transactions to the preparation of trial balance including adjustments: journal, sub-division of journal, ledger accounts, trial balance.

Unit – II: Reporting Standards & Business Income

1. Concepts of AS, Ind AS (Indian Accounting Standards), IFRS (International Financial Reporting Standards) & XBRL (extensible Business Reporting Language)
2. Measurement of business income-Net income: the accounting period, the continuity doctrine and matching concept. Objectives of measurement and revenue recognition.
3. Depreciation Accounting: The accounting concept of depreciation. Factors in the measurement of depreciation. Methods of computing depreciation: straight line method and diminishing balance method; Disposal of depreciable assets-change of method. Salient features of Accounting Standard 6 (AS- 6) issued by ICAI

Unit – III: Final Accounts

Capital and revenue expenditures and receipts, Preparation of financial statements of Sole Trade and Partnership Business with adjustments

Accounting for Partnership Firm: Accounting of Admission of partner, Retirement and Death of partner and Dissolution of the Partnership Firm Including Insolvency of partners

Unit – IV:

- i. Hire Purchase and Instalment Systems and Accounting for Branch & Department
- ii. Concepts of operating and financial lease (theory only)
- iii. Departmental Accounting and Branch Accounting including foreign branch (Theory and Problem)
- iv. Hire purchase and Instalment System

Learning Outcomes: The course structure of this paper would equip the students to get in-depth knowledge of financial accounting along with its practical application thereby giving an opportunity to gain easy access to this competitive business world.

Text Books Recommended

1. Financial Accounting I and Financial Accounting II: Mukherjee, Oxford University Press
2. Jain, S.P. and K.L. Narang. Financial Accounting, Kalyani Publishers, New Delhi

Suggested Readings:

1. Financial Accounting, R.K. Mittal , M.R. Bansal, V.K, Global Publication.
2. Bal Ranjan Kumar, Financial Accounting – S. Chand
3. Text Book of Financial Accounting-Anil Kumar and Mariappa- Himalaya Publishing House
4. Financial Accounting - P. C. Tulsiani, Pearson Publication
5. Anthony, R.N. Hawkins, and Merchant, Accounting: Text and Cases. McGraw-Hill Education.
6. Bansal.K.M- Financial Accounting – Taxman Publication
7. Horngren, Introduction to Financial Accounting, Pearson Education.
8. Maheshwari, S.N. and. S. K. Maheshwari. Financial Accounting. Vikas Publishing House, New Delhi.
9. Compendium of Statements and Standards of Accounting. The Institute of Chartered Accountants of India, New Delhi
10. N.Godwin and D. Sanyal, Financial ACCT, Cengage Learning

(CORE – 2) BUSINESS LAW

Objective: The objective of the course is to impart basic knowledge of the important business laws along with relevant case laws.

Unit I: The Indian Contract Act, 1872

1. Contract – meaning, characteristics and kinds, Essentials of a valid contract
2. Offer and acceptance (Definition, Rules, Communication and Revocation of offer and acceptance)
3. Consideration (Definition, Elements, Types, Rules), “No Consideration No Contract” and its exceptions; Capacity to Parties (Definition and Types)
4. Consent, Free consent, Coercion, Undue Influence, Fraud, Misrepresentation, Mistake
5. Legality of objects and Consideration
6. Void and Voidable agreements – Definition, Types and Distinction
Discharge of a contract – Modes of discharge, Breach and Remedies against breach of contract

7. Specific Contracts - Contingent contracts, Quasi, Contract of Indemnity, Guarantee, Bailment, Pledges

Unit II: The Sale of Goods Act, 1930

1. Contract of sale, meaning and difference between sale and agreement to sell
2. Conditions and warranties
3. Transfer of ownership in goods including sale by a non-owner
4. Unpaid seller – meaning, rights of an unpaid seller against the goods and the buyer

Consumers Protection Act, 1986 and Right to Information Act

- a. Objectives and features of Consumers Protection Act
- b. Definitions – Complainant, Complaint, Consumer, Consumer Dispute, Defect, Deficiency, District Forum, Person
- c. Unfair trade practices
Consumer Protection Council (Central, State and District – their constitutions and objectives)

Unit III: Partnership Laws

- A. The Partnership Act, 1932
 - a. Definition – Partner, Partnership
 - b. Nature and Characteristics of Partnership
 - c. Types of Partners
 - d. Registration of a Partnership Firms and consequences of non-registration
 - e. Rights and Duties of Partners
 - f. Dissolution of firms – meaning and grounds
- B. The Limited Liability Partnership Act, 2008
 - a. Definition
 - b. Salient Features of LLP
 - c. Advantages and disadvantages of LLP
 - d. Differences between: LLP and Partnership, LLP and Company
 - e. Incorporation of LLP

Unit IV: The Negotiable Instruments Act 1881

- a. Definition, Features, Types, Parties of Negotiable Instruments: Promissory Note, bill of exchange, Cheque (Definition and Types)
- b. Endorsement: Meaning and Types of Endorsement
- c. Holder and Holder in Due Course, Privileges of Holder in Due Course.
- d. Dishonour of Negotiable Instruments: Modes, Consequences, Notice of Dishonour; Noting and Protesting
- e. Discharge of Negotiable Instruments: Meaning and Modes

Learning Outcomes: The students would be able to deal with the legal aspect of different business situations.

Text Books Recommended

1. Business Law, Garg K.C., Saareen, Sharma, Kalyani Publishers
2. Kumar, R. Legal Aspects of Business, Cengage Learning

Suggested Readings:

1. Arora Sushma – Business Law – Taxmann Publication
2. A Book of Business Laws-Jena B and Mohapatra-Himalaya Publishing House
3. Business Law, Ashok Sharma, V.K. Global Publication.
4. Business Laws: Das & Roy, Oxford University Press
5. Business Law- S K Matta, Geetika Matta, Vrinda Publications (P) Ltd
6. Business Law - Tejpal Singh, Pearson Publication
7. Kuchhal, M.C. and Vivek Kuchhal, Business Law, Vikas Publishing House, New Delhi.
8. Tulsian, P.C, Business Law, S.Chand
9. Maheshwari & Maheshwari, Business Law, National Publishing House, New Delhi.

(Core-3)

COST ACCOUNTING

Objective: To acquaint the students with basic concepts used in cost accounting, various methods involved in cost ascertainment.

CONTENTS:

Unit- 1:

Introduction to Cost Accounting: Meaning, concept, scope, objectives, principles, importance and limitations of cost accounting; Implementation of costing system; Methods & Techniques of costing; Cost concepts and Cost Sheet, Job costing and Batch Costing.

Unit – II:

Accounting for Material: Concept and technique of accounting for material; Methods of pricing of materials issues – FIFO, LIFO and Average; Treatment of material losses; Techniques of material control – level setting, Economic Ordering Quantity, ABC Analysis, VED Analysis, Perpetual inventory system, & Just-In-Time.

Unit – III:

Accounting for Labour:

Accounting for labour cost, control procedure, labour turnover, idle time, overtime, Methods of wage payment and the Incentive schemes- Halsey, Rowan, Taylor's Differential piece wage plan.

Accounting for Overheads:

Classification, Allocation & Apportionment of production overheads; Re-apportionment of Service department overheads; Absorption of overheads, methods of absorption – actual and predetermined rates, blanket and multiple rates, choice of an overhead absorption rate; Administration, selling and distribution overheads; Under absorption and over absorption of overheads.

Unit – IV:

Methods of Costing: Contract costing: Features and procedure of contract costing, uncompleted contract profit determination, Escalation clause, cost plus contracts. Process costing: Meaning and characteristics of Process costing, Procedure for process costing, treatment of process losses and wastages.

Learning Outcome: After the completion of this paper, the students will be able to have confidence in managing cost issues and also to keep a check on cost control and taking managerial decisions.

Text Books Recommended

1. Cost Accounting-Arora MN A- Himalaya Publishing House
2. Nigam, B.M. Lall and I.C. Jain. Cost Accounting: Principles and Practice. Prentice Hall of India, New Delhi.

Suggested Reading:

1. Jain, S.P. and K.L. Narang. Cost Accounting: Principles and Methods. Kalyani Publishers, Jalandhar.
2. Cost accounting, S.P. Gupta/ A Sharma- V.K. Global Publishing Pvt. Ltd.
3. Cost & Management Accounting I: Mitra, Oxford University Press.
4. Cost & Management Accounting, Taxmann Publications
5. Colin Drury, Management and Cost Accounting, Cengage Learning
6. Lal, Jawahar. Cost Accounting. Tata McGraw Hill Publishing Co., New Delhi.
7. Arora, M.N. Cost Accounting – Principles and Practice. Vikas Publishing House, New Delhi.
8. Lal, Jawahar. Advanced Management Accounting Text and Cases. S. Chand & Co., New Delhi.
9. Cost Accounts - Datar and Rajan, Pearson Publication

(Core-4) CORPORATE LAWS

Objectives: The objective of the course is to impart basic knowledge of the provisions of the Companies Act, 2013 and the Depositories Act, 1996. Case studies involving issues in corporate laws are required to be discussed.

Contents:

Unit – I: INTRODUCTION TO COMPANY

Meaning and Definition – Features –, High Lights of Companies Act 2013 - Body Corporate, Kinds of Companies (Concept, Definition and Features) – One Person Company, Private Company, Public Company, Company limited by Guarantee, Company limited by Shares, Holding Company, Subsidiary Company, Government Company, Associate Company, Small Company, Foreign Company, Listed Company, Dormant company

FORMATION OF A COMPANY

Steps in formation of a Company, Promotion Stage, Meaning of Promoter, Position of Promoter & Functions of Promoter, Incorporation Stage – Meaning, Contents, Forms 23

Memorandum of Association & Articles of Association and its alteration, Distinction between Memorandum of Association and Articles of Association, Certificate of Incorporation, Subscription Stage – Meaning & contents of Prospectus, Types, Mis- statement in prospectus and its consequences.

Unit - II: COMPANY ADMINISTRATION

Director (Concept and Definition), DIN, Qualification, Disqualification, Appointment, Position, Rights, Duties, Power, Resignation, Liabilities, Removal and Resignation of director, Key Managerial Personnel (Definition, Appointment and Qualifications) – Managing Director, Whole time Directors, the Companies Secretary, Chief Financial Officer, Resident Director, Independent Director, Women director.

Unit - III: SHARE CAPITAL & DEBENTURE

Share and Share Capital - Types and Definition, Allotment and Forfeiture, Calls on Shares, ESOP, Buyback, Sweat Equity, Bonus, Right, Capital Reduction, Share Certificate, Demat System, Transfer and Transmission, Redemption of Preference Shares, Debenture – Definition, Types, Rules Regarding Issue of Debenture, Rules regarding Dividend and distribution of dividend.

Unit - IV: CORPORATE MEETINGS

Corporate Meetings - Shareholder and Board, Types of Meetings – Annual General Meeting Extraordinary General meeting, Minutes of Proceedings of General Meeting, Meeting of BOD and other meetings (Section 118), Requisite of Valid Meeting- Notice, Agenda, Chairman, Quorum, Proxy, Resolutions, Minutes, Postal Ballot, E- voting, Video Conferencing,

Learning Outcomes: Students would acquire knowledge about the legal framework and the ways and means to deal with the legal aspect of different situations of corporate sector.

Text Books Recommended

1. Corporate Laws-Maheswari, Maheswari- Himalaya Publishing House
2. Corporate Law, Ashok Sharma, V.K. Global Publishing Pvt. Ltd., New Delhi

Suggested Readings:

1. A Compendium of Companies Act 2013, along with Rules, by Taxmann Publications.
2. Corporate Law, Gupta, Garg, Dhingra, Kalyani Publication
3. Company Law: Roy & Das, Oxford University Press.
4. Kumar, R., Legal Aspects of Business, Cengage Learning
5. Corporate Law– S K Matta, Geetika Matta, Vrinda Publications (P) Ltd
6. Arora & Banshal, Corporate Law – Vikash Publication
7. Gogna, P.P.S – Company Law, S. Chand
8. MC Kuchhal Corporate Laws, Shri Mahaveer Book Depot. (Publishers).
9. GK Kapoor & Sanjay Dhamija, Company Law, Bharat Law House.

(Core-5) CORPORATE ACCOUNTING

Objectives: To help the students to acquire the conceptual knowledge of the corporate accounting and to learn the techniques of preparing the financial statements.

Contents:

Unit – I

Meaning of Company; Maintenance of Books of Accounts; Statutory Books; Annual Return Company – Issue of Shares – issue, forfeiture, reissue, issue other than cash consideration and issue to the promoters; Pro-rata issue of shares. Issue of Right and Bonus Share – Rules,

Accounting for debentures: Issue of debenture, Underwriting of shares and debentures: Determination of Underwriters Liability – with marked, unmarked & firm underwriting; Accounting of Employee Stock Option Plan – meaning; rules; Vesting Period; Exercise Period, Accounting for ESOP and Accounting of ESPS.

Unit – II: Redemption of Preference shares & Debentures

Buy Back of Securities: meaning, rules and accounting.

Redemption of Preference Shares – Rules and Accounting (with and without Bonus Shares) ; Redemption of Debenture – Important Provisions, Redemption of debenture Accounting for Redemption: by conversion, by lot, by purchase in the open market (cum and ex-interest), held as Investment and Use of Sinking Fund

Unit – III: Company's Final Accounts

Introduction to Schedule III of Companies Act 2013; Treatment of Tax; transfer to reserve, Dividend and applicable tax (out of current profit, out of past reserve); Preparation of Statement of Profit & Loss and Balance Sheet. (tax on net profit without recognizing deferred tax)

Valuation of Goodwill & Shares

Goodwill – valuation using different methods, i.e., Average Profit, Super Profit, Capitalization and Annuity.

Shares – Valuation using different methods: Asset approach, Earnings approach, Dividend Yield, Earnings-Price, Cum-div and Ex-div, Majority and Minority view and Fair Value

Unit – IV: Liquidation

Meaning of liquidation, modes of winding up, consequences of winding up, statement of affairs, liquidator's final statement of account, list 'B' contributories

Learning Outcomes: This paper can provide conceptual clarity about the techniques to prepare financial statements of companies along with accounting treatment of various situations viz. floating of shares, amalgamation and liquidation of companies.

Text Books Recommended

1. Jain, S.P. and K.L. Narang. Corporate Accounting. Kalyani Publishers, New Delhi.
2. Maheshwari, S.N. and S. K. Maheshwari. Corporate Accounting. Vikas Publishing House, New Delhi.

Suggested Readings:

1. Sehgal, Ashok and Deepak Sehgal. Corporate Accounting. Taxman Publication, New Delhi.
2. Corporate Accounting, R.K. Mittal? S. Ahuja- V .K. Global Pub. Pvt. Ltd, New Delhi.
3. Corporate Accounting – Anil Kumar, Mariappa- Himalaya Publishing House
4. Tulsian, P.C, Corporate Accounting, S. Chand
5. Monga, J.R. Fundamentals of Corporate Accounting. Mayur Paper Backs, New Delhi.
6. Gupta, Nirmal. Corporate Accounting. SahityaBhawan, Agra.
7. Bhushan Kumar Goyal, Fundamentals of Corporate Accounting, International Book House

(Core-6)

INCOME TAX LAW AND PRACTICE

Objective: To provide basic knowledge and equip students with the application of principles and provisions of Income Tax Act 1961.

Contents:

Unit I :

- a) **Basic Concepts and Definitions under IT Act:** Assessee, Previous year, Assessment year, Person, Income, Sources of income, Heads of income, Gross total income, Total income, Maximum marginal rate of tax, Tax Evasion, Tax avoidance and Tax planning
- b) Residential Status and Incidence of Tax, Residential status of all persons except company
- c) Incomes which do not form part of Total Income Except section 10AA.
- d) Agricultural Income Definition, determination of agricultural and non-agricultural Income, assessment of tax liability when there is both agricultural and non-agricultural income

Unit II:

Heads of Income and Provisions governing Heads of Income

- a) Income from Salary
- b) Income from House property

Unit III:Heads of Income and Provisions governing Heads of Income

- a) Profits and Gains of Business and Profession Special emphasis on sec. 32, 32AC, 32AD, 35, 35D, 36(i)(ib), (ii), (iii), (iv), (vii), 37, 37(2B), 40A(2), 40A(3), 43B, (Excluding presumptive taxation)
- b) Capital Gains
Meaning and types of capital assets, basic concept of transfer, cost of acquisition, cost of improvement and indexation, computation of STCG and LTCG, exemptions u/s 54B

54B, 54EC and 54F, capital gain on transfer of bonus shares, right entitlement and right shares, taxability of STCG and LTCG.

- c) Income from Other Sources
Basis of charge excluding deemed dividend

Unit IV:

- a) **Income of other Persons** included in Assessee's Total Income Remuneration of spouse, income from assets transferred to spouse and Son's wife, income of minor.
- b) Set off and Carry Forward of Losses
Mode of set off and carry forward, inter source and inter head set off, carry forward and set off of losses u/s 71B, 72, 73, 74, 74A.
- c) Deductions from Gross Total Income
Basic concepts, deductions u/s 80C, 80CCC, 80CCD, 80CCE, 80D, 80DD, 80DDB, 80E, 80G, 80GG, 80GGC, 80TTA, 80U
- d) Rebate u/s 87A

Computation of Total Income and Tax Payable

- a) Rate of tax applicable to individual assessee
- b) Computation of tax liability of an individual
- c) Provision for Filing of Return Date of filing of return, relevant forms of return, different types of returns, return by whom to be signed, PAN, TAN
- d) Assessment of Return Self assessment u/s 140A, Summary assessment u/s 143(1), Scrutiny assessment u/s 143(3) and Best judgement assessment u/s 144.
- e) Advance Tax Who is liable to pay, due dates and computation of advance tax (excluding corporate assesseees)
- f) Interest & Fees Section 234A, 234B, 234C, 234F
- g) TDS Provisions regarding TDS from salary, interest on securities, horse racing, lottery.

Learning Outcomes: This paper would provide the understanding of various provisions of Income Tax Act as well as equip the students to make practical applications of the provisions for taxation purpose.

Text Books Recommended

1. Gour and Narang, Income tax: Law and practice, kalyani Publishers
2. Dr. Vinod Kumar Singhania, e-filing of Income Tax Returns and Computation of Tax,
3. Taxmann Publication Pvt. Ltd, New Delhi. Latest version.

Suggested readings:

1. Income tax Law and practice, Makta Jain/ Rakesh Jain, V.K. Global Pub. Pvt. Ltd., New Delhi
2. Income Tax Law and Praticce-Saha, Dash- Himalaya Publishing House.
3. Pagare, Dinkar. Law and Practice of Income Tax. Sultan Chand and Sons, New Delhi.
4. Lal, B.B. Income Tax Law and Practice. Konark Publications, New Delhi.

(Core-7)

MANAGEMENT PRINCIPLES & APPLICATIONS

Objective:

The objective of the course is to provide the student with an understanding of basic management concepts, principles and practices.

Unit-I: Introduction:

Management-definition, importance, functions, nature-as profession, science and art, universality of management; levels of management; managerial tasks and skills

Different Schools of Thoughts: Classical School-contributions of Taylor and Henri Fayol; Neo-classical school-Human Relations approach and Behavioural Science Approach; Modern School; System approach and Contingency approach

Unit-II: Planning:

Concept, importance, steps, types, premises, barriers to effective planning and remedial measures; strategic planning-concept forecasting –concept, techniques.

Organizing:

Concept, importance, principles, different organization models-line and staff; Functional; Departmentation-need, basis, principles, Delegation of Authority-elements, steps barriers; Centralization and Decentralization of Authority; Span of Management; concept and determining factors

Unit-III: Directing and Staffing:

Directing: concepts, importance of directing, Leadership: Concept, importance, types, leadership traits, Tannenbaum & Schmidt's Model and Blake & Mouton's Model.

Staffing: concepts, importance

Unit- IV: Motivation, Co-ordination and Control:

Motivation: Concept, importance, importance of need theory, and contributions of McGregor, Maslow, Herzberg.

Coordination: concepts, importance, principles and implementation techniques. **Control:** concepts, importance and tools of control.

Learning Outcomes: Students would be able to make use of different management principles in the course of decision making in different forms of business organizations.

Text Books Recommended

2. Prasad, L.M. Principles and Practice of Management, Sulatan Chand

Suggested Readings:

1. Sharma gupta , Management: Principles and application , Kalyani Publishers
2. R. K . Singhal, Management Principle and application, V.K. Global Pub. Pvt. Ltd, New Delhi.
3. Management Principles and Applications-Jhunjhunwala J Mohanty- Himalaya Publishing House
4. Principles of Management: Mitra, Oxford University Press.
5. Griffin, R.W. – Management :Principles& Practices, Cengage Learning
6. Gupta R.N - Principles & Practice of Management – S. Chand
7. A K Jha, Management Principles and Application - Vrinda Publications (P) Ltd.
8. Chandan J.S – Management Concepts of Strategy – Vikash Publication
9. B.P. Singh and A.K.Singh, Essentials of Management, Excel Books
10. TN Chhabra, Management Concepts and Practice, DhanpatRai& Co. (Pvt. Ltd.), New Delhi
11. Peter F Drucker, Practice of Management, Mercury Books, London

(Core-8)

GST & INDIRECT TAX

OBJECTIVE:

The objective is to equip students with the principles and provisions of Goods and Services Tax (GST), which is, implemented from 2017 under the notion of One Nation, One Tax and One Market and to acquaint students with basic provisions of GST Law and basic working knowledge.

Unit I- INTRODUCTION TO GOODS AND SERVICES TAX (GST)

Introduction to GST : Introduction, Constitutional provisions regarding Taxation In India, Pre-GST Indirect Taxation Structure in India, What is GST, Need for GST in India, Overview and Genesis of GST IN INDIA, GST objectives, **Scope of GST**, Salient features of GST, GST and Centre-State Financial Relations, The Constitution (122nd Amendment) Bill, Constitutional Amendments required for introduction of GST Indirect Taxes subsumed Post-**GST : Principles for subsuming taxes under Goods & Services Tax (GST) in India, Indirect Taxes and Levies subsumed in GST, Events that have led to the introduction of GST, DUAL GST : Benefits of Dual GST**, Structure Of Dual Model of GST , Key Features of Dual Model of GST, Benefits of implementing GST, **CENTRAL GST – STATE / UNION TERRITORY GST – INTEGRATED GST and GST Cess, Pre-GST Regime Vs. GST Regime, Indirect Taxes**

Unit II- GST ACTS: (Structure & Terminology)

Salient features of CGST Act, SGST Act (Odisha State), IGST Act, Meaning and Definition of various terms used under GST

(Coverage- Provisions and Illustration)

PROCEDURE RELATING TO LEVY OF, COLLECTION AND EXEMPTION FROM, TAX

PROCEDURE RELATING TO LEVY OF, COLLECTION AND EXEMPTION FROM, TAX: (CGST & SGST)- **Meaning and Scope of ‘Supply’ under GST Law**, Taxable Person, Time of supply, Place of supply and Value of supply. Computation of Taxable Value and Tax Liability, Composition scheme; INPUT TAX CREDIT; PROCEDURE RELATING TO LEVY, COLLECTION AND EXEMPTION OF IGST; PAYMENT OF TAX, TCS, TDS; PRACTICAL PROBLEMS.

(Coverage- Provisions and Illustration)

Unit III- REGISTRATION, RETURNS AND ASSESSEMENT

REGISTRATION - Persons liable for registration, Persons not liable for registration, Types: Compulsory registration, Voluntary registration, Deemed registration - Procedure for registration, Special provisions for Casual taxable persons and Non-resident taxable persons; **CLASSIFICATION OF GOODS & SERVICES**- HSN, SAC; **TAX INVOICE AND OTHER SUCH INSTRUMENTS IN GST** - Debit Note, Credit Note, Vouchers, Invoice; **ACCOUNTS AND RECORDS**; **RETURN**- Process of Return Filing, Furnishing details of outward supplies and inward supplies, First return, Claim of input tax credit, Matching reversal and reclaim of input tax credit, Annual return and Final return; **REFUND**; **OFFENCES AND PENALTIES**; **ASSESSMENT**; **AUDIT**; **APPEALS AND REVISION**.

Unit IV- GST Council AND REGULATORY FRAMEWORK

GST COUNCIL: Structure, Powers and Functions. Provisions for amendments; **ROLE OF CBEC**; Division of Administrative Powers; **GST AND TECHNOLOGY**- GST Network, GST ECO SYSTEM, GSP, ASP; **NATIONAL ANTI-PROFITEERING AUTHORITY IN GST**; **COMPLIANCE RATING**.

Text Books Recommended

1. Swain AK & Agrawal – GST: Concepts and Applications, Himalayan Publishing House.
2. GST Manual:Taxman’s Publication Ltd., New Delhi.

Suggested Books:

1. GST and Indirect Taxes,Sanjeet Sharma, V.K. Global Pub. Pvt. Ltd, New Delhi.
2. Mishra, Padhi and Bera – Text Books on GST & Practice, Vikash Publishing House Pvt. Ltd. New Delhi.

(Core-9)

FUNDAMENTALS OF DATA MANAGEMENT

Unit I: Word Processing

Working with word document- Editing text, Find and Replace text, Formatting, Spell check, Autocorrect, Auto text; Bullets and numbering, Tabs, Paragraph Formatting, Indent, Page Formatting, Header and footer, Macros, Drop cap; Tables: Inserting, Filling and formatting a Table, Inserting Pictures and Video; Mail Merge- including linking with Database, Printing documents. Creating Business Documents using the above facilities

Preparing Presentations

Basics of presentations: Slides, Fonts, Drawing, Editing; Inserting: Tables, Images, texts, Symbols, Media; Design; Transition; Animation, Hyperlink and Slideshow. Creating Business Presentations using above facilities

Unit II: Spreadsheet and its Business Applications

Managing worksheets- Formatting, Entering data, Editing, and Printing a worksheet; handling operators in formula, Project involving multiple spreadsheets, Organizing Charts and graphs, Pivot Table

Spreadsheet Functions: Mathematical [SUMIF, SQRT, SUBTOTAL, SUMPRODUCT etc.], Statistical [AVERAGE, STDEV, VAR, CORRELATION, REGRESSION etc.], Financial [PMT, RATE, PV, FV, NPER, IRR, NPV, Data Table Etc.] Logical [AND, OR, IF etc.], Date and Time, lookup and reference, Database and Text functions.

Creating Spreadsheet in the area of : Loan and Lease statement; Ratio Analysis; Payroll Statements; Capital Budgeting; Depreciation Accounting; Graphical Representation of Data; Frequency Distribution and its Statistical Parameters; Correlation and Regression

Unit III: Database Management System

Creation of Tables, Multiple Table Handling-Defining Relationship [Foreign Key], Simple and Conditional Queries, Types of Queries [Update, Delete, Append], Forms, Reports, Introduction to SQL through Basic Commands.

Applying DBMS in the areas of Accounting, Inventory, HRM and its accounting, managing the data records of Employees, Suppliers and Customers

Unit IV: Website Designing

Introduction to HTML; Tags and Attributes: Text Formatting, Fonts, Hypertext Links, Tables, Images, Lists, Forms, Frames, Cascading Style Sheets.

Text Books Recommended

1. Coronel and Rob, Database Principles, Cengage Learning
2. Fundamentals of Data Management –Saha RG- Himalaya Publishing House

Suggested Readings

1. Thareja, IT & Application, Oxford
2. Aurora, Computer Fundamentals, Vikash
3. Sinha & Sinha, Fundamentals of Computers, BPB Publications
4. Dhar, P., Fundamental of IT and Its Application in Business, APH

Practical Aspects:

- Preparation of Project report and business letters using Ms Excel and its various features
- Preparing PPT using Ms PowerPoint for presentations
- Using Ms Excel for various data analysis, Graphical Representation of Data, 24

pivot tables and their analysis

- Maintenance of accounting data records and its management by applying DBMS
- Practical application of various web designing tools

(Core-10)

MANAGEMENT ACCOUNTING

Objective: To acquaint the students with basic concepts of management accounting, and basic understanding of tools and techniques used for managerial decision making.

CONTENTS:

Unit – I:

Management Accounting: Meaning, nature, scope, and importance of management accounting; Role of management accounting; management accounting vs. financial accounting; Role of management accounting in modern business; Tools and techniques of management accounting.

Unit – II: Ratio Analysis & Cash flow

statement Ratio Analysis:

Meaning and utility of ratios; significance of Ratio analysis; Classification of Ratios – Profitability ratios, Efficiency Ratios, Liquidity Ratios, Solvency Ratios; Advantages and limitations of Ratio Analysis.

Cash flow Statements:

Cash Flow Statements: Meaning and utility of Cash flow statements; Preparation of Cash flow statements – Indirect method; Limitations of Cash flow statements; Cash flow statements vs. Funds flow statements. (Reference to Revised AS-3 and Ind AS-7)

Unit – III:

Absorption & Marginal Costing: P/V Ratio, Break-even analysis, Margin of safety, angle of incidence; Marginal and differential costing as a tool for decision making – make or buy, change of product mix, exploring new markets, shut down decisions.

Unit – IV:

Budgeting & Standard Costing: Concept of budget and budgetary control; objectives, merits and limitations of budgetary system; Master budget, Functional budget, Fixed and Flexible budgets; Zero based budgeting. Standard Costing & Variance Analysis: Meaning of standard cost and standard costing, Advantages and disadvantages of standard costing and variance analysis: Material, Labour, & Overhead.

Learning Outcome: After the completion of this paper, the students will be able to have

confidence in managing cost issues and also to keep a check on cost control and taking managerial decisions.

Text Books Recommended

1. Management Accounting, S swain/ S.P. Gupta/ A Sharma, V.K. Global Pub. Pvt. Ltd.,
2. Horngreen, Charles T., Gary L. Sundem. Introduction to Management Accounting.
3. Prentice Hall.

Suggested Reading:

1. Jain & Narang, Management Accounting, Kalyani Publications
2. Management Accounting-M Wilson- Cost Accounting-Jena B,Bal S and Das A- Himalaya Publishing House
3. Narasimhan M.S. , Management Accounting, Cengage Learning
4. Cost & Management Accounting, Taxmann Publications
5. Arora, M.N. Cost Accounting – Principles and Practice. Vikas Publishing House, New Delhi.
6. Maheshwari, S.N. and S.N. Mittal. Cost Accounting: Theory and Problems. Shri Mahabir Book Depot, New Delhi.
7. Lal, Jawahar. Advanced Management Accounting Text and Cases. S. Chand & Co., New Delhi.
8. Khan, M.Y. and P.K. Jain. Management Accounting. Tata McGraw Hill, Publishing

(Core-11)

COMPUTERIZED ACCOUNTING & E-FILING OF TAX RETURNS

Unit – I: Computerized Accounting Package: Using Generic Software

- a. Company creation, ledger creation, order processing, accounting voucher, inventory voucher, memorandum voucher, invoicing, multiple godown handling, Transfer of materials across go downs, Bank Reconciliation
- b. Cost Centre, Cost Category, Bill of Material (BoM), Budget and Controls
- c. Payroll Accounting
- d. TDS, GST
- e. Back up & Restore, Export and Import data

Unit II: Designing Computerized Accounting System

- (a) Introduction to DBMS Package – Table, Query, Form and Report
- (b) Designing Computerized Accounting System using DBMS Package
Creating a voucher entry Form, Preparing ledgers, trial balance, profit & loss a/c, and

Balance Sheet with Form wizard and Report

Unit-III: E-filing of Tax return

- (a) Preparation and submission online form 10E [Relief u/s 89(1)] (a) Preparation and submission of the Income Tax Return (ITR) offline/online for individual Taxpayer [e-filing without using DSC and with using DSC, EVC]
- (b) View form 26AS, Upload return, View e-file returns, e-verification
- (c) Use of e-tax calculator (including interest calculation u/s 234A, 234B, 234C)
- (d) E-Pay tax (Challan No./ITNS 280, ITNS 281)
- (e) Preparation and submission online form 10E[Relief u/s 89(1)]

Text Books Recommended

1. Software: Singhanian, V.K., E-Filing of Income Tax Returns and Computations of Tax, Taxmann
2. Book of Computerized Accounting and E Filling of Tax Returns-Mohanty R, Dash ALN- Cost Accounting-Jena B,Bal S and Das A- Himalaya Publishing House

Suggested Readings

1. Software: “Excel Utility”, incometaxindiaefiling.gov.in

Practical Aspects:

- Creation of company and ledger accounts, voucher entries, payroll accounting & data management in accounting software packages including TDS and GST
- Use of DBMS Package for various accounting database, designing of Payroll and report generation
- Preparation and submission of online Income Tax Returns, E-payment of tax, E-verification of returns, and viewing of 26AS.

(Core-12)

FUNDAMENTALS OF FINANCIAL MANAGEMENT

Objective: To familiarize the students with the principles and practices of financial management.

Contents:

Unit – I: Introduction& Basic Concepts

Important functions of Financial Management, Objectives of the firm: Profit maximization

vs. Value maximization, Role of Chief Financial Officer. Financial environment in which a firm has to operate, Time Value of Money: concept and reasons, Compounding and Discounting techniques, Concepts of Annuity and Perpetuity. Risk-return relationship (concepts only)

Unit – II: Sources of Finance and Cost of Capital/ Financing Decisions

Different sources of finance; long term and short term sources, Cost of capital: concept, relevance of cost of capital, Implicit and Explicit cost, specific costs (its computation) and weighted average cost (its computation) , rationale of after tax weighted average cost of capital, marginal cost of capital (its computation).

Unit – III: Capital Expenditure Decisions / Long term Financial Decisions & Dividend Decisions

Capital Expenditure Decisions / Long term Financial Decisions

Objectives of Capital Budgeting Process, Concept of Cash flow, Methods of long term investment decisions - Discounted Payback Period, Net Present Value, Profitability Index, Average Rate of Return / Accounting Rate of Return, Internal Rate of Return (Including relative merits and demerits of each of the methods)

Dividend Decisions

Meaning, Nature and Types of Dividend, concept of pay-out ratio, retention ratio Decisions and growth, Dividend policies and formulating a dividend policy, Dividend Theories: Walter's Model, Gordon's Model

Unit – IV: Working Capital Management/ Liquidity Management

Meaning and various concepts of Working Capital, Management of Working Capital and Issues in Working Capital, Estimating Working Capital Needs; Operating or Working Capital Cycle, Policies relating to Current Assets – Conservative, Aggressive and Balance, Various sources of finance to meet working capital requirements

Learning Outcome: After the completion of this paper, students will be able to understand finance in a better way along with giving them insight to practical management of long and short finance for real business houses.

Text Books Recommended

1. Rostogi, Fundamentals of Financial Management, Taxmann Publications
2. Fundamental of Financial Management, Sharma, Gupta, Kalyani Publishers, New Delhi.

Suggested Readings

1. Fundamentals of Financial Management, Vandana Dangi, V.K. Global Pvt. Ltd., New Delhi
2. Parasuraman – Financial Management : A Step by Step Approach, Cengage Learning

3. Pandey, I.M. Financial Management. Vikas Publications.
4. Financial Management, Himalaya Publishing House
5. Bhalla V.K – Financial Management – S.Chand
6. Horne, J.C. Van and Wackowich. Fundamentals of Financial Management. 9thed. New Delhi Prentice Hall of India.

(Core-13)

AUDITING AND CORPORATE GOVERNANCE

Objective: To provide knowledge of auditing principles, procedures and techniques in accordance with current legal requirements and professional standards and to give an overview of the principles of Corporate Governance and Corporate Social Responsibility

Unit-I

Auditing: Introduction, Meaning, Objects, Basic Principles and Techniques; Classification of Audit, Audit Planning, Internal Control – Internal Check and Internal Audit; Audit Procedure – Vouching and verification of Assets & Liabilities

Unit-II

Audit of Limited Companies:

Company Auditor- Qualifications and disqualifications, Appointment, Rotation, Removal, Remuneration, Rights and Duties Auditor's Report-Contents and Types. Liabilities of Statutory Auditors under the Companies Act 2013

Special Areas of Audit:

Special features of Cost audit, Tax audit, and Management audit; Recent Trends in Auditing; Basic considerations of audit in EDP Environment; Standard on Auditing(SA); Relevant Case Studies/Problems;

Unit-III

Corporate Governance : Conceptual framework of Corporate Governance, Corporate Governance Reforms. Major Corporate Scandals in India and Abroad: Common Governance Problems Noticed in various Corporate Failures. Codes & Standards on Corporate Governance

Unit-IV

Corporate Social Responsibility (CSR): Strategic Planning and Corporate Social Responsibility; Corporate Philanthropy, Meaning of CSR, CSR and CR, CSR and Corporate Sustainability, CSR and Business Ethics, CSR and Corporate Governance, Environmental Aspect of CSR, CSR provision under the Companies Act 2013, CSR Committees

Learning Outcome: At the end of the paper student will have detail knowledge about principles and techniques of audit in accordance with current legal requirement and as per the guidelines of different statutory authorities.

Text Books Recommended

1. Gupta, Kamal and Ashok Arora. Fundamentals of Auditing. Tata Mc-Graw Hill Publishing Co. Ltd., New Delhi.
2. Auditing and corporate governance, Pradeep kumar , Klayani Publishers , New Delhi.

Suggested Readings:

1. Auditing and corporate governance, A. Sharma, V.K. Global Pvt. Ltd., New Delhi
2. SATHEESH KUMAR Corporate Governance, Oxford University Press.
3. Shikha, N. and Sharma, G. Corporate Governance in India : Principles and Policies, CENGAGE Learning
4. Jha, Aruna. Auditing. Taxmann.
5. Tandon, B. N., S. Sudharsanam and S. Sundharabahu. A Handbook of Practical Auditing. S. Chand and Co. Ltd., New Delhi.
6. Ghatalia, S.V. Practical Auditing. Allied Publishers Private Ltd., New Delhi.
7. Singh, A. K. and Gupta Lovleen. Auditing Theory and Practice. Galgotia Publishing Company.
8. Alvin Arens and James Loebbecke, Auditing: an Integrated Approach
9. MC Kuchhal Corporate Laws, Shri Mahaveer Book Depot. (Publishers). (Relevant Chapters)
10. Khanka – Business Ethics & Corporate Governance – Vikash Publication
11. Auditing Principles and Techniques- S. K. Basu, Pearson Publication

(Core-14)

BUSINESS

MATHEMATICS

Objective: The objective of this course is to familiarize the students with the basic mathematical tools with emphasis on applications to business and economic situations.

Contents:

Unit I Matrices and Determinant

Algebra of matrices., Inverse of a matrix, Matrix Operation – Business Application Solution of system of linear equations (having unique solution and involving not more than three variables) using matrix inversion Method and Cremer’s Rule.

Unit II

Calculus

Calculus I

Mathematical functions and their types- linear, quadratic, polynomial, exponential,

logarithmic and logistic function. Concepts of limit and continuity of a function, Concept and

rules of differentiation, Maxima and Minima involving second or higher order derivatives

Calculus II

Integration: Standard forms. Methods of integration – by substitution, by parts and by use of partial fractions, definite integration, Finding areas in simple cases, Application of Integration marginal analysis. Consumer's and Producer's Surplus, Rate of Sales and the Learning Curve.

Unit III Mathematics of Finance

Compounding and discounting of a sum using different types of rates. Types of annuities, like ordinary, due, deferred, continuous, perpetual, and their future and present values using different types of rates of interest. Depreciation of Assets (General annuities to be excluded)

Unit IV Linear Programming (Use of Excel spreadsheet & Other mathematical software)

Formulation of linear programming problems (LPP): Graphical solution to LPPs. Cases of unique and multiple optimal solutions, Unbounded solutions and infeasibility, Solution to LPPs using Simplex method – maximization and minimization cases, PERT and CPM (simple Problem)

Learning Outcome: After reading this subject the students will be able to understand basic concepts in the areas of business calculus and financial mathematics and to connect acquired knowledge with practical problems in economic practice.

Text Books Recommended

1. Business Mathematics, Patri and Patri, Kalyani Publishers, New Delhi
2. Business Mathematics - S K Sahoo, Vrinda Publications (P) Ltd.

Suggested Readings:

1. Arora P.N. Business Mathematics – S.Chand
2. Business Mathematics, S.C. Agarwal, V.K. Global Pub. Pvt. Ltd., New delhi.
3. GHOSH & SINHA BUSINESS MATHEMATICS & STATISTICS, Oxford university press.
4. Francis, J. Business Statistics, Cengage Learning
5. Anthony, M. and N. Biggs. Mathematics for Economics and Finance. Cambridge University Press.
6. Arora S.R & Gupta K. – Business Mathematics – Taxmann Publication
7. Ayres, Frank Jr. Theory and Problems of Mathematics of Finance. Schaum's Outlines Series. McGraw Hill Publishing Co.
8. Mizrahi and John Sullivan. Mathematics for Business and Social Sciences. Wiley and Sons.
9. Zamirudeen&Bhambri – Business Statistics – Vikash Publication
10. Wikes, F.M. Mathematics for Business, Finance and Economics. Thomson Learning.
11. Prasad, Bindra and P.K. Mittal. Fundamentals of Business Mathematics. Har-Anand

12. Thukral, J.K. Mathematics for Business Studies. Mayur Publications.
13. Soni, R.S. Business Mathematics. Pitambar Publishing House.
14. Singh J. K. Business Mathematics. Himalaya Publishing House

DSE – 1

Elective – I (Any one of the following Groups)

Group – A: Accounting & Finance

Financial Markets, Institutions, & Services

Objectives: To enable the students to understand the financial institutions operating in India and services provided by them.

Unit-I

Basic Theoretical Framework: The financial system and its technology; The factors affecting the stability of the financial system; Development finance vs. universal banking; Financial intermediaries and Financial Innovation; RBI-Central Banking.

Unit-II: Financial Institutions & Non-Banking

Financial Institutions Financial Institutions:

A brief historical perspective. An update on the performance of IDBI, ICICI, IFCI and SFCs, LIC & GIC, Banking Institutions: Commercial banks - the public and the private sectors - structure and comparative performance, problems of competition; interest rates, spreads, and NPAs. Bank capital - adequacy norms and capital market support.

Non-banking financial institutions:

Evolution, control by RBI and SEBI. A perspective on future role, Unit Trust of India and Mutual Funds, Reserve bank of India Framework for/Regulation of Bank Credit . Commercial paper: Features and advantages, Framework of Indian CP Market, effective cost/ interest yield.

Unit-III

Financial services: Asset/fund based Financial services - lease finance, consumer credit and hire purchase finance, factoring definition, functions, advantages, evaluation and forfeiting, bills discounting, housing finance, venture capital financing. Fee-based / Advisory services: Stock broking, credit rating.

Unit-IV

Operations: Financial Assets/ Instruments Rights issues, issue of Debentures, issue of Equity shares - pre-issue activity, post-issue activities. The regulatory framework: SEBI and Regulation of Primary and Secondary Markets, Company Law provisions.

Learning Outcome: After completion of this paper, the students will be able to understand the role and benefits of financial institution and services.

Text Books Recommended

1. Financial Markets, Institutions & Services-Gordon, Natrajan-Himalaya Publishing 25

- House
2. Pathak: Indian Financial Systems Pearson Education

Suggested Readings

1. Financial Market and Int. , A. goyal and M. Goyal, V.K. Global Pvt. Ltd., New Delhi
2. Financial Markets , Institutions and Services, Kaur, Talwar, KAlyani Publishers, New Delhi.
3. BHATTACHARYYA INDIAN FINANCIAL SYSTEM 2e, Oxford University Press.
4. M.Y.Khan, Financial Services, Tata McGraw-Hill, New Delhi, 2004.
5. H.R Machiraju, Indian Financial Systems, Vikas Publishing House Pvt. Ltd.2002.
6. Madura, J., Financial Institutions and Markets; Sharma R. and Mehta K. Financial Services, Cengage Learning

DSE – 1

Group B: Banking & Insurance

INDIAN BANKING AND INSURANCE SYSTEM

Objectives: To enable the students to acquire knowledge about basics of banking and insurance.

Unit-I: Concept of Bank and Banking & Types of Customers and Account holders Concept of Bank and Banking:

Historical Evolution of Banking: Origin and Development of Banking - Structure of Banking in India – Banks and Economic Development –Functions of Commercial banks (conventional and innovative functions) – Central Bank – RBI – functions – Emerging trends in Banking.

Types of Customers and Account holders:

Procedure and practice in opening and operating the accounts of customers - individuals including minors - joint account holders -Partnership firms - joint stock companies - executors and trustees-clubs and associations

Unit-II

Introduction to insurance: Purpose and need of insurance, insurance as a social security tool - insurance and economic development - Principles of insurance -various kinds of insurance - life, marine, fire, medical, general insurance - features.

Unit-III

Life Insurance - Law relating to life Insurance; General Principles of Life Insurance Contract; Proposal and policy; assignment and nomination; title and claims; General Insurance - Law relating to general insurance; different types of general insurance; general insurance Vs life insurance – Insurance business in India.

Unit-IV

Fundamentals of Agency Law: Definition of an agent; Agents regulations; Insurance intermediaries; Agents' compensation. Procedure for Becoming an Agent: Pre-requisite for obtaining a license; Duration of license; Cancellation of license; Revocation or suspension/termination of agent appointment; Code of conduct; Unfair practices. Functions

of the Agent: Proposal form and other forms for grant of cover; Financial and medical underwriting; Material information; Nomination and assignment; Procedure regarding settlement of policy claims.

Learning Outcome: After the completion of this paper, the student will acquired practical knowledge of working mechanism of banking and insurance industries in India.

Text Books Recommended

1. M.N. Mishra: Insurance Principles and Practice, S. Chand & Company Ltd, Delhi.
2. Indian Institute of Bankers (Pub) Commercial Banking Vol-I/Vol-II (part I&II) Vol- III.
3. Hota P.K., and Das S.K. Financial Literacy and Banking, Kalyani Publishers

Suggested Readings

1. Dr. P. Periasamy: Principles and Practice of Insurance, Himalaya Publishing House, Delhi.
2. Mishra S. Banking Law and Practice – S Chand
3. Prasad – Banking Insurance – Vikash Publication
4. Inderjit Singh, RakeshKatyal& Sanjay Arora: Insurance Principles and Practices, Kalyani Publishers, Chennai.
5. Sheldon H.P :Practice and Law of Banking.
6. Bedi. H.L :Theory and Practice of Banking.
7. Maheshwari. S.N. :Banking Law and Practice.
8. Shekar. K.C :Banking Theory Law and Practice.
9. Pannandikar&Mithami': Banking in India.
10. Radhaswamy&Vasudevan: Text Book of Banking.
11. Varshaney: Banking Law and Practice.
12. G. Krishnaswamy : Principles & Practice of Life Insurance
13. Kothari &Bahl : Principles and Pratices of Insurance.

DSE – 1

Group – C: Management

Human Resource Management

Objective:The objective of the course is to acquaint students with the techniques and principles to manage human resource of an organization.

Contents:

Unit I: Nature and Scope & Human Resource Planning

Nature and Scope

Concept and meaning of IR &HR, Understanding the Nature and Scope of IR & HRM, Functions and importance

Human Resource Planning

Definition, Need and Features of Human Resource Planning, factors affecting Human Resource Planning

Unit II: Recruitment and Selection

Definition of Recruitment, Source, need and importance of Recruitment, Recruitment Policy process – sources of Recruitment Definition of Selection, Steps in selection.

Unit III: Training and Development

Training and Development Meaning and purpose of training, Benefits of training to organization and employees - Training methods

Unit IV: Job Evaluation and Performance Appraisal

Job evaluation - objectives, scope, method, Job analysis, Job description, Job Specification - basic concept and significance, Performance Appraisal - Concept

Learning Outcomes: This paper can enhance the capability of the students to manage the most important assets of organization i.e. human beings which is much needed to ensure growth of that organization.

Text Books Recommended

1. Rao V.S.P - Human Resource Management. Vikash Publication
2. Human Resource Management, Sagun Ahuja, V.K. Global Pvt. Ltd., New Delhi

Suggested Readings:

1. Human Resource Management-Satapathy, Taheer and Mohanty—Himalaya Publishing House P Ltd.
2. Human Resource Management, Gupta, Joshi. Kalyani Publishers, New Delhi
3. Marketing Management & Human Resource Management: Verma et.al, Oxford University press.
4. Sinha, P. R. N. Shekhar, S.P. Human Resource Management, Cengage Learning
5. Human Resource Management -Gajendran, A K Jha, Vrinda Publications (P) Ltd
6. DeCenzo, D.A. and S.P. Robbins, "Personnel/Human Resource Management", Prentice Hall of India, New Delhi.
7. Khanka S.S. Human Resource Management. S Chand.
8. Ivancevich, John M. Human Resource Management. McGraw Hill.
9. Reather and Davis. Human Resource Management. Pearson Education.

DSE-2

Group B: Banking & Insurance

MERCHANT BANKING AND FINANCIAL SERVICES

Objectives: To enable the students to understand the basic knowledge about the financial services available in India.

Unit-I

Merchant Banking: Nature and scope of Merchant Banking - Regulation of Merchant Banking Activity - overview of current Indian Merchant Banking scene - structure of Merchant Banking industry - primary Markets in India and Abroad - professional Ethics and code of conduct - current Development

Unit-II

Financial Services: Meaning and Definition, Role of Financial Services in a financial system. Leasing: Meaning and features. Introduction to equipment leasing: Types of Leases, Evolution of Indian Leasing Industry. Legal Aspects of Leasing: present Legislative Framework. Hire purchase: concept and characteristics of Hire purchase. Difference between hire purchase and leasing

Unit-III

Factoring: concept, nature and scope of Factoring - Forms of Factoring - Factoring vis-à-vis Bills Discounting - Factoring vis-à-vis credit Insurance Factoring vis-à-vis Forfeiting-Evaluation of a Factor - Evaluation of Factoring - Factoring in India current Developments.

Unit-IV

Securitization / Mortgages: Meaning, nature and scope of securitization, securitization as a Funding Mechanism, securitization of Residential Real Estate - whole Loans - Mortgages - Graduated-payment. Depository: Meaning, Evolution, Merits and Demerits of Depository. Process of Dematerialization and Dematerialization, Brief description of NSDL and CDSL

Security Brokerage:

Meaning of Brokerage, types of brokers. Difference between broker and jobber, SEBI Regulations relating to brokerage business in India.

Learning Outcome: After the completion of this course, the student will be able to understand the structure and function of mercantile banking and various financial services available in the present business world.

Text Books Recommended

1. Machiraju, Indian Financial System, Vikas Publishing House, 2nd Edition, 2002.
2. Merchant banking and financial services, Gupta /Gupta, Kalyani Publishers, New delhi

Suggested Readings:

1. M.Y.Khan, Financial Services, Tata McGraw-Hill, 11th Edition, 2008
2. Gopal C.R – Management Financial Service – S.Chand
3. NaliniPravaTripathy, Financial Services, PHI Learning, 2008
4. J.C.Verma, A Manual of Merchant Banking, Bharath Publishing House, New Delhi.
5. Varshney P.N. & Mittal D.K., Indian Financial System, Sultan Chand & Sons, New Delhi.
6. Sasidharan, Financial Services and System, Tata Mcgraw Hill, New Delhi, 1st Edition, 2008.
7. Website of SEBI.
8. Merchant Banking and Financial Services-Sharma M--Himalaya Publishing House
9. Sharma R. and Mehta K. Financial Services, Cengage Learning

Group – C: Management
INTERNATIONAL BUSINESS

Objective: The objective of the course is to familiarize the students with the concepts, importance and dynamics of international business and India's involvement with global business. The course also seeks to provide theoretical foundations of international business to the extent these are relevant to the global business operations and developments.

Unit I: Introduction to International Business

- a. Introduction to International Business: Globalization and its importance in world economy; Impact of globalization; International business vs. domestic business: Complexities of international business; Modes of entry into international business
- b. International Business Environment: National and foreign environments and their components - economic, cultural and political-legal environments, Issues in International Trade

Unit –II Theories of International Trade and International Organizations

- a. Theories of International Trade – an overview (Classical Theories, Product Life Cycle theory, Theory of National Competitive Advantage); Commercial Policy Instruments - tariff and non-tariff measures – difference in Impact on trade, types of tariff and non tariff barriers (Subsidy, Quota and Embargo in detail) ; Balance of payment account and its components.
- b. International Organizations and Arrangements: WTO – Its objectives, principles, organizational structure and functioning; An overview of other organizations – UNCTAD,; Commodity and other trading agreements (OPEC).

Unit –III International Financial Environment

- a. Regional Economic Co-operation: Forms of regional groupings; Integration efforts among in Europe, North America and Asia (NAFTA, EU , ASEAN and SAARC) .
- b. International Financial Environment: International financial system and institutions (IMF and World Bank – Objectives and Functions) ; Foreign exchange markets and risk management; Foreign investments - types and flows; Foreign investment in Indian perspective

Unit –IV Foreign Trade Promotion and Financing of foreign trade

- a. Foreign Trade Promotion Measures and Organizations in India; Special economic zones(SEZs) and export oriented units (EOUs), ; Measures for promoting foreign investments into and from India; Indian joint ventures and acquisitions abroad.
- b. Financing of foreign trade and payment terms – sources of trade finance (Banks, factoring, for factoring, Banker's Acceptance and Corporate Guarantee) and forms of payment (Cash in advance, Letter of Credit, Documentary Collection, Open Account)

Text Books Recommended

1. Daniels John, D. Lee H. Radenbaugh and David P. Sullivan. International Business.25

2. Pearson Education
3. Cherunilam, Francis. International Business: Text and Cases. PHI Learning

Suggested Readings:

1. Charles W.L. Hill and Arun Kumar Jain, International Business. New Delhi: McGraw Hill Education
2. Johnson, Derbe., and Colin Turner. International Business - Themes & Issues in the Modern
3. Global Economy. London: Roulledge.
4. Michael R. Czinkota. et al. International Business. Fortforth: The Dryden Press.
5. Peng and Srivastav, Global Business, Cengage Learning
6. Subba Rao P – International Business-Himalaya Publishing House
7. JOSHI INTERNATIONAL BUSINESS SITKIN INTERNATIONAL BUSINESS, Oxford University Press.

DSE – 3

Elective – III (Any one of the following Groups)

Group – A: Accounting & Finance

Fundamentals of Corporate Tax Planning

Objective:To provide a conceptual idea about the various provisions of tax planning related to corporate sector.

Contents

Unit-I:

Corporate Tax in India–Concept of Tax planning, Tax management, Tax avoidance, Tax evasion, Assessment year and Financial Year

Residential status of corporate and its incidence of tax, Minimum Alternate Tax, Calculation of Tax Liability.

Unit-II:

Carryforward and set-off of losses and unabsorbed depreciation (headwise)

Unit-III:

Tax Planning with reference to Depreciation, Capital Gain and Scientific Research

Unit-IV:

Corporate Tax returns–Assessment, Return Filing, Penal provision, Double taxation Relief

Learning outcome: After completion of this paper, students will be able to help tax consultants in tax planning, assessment and filing income tax returns of corporate sector, thereby they can get themselves self-employed.

Text Books Recommended

1. Bhagabati Prasad, Direct Tax Laws & Practices
2. Corporate Tax Planning, V.K. Global Publications

Suggested Readings

1. Singhanian V.K. Direct Taxes: Law & Practices, Taxmann Publication.
2. Corporate Tax Planning, Kalyani Publishers

DSE – 3

Group B: Banking & Insurance

Fundamentals of Investment

Objective: To familiarize the students with different investment alternatives, introduce them to the framework of their analysis and valuation and highlight the role of investor protection.

Content

Unit-I:

The Investment Environment- The investment decision process, Types of Investments – Commodities, Real Estate and Financial Assets, the Indian securities market, the market participants and trading of securities, security market indices, sources of financial information, Concept of return and risk, Impact of Taxes and Inflation on return.

Investor Protection

Role of SEBI and stock exchanges in investor protection; Investor grievances and their redressal system, insider trading, investors' awareness and activism.

Unit-II:

Fixed Income Securities- Bond features, types of bonds, estimating bond yields, Bond Valuation types of bond risks, default risk and credit rating

Unit-III:

Approaches to Equity Analysis: Introductions to Fundamental Analysis, Technical Analysis and Efficient Market Hypothesis, dividend capitalization models, and price-earnings multiple approach to equity valuation.

Unit-IV:

Portfolio Analysis and Financial Derivatives:(a) Portfolio and Diversification, Portfolio Risk and Return. (b) Mutual Funds. (c) Introduction to Financial Derivatives, Financial Derivatives Markets in India.

Learning outcome: After completion of this paper, this paper will educate the students about various aspect of investment in detail along with understandability of stock market operation, focusing on need for common investor protection.

Text Books Recommended

1. Bhalla – Fundamentals of Investment – S.Chand
2. Rustogi, R.P., Fundamentals of Investment, Sultan Chand & Sons, New Delhi.

Suggested Readings

3. Pandian P. – Security Analysis & Portfolio Management – Vikash Publication
4. Jones, C.P., “Investments Analysis and Management”, Wiley, 8thed.
5. Prasanna, Chandra., “Investment Analysis and Portfolio Management”, Tata McGraw Hill.
6. Vohra, N.D., and B.R. Bagri, “Futures and Options”, McGraw Hill Publishing
7. Mayo, An Introduction to Investment, Cengage Learning.
8. Fundamentals of Investment, Sashi Gupta, Kalyani Publishers, New Delhi,
9. Fundamentals of Investment, Vandana Dangi, V.K. Globa. Pub. Pvt. Ltd. New delhi.

DSE-3

Group – C: Management

Consumer Affairs & Customer Care

Objective: This paper seeks to familiarise the students with of their rights as a consumer, the social framework of consumer rights and legal framework of protecting consumer rights. It also provides an understanding of the procedure of redress of consumer complaints, and the role of different agencies in establishing product and service standards. The student should be able to comprehend the business firms’ interface with consumers and the consumer related regulatory and business environment.

Unit I: Conceptual Framework

Consumer and Markets: Concept of Consumer, Nature of markets, Concept of Price in Retail and Wholesale, Maximum Retail Price (MRP) and Local Taxes, Fair Price, labeling and packaging Experiencing and Voicing Dissatisfaction: Consumer Satisfaction/dissatisfaction- Grievances- complaint, Consumer Complaining Behaviour: Alternatives available to Dissatisfied Consumers; Internal and External Complaint handling: Corporate Redress Systems and Public Redress Systems

Unit II: The Consumer Protection Act, 1986 (CPA)

Objectives and Basic

Concepts: Consumer, goods, service, defect in goods, deficiency in service, spurious goods and services, unfair trade practice, restrictive trade practice.

Organizational set-up under the Consumer Protection Act: Advisory Bodies: Consumer Protection Councils at the Central, State and District Levels, Basic Consumer Rights; Adjudicatory Bodies: District Forums, State Commissions, National Commission: Their Composition, Powers, and Jurisdiction (Pecuniary and Territorial), Role of Supreme Court under the CPA.

Unit III: Grievance Redress Mechanism under the Consumer Protection Act, 1986:

Who can file a complaint? Grounds of filing a complaint; Limitation period; Procedure for filing and hearing of a complaint; Disposal of cases, Relief/Remedy to be provided; Temporary Injunction, Enforcement of order, Appeal, frivolous and vexatious complaints; Offences and penalties.

Unit IV: Industry Regulators and Consumer Complaint Redress Mechanism

- i. Banking: RBI and Banking Ombudsman
- ii. Insurance: IRDA and Insurance ombudsman
- iii. Telecommunication: TRAI
- iv. Food Products: FSSAI (an overview)
- v. Electricity Supply: Electricity Regulatory commission
- vi. Advertising: ASCI

Text Books Recommended

1. The Consumer Protection Act, 1986
2. Bhatta KG- Customer Care Management-Himalaya Publishing House

Suggested Readings:

1. Khanna, Sri Ram, Savita Hanspal, Sheetal Kapoor, and H.K. Awasthi. Consumer Affairs”
2. (2007) Delhi University Publication. 334 pp.
3. Aggarwal, V. K. (2003). Consumer Protection: Law and Practice. 5th ed. Bharat Law
4. House, Delhi, or latest edition.
5. Girimaji, Pushpa (2002). Consumer Right for Everyone Penguin Books.
6. Nader, Ralph (1973). The Consumer and Corporate Accountability. USA, Harcourt Brace
7. Jovanovich, Inc.
8. Sharma, Deepa (2011).Consumer Protection and Grievance-Redress in India: A Study of
9. Insurance Industry (LAP LAMBERT Academic Publishing GmbH & Co.KG,
10. Saarbrucken, Germany. 263 pp.
11. Empowering Consumers e-book, www.consumeraffairs.nic.in
12. ebook, www.bis.org
13. Nair Suja – Consumer Behaviour – Himalaya Publishing House

DSE-4

B.Com. (Hons.): Semester – VI

Business Research Methods and Project Work

Objective: This course aims at providing the general understanding of business research and the methods of business research. The course will impart learning about how to collect, analyze, present and interpret data.

Section A: Business Research Methods

50 Marks Unit-I

Introduction: Meaning of research; Scope of Business Research; Purpose of Research – Exploration, Description, Explanation; Unit of Analysis – Individual, Organization, Groups, and Data Series; Conception, Construct, Attributes, Variables, and Hypotheses.

Unit-II

Research Process: An Overview; Problem Identification and Definition; Selection of Basic Research Methods- Field Study, Laboratory Study, Survey Method, Observational Method Existing Data Based Research, Longitudinal Studies, Panel Studies

Unit-III

Measurement: Definition; Designing and writing items; Uni-dimensional and Multi-dimensional scales; Measurement Scales- Nominal, Ordinal, Interval, Ratio; Ratings and Ranking Scale, Thurstone, Likert and Semantic Differential scaling, Paired Comparison; Sampling –Steps, Types, Sample Size Decision; Secondary data sources

Hypothesis Testing: Tests concerning means and proportions; ANOVA, Chi-square test and other Non-parametric tests; testing the assumptions of Classical Normal Linear Regression.

Section B – Project Report Marks (30 + 20)

Unit-IV Report Preparation: Meaning, types and layout of research report; Steps in report writing; Citations, Bibliography and Annexure in report; JEL Classification

Note:

1. There shall be a written examination of 50% Marks on the basis of Unit I to III.
2. The student will write a project report under the supervision of a faculty member assigned by the college/institution based on field work. The Project Report carries 50% Marks and will be evaluated by University appointed examiners.

Learning Outcome: After completion of this paper, the students will be able to assess and apply a range of research method on a practical project.

Text Books Recommended

1. Mishra Business Research Methods , Oxford University Press.
2. Business Research Methods and Project work, Priyaranjan Dash, Vrinda Publications (P) Ltd

Suggested Readings:

1. Business Research methods, S.C. Agarwal, V.K. Global Pub. Pvt. Ltd., New Delhi. 26

2. Upagade & Shende – Research Methodology – S. Chand
3. A.K.P.C. Swain, Business Research methods and Project work, Kalyani Publishers, New Delhi
4. Dangi, H.K. Business Research methods, Cengage Learning
5. Chawla Deepak – Research Methodology – Vikash Publication

(GE – 1) MICRO ECONOMICS

Objective: Objective of the course is to acquaint the students with the concepts of micro-economics dealing with consumer behavior. The course also makes the student understand the supply side of the market through the production and cost behavior of firms.

Unit: I Demand and Consumer behaviour

Concept of demand: demand function, law of demand, derivation of individual and market demand curves, shifting of the demand curve, elasticity of demand, Consumer behavior, Marshallian utility approach and Indifference Curve approach; utility maximization conditions. Income-Consumption Curve (ICC) and Price-Consumption Curve (PCC)

Unit: II Production and Cost

Production function: Short-run and Long-run; Total Product, Average Product and Marginal Product, Law of returns to a variable factor, Law of Returns to Scale; Concepts of Iso-quant and iso-cost line;
 Cost: Accounting and Economic Costs; Social and Private Costs; Short-run and Long-run Costs; Relation between Average and Marginal

Unit: III Perfect Competition

Concept of Perfectly Competitive market: Assumptions, Profit maximization conditions; Related concepts of Total Revenue, Average Revenue and Marginal Revenue, Short-run and Long-run equilibrium of a firm; determination of short-run supply curve of a firm, measuring producer surplus under perfect competition

Unit: IV Imperfect

Competition Monopoly

Concept of Monopoly: Sources of monopoly power; Short-run and Long-run equilibrium of a monopoly firm; Price discrimination; Social Cost of Monopoly (concept only).

Monopolistic Competition

Concept of Imperfectly Competitive market; Monopolistic Competition: Features and examples; Oligopoly: Non-Collusive Oligopoly: Sweezy's Kinked demand Curve Model, Collusive Oligopoly: Cartel (concept with example)

Learning Outcomes: The students would be able to apply tools of consumer behaviour and firm theory to business situations.

Text Books Recommended

1. Micro Economics-K C Dash- Himalaya Publishing House
2. Ahuja, H.L, Micro Economics, S.Chand

Suggested Readings:

1. Mehta P.K, Singh M. – Micro Economics – Taxmann Publication
2. Micro Economics-T.R. Jain , B.D. Majhi, V.K. Global
3. Browning, E.K. and J.M. Browning; Microeconomic Theory and Applications,
4. Kalyani Publishers, New Delhi.
5. Microeconomics I and Statistics: Das & Sengupta, Oxford University Press
6. N. Gregory Mankiw, Principles of Micro Economics, Cengage Learning
7. Dwivedi, D.N. Micro Economics, Vikash Publication
8. Pindyck, R.S., D. L. Rubinfeld and P. L. Mehta; Microeconomics, Pearson Education.
9. N. Gregory Mankiw, Principles of Micro Economics, Cengage Learning
10. Maddala G.S.and E.Miller; Microeconomics: Theory and Applications,
11. MCGraw-Hill International.

(GE-2)

Macro & Indian Economy

Objectives:The course aims at providing the student with knowledge of basic concepts of the macro economics. The modern tools of macro-economic analysis are discussed and the policy framework is elaborated, including the open economy.

Contents:

Unit I Introduction to Macro Economics

Introduction: Meaning and definition of Microeconomics and macroeconomics, Difference between Microeconomics and macroeconomics, macro-economic goals, components of Macroeconomics, Economic Systems: Mixed economy, Socialism economy, Capitalism economy and Islamic economy (only meaning and characteristics)

Unit II National Income Accounting

Definition of National Income, Concepts of National Income,GDP and GNP, Methods of Measuring National Income, Uses of National Income, Difficulties in calculating National Income, Real Income, Per Capita Income and Growth Rate

Unit:III National Income Equilibrium

I Concepts of Equilibrium, Consumptions & Savings, Investment Theory, Government Sector, Foreign Sector, Determination of Equilibrium, Multiplier Concept, Inflationary Gap and Deflationary Gap, Summary of Two-, Three- and Four-sector Economies

Unit:IV Role of Government

Expenditure, Public Debt, and Government Policy

Macroeconomic Problems

Introduction, Business cycle, Unemployment, Inflation, Deflation, Depression, RBI and monetary policy

Learning Outcomes: Students would be able to apply the modern tools of macro-economic analysis so as to minimize the adverse impact of macro-economic factors on business.

Text Books Recommended

1. Macro & Indian Economy, M. Treheran, T Treheran, V.K. Global publishing Pvt. Ltd., New Delhi
2. Ahuja H.L – Macro Economics – S.Chand

Suggested Readings

1. Mankiw, N. Gregory. Principles Macroeconomics. Cengage Learning
2. Macro and Indian economy, P.K. Dhar, Kalyani Publishers
3. Macro and Indian Economy-V K Puri- Himalaya Publishing House
4. Dornbusch, Rudiger., Stanley. Fischer and Richard Startz, Macroeconomics. Irwin/McGraw-Hill.
5. Vaish – Macro Economics – Vikash Publication
6. Macroeconomics & Indian Economy: Bhattacharyya, Oxford University Press.

(GE-3)

Business Statistics

Objective: The objective of this course is to familiarize students with the basic statistical tools used for managerial decision-making.

Contents:

Unit I:

Statistical Data and Descriptive Statistics (With the use of Excel and other statistical software)

Nature and Classification of data: Univariate, Bivariate and multivariate data; time-series and cross-sectional data

Measures of Central Tendency

a) Mathematical averages including arithmetic mean, geometric mean and harmonic mean. Properties and applications.

b) Positional Averages

Mode and Median and other partition values including quartiles, deciles, and percentiles

Unit II:

Measures of Variation (With the use of Excel and other statistical software)

Absolute and relative, Range, quartile deviation, mean deviation, standard deviation, and their coefficients, Properties of standard deviation/variance Skewness: Meaning, Measurement using Karl Pearson and Bowley's measures; Concept of Kurtosis

Unit III:

Simple Correlation and Regression Analysis (With the use of Excel and other latest software)

Correlation Analysis: Meaning of Correlation: simple, multiple and partial; linear and non-linear, Correlation and Causation, Scatter diagram, Pearson's co-efficient of correlation; calculation and properties (proofs not required). Correlation and Probable error; Rank Correlation

Regression Analysis: Principle of least squares and regression lines, Regression equations and estimation; Properties of regression coefficients; Relationship between Correlation and Regression coefficients; Standard Error of Estimate

Unit IV:

Index Numbers (With the use of Excel and other latest software)

Meaning and uses of index numbers: Construction of index numbers: fixed and chain base: univariate and composite. Aggregative and average of relatives – simple and weighted

Tests of adequacy of index numbers, Base shifting, splicing and deflating. Problems in the construction of index numbers

Construction of consumer price indices, important share price indices

Time Series Analysis (With the use of Excel and other latest software)

Components of time series, Additive and multiplicative models Trend analysis, Fitting of trend line using principle of least squares – linear, second degree parabola and exponential, Conversion of annual linear trend equation to quarterly/monthly basis and vice-versa; Moving averages Seasonal variations- Calculation of Seasonal Indices using Simple averages, Ratio-to-trend, and Ratio-to-moving averages methods. Uses of Seasonal Indices

Learning Outcomes: Students would be armed with the knowledge of using different statistical tools very much required in the decision making process in any business as well as business research.

Text Books Recommended

1. Gupta, S.P., and Archana Gupta. Statistical Methods. Sultan Chand and Sons, New Delhi.
2. Business Statistics - Levine and Viswanathan, Pearson Publication

Suggested Readings:

1. Business statistics, S.C. Agarwal, V.K. Global Pub. Pvt. Ltd, New Delhi.
2. Patri and Patri, Business statistics , Kalyani Publishers New Delhi.

3. Keller G, and Arora H, BSTAT, Cengage Learning
4. Gupta, S.C. Fundamentals of Statistics. Himalaya Publishing House.
5. Business Statistics– S K Sahoo, P K Prusty, Vrinda Publications (P) Ltd
6. Microeconomics I and Statistics: Das & Sengupta, Oxford University Press.
7. Sharma J K, Fundamentals of Business Statistics – Vikash Publication
8. Vohra N. D., Business Statistics, McGraw Hill.

(GE-4)

Principles of Marketing

Objective: The objective of this course is to provide basic knowledge of concepts, principles, tools and techniques of marketing.

Contents:

Unit I: Introduction:

Nature, scope and importance of marketing; Selling vs Marketing; Marketing mix, Marketing environment: concept, importance, and components (Economic, Demographic, Technological, Natural, Socio-Cultural and Legal).

Consumer Behaviour and Market segmentation:

Consumer Behaviour: Nature and Importance, Factors influencing consumer buying behaviour. Market segmentation: concept, importance and bases; Product differentiation vs. market segmentation.

Unit II: Product:

Concept and importance, Product classifications; Concept of product mix; Branding, packaging and labeling; Product life-cycle; New Product Development Process

Unit III: Pricing, Distribution Channels and Physical Distribution

Pricing: Significance, Factors affecting price of a product, Pricing policies and strategies, Distribution Channels and Physical Distribution: Channels of distribution - meaning and importance; Types of distribution channels; Factors affecting choice of distribution channel

Unit IV: Promotion and Recent developments in marketing:

Promotion: Nature and importance of promotion; Communication process; Types of promotion: advertising, personal selling, public relations & sales promotion, and their distinctive characteristics. Recent developments in marketing: Social Marketing, online marketing, direct marketing, services marketing, green marketing, Rural marketing; Consumerism

Learning outcome: After the completion of this paper, the students will be able to identify marketing components and fit them in the value chain along with the various marketing strategies.

Text Books Recommended

1. Marketing Principles and Management-Sherleker and Pany-- Himalaya Publishing House
2. Kotler, Philip, Gary Armstrong, Prafulla Agnihotri and AhsanUIHaque. Principlesof Marketing. 13thedition. Pearson Education.

Suggested Readings:

1. Principles of Marketing, Bajaj, Kaur, Kalyani Publishers, New Delhi.
 2. Principles of Marketing , R.K. Mittal , A. Sharma, V .K. Global Pub. Pvt. Ltd, New Delhi.
 3. Marketing Management & Human Resource Management: Verma et.al, Oxford University Press.
 4. Lamb, C. W., Hair, J.F. and Sharma, D. MKTG, Cengage Learning
 5. Principles of Marketing M K Nabi, K C Raut, Vrinda Publications (P) Ltd
 6. Arun Kumar – Marketing management – Vikash Publication
 7. Rudani R.B – Basics of Marketing Management – S. Chand
 8. Majaro, Simon. The Essence of Marketing. Prentice Hall, New Delhi.
 9. Zikmund William G. and Michael D’Amico. Marketing; Creating and Keeping Customers in an E-Commerce World. Thomson Learning.
 10. Chhabra, T.N., and S. K. Grover. Marketing Management. Fourth Edition. DhanpatRai& Company.
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**UTKAL UNIVERSITY COURSES OF STUDIES,
REGULATIONS & SYLLABUS FOR THE
MASTER OF ARTS IN
SOCIAL WORK
(2019 - 2020)**

**Nayagarh Autonomous College
Nayagarh**

**COLOUR SCHEME OF MAPPING THE SYLLABI FOR
ENTREPRENEURSHIP, EMPLOYABILITY AND SKILL
DEVELOPMENT**

	Skill Development
	Employability
	Entrepreneurship
	All the three
	Skill Development and Employability
	Skill Development and Entrepreneurship
	Employability and Entrepreneurship

**UTKAL UNIVERSITY REGULATION
For the
M.A. in SOCIAL WORK (MSW) EXAMINATIONS
(Semester Scheme)**

REGULATIONS

1. Introduction:

1.1. The two year post graduate degree course leading to the Master of Arts in Social Work (MSW) of Utkal University shall be spread over a period of two academic years. Each academic year comprises of two semesters namely the Odd and Even Semester.

1.2. A candidate for the Master of Social Work shall be required to pass the following

examinations.

- End Semester Examination – I
- End Semester Examination – II
- End Semester Examination – III
- End Semester Examination – IV
- Internal Assessment for Fieldwork in semesters I – IV
- External Examination for Fieldwork in semesters I – IV
- Internal Assessment for Dissertation in semester IV
- External Examination for Dissertation in semester IV

- 1.3. A candidate shall be eligible to appear for the oncoming semester courses subsequent to the first semester University examinations respectively irrespective of declaration of the results in the previous semester but.
- 1.4. Candidate who fails in the odd semester examinations shall be eligible to appear for the examination in which s/he has failed in the next odd semester and vice versa.
- 1.5. Students who have failed in a semester or are desirous to improve their performance will be allowed a single chance in the subsequent semester examination of the following year. Thus in no case the course completion will go beyond three years.

- 1.6. A candidate for the Master of Arts in Social Work Examination shall be required to enroll himself / herself under these conditions as a student in one of the colleges affiliated to this University.

2. Admission Criteria:

- 2.1. Any person who has passed the Under Graduate Degree in any subject with a minimum of 50% marks (General candidates) and 45% marks (SC/ST/OBC candidates) from an examination conducted by a recognized University is eligible to be admitted to the 1st Semester of this course. Students from SC/ST/OBC background have to apply with valid caste certificate.

3. Duration:

- 3.1 Odd semester shall be from July to December (I and III Semesters).
- 3.2 Even semester shall be from January to June (II and IV).
- 3.3 There shall be not less than 90 working days for each semester. This excludes the days for the conduct of University end semester examinations and other holidays.
- 3.4 A student would be required to complete the course within a maximum of three (Ref. 1.5 above) academic years from the date of admission.

4. Course:

Each course is well designed under lectures / tutorials / fieldwork / seminar / assignments / report writing so that it achieves the goals of effective teaching and learning needs of the students.

5. Contents in the Courses of Study:

- 5.1 The Master of Social Work programme of study consists of a number of contents. The term 'course' is applied to indicate a logical part of the subject matter of the programme and is invariably equivalent to the subject matter of a 'Paper' in the conventional sense. The following are the various categories of courses suggested for the Master of Social Work programme.
- 5.2 There are six Foundation papers.
- 5.3 Core compulsory papers comprise of twenty two courses. These are compulsory for all students.

- 5.4 There are eleven elective courses spread over two semesters III and IV. Out of the given electives student can choose any two of his or her interest for study in the respective semester.

6. Attendance:

Students must have 75% of attendance in each theory paper and 100% attendance in fieldwork and in related assignments. This is mandatory for appearing in the examination.

7. Examinations:

- 7.1 There shall be examinations at the end of each semester.
- 7.2 Examination for odd semesters shall be conducted in the month of November – December.
- 7.3 Examination for the even semesters shall be held in the month of May – June.
- 7.4 A candidate who does not pass the examination in any of the papers shall be permitted to appear in such failed papers in the subsequent examination to be held either in November – December or May – June as the case may be.

8. Pass Marks and Classification of Successful Candidates

- 8.1 Aggregate marks for passing the examination of the Degree of Master of Arts in Social Work (MSW) shall be the sum total of the aggregate of all the four semester Examinations taken together.
- 8.2.1 Divisions will be awarded on the basis of Utkal University Regulations for the M.A. Examination.
- 8.2.2 A candidate to be considered as Pass has to secure a minimum of 50% marks in the Field Work. Each of the field-work components namely Observation Visits, Concurrent Field Work in Community and Agency settings, Rural Camp and Block Placement has to be compulsorily completed to be considered as Pass.
- 8.3.a If a candidate is marked absent in a sitting(s) of an examination, such a candidate shall have to reappear in that paper (s) of the course in order to be considered as having completed the course.

.b If a candidate does not complete the requisite field-work days in a semester and does not appear for Field Work evaluation, Field Work Seminar and Viva Voce then he/she will be considered as not having completed the course and thereby ineligible to receive the M.A. degree.

8.3.b A candidate failing to secure a minimum of 30% in any Compulsory and a minimum of 50% in the Practical (Field Work - Ist, IInd & IIIrd & IVth) either in the First, Second, Third or Final examination of this University may be allowed to appear in those papers in not more than one chance (examination) immediately following that examination for which he/she was registered, in order to clear the back paper(s) on the payment of prescribed fees.

COURSE STRUCTURE UNDER THE SEMESTER SYSTEM – MSW

Semester – I

Paper	Course Code	Course Title	Credit	Total Instruction Hours	Marks
01	SWFC – 01	Foundations of Social Work: History, Philosophy, Ethics, and Theories in Social Work	4	60	100
02	SWFC – 02	Social Science Concepts I: social structure, social institutions and social change	4	60	100
03	SWFC – 03	Social Science Concepts II: Political Judicial and Economic System,	4	60	100
04	SWFC – 04	Social Science Concepts III: Poverty, Inequality and Social Exclusion	4	60	100
05	SWFC – 05	Social Science Concepts IV: Psychological Concepts, Human Behavior and Relationships	4	60	100
06	SWFC – 06	Orientation Visit Group Lab Concurrent Field Work	8	120	200
TOTAL			28	420	700

Semester – II

Paper	Course Code	Course Title	Credit	Total Instruction Hours	Marks
07	SWCP - 01	Working with Individuals	2	30	50
08	SWCP - 02	Working with Groups	2	30	50
09	SWCP - 03	Working with Communities	4	60	100
10	SWCP - 04	A Human Rights Approach to Social Work Practice	4	60	100
11	SWCP - 05	Social Welfare Administration	4	60	100
12	SWCP - 06	Social Work Research and Statistics	4	60	100
13	SWCP - 07	Concurrent Field Work + Rural Camp	8	120	200
TOTAL			28	420	700

Semester – III

Paper	Course Code	Course Title	Credit	Total Instruction Hours	Marks
14	SWCP - 08	Child Protection and Child Rights	4	60	100
15	SWCP - 09	Social Work with Women: Issues of gender and development	4	60	100
16	SWCP - 10	Ethnic Sensitive Social Work Practice in India	4	60	100
17	SWCP - 11	Rights of persons with Disabilities and their Rehabilitation.	4	60	100
18	SWCP - 12	Community Health and Social Workers	4	60	100
19	SWCP - 13	Social Management	4	60	100
20	SWCP - 14	Concurrent Field Work	8	140	200
21	SWEP – 01 SWEP – 02 SWEP – 03 SWEP - 04 SWEP - 05 SWEP - 06 (Any One)	School Social Work Working with Women Working with Alcoholics and Substance Abusers Correctional Social Work Counseling in Social Work Social Work with the Elderly	2	30	50
TOTAL			34	530	850

Semester – IV

Paper	Course Code	Course Title	Credit	Total Instruction Hours	Marks
22	SWCP - 15	Development Theories and Strategies: Issues Challenges and Responses	4	60	100
23	SWCP - 16	Social Work Practice in Rural Areas	4	60	100
24	SWCP - 17	Social Work Practice in Urban Areas: Migration, Unorganized Labour and Livelihoods	4	60	100
25	SWCP - 18	Social Policy, Planning and Implementation	4	60	100
26	SWCP - 19	Development Communication	4	60	100
27	SWCP - 20	Sustainable Agriculture	4	60	100
28	SWCP - 21	Dissertation: Research Project	4	70	100
29	SWCP - 22	Concurrent Field Work + Block Placement	2	340	100
30	SWEP - 07 SWEP - 08 SWEP - 09 SWEP – 10 SWEP – 11 (Any One)	Entrepreneurship Development NGO Management Project Management Disaster Management People Centred Advocacy.	2	30	50
TOTAL			34	740	850

Examination Question Paper Pattern:

There shall be three types of questions – Essay / Descriptive, Short Answer & Objective.

Distribution of Marks for courses carrying 100 Marks:

Five Essay type questions carrying 12 Marks each

(Out of a choice of seven) (Answer in 700 – 1000 Words) 5 x 12 Marks = 60
Marks

Four short type questions carrying 6 Marks each

(Out of a choice of six) (Answer in 150 – 200 Words) 4 x 6 Marks = 24
Marks

Eight objective type questions carrying 2 Marks each

(Out of a choice of ten) (Answer in one or two sentences) 8 x 2 Marks = 16
Marks

Social Work Practice (Fieldwork):

Fieldwork is an integral component of the course of Master of Social Work. A student shall have to undertake his/her fieldwork for 20 hours in every week in the semester. Students shall do the fieldwork under the guidance of a faculty supervisor. Fieldwork is mandatory for all students of social work.

Field Work Schedule:

Sl. No.	Semester	Field Practicum Component	Duration	Credits
1	SWFC - 06 MSW(I)	1. Observation Visit	10 Organizations	2
		2. Concurrent Fieldwork (Community Placement)	20 hrs/week (16 hrs in the field + 4 hrs report writing)	6
2	SWCP- 07	1. Concurrent Fieldwork (Community Placemen)	20 hrs/week (16 hrs in the field +	6

	MSW (II)		4hrs report writing).	
		2. Rural Camp	10 days	2
3	SWCP- 14 MSW (III)	1. Concurrent Fieldwork (Agency Placement)	20 hrs/week (16 hrs in the field + 4hrs report writing).	8
4	SWCP- 22 MSW (IV)	1. Concurrent Fieldwork (Agency Placement)	20 hrs/week (16hrs in the field + 4 hrs report writing).	2
		2. Block Placement	One Month before the end of the semester	2

Evaluation of Fieldwork: Regulation of Fieldwork:

At the end of each semester, the Chairman of the Board of studies shall call for the submission of the Field Work Attendance Record of the students, Field Work Report files of the students, the Fortnightly Reports on the students and the Self Evaluation Report of the students. This is to facilitate the external examiners to mark the performance.

Fieldwork carries 200 marks in Semester1, 2&3 and 100 marks in Semester 4. It is divided into internal and external.

The internal evaluation carries 50% marks and it shall be evaluated by the Faculty Supervisor on the basis of field-work records, practical fieldwork and reports.

The external carry 50% marks and it shall be evaluated by the external examiners on the basis of fieldwork seminar and practical knowledge gained by the student. The external examiner shall be any person authorized by the Chairman of the Board of studies for Social Work of Utkal University.

The minimum pass mark in the fieldwork shall be 50% in both the internal and the external examinations taken together in each semester. Both these marks together will comprise the university mark for field-work.

Field Work Assessment: [SL. No. 1 and 2 will be evaluated internally. Sl. No.3, 4 & 5 will be evaluated by an external examiner appointed by the Utkal University]

Sl. No.	Criteria for Assessment	Weightage In %
1	Field Work Reports	25%
2	Fortnightly Reports by Faculty	25%
3	Self-Evaluation Report by student	25%
4	Field Work Seminar	15%
5	Viva Voce	10%
	Total	100%

Evaluation of the Dissertation:

Students to practice Social Work Research Methodology shall submit a Dissertation in any area of their interest by working on a research project under the supervision of a faculty supervisor.

Total marks assigned for project work shall be 100. This total mark is distributed equally among internal and external evaluations. The internal marks of 50 and external marks of 50 shall be calculated in the basis of the Objective, Methodology, Analysis, Findings, Presentation and Viva-Voce. It is mandatory that it be the original work of the student.

HARD CASE RULE

The Hard Case Rule mentioned on the item No.5.2.4 (I,II,&III) in the correction ship No-1222 of Utkal University as amendments to the Regulation governing 2 Years Degree Course (Master of Arts, Science, Commerce Examinations) effective for the students admitted to such courses during the Academic 2002-2003 and 2003-2004,

shall be applicable to all the Compulsory and theory papers of Ist, IInd Year Examinations while computing the Final result of Master of Social Work Examinations. In case of any new regulation added to the Hard Case Rule by the University for 2 year Degree Course (Master of Arts, Science, Commerce Examinations) shall be applicable to the 2 years Degree Course of Master of Social Work.

REGULATION FOR FIELD-WORK

Introduction:

The student of the M.A in Social Work through field work practice is supposed to be committed to the people and social institutions in which they are placed. They are expected to serve individuals, families and communities through effective practice guided by qualified field-work supervisors (with MSW degrees) and by the social- work faculty in each college affiliated to this university.

Goals of Field Work:

1. To critically assess their own roles in field-work by conducting themselves ethically and professionally and by utilizing supervision & self-reflection.
2. To develop knowledge, skills and values required to engage in quality practice with individuals, families, groups, organizations and communities.
3. To demonstrate their ability to engage practically in problem solving as change agents in a variety of settings.
4. To demonstrate knowledge and ability to apply social theories and theories of human behavior and conceptual frameworks to assess, intervene and evaluate social work practice in the individuals, families and groups.
5. To recognize and understand various forms of discrimination and oppression as they apply to members of diverse groups and communities and advocate for social and economic justice for individuals, families, groups and communities.

Semester – I:

Observation Visits: 10 social work / welfare agencies have to be compulsorily visited. In each observation visit to an agency of community organization the student must be exposed to different field Situations. This observation visit will provide an opportunity to have an exposure and orientation to the services being offered by various Organisations/ Social institutions/ Agencies and open communities such as slums / rural settings as a response to community member's needs.

Understanding the Community: To understand the dynamics of the communities specifically the slum and the rural setting. This would imply comprehending the Socio-Cultural dynamics, economic and health status, being familiar with the problems of the communities, their causes, and observing how the people respond to such situations.

Semester – II:

Work with Individuals: Students shall be placed in slums or villages. They need to identify any issue affecting an individual and apply the principles and process of social case work. Similarly two separate case work should be done. The report should reflect learning derived from these two case work.

Work with Groups: Students shall be placed in slums or villages. They need to identify groups, study them well and carefully identify dysfunction if any in them and apply the principles and process of social group work.

Students may also start new groups such as Self Help Groups, children groups, Youth Clubs, integrated groups for person with disabilities, widows groups, senior citizens, adolescent girls group, study groups and etc. The purpose of this group formation is to learn group interaction, goal setting and group dynamics. The students should demonstrate principles and processes of group work. The reports should reflect on the learning derived out of it.

Community Organisation: Students shall be placed in a slum or village in a team of 4. Students shall be trained to demonstrate the skills and process of community organization. Each team shall identify a community issue along with the participation of the people and organize a programme that aims at resolving the community issue. The purpose of this fieldwork is to ensure students learning on community organization through demonstration and also for the students to learn to work in a team.

Rural Camp: All students shall compulsorily participate in a rural camp. This camp provides ample opportunity to learn about the community through experiences of living with them. It is to be a continuous 10 days camp and students and teachers are expected to stay in the rural area for all the 10 days continuously.

Semester – III:

Understanding Formation and Management of Social Welfare Agencies: Each student shall be linked with an agency promoting social welfare. These agencies may be either Governmental or Non-Governmental or Privately managed Corporate houses. Reports of students should reflect on their learning related to the above mentioned areas. Daily Report, Consolidated fieldwork report should be submitted by every student individually. Students will work under a Faculty Supervisor and Agency Supervisor.

- To provide an opportunity to work with social welfare agencies.
- To understand the agency as an organization, its structure, functions, activities sources of funding and management.

Semester – IV:

Students shall be directed to learn about the formation, legal formalities, taxation related formalities, project formulation, resources mobilization techniques, project management, Documentation, POSDCORB, Evaluation, Need Analysis, Problem Tree Analysis, Logical Frame Analysis and so on.

- To develop an understanding of the problem and opportunities in an organisational setting.
- To develop an understanding of the problems and opportunities of the organisation and the methods they adopt to respond to their environment.

Block Placement (On the Job Training): The students of Social Work will be assigned an agency. This agency setting should be located anywhere within or out of the State. Students will work in the agency and obtain on the job training experience. This training lasts for a continuous 25 days prior to the semester examination. It is compulsory for all.

Course Title: HISTORY, PHILOSOPHY, ETHICS AND THEORIES IN SOCIAL WORK

Course Code: SWFC – 01

Level: MSW (I)

Objectives:

- To understand the historical development of the philosophy of Social Work and its emergence as a profession.
- To understand the ethical and value base of Social Work.
- To bring clarity to the basic concepts of Social Work.
- To briefly introduce Social Theory relevant to Social Work practice.

Unit I: History and Evolution of Social Work Practice

History of Social Welfare in the West (UK and USA): The Elizabethan Poor Law (1601), Charity Organisation Society (1869) Settlement House Movement, The Poor Law Commission of (1905), Beveridge Report (1941); The development of Social Work as a profession; Development of the definition of Social Work; (From Charity to Human Rights and Social Justice); History of Social Work education in India: YMCA School of Social Work Lucknow, TISS Mumbai, Delhi School of Social Work

New Delhi; Voluntary Social Work in India.

Unit II: Philosophy of Social Work and Social Work Ethics

The Traditional religious doctrine of Charity; Scientific Naturalism; Liberalism; Scientific Charity; The ideological base of the Welfare state. (with specific reference to the Indian Constitution); Gandhian ideals in Social Work Practice in India; Ambedkar's ideals in Social Work Practice in India; Professional Code of Ethics: IFSW and IASSW code of Ethics; The meta-ethical dimension of Social Work Ethics; Ethical Dilemmas in specific contexts.

Unit III: Basic Concepts in Social Work

Social Work: Concepts, Definitions, Objectives & Functions, and Methods; Contributions of Social Sciences to Social Work; Traditional Social Work and

Radical Social Work; Social Service and Social Welfare Service; Social Welfare and Social Security; Social Reform and Social Justice ; Human Rights and Human Development; Social Inclusion & Empowerment; Social Change and Social Development; Social Action and Social Movements

Unit IV: Theories relevant to Social Work Practice

Social Welfare Theory: Emile Durkheim, Herbert Spencer and Max Weber; Social Justice Theory: Distributive and Retributive Justice, Rawls Theory of Justice, Nozick's Theory of Social Justice; Radical and Marxist perspective in Social Work: L. Althusser; Anti-discriminatory and Anti-oppressive Perspective; Communication Theory: J. Habermas, Erving Goffman; Critical Theory: J. Adorno; Structure Theory: Anthony Giddens & P. Bourdieu; The Ecological Perspective; The Generalist Perspective.

Reading List:

- Beilharz, Peter (Ed) (1991): Social Theory: A Guide to Central Thinkers.
- Elliot, Anthony (Ed) (2010): The Routledge Companion to Social Theory.
- Payne, Malcolm(1997), Modern Social Work Theory and Social Work Practice.
- Mulally, Robert P. (1993), structural Social Work: Ideology, Theory and Practice.
- Reamer, G.G.(2013), Social Work Values and Ethics.
- Hugman, Richard and Smith, David(Ed)(1995) Ethical Issues in Social Work.
- Tnattner, Walter I. (1998) From Poor law to Welfare State: A History of Social Welfare in America.
- Reisch, Michael (2002), The Road not Taken: A History of Radical Social Work in the United States.
- Zastow, C(2009) Introduction to Social Work and Social Welfare: Empowering People.
- Pierson, John(), Understanding Social Work: History and Context.
- Hering.S and Waaldijk (Eds); History of Social Work in Europe(1900-1960)
- Basanquet, Helen Dendy, Social Work in London, 1869-1912; A History of the Charity Organization Society.
- Queen, S.A, Social Work in the Light of History.

Course Title: SOCIAL SCIENCE CONCEPTS - I: SOCIAL STRUCTURE, SOCIAL INSTITUTIONS AND SOCIAL CHANGE

Course Code: SWFC – 02

Level: MSW (I)

Objectives:

- This introductory course seeks to familiarize the students with Sociology as a social science and the basic concepts necessary in understanding the social and cultural processes. It is organized in such a way that even students without previous exposure to sociology could acquire an interest in the subject and follow it. Understand the role of individual in the society and importance of various social Institutions and their impact. Get a scientific insight about the social structure, stratification and issues related to caste & class. Develop clarity about social issues and challenges in the social work field.

Unit – I: Basic Concepts

- Sociological Concepts: Society, Community, Association and Institution, social organisation.
- Social Group: Meaning, Types: Primary, Secondary, In-group - Out-group, formal and informal group, pressure group and reference group.
- Tradition: Little Tradition and Great Tradition, Parochialisation and Universalization.

Unit - II: Social structure and culture

- Concept of Social Structure and function.
- Social stratification: varna, caste, class, occupation, tribe and gender.
- Social Interaction and Social Processes: Associative and Dissociative Social Processes
- Culture: definition and types, norms & values, patterns of culture, culture and personality.

Unit - III: Social institutions and Socialisation

- Marriage and Family: Characteristics, types and functions, Rules of Marriage.

- Kinship: Meaning, Definition, Types, Functions.
- Social Process: Socialisation, Acculturation, Enculturation, Assimilation
Resocialisation, Anticipatory, Adult socialisation and agency of socialisation.
- Status and Role: Multiple Roles, Role Set, Status Set, Role Conflict.

Unit – IV: Social change and Mobility

- Concepts, processes and theories of social change,
- Meaning and nature of Social change,
- Factors of social change: Sanskritisation, Westernisation, Modernisation,
Orthogenetic and Heterogenetic factors of social change; Social Mobility:
Horizontal & Vertical,

Reading List:

- Abraham Francis, Contemporary Sociology, Oxford University Press, 2006.
- Ahuja Ram, Indian Social System, Rawat Publication, Jaipur, 1993
- Ahuja Ram, Social Problems in India, Rawat Publication, Jaipur, 1997
- Ahuja Ram, Society in India, Rawat Publication, New Delhi, 2010
- Kuppaswamy, Social Change in India, 1998
- Beteille, Andre, *Sociology: Essays on Approaches and Method*, New Delhi: OUP, 2002
- Bose, N.K. 1967, Culture and Society in India, Bombay: Asia Publishing House.
- Bottomore, T.B.: *Sociology: A Guide to Problems and Literature*, Blackie and Sons, Bombay, 1986.
- Desai, A.R. (Ed), *Rural Sociology in India*, Popular Praakashan, 2008
- Dube S C, *Indian Society*. New Delhi: NBT 1995
- Dube, S.C. 1995, *Indian Village* (London : Routledge)
- Dumont L, *Homo Hierarchicus : The Caste System and its Implications*, Chicago University Press, 1970
- Gupta Dipankar (ed). *Social Stratification*, New Delhi: Oxford University Press, 1991

- Jodhka, S.S. (ed), *Village Society*, New Delhu: Orient BlackSwan, 2012
- Karve, Irawati, 1961 : *Hindu Society : An Interpretation*(Poona : Deccan-College)
- Kothari, Rajni, *Caste in Indian Politics in Manoranjan Mohanty* (ed.) *Class, Caste, Gender: Readings in Indian Government and Politics*, New Delhi, Sage. 2004
- Maclver & Page, *Society, Introductory Analysis*, MacMillan, Delhi, 2001.
- Madan & Majumdar, *An Introduction to Social anthropology*, Mayur, 1999.
- Madan, Vandana. *Village in India*, India: OUP, 2003.
- Mandelbaum David,G, *Society in India*, Popular Prakashan, 2008
- Mukherjee Ramakrishna, *Sociology of Indian Sociology*, Allied Publishers, 1979
- Satish Deshpande, "*Contemporary India A Sociological View*", Viking Publishers, New Delhi, 2003.
- Singer Milton, B, *When a Great Tradition Modernises. An Anthrapological Approach to Indian Civilization*, Praeger Publishers, 1972
- Srinivas, M.N, *Caste and its New Avatar*, Penguin, 1996
- Srinivas, M.N. 1963: *Social Change in Modern India* (California, Berkeley: University of California Press).
- Srinivas, M.N. *Caste in Modern India and Other Essays*, Bombay Asia Publishing House, 1962
- Uberoi, Petricia, *Family Kinship and marriage in India*, OUP, 2005

Course Title: SOCIAL SCIENCE CONCEPTS II: POLITICAL JUDICIAL AND ECONOMIC SYSTEM

Course Code: SWFC - 03

Level: MSW (I)

Objectives:

1. To impart knowledge about the political institutions that regulate people's life and promote their interests.
2. To Understand the basic economic concepts, principles, theories & its application in social work profession.
3. To Understand and analyze economic problems on social work perspective.

Unit - I: System of Governance

- Indian Constitution: Objective(Preamble) Characteristic Features and Amendment Process, Fundamental Rights, Fundamental Duties and Directive Principles of State Policy.
- Indian Political System: Parliamentary Democracy, Federalism and Issue of State Autonomy, Coalition Government and Role of Bureaucracy in Administration.
- India- A Welfare State: Social Policy and Social Legislation, Increasing Partnership between Government Agencies and Private Voluntary Organization.
- Judiciary: Judicial Review, Judicial activism and P.I.L.

Unit – II: Social structure and Democratic Process

- Features of Indian Democracy: Multiparty System, Role of National Parties, Regional Parties and Pressure Groups.
- Grassroots Democracy: Panchayati Raj System and Empowerment
- Issues Concerning Religion, Language, Caste, Problem of Gender, Illiteracy and Reservation.
- Institutions: Bureaucracy, National Planning, Election and Participation.
- Socio-Political Movements: Peasant Movement, Trade Union Movement, Tribal Movement, Women's Movement, and Dalit Movement

Unit – III: Development Economic

- Development Economics: Meaning Nature and Significance, Contemporary Development, Problems: Poverty and Inequality.
Economic Systems: Capitalism, Socialism, Mixed Economy – Definitions, Features, Advantages and Disadvantages.
- Rural and Urban economy: Nature and structure of rural economy; rural financial structure-formal and informal; Regional Rural Banks Policy and Planning concerning development of rural area.
Urban economic growth: State and local policies; and urban poverty-policy responses.

Unit – IV: Indian Economy and Financial Institutions

- Indian economy: Nature and Characteristics
Inflation and Over population: Meaning, magnitude, causes and consequences;
Programmes for alleviation of poverty and unemployment.

- Economic Planning and Reforms: Rationale, Features and Objectives; Globalization, Privatization and Liberalization and their impact on Agriculture and Marginalized sections of India.
Meaning and concept of Free trade, Special Economic Zone and its impact on Indian social concerns.
- Financial Institutions: National and International Financial Institutions and their Role in Social Welfare- World Bank, International Monetary Fund (IMF), Reserve Bank of India (RBI), World Economic Forum, NABARD, Commercial Banks; Role of Non Bank Financial Institutions; and National and International Funding agency for social development.

Reading List:

- Kashyap Subhash(ed), 1993, Perspective on the Constitution, Shipra Publication, Delhi.
- Basu D. D., 1992, Introduction to the Constitution of India, Prentice Hall of India Pct. Ltd., New Delhi.
- Kaushik Sushila, 1993, Women and Panchayati Raj, Har Anand publication, New Delhi.
- Kulkarni P.D, Social Policy and Social Development in India.
- Reed Elaw, Social Welfare Administration.
- ND Kumble, Ashish, Deprived Castes and Their Struggle for quality, Publishing House, New Delhi.
- Murthy(ED),Planning for Change- Council for Social Development , Aspects of Social Development.
- Setty Krishna, K.R. Chaitanya, Fundamental Rights and Socio Economic Justice in the Constitution, Publishing House, Allahabad.
- Singh M.P. and Roy Himanshu, Indian Political System, Structures, Policies, Development, 1995, Jnanada Prakashan (P & D), New Delhi.
- Misra & Puri : Advanced economic theory
- Mitchell A Seligson & John T Passé Smith, Development & Underdevelopment- The political economy of global inequality
- Agarwal A.N., Indian economy- Problems of development & planning
- A Vaidyanathan : India's economic reforms & development
- Patel Surendra J: Indian economy towards the 21st century

- Lekhi R.K.: The Economics of Development and Planning
- Dhar P.K.: Indian Economy: Its Growing Dimensions
- Datt Rudra & KPM Sundharam: (2004), Indian Economics Theory: S, Chand & Co New Delhi.
- K.G Karmakar, Rural Credit And Self Help Groups: Microfinance Needs and Concepts in India: Sage publication.
- Thakur S.N., (1988): Economic theory of profile of Indian Economy: Deep & Deep Publication, New Delhi.

Course Title: SOCIAL SCIENCE CONCEPTS III: POVERTY, INEQUALITY AND SOCIAL EXCLUSION

Course Code: SWFC – 04

Level: MSW (I)

Objectives:

- To develop clarity and understanding on the various perspectives about the concept of poverty, Inequality and social exclusion.
- To discuss policy interventions that aim to reduce poverty, inequality and exclusion.

Unit – I: Understanding Poverty

- Concept of Poverty, Different types of poverty: relative, absolute, material and social; culture of poverty, theories of poverty; Deprivation.
- Poverty Measurement: Indicators of poverty, PQLI, HDI, Poverty lines.
- Anti-poverty programmes in India.

Unit – II: Understanding Inequality

- Equality, inequality, capability, post-industrial structuralism, norm of structural exclusion, inequality and globalization;
- Bases of inequality in India: religion, caste, ethnicity, gender, disability, merit, region, language, culture, migrants.
- Diversity & Inequality: Socio-cultural and geological analysis

Unit – III: Understanding Social Exclusion

- Definitions and Concepts, Evolution of the concept of Social Exclusion; Dimensions of Social Exclusion, Theories of Social Exclusion;
- Social Exclusion and the role of: Religion, Race, Caste, Ethnicity; Gender; and Disability.
- Relationship of Social Exclusion and Discrimination

UNIT – IV:

- Social policy response to combat Poverty. Inequality and Social Exclusion in India.
- The role of social work in addressing issues of poverty, inequality and social exclusion.

Reading List:

- Sen, Amartya 2000 Social Exclusion: Concept, Application and Scrutiny. Social Development Papers NO.1. Asian Development Bank.
- Sen, Amartya "Poverty as Capability Deprivation," chapter 4 in Development as Freedom, OUP, 2000.
- Sullivan, Elizabeth 2002 Social Exclusion, Social Identity and Social Capital: Reuniting the Global, the Local and the Personal. De Montfort University, UK.
- Silver, Hilary and S.M. Miller 2003 Social Exclusion: The European Approach to Social Disadvantage. Indicators.2.2: 1-17.
- Haan, Arjan de 2001 Social Exclusion: Enriching the Understanding of Deprivation. Institute of Development Studies and Poverty Research Unit, University of Sussex. Sussex. UK
- O'Brien, D, Joanna Wilkes, Arjan de Haan, Simon Maxwell Poverty and Social Exclusion in North and South. Institute of Development Studies and Poverty Research Unit, University of Sussex. Sussex. UK.
- Kabeer, Naila 2006 Social Exclusion and the MDGs. The Challenge of 'Durable Inequalities' in the Asian Context. Institute of Development Studies and Overseas Development Studies Institute.
- Beall, Jo 2002 Globalization and Social Exclusion in Cities: Framing the Debate with Lessons from Africa and Asia. Development Studies Institute, LSEP, London.
- Chebolu, Radha Mohan 2007 Corporate Quotas: The Myth Action'. Pravartak. 2:2: 159-165.
- Saith, Ruhi 2001 Social Exclusion: The Concept and Application to Developing Countries. QEH Working Paper Series -72.
- Loury, G.C 2000 Social Exclusion and Ethnic Groups: The Challenge to Economics. Annual World Bank Conference on Development Economics 1999. The International Bank for Reconstruction and Development! The World Bank.

- Jenkins, Robert 2006 Social Exclusion of Scheduled Caste Children from Primary Education in India; UNICEF India. New Delhi.
- Sen, Amartya 1992 Inequality Re-examined, New Delhi Oxford University Press.
- Byrne, David 1999 Social Exclusion. Buckingham: Open University Press.

Course Title: SOCIAL SCIENCE CONCEPTS IV: PSYCHOLOGICAL CONCEPTS, HUMAN BEHAVIOUR AND RELATIONSHIPS

Course Code: SWFC – 05

Level: MSW (I)

Objectives:

- To understand the concept of human behavior
- To understand the basic concepts and factors of human behavior
- To understand the relevance of psychology in social work
- To understand the concept of personality and its application in social work education

UNIT – I: Nature and Scope of Psychology

Meaning and definition of psychology – Schools of psychology: Structural, Functional and Behaviourist, Importance of psychology in social work practice, Factors influencing Human Behaviour-Heredity, Environment and Self

UNIT – II: Human growth and development

Human growth and development: Meaning and principles; Social, Emotional, Cognitive and Physical Stages in Life Span approach from Conception to Old Age: characteristics, needs, tasks and problems at each stage.

UNIT – III: Personality

Meaning of personality, Theories of personality: Trait and Type theories; important concepts of the contributions of Freud, Jung, Adler, Maslow and Ericson: factors influencing personality Development Psychological Processes in Behaviour: Perception, Emotion, Motivation, Attitude; Processes of Adjustment: Concept and Factors; Coping Mechanism, Defence Mechanism

UNIT – IV: Theories of Human Development

Psychoanalytic theory: Psycho-sexual theory by Freud, Psycho-social theory by Erickson.

Behavioural theory: Classical conditioning by I P Pavlov, Operant.

Humanistic theory: Abraham Maslow and Carl Rogers, Alfred Adler. Cognitive theory: Jean Piaget's theory

Reading List:

Davidoff.L.L.: Introduction to Psychology, Auckland; McGraw Hill Inc:1881

Morgan, C.T.& King, R.A:Introduction to psychology New York.

Weix;J.R& Schopler J: McGraw Hill;7th Ed.,1986.

Munn,N.A.:psychology-The fundamentals of human Behaviour;London;

Hurlock E. B: Developmental psychology, New Delhi, Tata McGraw Hill 5th Ed.1971

Rayner, Eric: Human Development, London; George Allen and Unwin, 1978.

Sareswathi T.S, Dutta R: Development psychology in India, Delhi; Sage publications, 1987.

Kuppusamy B: An Introduction to social Psychology; Bombay; Media Promoters and pub.Pvt.Ltd., 1980.

Coleman, J.C: Abnormal Psychology and Modern Life

Fair-weather George W.: Social Psychology Treating in Mental Illness, Sydney, John Wiley and Sons

Course Title: WORKING WITH INDIVIDUALS

Course Code: SWCP – 01

Level: MSW (II)

Objectives:

- To develop theoretical knowledge and understanding about working with individuals
- To critically examine the application of social case work method in human

personality and development.

Unit - I: Basics of Case Work

Social Case Work: nature, assumptions, values and principles. Components of social case work: person, place, problem & process. History of social case work.

Unit – II: Client Worker Relationship

Need and importance of Relationship: nature and ways to establish. Psychoanalytical theory. Ego - functions and defense mechanisms. Concept of Human needs, stress, social role and adaptation

Unit – III: Process of Case Work

Process of social case work- study, assessment, goal formation, planning, treatment, evaluation, termination. Techniques of social case work: interviewing, support, encouragement, clarification, correcting perception, reality orientation; resource mobilization, home visit, interpretation, topical shift, logical reasoning, crisis intervention, burnout. Transference and Counter-Transference and its use in case work. Supportive techniques. Referral: its use in social case work. Recording: types and format.

Unit – IV: Models of Case Work

Models of social case Work practice: Problem solving, Psycho- social, Task oriented. Rational Emotive Therapy in social case work. Discussion on role of case worker from the records in school, family and marriage settings. Presentations and discussions on cases and practical questions.

Readings List:

Banarjee, G.R. TISS Series 23. Papers on Social Work: An Indian Perspective; Tata Institute of Social Sciences, Mumbai. TISS(Series 23).

Batra, Sushma & Marlin Taber, 1996. Social strains of Globalization in India, Mittal Publication, New Delhi.

Biestek, F.P. 1970. The Case Work Relationship: London: Unwin University Books, Impression.

Bogo, Mario, 2006-07. Social Work Practice: Concepts, Processes and Interviewing. Columbia University Press-2006. Indian Reprint by Rawat Publication : New Delhi,2007.

Friedlander, W.A. 1964. Concepts and Methods of Social "Work, New Delhi: Prentice Hall of India Pvt. Ltd.

Fisher, J, 1978. Effective Case Work Practice: An Effective Approach, New York McGraw Hill Book Co.

Florence, H., 1964. Case Work: A Psycho social therapy, Random House, New York.

Farard, M.L. & N.K. Hunnybun, 1962 The Case Work's use of relationship London, Tavistock. Pub.

Goldstein, H., 1970. Social Work Practice: A Unitary Approach, Carolina: Univ. of S. Carolina Press.

Grace, Methew, 1992. Introduction to School Case Work, Tata Institute of Social Sciences, Mumbai.

Hamilton, G., 1946. Principles of Social Case recording, New York: Columbia University Press.

Himilton, Gordon, 1959. Theory & Practice of Social Case Work, New York: Columbia University Press, VI Ed.

Husband. E.(ed) New Developments in Social Case Work Reading in Social Work, Vol. III, London: Georque Allen & unwin Ltd.

Mishra, P.D., 1985. Samajik Vijyaktik Sewa Karya (Hindi) Uttar Pradesh Hindi Sansthan, Lucknow.

Perlman, 1957 Social Case Work-A Problem solving Process, Chicago: The University of Chicago Press, V Impression.

Pathak, S.H. 1966. Records in Social Case Work, Delhi School of Social Work, Delhi.

Pinkus, Helen, 1971. Case Records for Teaching Purposes, Faculty as social Work, M.S. University, Baroda.

Roberts R.W. Nee, R.H. 1972 Theories of Social Case Work, the Uni. Of Chicago Press, Chicago, London.

Reid, W.K. & Anne W. Shyne, 1969 Brief and Extended Case Work: New York: Columbia Uni. Press.

Scott Briar and Henry Miller, 1971 Problems and issues in social Case Work: Columbia University Press, New York.

Timmis, N., 1964. Social Case Work: Principles and Practice, London; Rout ledge and Kegan Paul.

Timmis, N., 1972. Recording in Social Work, London, Rout ledge & Kegan Paul.

Terner, F (Ed) 1974. Social Work Treatment, New York: The Free Press.

Upadhyay, R.K. 1991. Samajik Vijyaktik Karya (Hindi) Haryana Sahitaya Academy, Chandigarh.

Upadhyay, R.K. 1993. Indian Philosophical Concepts in Clinical Social work, Kurukshetra Press, Kurukshetra.

Upadhyay, R.K. 2003. Social Case Work, Rawat publications, New Delhi, Jaipur.

Course Title: WORKING WITH GROUPS

Course Code: SWCP – 02

Level: MSW (II)

Objectives:

- To understand theoretical knowledge of social group work.
- To understand group work as an instrument of change/development in individual in groups.
- To understand the relevance of group work in different settings.

Unit – I: Social Group Work:

Definition, objectives and scope - Models of Social Group Work- Historical Development of Group Work, Principles of Group Work, Values, Significance, Limitation of social group work practice in India.

Social Groups and Development: Definition, Characteristics, Types of Groups and Functions of a Group - Basic Human Needs met by Groups at Different Stages of Group Development - Group Process : Bond, Acceptance, Isolation, Rejection, Sub- Group Formation, Withdrawal, Behaviour Contagion, Conflict and Control.

Unit – II: Approaches to the Practices of Group Work:

Group Therapy, Group Psychotherapy, Use of Home Visits and Collateral Contacts. Leadership: Concepts, Definition, Characteristics, Functions, Qualities of Leader, Types and Theories of Leadership, Training for Leadership - Sociometry and Sociogram - Group Work Supervision: Meaning, Purpose and Functions. Skills of social group worker.

Unit – III: Group Work Programme Planning:

Meaning and Definition of Programme, Principles and Process of Programme Planning and the place of Agency in Programme Planning - Programme Laboratory: Values and Techniques (Games, Singing, Dancing, Dramatics, Street play, Puppetry, Group Discussions, Excursion, Psychodrama, Socio drama, Role play, and Brain Storming); Rural Camp: Planning, Organizing, Executing, Evaluating and Reporting.

Unit – IV: Group Work Recording:

Meaning, Purpose, Principles, types of group work recording; Steps and Criteria for Good Group Work. Application of Group Work Methods in Different Settings: Community Settings, Medical and Psychiatric Settings, De-Addiction Centres, Correctional Institutions, Schools, Industries, Physically Handicapped and Aged Homes.

Reading List:

Alissi, A.S.1990 Perspectives on Social Group Work Practice: A Book of Readings, New York, The Free Press.

Balgopal, P.R. and Vassil. Groups in social Work- An Ecological Perspective, New York, Macmillan Publishing Co. Inc.

Bhatt, P.M.1970 Records of Group Work Practice in India, faculty of Social Work, M.S. University, Baroda.

Brandler S & Roman CP 1999 Group work, Skills and Strategies for Effective Interventions, New York. The Haworth Press.

Brandler S & Roman CP 1991. Group work, Skills and Strategies for Effective Interventions, New York. The Haworth Press.

Garland, J.A.(Ed) 1992. Group Work Reaching Out: People, Places and Power, New York, The Haworth Press.

Garwin, C 1987. Contemporary Group Work, New York Prentice- Hall Inc.

Golpelwar, Banmala, 2007 social Group Work, Indian Institute of Youth welfare, Nagpur.

Kemp, C.G. 1970. Perspectives on the Group Process, Boston: Houghton Mifflin C.

Klein, A.F.1970. Social Work Through Group Process,: School of Social Welfare- Albany: State University of New York.

Konopka, G 1963. Social Group Work: A Helping Process, Englewood Cliff, NJ Prentice Hall, Inc.

Kurland, R & Salmon, R 1998. Teaching a Methods Course in Social Work with Groups Alexandria: Council on Social Work Education.

Middleman, R, R 1968. The Non- Verbal Methods in Working with Groups.

Northen, H 1969. Social Work with Groups, New York: Columbia University Press.

Pepell, C.P & Rothman B. Social Work with Groups, New York: The Haworth Press.

Sundel, M, Glasser, P sari, Individual change Through Small R., Vinter, 1985 Groups. The Free Press.

Samuel, T. Gladhing 1999. Group Work: A Counseling Specility, Simon& Schaster, NJ Printice Hall Inc.

Siddiqui H.Y.2005. Group Work, theories and Practice, Rawat Publication New Delhi.

Toseland RW 1998. An introduction to Group Work Prectice, New York Macmillan Publication Co.

Trecker, Harleigh B 1990. Social Group Work: Principles and Practice, New York: Association Press.

Wilson, G. Ryland, G 1949. Social Group Work Practice, Boston: Houghton Mifflin, Co

Course Title: WORKING WITH COMMUNITIES

Course Code: SWCP– 03

Level: MSW (II)

Objectives:

- To provide theoretical and conceptual understanding of community organization as a method in social work.
- To practice and critically examine the steps and process of community organization in various community setting.

Unit – I: Community and Community Organisation

Community: Concept, characteristics, types and functions. Understanding of community organisation practice: Definition, values, ethics and principles; Historical development of community organisation practice; Community organization as a method of social work intervention; Role and skills of Community Organizer

Unit – II: Models and Strategies of Community Organization

Models and Strategies of Community Organization - Locality Development Model - Social Planning Model - Social Action Model - Select methods of public interest mobilization, litigation, protests and demonstrations, Dealing with authorities, Public Relations, Planning, Monitoring and Evaluation - Roles in different models attributes and attitude.

Unit – III: Community Organization Practice in the Context of Various Settings

Health, Education, Residential institutions, Livelihood and work, Natural resource management, Sustainable development, Working with tribal and Dalit populations, in rural and urban communities, Displaced population and rehabilitation, Community organization in disaster preparedness and response, Peace building and national integration .

Unit – IV: Social Action

Social work and social action, History of social action in India, Radical or emancipatory social work; Rights based approach, Different forms of protest, various contributions to the theory of social action (Lees, Saul Alinsky, Paulo Friere, Mahatma Gandhi's (Sarvodaya and Siddique) Strategies for social action from various social movements.

Reading List:

- Gangrade, K. D. 1971. Community Organization in India, Mumbai; Parkashan, 1971.
- Karamer, R.M. & Spech, H. Reading in Community Organization Practice-Hall Inc. Englewood Cliffs, 1983.
- Murphy C. G.: Community Organization Practice, Boston; Houghton Mifflin Co. Ross, 1954
- Patil, S.H. Community Dominance & Political Modernization; Mittal Publication; New Delhi; 2002.
- Rashmi Dewas & R. Community Participation & Empowerment in Primary Education; Mittal Publication New Delhi; 2003.
- Sengupta, P.K.; Community Organization Process in India, Kiran Publishers, 1976.
- Selgen, S. Empowerment & Social Development Issues in Community Participation; Mittal Publication: New Delhi; 2005.
- Speech, H & Karmer: R.M; 1969 Reading in Community; Englewood Cliffs: Prentice Hall.
- Surya Rao: Under Development with community initiative retrospect & prospect: mittal Publication: New Delhi, 2000.

- Zastrow Charles: 1978. Introduction to social Welfare Institution Social Problems, services & Current Issues (Social work Community Practices Part-3 Chapter-10) Ontario: The Dorsey Press.
- Butcher H. 2007: Critical community Practice.
- Kothari M 2006: Development and Social Action, Rawat Publication, New Delhi.
- Grundy M : Community Work, Rawat Publication, New Delhi,
- Siddiqui. H.V., Social Action in India.

Course Title: A HUMAN RIGHTS APPROACH TO SOCIAL WORK PRACTICE

Course Code: SWCP – 04

Level: MSW (II)

Objectives:

- To understand Human Rights and engage in critical self-reflection and correction for professional development.
- To recognize the extent to which a culture's structures and values may oppress, marginalize, exclude and enhance power and privilege.
- To engage in processes that advance social and economic justice.
- To critically analyse how the intersection of Human Rights Values with Social Work influences practice

UNIT I: Introduction to Human Rights

- Historical evolution and normative framework of the Universal Human Rights System: The UN Charter, Universal Declaration of Human Rights, the ICCPR and ICESCR.
- The generations of Rights
- UN vs National perspectives: Issues of cultural relativism: Rights and Duties, Rights of Indigenous Peoples and Rights of the Scheduled Tribes, Racial discrimination and Caste based discrimination, Right to Self-determination.

UNIT II: Human Rights in the Indian Constitution: Interpretation and Application

- The Preamble, the Fundamental Rights and the Directive Principles of State Policy;
- Special provisions for vulnerable groups: Scheduled Castes, Scheduled Tribes, Women, Religious, cultural and linguistic minorities.

- Role of the Judiciary in responding to Human Rights issues in India: The case of Niyamgiri, Reservations to OBCs, Women's issues, etc
- Role of the National Commissions on: Human Rights, Women, Scheduled Castes, Scheduled Tribes, Minorities, Backward Classes.
- Role of Human Rights NGOs.

UNIT III: Monitoring Human Rights

- Who monitors human Rights?: Social Work Professionals, Medical Professionals, the Police, Lawyers and Judges;
- How to monitor? : prisons, trials, hospitals, cemeteries, vulnerable groups;
- How to investigate? : practical steps on gathering evidence;
- How to report? : How to write a report, How to take a statement, How to collate evidence;
- Commissions of Enquiry; the NHRC
- International and National Reporting and Complaints Procedure.

UNIT IV: Human Rights in Social Work Practice

- The elements of the Human Rights approach and its value to Social Work: Respecting principles of Equality and non-Discrimination; incorporating the Gender perspective.
- The Right to Development: Application to International Agencies and NGOs; ensuring participation of service users; accountability of service providers and empowerment of all stakeholders.
- Applying Human Rights approach to Advocacy in the context of Social Work: Legislation; funds to respond to identified social needs; follow-up; public campaigns; networking.

Reading List:

- Youth for Human Rights (2010). What are human rights?
<http://www.youthforhumanrights.org/what-are-human-rights.html>
- Ife, J. (2001). Local and global practice: Relocating social work as a human rights profession in the new global order. *European Journal of Social Work*, 4(1), 5-15.

- United Nations. (1948). The Universal Declaration of Human Rights. Retrieved from <http://www.un.org/en/documents/udhr/>
- United Nations. (1994). Human rights and social work: A manual for schools of social work
 - and the social work profession. Geneva: United Nations Centre for Human Rights.
- Ife, J. (2012). Human Rights and Social Work: Towards Rights based Practice, CUP: London.
- Reichert, E. (2011). Social Work and human Rights: A Foundation for policy and practice, Columbia University Press.
- Lundy, Colleen (2011). Social Work, Social Justice and Human Rights: A Structural Approach to Practice. University of Toronto Press.
- Mullaly, Bob. () Challenging Oppression and Confronting Privilege, OUP.
- Wronka, Joseph. M. () Human Rights and Social Justice: Social Action and Service for the Helping and Health Professions, Sage publications.
- Hokenstad, Healy, M. and Segal, Uma A (2013). Learning to Teach, Teaching to Learn.

Course Title: SOCIAL WELFARE ADMINISTRATION

Course Code: SWCP – 05

Level: MSW (II)

Objectives:

- To have conceptual clarity about social welfare Administration.
- To understand the principles, structure and functioning of the social welfare Administration system in India.
- To understand the role of voluntary agencies/NGOs in social welfare administration.

Unit – I: Concept: Administration

- Evolution, Meaning Nature, Bureaucratic Human Relations, Philosophy of Social

Welfare Administration, Distinction between Welfare Administration and Public Administration.

- Structure of Social Welfare Administration in India: Departmental Administration in the Government of India; Ministry of Social Justice and Empowerment; Ministry of Women & child Development; Ministry of Rural Development; etc.

Unit – II: Principles and Techniques

- Planning: meaning and process.
- Organizing: Meaning, types of organizational structure, Delegation and Decentralization, Personnel Policy of the organization.
- Staffing: Recruitment and selection process, Terms and conditions of service Probation, confirmation, promotion, Human Relations in Social Welfare Agencies,
- Budgeting: Formulation, controlling mechanism, Problems of budgeting in welfare agencies.
- Commitment of Personnel.

Unit – III: Voluntary Agencies/NGOs

- Voluntary agencies/NGOs in Social Welfare: mandate, role and functioning.
- Administrative structure of voluntary Agencies/NGOs: General Body, Board of Management / Executive Committee, Directors, Secretary Policy formulation, Fund raising, public relations, challenges.
- Voluntary Organizations in the Welfare Section: Helpage India, Child Relief and you, Spastic Society of Northern India, etc.

Unit – IV: Institutions of Social Welfare

- Structure & functions of Central Social Welfare Board.
- State Social Welfare Advisory Board.
- Rehabilitation Council of India
- National Commission for Scheduled Tribes, National Commission for Scheduled Castes, National Commission for Minorities, etc.
- National Institute of Social Defense.

- National Institute of Public Cooperation & Child Development (NIPCCED) etc.
- Welfare Schemes of the various departments of the government of Odisha and the Department for SC,ST, OBC and Minorities Development.

Reading List:

- Choudhry Paul, Social Welfare Administration
- Sharma Urmila & Sharma S K: Public Administration, Atlantic Publishers and Distributors New Delhi.
- Arora Ramesh K. and Goyal rajni, 1995, Indian Public Administration Institutions and Issues: Viswa Prakashan, New Delhi.
- Ramachandran Padma, 1996, Public Administration in India: National Book Trust New Delhi.

Course Title: SOCIAL WORK RESEARCH AND STATISTICS

Course Code: SWCP-06

Level: MSW (II)

Objectives:

- To develop understanding about the components involved in the social work research methodology.
- To improve the ability to link between practice, research, theory and their role in enriching one another.
- To make students understand the importance of statistical tools and techniques and help them to arrive at better research conclusion.

Methods of Social Work Research

Unit-I

Social Work Research: Meaning and Objective. Ethical, Political and cultural context of Social Work research. Social Work research fields: professional practices research, contextual research, system research, trend research, community based participatory research. Qualitative vs. Quantitative research. Research process:

Feasibility issues influencing the research process. Research problems, questions, variables and hypotheses: Conceptualisation and operationalization. Critiquing knowledge bases and reviewing the literature.

Unit-II

Research Design: Matching design to purpose. Designs for evaluating policies, programs & practices: Single Subject Design, Case studies, Survey design, Experimental and Quasi experimental design. Finding research subjects: Sampling: Probability and non probability sampling. Sources of data and data collection techniques: Observation, Interview, Questionnaire, Focus Group Discussion, Brain storming, Delphi method and Projective techniques. Writing research abstract and research report: components of research report.

Methods of Data Analysis

Unit-III

Qualitative Analysis: Thematic analysis, Content analysis, Triangulation, *Phenomenology, and Hermeneutical Analysis*. Quantitative Analysis: Choosing and Understanding Statistical Tests: Levels of Measurement, Descriptive Statistics- Measures of Central Tendency: Mean Median and Mode, Measures of Dispersion: Standard deviation and variances.

Unit-IV

Inferential Statistics and Hypothesis Testing: Correlation and regression analysis, hypothesis testing and test of significance. Bi-variate Statistics: t-tests, ANOVA and Chi Square. Introduction to SPSS for analyzing quantified data. Critical Reflections in Data Analysis: looking for anomalies, discussing findings, analyzing limitations and biases of the study and considering future directions for research.

Reading List:

Anderson, J. Durston H. S & Pooram (1992) Thesis and Assignment Writing; Wiley Eastern Ltd, New Delhi.

Baper, L.T. (1998) Doing Social Research, McGraw Hill, Singapore.

Bryman, Alan & Duncan Cramer (1990) Qualitative data analysis for Social Scientists, Rutledge, London.

Denzin, K Norman & Lincoln, S Yuonna., (1998), Collecting and Interpreting Qualitative Materials, Sage publications, New Delhi.

Denzin, K Norman & Lincoln, S Yuonna.(2000), Hand book of qualitative research, Sage publications, Thousand Oaks.

Gupta, S. P (1992) Elementary Statistical methods sultan chand & sons, New Delhi.

Goode & Hatt (1981) Methods in Social Research, McGraw Hill, New Delhi.

Laldas, D.K (2000) Practice of Social Research, Rawat, Jaipur.

Nachmias & Nachmias (1981) Research methods in the Social Sciences; St. Martin"s press, New York.

Richard, G., et al, (2003) Scaling Procedure –issues and applications, Sage, Thousand Oaks.

Rubin & Bobbie (1993) Research Methods for Social Work, Brooks/Cole publishing Company, California.

Fundamentals of Research Methodology and Statistics by Y. K Singh , New Age International

C.R.Kothari, Research Methodology.

Mukarji Nath Ravindra, Social Research and Statistics, Vivek Prakashan, Delhi.

Kapoor B.K. & Gupta, S.C., Fundamental of Statistics, S. Chand Publication, New Delhi.

Ramchandran, P. Social Work Research And Statistics, Bombay : Allied Publishers

Gupta, S.P, Statistical Methods, Sultan Chand & Sons

Swain A.K.P.C, A First Course in Statistics With Applications, Kalyani Publishers

Patri, D., Statistical Methods, Kalyani Publishers

Bhatnagar, O.P. Reserach Methods And Measurements In Behavioral And Social Sciences, New Delhi, Agri Cole Publishing Academy

Dwivedi R.S. Research Methods in Behavioral Sciences. Delhi, Macmillan

D'cruz, Jones, Social Work Research

Ahuja Ram, Research Methods

SPSS for Social Scientists By Robert L. Miller, Ciaran Action, Deirdie A. Fullerton And John Maltby.

The SPSS Book: A Student Guide To The Statistical Package For The Social Sciences By Matthew J Zagumny

SPSS For Windows Step-By-Step: A Simple Guide And Reference By Paul Mallery And Darren George

Discovering Statistics Using SPSS by Andy Field

Drake, Brett, and Melissa Jonson-Reid. 2007. *Social work research methods: From conceptualization to dissemination*. Boston: Allyn and Bacon.

Grinnell, Richard M., and Yvonne A. Unrau, eds. 2007. *Social work research and evaluation: Quantitative and qualitative approaches*. 8th ed. New York: Oxford Univ. Press.

Rubin, Allen, and Earl R. Babbie. 2007. *Essential research methods for social work*. Belmont, CA: Thomson Brooks Cole.

Rubin, Allen, and Earl R. Babbie. *Research Methods for Social Work*. 6th ed. Belmont, CA: Thomson Brooks Cole, 2008.

Light, R. J., and D. B. Pillemer. 1984. *Summing up: The science of reviewing research*. Cambridge, MA: Harvard Univ. Press.

Course Title: CHILD PROTECTION AND CHILD RIGHTS

Course Code: SWCP – 08

Level: MSW (III)

Objectives:

- To understand the situation of children in India
- To understand the national & international efforts for child welfare
- To know the child related laws.
- To know the programmes & services for child welfare
- To understand & acquire the skills for working with children

Unit – I: Child Rights

Concept of Child Welfare and Child Rights; Demographic profile of the child in India, UN convention on the Rights of the Child, National Policy for Children(1974), National Policy on Education(1986), National Nutrition Policy (1993), National Charter for Children (2004), National Plan of Action for Children (2005) Changing trends in child welfare and protection services.

Unit - II: Problems of the Child and the response of Social Work

Social Work with: Street children, destitute, delinquent, abandoned, orphaned, child with disabilities, sexually abused child, child labour, child trafficking, children affected by natural calamity, HIV/AIDS affected and infected children, child prostitute, children in

poverty, the girl child, truant children, runaway children.

Health Problems: Causes of infant mortality and morbidity; Common childhood diseases; Development delay; Child Nutrition; Nutritional problems: PEM, Micro-nutrient deficiencies disorders, Mineral and vitamin deficiencies, Nutritional guidelines on infant and young child feeding.

Unit – III: Legal Provisions for child protection

The Constitution of India: Articles 14,15,15 (3),19 910 9a0, 21,21 (a),23,24,39(e),39(f); The Indian Penal Code, 1860: Feticide (Section 315 and 316), Infanticide (section 315), Abatement of Suicide (section 305), Exposure and Abandonment (section 317), kidnapping and Abduction (section 360 to 369),Procurement of Minor Girls (section 366-A), Selling of girls for Prostitution (section 372,373), Rape (Section 376), Unnatural sex(section 377); The Pre-natal diagnostic Techniques (Regulation and Prevention of Misuse) Act, 1994; The Juvenile Justice (Care and Protection of Children) Act, 2000; The Immoral Traffic (Prevention) Act, 1956; Child Labour (Prohibition and Regulation) Act, 1986; The Prohibition of child Marriage Act, 2006; The Commission for the Protection of child Rights Act, 2005; Protection of Children Against Sexual Offences Act,2012.

Unit - IV: Social work practice with children

Child guidance clinics; School social work; Child counselling; Life skills training; Child help lines; Adoption services; International and national NGOs working with children: UNICEF, CARE, CRY, SOS-Children's Villages.

Reading List:

- Banerjee, B. G. (1987) Child Development and Socialisation, New Delhi : Deep & Deep Publication
- Baroocha, Pramila Pandit (1999) Hand book on Child, New Delhi : Concept Publishing Com.
- Bhalla, M. M. (1985) Studies in Child Care, Delhi : Published by NIPCCD
- Bhangana. Vinita (2005) Adoption in India.
- Chaturvedi, T. N. (1979) Administration for Child Welfare, Admin, New Delhi : Indian Institute of Pub.
- Choudhari, D. Paul (1980) Child Welfare / Development, Delhi : Atma Ram & Sons.
- Deshpabhu, Rashmi (2001) Child Development & Nutrition Management, Jaipur : Book Enclave
- Ghathia, Joseph (1999) Child Prostitution in India, New Delhi : Concept Publishing Company
- Hugh, Jolly (1981) Diseases of Children, Oxford, London, Edinburgh : The English Language book society and Blackwell Scientific Publications

- Hurlock, Elizabeth B. (1968) Child Development, New Delhi : Tata McGraw Hill Pub; Com; Ltd.
- Rani, Asha (1986) Children in Different situations in India- A Review, TISSS.
- UNICEF, State of Worlds Children Annual Report
- Venkatesan S.(2004) Children with Developmental Disabilities.

Course TITLE: SOCIAL WORK WITH WOMEN: ISSUES OF GENDER AND DEVELOPMENT

Course Code: SWCP – 09

Level: MSW (III)

Objectives

- Develop an ability among students to analyze the position of women in rural and tribal society and the role of the social worker thereof.
- To develop an understanding of problems specific to women.
- To be introduced to legislative protection of women.
- To understand the concept of gender in various areas of social work practice.

UNIT-I: Construction of Gender

- Socio-Cultural Concepts: Gender, Sex, Patriarchy, Masculinity and Feminism.
- Women and Society: Status of Women in Indian society (Urban, Rural, Tribal and Dalits):
- Role of Women in Socio- Economic life: Family, Marriage, Religion, Caste, Tribe, Economy, Health and Education, Environment , Women and Media

UNIT-II: Issues and Challenges of Women in India and Odisha

- Problems of Women: Dowry, Domestic Violence, Crime against Women, Immoral Trafficking, Prostitution etc.
- Maternal Health Issues: Maternal Morbidity, Maternal Mortality, Infant Mortality, Female foeticide, Women's reproductive health and rights; and Changing concepts of Motherhood: Surrogate motherhood; Family Planning: Objectives and methods.
- Community based mental health programmes with a focus on mental health needs of women.

UNIT-III: State and Women

- Social Legislation for Women : Property Rights Act under the Hindu Succession Act,1956(Sect 6,14,15,16), Property Rights of Muslim Law, Dowry Prohibition Act,1961, Family Courts 1984, The Pre-conception and Pre-natal Diagnostic Techniques(Prohibition of Sex Selection) Act 1994, The

Protection of Women from Domestic Violence Act,2005, The Indecent Representation of Women(Prohibition)Act, 1986

- Social Policies regarding Women: National Health Policy, National Education Policies,
- Provisions, Schemes and Programmes for women empowerment.

UNIT-IV: Women's Development and Social Work

- Concept of engendering Social Work and the role of the Social Worker.
- Applications of Social Work methods for Women empowerment and Development.
- Political Empowerment of Women: Participation of Women in National Movements; Women in National and Regional politics, Panchayati Raj Institutions and Urban Local bodies.

Reading List:

- Brook E and Davis, Ann (1985) Women, The family and Social Work, London.
- Samanta, R.K (2005) Empowering Rural Women and Issues, Opportunities and Approaches, B.R world of books
- Saxena,S(2005) Crimes against Women and Protective laws, Deep and Deep Publications, Pvt.Ltd. New-Delhi
- Paul chowdhry, D Women welfare and Development(A Source Book) Inter-India Publication, New-Delhi 1991
- Agarwal Sushila, Status of Women, Print well Publisher, New-delhi.
- Bodra Gomati, Empowerment of Tribal Women
- Baig, Tara Ali Women In India, Ministry of information and Broadcasting, Govt. Of India Publication Division, New Delhi
- Agrawal Bina, Gender And Legal Rights in Landed Property in India, Kali for Women.
- Bhargava V. Durvar, Mental Health from a Gender Perspective, Sage publication.
- Gore,M.S: Urbanisation & family Change, popular Prakashan, Bombay, 1986.
- Agarwal, R.K. Hindu Law-central Law Agency, Allahabad.
- Adhikari, A.K and Pramanik: Gender inequality and Women's empowerment, Abhijeet Publication,2006
- Sikligar, P.C:Empowerment of Tribal Women, Jaipur Mangal Deep Publications,2006.

Course Title: ETHNIC SENSITIVE SOCIAL WORK PRACTICE IN INDIA

Course Code: SWCP - 10

Level: MSW (III)

Objectives:

- To tune Social Work Practice to the values and dispositions related to the social background of the client and the behavior of the larger social system, to work towards social justice and human liberation.

UNIT – I: What is Ethnic Sensitive Practice (ESP) in Social Work?

- Definition, conceptual formulation and perspectives on ethnic sensitive practice.
- Assumptions and principles for ethnic-sensitive practice.
- The layers of understanding in ethnic sensitive practice.
- Ethnic sensitive practice with displaced populations, migrants, families, communities, students, etc.

UNIT – II: The Ethnic Scenario in India

- The Schedule Tribes (ST), particularly vulnerable tribal groups (PVTGs) and Denotified Tribes: Demographic profile, their education, health, employment and economic status.
- The Scheduled Castes (SC) and other Backward Castes (OBC): Demographic profile, their education, health, employment and economic status.
- An analysis of the caste system, and the practice of untouchability.
- Ethnic based discrimination in India with respect to public services, government schemes and employment programmes etc.
- An analysis of industrialization, urbanization, liberalization, privatization, globalization, development projects and their impact on STs and SCs land alienation, loss of forest rights, displacement, socio-cultural loss, poverty and impoverishment, indebtedness, psychological issues.

UNIT – III: Constitutional Safeguards Legal Provisions and Policies

- The Preamble, The Directive principles of state policy ensuring social safeguards: Articles 17,23,24,25,(2)(b); Economic safeguards: Articles 46, 23, 24, 244, 275(I), fifth schedule, sixth schedule; Education and cultural safeguards: Articles 15 (4), 29 (i), 350 A; Political safeguards: Articles 164 (I), 330, 332, 334, 371 A, 371 B, 371 C, 371 C, 371 F, 371 G, 371 H. Service Safeguards; Article 16 (4), 16(4a), 335, 320 (4); To ensure these safeguards Articles 338 and 338A provide for two statutory commissions: The National commission for Scheduled Castes and the National Commission for Scheduled Tribes.
- Protective Legislations: The Protection of Civil Rights (PCR) Act 1955; The Scheduled Castes and Scheduled Tribes (Prevention of Atrocities): POA Act, 1989; The Orissa Scheduled Areas Transfer of immovable property (by ST) Regulation (1956); The Orissa Land Reforms Act (1960)
- Schemes of the Ministry of social justice and empowerment; Scheduled Caste Sub Plan (SCSP) and Schedule Tribe Sub Plan (STSP) introduced since the sixth Five Year Plan.

UNIT – IV: Strategies for Social Workers to Work for Social Justice and Rights

- Identifying the sources and dynamics of injustice, discrimination and oppression.
- Adopting the layers of understanding in ESP in all fields of social work practice.
- Adopting 'radical' change oriented methods such as: advocating human rights, affirming core social work values, affirming politics of social justice and human liberation, facilitating critical consciousness, participatory-democratic egalitarian social movements.

Reading List:

- Denove.W and Schlesinger E.G, (1999) Ethnic-Sensitive Social Work Practice.
- Yil. David. G, (1998), Confronting Injustice and Oppression.
- Thorat S.K. (2009) Dalits in India: Search for a Common Destiny.
- Thorat S.K. and Newman Kathernic S., (2010) Blocked by Caste: Economic Discrimination and Social Exclusion in Modern India.
- Constitution of India

- Website of Ministry of Social Justice and Empowerment, Government of India.
- Munshi. Indra, (2007) Adivasi Life Stories: Contexts, Constraints, Choices, Rawat Publication.
- Jain, P.C. 1991. Social Movements among Tribals, New Delhi: Rawat Publications.
- Singh K.S. (ed.). Tribal Movements in India, Vol. I & II;
- Singh, J.P. & Vyas. M.N. Tribal Development: Past Efforts and New Challenges.
- Alinsky Saul, Rules for Radicals. Vintage Books Edition, 1972
- VirginiusXaxa (2003), "Tribes in India," The Oxford India Companion to Sociology and Social Anthropology, (Ed) Veena Das, New Delhi: Oxford University Press,
- Baviskar, Amita. 1997. "Tribal Politics and the Discourses of Environmentalism," Contributions to Indian Sociology, Volume 31, Number 2.
- Abbi, Anvita. 2102. Chapter 13, "Declining Adivasi Knowledge Systems and Killing of Linguistic Diversity," Social Exclusion and Adverse Inclusion: Development and Deprivation of Adivasis In India, (Editors) Dev Nathan and VirginiusXaxa, Oxford University Press, 2012.
- Jean Dreze, Meera Samson and Satyajit Singh. 1997. Chapter 2, "Resettlement Politics and Tribal Interests," Dam and the Nation: Displacement and Resettlement in the Narmada Valley. New Delhi: Oxford University Press.
- Dev, Nathan. 2012. Chapter 17, "Displacement and Reconstruction of Livelihoods," and Chapter 18, "Community Representatives" Views on Development Processes," Social Exclusion and Adverse Inclusion: Development and Deprivation of Adivasis in India, (Editors) Dev Nathan and VirginiusXaxa, Oxford University Press, 2012.
- Xaxa, Virginius. 2008 "Protective Discrimination: Why the Scheduled Tribes Lag Behind the Scheduled Castes," State, Society and Tribes, New Delhi: Pearson Education.

Course Title: RIGHTS OF PERSONS WITH DISABILITIES AND THEIR REHABILITATION

Course Code: SWCP – 11

Level: MSW (III)

Objectives:

- To facilitate basic understanding about person living with disability
- To disseminate information about the variety of policies and programmes targeting to include persons with disabilities.
- To develop understanding on the possible rehabilitation measures.
- To develop insight into the workable models of interventions for inclusion of persons with disabilities.

UNIT – I: Understanding Disability

- Definition, types, magnitude and causes of disabilities.
- Approaches towards disability; medical, psychological, economic-vocational, socio-political, human rights and capabilities.
- Examining the impact of disability on the quality of life of persons with disabilities in the context of their family, society and environment.
- Issues related to their daily living, education, sexuality, integration, employment, interpersonal relationships, marriage and the need for social work intervention.

UNIT – II: Role of the Social Worker in the Rehabilitation and Inclusion of the Disabled

- Assessment treatment and rehabilitation of persons with disabilities through a multi-disciplinary team including the social worker.
- Inclusion of persons with disabilities in schools and educational institutions.
- Skill development and vocational rehabilitation of persons with disabilities.
- Equality of opportunity and treatment in employment and occupation of persons with disabilities.

UNIT – III: International Initiatives and National Legislations and Policies for the Empowerment of persons with disabilities

- UN Initiatives: UN convention on the rights of persons with disabilities 2006; Un standard rules on the equalization of opportunities for persons with disabilities (1993); and Darter Framework for Action.
- ILO Initiatives for enhancing support to vulnerable groups including the disabled: Global employment agenda(2003); Declaration on social justice for fair globalization 92008); Global jobs pact (2009); ILO code of practice on managing disability in the workplace (2002)
- National Legislations: Rehabilitation Council of India Act, 1992; Persons with disabilities (equal opportunities, Protection of rights and full participation Act, 1995; National Trust for Welfare of Persons with Autism, Cerebral Palsy, Mental Retardation and Multiple Disability Act, 1999; The Rights of Persons with Disabilities Bill, 2011.
- National Policies:
 - National Policy for Persons with Disabilities (2006): Physical rehabilitation, Educational rehabilitation and Economic rehabilitation.
 - Guidelines for: Issue of disability certificates; evaluation of various disabilities and procedure for certification; space standards for barrier free built environment for disabled and elderly persons.
 - Identified posts for persons with disabilities -2007.

UNIT – IV: Role of Social Work

- Intervention strategies at individual level: counselling, building support groups, assertiveness training;
- Intervention strategies at family level: Parent counselling, parent training and family crisis intervention.
- Intervention strategies at community level: Community education, community based rehabilitation
- Intervention strategies at policy making level: Advocacy in legislative and policy making bodies; research and influencing public opinion.

Reading List:

- Ministry of Social Justice and Empowerment;
http://www.socialjusticenic.in/policies_acts3.php

- Bhumali.Anil,(2009) Rights of disabled women and children in India, serials publications, New Delhi.
- Hans. Asha and patri.A (2003) Women Disability and Identity sage, New Delhi
- Mukhrjee, Manjumohan(2006) Problems of Disabled People, Associated Publishes, India.
- Kanna. G.N. (2001), Disability Studies in India-Retrospect's and prospects Gyan Publishing house, New Delhi.
- Buckup, s. (2009), The Piece of exclusion; The economic consequences of excluding people with disabilities from the world of work. Employment sector working paper No. 43 (genevalLO)
- O'Reilly, A. (2007) The right to decent work of persons with disabilities (geneva ILO)
- Davis, Lennard. J. (1999) The Disability Studies Reader, Routage, NY
- Shapiro, Joseph P. (1993) No Pity: People with Disabilities Forging a New civil Rights Movements.

Course Title: COMMUNITY HEALTH AND SOCIAL WORKERS

Course Code: SWCP – 12

Level: MSW (III)

Objectives:

- To understand the basic concepts related to Health and its importance.
- Identify and understand the changing health needs of ever-changing community and organize relevant effective interventions for amelioration of health problem.
- To develop students' appreciation and a commitment to healthy and socially just ways of living.
- To develop student's knowledge and understanding about ways of enhancing personal and community health and wellbeing.

UNIT – I: Concepts of Health & Nutrition

- Definition & type (Physical & Mental) of health and its dimensions; appreciation of health as relative concept; determinants of health, changing concepts of health.
- Characteristics of agent, host and environmental factors in health and disease.
- Health situation in India and Odisha-especially the demography, mortality and morbidity profile and the existing health facilities in health services.
- Mental Health- concept, community based mental health programmes.
- Nutrition- definition, concept, balance diet nutritive values and food items.
- Genetically Engineered and modified foods.

- Nutritional Assessment and monitoring.

UNIT – II Epidemiology

- Epidemiology: definition, concepts and its role in health and disease, public health-concept & importance
- Definition of the terms used in describing disease, transmission and control.
- Epidemiology of specific diseases: Communicable and non-communicable diseases, symptoms causes and prevention of disease caused by virus: measles, chickenpox, polio, & leprosy, disease caused by bacteria: diphtheria, typhoid, tuberculosis, plague, dengue, hepatitis. disease caused by parasites: Malaria, scabies, intestinal worms. Preventive & Social Medicine: concept, meaning, programmes for controlling communicable diseases.

UNIT – III Environmental Health

- Awareness of the concept of safe and wholesome water.
- Awareness of the requirements of a sanitary source of water.
- Understanding the methods of purification of water on small scale with stress on chlorination of water.
- Disposal of solid waste, liquid waste, both in the context of urban and rural conditions in the country.
- Problems in the disposal of refuse, sullage and sewage.
- Role of social worker in environmental health.

UNIT – IV Community Health and Role of Social Work

- Primary Health Care Services: organizations & functions
- Medical Social Work: meaning nature & scope
- Health Care in Rural and Urban areas of Odisha:
- Role & Functions of Social Worker in hospital setting and community health: individual, family and community level; communication tools and techniques.

Reading List:

- Park J. E. and Park K.: Textbook of Preventive and social Medicine Banarasi Das Bharat Publishers, Jabalpur.
- Bedi, Yash Pal (1979) Social Preventive Medicine, Atma Ram and Sons; New Delhi.
- VHAI – State of India's Health.
- Shah. Ghanshyam (1997) Public Health and Urban Development, Sage; New Delhi.

- Werne. David (1994) where there is no Doctor, VHAJ.
- Sinha. A.K, (ed) (1997) Human Health and Environment, Vol. I & II, APH Publishers: New Delhi.
- John Webb (2002) Medical Social Work: The Reference Book, Trafferd Publishing.
- Gehlert, Sarah and Browne. Teri (Ed) (2011) Handbook of Health Social Work Wiley Publication.

Course Title: SOCIAL MANAGEMENT

Course Code: SWCP – 13

Level: MSW (III)

Objectives:

- To understand the eco system of communities and their market landscape to help community based organizations engage with a market based economy.
- To help build the capability needs of communities towards self reliance through sustainable community enterprises.
- To help gain fundamental principles of Management.

Unit I: Understanding the community and deciphering the market

- The village social structure: relationship between social groups, communication patterns, processes of exclusion and inclusion, culture and Social value base.
- Identifying community resources: social capital, natural resources, common- property resources, education, health & employment status.
- Institutions in the community: Social institutions, formal community based institutions for eg: clubs, SHGs, village Council, etc; PRI; Administrative Structure from Block to District level; Educational Institutions; Health and Medical Institutions
- The local market economy: Money Lenders, Small & Large traders, entrepreneurs, corporations and companies; key factors of Local Market Economy: Market Boundaries; Market Values; Market Values Chains.
- Need Assessment and mapping of village resources, producers and institutions study of the community.

Unit II: Operations and Marketing Management

- Operations Management in the context of community based enterprises- organizations: product design, process selection and design, capacity decisions, location and layout decisions, sowing, transformation and storage, quality of inputs and finished products, material handling and logistics.
- Farm, Forest and Livestock resources and their conversion to products: process & risks involved. Tools for process mapping and mapping a supply chain.
- Agricultural Products: Types and issues, value addition, pricing and distribution; Agricultural Product Buyers: Retail and Wholesaler, Consumers, Customers and key buyer characteristics.
- Key aspects of sales, marketing and planning; Negotiation and selling techniques.

Unit III: Accounting and Finance

- Accounting: Need, Meaning and objectives; role of an accountant; uses of accounting information; Origin and analysis of business transactions; accounting equation.
- Financial Statements: Balance sheet, Income statement; Recording business transactions: Double entry system, the T-accounts, principles and conventions of accounting, journal entries.
- Books of accounts: Cash book, ledger, sales register, etc; posting of transactions in books
- Trial balance: closing and balancing of accounts; locating and correcting errors; preparation of balance.
- Bank transactions and bank reconciliation: need for reconciliation, causes of difference in passbook and cash book balance, procedure for bank reconciliation statement.
- Distribution of profit: determination of distributable surplus; basis of distribution.

Unit IV: Planning and Budgeting

- Levels of Planning: Village level, cluster level community enterprise / organization level
- Planning for distribution of responsibilities among community based leaders / coordinators / facilitators.
- Planning for Product basket, their local value addition for greater shelf-life and for sale in local markets.
- Planning for marketing.
- Developing proposals considering resources, cost and time budget.
- Planning for Resource Generation: Internal resource generation and from external institutions Government Departments, Banks, Public and Private, NGOs and INGOs
- Planning for improving technical capabilities.

- Planning for allied services like Health, Education, etc.

Reading List:

- Implementing Community Enterprise system for Sustainability of Agricultural Communities: A Manual, Nayak, Amar KJR (2012)
- A Proposal for Holistic Development at a GP Level for Long Term sustainability of Small and Marginal Farmers/Producers in the GP. Amar KJR Nayak (2011)
- Ongoing Programmes & Schemes of the State Government and the Central Government, Rabindra Kumar Gouda (2012)

Course Title: SOCIAL WORK IN SCHOOLS

Course Code: SWEP – 01

Level: MSW III

Objectives:

- To understand the Rights of the Child in the context of schools.
- To acquire necessary understanding and skills to work with children in schools.

UNIT I: Conceptual framework for Social Work Practice in Schools

- Conceptual Perspectives: Social Learning Theory, General Systems Theory, Ecological Perspective
- Models of intervention: Traditional Clinical Model, The School Change model, The Community School Model, Social Interaction Model, School-Community- Pupil Relations Model

UNIT II: Context of Social Work Practice in Schools: Legislations and Policies

- UN Rights of the Child, Commission for Protection of Child Rights Act, 2005
- Constitution of India, Article 21 A, National Policy on Education (1986), National Curriculum Framework for School Education (2000), Right to Education Act (2009)
- Constitutional provisions for the education of SC, ST and religious, cultural and

linguistic minorities, policies and programmes of the Government.

- Inclusive Education policies in the V Year Plans, Integrated Education for Disabled Children (IEDC), District primary Education Programme (DPEP), Sarva Shiksha Abhijan (SSA)

UNIT III: Social Justice Issues in School

- Dealing with stereotype, bias and discrimination;
- Intervention for the vulnerable populations i.e., Challenged children, SC, ST and minority;
- Dealing with the 'Achievement gap' i.e, difference in performance between students of vulnerable and privileged backgrounds.

UNIT IV: The Role of the Social Worker

- Services to students: Dealing with social or behavioural problems (Depression, Truancy, Aggression, Trauma, Substance Abuse, Sexual Activity), poor attendance, drop-out, poor performance, offences against children.
- Services to teachers: Teacher support groups, teacher training, teaching stress;
- Services to families: Providing parent support, consultation, parenting skill classes, family programming; organizing financial support for vulnerable families;
- Services to the community: Community outreach, community involvement, village Education Councils.

Reading List:

- Allen- Meares, P., Washington, R. O., & Welsh, B. L. (1996). Social Work Services in schools. 2nd ed. Boston: Allyn & Bacon.
- Dupper. David, (2003). School Social Work: Skills and Intervention for Effective Practice, John Wiley and Sons, NJ.
- Bye. Lynn and Alvarez. Michelle (2006). School Social Work: Theory to Practice, Cengage Learning.
- Germaine. Carel B and Bloom Martin (2008). Human Behaviour in the Social Environment: An Ecological View. Columbia University Press, New York.
- Greene. Roberta R,(2010) Human Behavior Theory and Social Work Practice (Modern Applications of Social Work), Transaction Publishers, New Brunswick, New Jersey.
- Journal of School Social Work(JSSW), Chennai, India.

- NCPCR, Protection of Children against Corporal Punishment in Schools and Institutions,
- http://www.ncpcr.gov.in/Reports/Protection_of_Children_against_Corporal_Punishment_in_Schools_and_Institutions_December_2008.pdf
- NCERT (2000). *Assessment of Needs for Inclusive Education: Report of the First Regional Workshop for SAARC Countries*. New Delhi: NCERT
- Mohapatra, C. S. (2004). *Disability Management in India: Challenges & Commitments*. New Delhi: National Institute for the Mentally Handicapped (NIMH) and the Indian Institute of Public Administration.
- Mishra, A. (2000). "India: Special Education", in C.R. Reynolds, and F.E. Janzen (eds), *Encyclopedia of Special Education: A Reference for the Education of the Handicapped and other Exceptional Children and Adults*, 2e. USA: John Wiley and Sons
- Ministry of Social Justice and Empowerment of India. *Annual Report* (latest), New Delhi: GOI
- Ministry of Human Resources Development (MHRD). *Annual Report* (latest). New Delhi: GOI
- Ministry of Human Resources Development (2000). *Sarva Shiksha Abhiyan : Framework for Implementation*, Department of Elementary Education & Literacy, New Delhi; GOI
- Five Year Plans: <http://www.planningcommission.nic.in/plans/planrel/fiveYr/7th/vol2/7v2ch10.html>.
- Department of Education (1986). *National Policy on Education*, 1986. New Delhi: MHRD, GOI
- Department of Education (2000). *Sarva Shiksha Abhiyan: A Programme for Universal Elementary Education*. New Delhi: MHRD, GOI.

Course Title: WORKING WITH WOMEN

Course Code: SWEP – 02

Level: MSW III

Objectives

- Develop an ability among students to analyze the position of women in rural and tribal society
- Acquire understanding on problems relating to women

- Develop in them a critical understanding about the schemes related to women

Unit-1

Status of women in rural and tribal community - in the context of family

marriage, religion and economy. Sexual division of labor its impact on health, education, illiteracy, adjustment, malnutrition, early marriages.

Unit-2

Problems relating to women – dowry, domestic violence, crimes against women, female feticide, child prostitution, exploitation and abuse of domestic female lab our.

Unit-3

Women in local self government with special reference to women in decision making. Impact of 73 amendment, development schemes and women's situations, case studies of DRDA, ICDS, SHGs.

Unit -4

Role of media in projecting the images of women, women in the media- print media, radio, films, television, and advertisement and publicity, Media and self employed women

Reading List:

- Paul chowdhry, D. Women welfare and development (A source book) ; Inter-India Publication, New Delhi -1991
- Sushila Agarwal , Status Of Women Printwell publishers, Jaipur, 1988
- Pandit, S.K. Women in Society, Rawat Publications, New Delhi 1998
- Brook E and Davis, Ann (1985) Women, The family and Social Work, London.
- Samanta, R.K (2005) Empowering Rural Women and Issues, Opportunities and Approaches, B.R world of books
- Saxena, S(2005) Crimes against Women and Protective laws, Deep and Deep Publications, Pvt.Ltd. New-Delhi
- Paul chowdhry, D Women welfarae and Development(A Source Book) Inter-India Publication, New-Delhi 1991
- Agarwal Sushila, Status of Women, Print well Publisher, New-delhi.
- Bodra Gomati, Empowerment of Tribal Women
- Baig, Tara Ali Women In India, Ministry of information and Broadcasting, Govt. Of India Publication Division, New Delhi
- Agrawal Bina, Gender And Legal Rights in Landed Property in India, Kali for

Women.

- Bhargava V. Durvar, Mental Health from a Gender Perspective, Sage publication.
- Gore, M.S: Urbanisation & family Change, popular Prakashan, Bombay, 1986.
- Agarwal, R.K. Hindu Law-central Law Agency, Allahabad.
- Adhikari, A.K and Pramanik: Gender inequality and Women's empowerment, Abhijeet Publication, 2006
- Sikligar, P.C: Empowerment of Tribal Women, Jaipur Mangal Deep Publications, 2006.

Course Title: Working with Alcoholics and Substance Abusers

Course Code: SWEP – 03

Level: MSW (III)

Objectives:

- To facilitate basic understanding about substance abuse
- To disseminate information about addiction to alcohol.
- To develop understanding about the role of social worker in rehabilitation.
- To develop insight into the role of counseling among alcoholics and substance abusers.

UNIT – I: Basics on Substance Abuse

- Substance abuse and dependence: Meaning, Definition, nature and extent of the problem in India and Odisha.
- Types of Addictive Substances: Natural, Synthetic, Narcotics, Stimulants and depressants.
- Symptoms, short term and long term impact of substance abuse.

UNIT – II: Addiction to Alcohol

- Alcohol dependence and Alcoholism: Causes, symptoms, long-term and short-term effects.
- Impact of Alcoholism on Individual, Community and Family.
- Concept of social drinking, alcoholic and relapse.

- Phases of alcohol addiction.
- Social and economic implications of addiction.
- Alcoholism among Youth-causes and remedies.

UNIT – III: Role of Social Workers in rehabilitation

- Role of Social Worker in Preventive, curative and Rehabilitative services for substance abusers.
- Multidisciplinary Approach services for substance abusers.
- Legislation Provisions and Government programmes to control drug abuse in India.

UNIT – IV: Role of counseling

- Concepts of counselling and its association with addiction; approaches to counseling: Psychoanalytical, client centred therapy. Indigenous approaches of help and self help: Yoga, Meditation, Attitude and Values, Counselling as an treatment method for substance abusers.

Reading List:

- Chopra, R.N. and Chopra, F.C., 1965: Drug Addiction with Special Reference to India, New Delhi Council of Scientific and Industrial Research.
- National Institute of Social Defence, Govt. of India, 1992: Drug Abuse.
- Single, Eric. Et. Al, 2003: International Guidelines for Estimating the Costs of Substance Abuse and Addiction.
- Delaney and Eisen Berg, 1973: The counseling Process.
- Singh, Chandra Paul, 2000 Alcohol and Drug Dependence Among Industrial Worker, Delhi Shipra Publications.
- Kaur, Ravneet and Gulati, J.k., 2007: Drug Abuse: Trends and issues, International Marketing Conference on Marketing & Society, IIMK.
- Ahuja, R, College Youth and Drug Abuse: A Sociological Study of Nature and Incidence of Drug Abuse among College and University Students, University of Rjasthan Jaipur

- Gupta, R. Punjab a drugged State, Meditrack.
- Chopra, L.C. and R.N., Chopra 1957,;: The use of Cannabis Drugs in Inda. Bulletin on narcotics (United Nations Publication)
- Mohan, D.A.K. Pravakar and P.N. Sharma: Prevalence and pattern of drug abuse among Delhi University students, Indian Journal of Medical Research.
- Ropar, C 2006: Social Use, abuse and addiction-site of the author University of Tekas, Austin.
- Horgan C. Substance abuse: The Nation's number one health Problem, Princeton NJ; The Robert Wood Johnson Foundation.

Course Title: CORRECTIONAL SOCIAL WORK

Course Code: SWEP – 04

Level: MSW (III)

Objectives:

- To understand crime and delinquency as a social problem.
- To study and understand the basic elements of correctional methods and approaches.
- To gain knowledge of legal provisions.
- To study and identify the practices of non-institutional services.
- To acquire skills of correctional social work and understand the role of professional social workers in correctional institutions.

Unit- 1: Crime in the context of Social problem

- Crime: Concept, Theories of Causation, Classification of crime and approaches to deal with crime and criminals.
- Crime in India and Odisha: crime against women, crime against children, Atrocities against Scheduled Castes and Scheduled tribes; Emerging patterns and trends.
- Juvenile Delinquency: Concept, Demography, Theories of causation and approaches to delinquency prevention.

Unit- 2: Criminology and Criminal Justice System

- Concept of criminology; Social, Psychological and Legal approaches
- Courts and correctional administration. Hierarchy of courts functions and powers. Lok Adalats, Lokayukta, Legal Aid, Functions of Law Commission. Analysis of the Criminal Justice System: Police, Judiciary, Prisons and Correctional Services.

Unit -3: Correctional Administration and Services

- Institutional services: Prison, observation homes, special homes, beggar homes, rescue homes, short-stay homes, protective homes, half-way homes, de-addiction centers.
- Community based corrections and non-institutional services: Early diversion and de-institutionalization, probation and parole, adoption, foster care, child guidance centers, family counselling, crisis intervention, after-care rehabilitation and reintegration of offenders; community po.

Unit- 4: Correctional Social Work

- Definition, history, philosophy: Retribution, Restitution, General Deterrence, Special Deterrence Incapitation, Just Desserts ,objectives, methods and approaches of contemporary correctional social work: Probation and Parole, Alternative to Capital Punishment.
- Correctional Social Work in India; role of professional social workers in correctional institution, crime prevention and rehabilitation of offenders: supervision, surveillance and counselling; skills unique to correctional social work; limitations of correctional social work.

Reading List:

- Gupta, M.C. & K. Chockalingam, J. Guha Roy (2001) Child Victims of Crime: Problems and Perspectives. New Delhi, Gyan Publishing house.
- Ahuja Ram. (1996) Youth and Crime. Jaipur, Rawat Publications.
- Tripathy, P. C. (2000) Crime against Working Women, APH Publishing Co., New Delhi.
- Dabir, Neela & Nigudjar, Mohua. (2005) Children in Conflict with Law. Mumbai, TISS.
- Coleman, Clive. (2000) Introducing Criminology, Willan Publication, UK

- Ahuja, Ram. (2000) Criminology, Rawat Publication, New Delhi
- Siegal, Larry J. (2000) Criminology, Wadsworth Thomson Learning, New Delhi
- Schmalleger, Frank. (1999) Criminology Today: An Integrative Introduction 2nd edition, Prentice Hall, New Delhi
- Alan Vand, K. Criminal Justice System – Readings
- Mehraj-ud-din, Mir, (1984) Crime and Criminal Justice System in India, Deep & Deep Publications, New Delhi
- Choudhuri, Mrinmaya. (1995) Languishing for Justice: Being a Critical Survey of Criminal Justice System, Datt Sons, Nagpur
- Chakrabarti, N. K. [Ed.] (1997) Administration of Criminal Justice (Vol.1.). New Delhi. Deep and Deep Publications.
- Robert M Carter, Daniel Glaser, Leslie T Wilkins, (1985) Correctional Institutions, Harper & Row Publishers Inc.
- Siddique, A. (1983) Criminology, Lucknow, Eastern Book Co.
- Smykla, J. Community based Corrections.
- Bartollas Clemens, (1985) Correctional Treatment: Theory and Practice, Prentice hall, New Jersey
- Panakal, J. J & Gokhale, S. D. (1989) Crime and Corrections in India, Mumbai, TISS

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Course Title: COUNSELLING IN SOCIAL WORK

Course Code: SWEP – 05

Level: MSW (III)

Objectives:

- To develop a holistic understanding of counseling as a tool for help
- To acquire knowledge of various approaches, their theoretical under-pinning for goals, values, process and techniques
- To develop skills of application to real life situations
- To develop ability to recognize and synthesize attitudes and values the enhance investment of self in the counselor's role

- To develop ability to use the tools/scales in various settings

Unit – I:

Introduction to Counseling: Meaning, Definition, Need and importance of counseling and professional counseling. Basic principles of Counseling: Participation, Individualization, Confidentiality, communication, acceptance, self confidence, self awareness and other principles governing the counseling relationship. Components of effective counseling: Personality of the counselor's skills – Role and functions of the counselors in schools, industries, family, hospital and rehabilitation institution

Unit – II:

Types of counseling – Individual and group Counseling, Family Counseling, Marital Counseling, Student Counseling and Industrial Counseling, E-Counseling: concept, conditions and importance of E-counseling; Techniques of group counseling, strategies and structure – barriers to effective counseling sessions; Counseling evaluation.

Unit – III:

Theories of counseling: Psychoanalytic, Adlerian, Client centered, Behavioural, Rational emotive, Reality, Gestalt, Transactional analysis and eclectic Theories.

Unit – IV:

Counseling process, Interview and its significance in counseling – Use of observation in counseling and understanding of emotions in counseling. Transference and counter transference. The following standardized tests must be practiced in counseling settings. Personality, intelligence, interpersonal relations, stress, anger, self esteem, anxiety, assertiveness, depression, adjustment, mental health and family intensive. Counseling in different settings: HIV/AIDS counseling, Alcohol and Substance dependence counseling and Trauma counseling.

Reading List:

- Burnett. J. : Counseling with young people
- Fred Machinery : Counseling for personal Adjustment
- Shestroi Everlett, Brammer M. Lawrence : The dynamics of counseling process.
- Tpbbert, E.L. Introduction to counseling

- Colin Fertham, Controversis in psycho therapy and counseling, Sage publications, New Delhi, 1999.
- Kathryn Geldard & David Geldard, Counseling Children, A practical Introduction, Sage publication, New Delhi, 1997.
- Fullmer, D.W. & Bernard H.W: Counseling content and process
- Harms E & Schreiber : Handbook of counseling Techniques
- Kennedt. E : On becoming a counselor – A basic Guides for non-professional counselors, Macmillan, New Delhi.
- Development theories of E.B. Harlock and Robert kegan Psychological theory(Eric Erickson, Need Hierarchy (Maslow's) Cognitive theory (Jean Piaget)

Course Title: SOCIAL WORK WITH THE ELDERLY

Course Code: SWEF – 06

Level: MSW (III)

Objectives:

- To study the basic characteristics about the elderly population
- To understand the development tasks associated with the elderly population.
- To know the various services provided at institution dealing with the elderly.
- To link social work methods in promoting welfare among the elderly.

UNIT – I: Basics about elderly

Gerontology – Definition and scope. Status of Elders in India & Odisha:- Demographic, social, cultural and economic aspects. Needs and problems of elders. Role of elders in family. Issues of Elderly in health, occupation, income retirement planning, property rights, gender issues and family supports. Constitutional guaranteed rights and policy on older persons.

UNIT – II: Developmental tasks

Developmental tasks in elderly: Issues in health care, changes in family structure, coping with aging process, challenges due to changing physiological, economic, safety, status

in the family and other issues, Healthy aging, quality of life, coping with demise of the life partner, bereavement, resolving one's death, and any other.

UNIT – III: Developmental services for the elderly

Institutional care settings for elderly: General hospitals, geriatric wards, home based care, homes for the aged, nursing homes, Day care centres, hobby centres, elder helpline, facilities for homeless elderly. Constitutional guaranteed rights and National policies on older persons. Role of National and International agencies providing developmental services to elders.

UNIT – IV: Social Work Interventions for the elderly

- Role of Social Worker in providing the legal and governmental welfare services to elders.
- Social Work intervention through Social Case Work, Social Group Work, Community Organisation and Social Welfare administration.

Reading List:

- Bali . P. Arun, 2001 Care of the Elderly in India. Shimla, Indian Institute of Advanced Studies.
- Chatterjee, S.C., Patna, Discourses on aging and Dying. New Delhi, and K.P., Charian, V. 2008., Sage Publications
- Dandekar, Kumudini. 1996 The Elderly In India, New Delhi, Sage Publications.
- Desai, Murli and Raju, Gerontological Social Work in India – Some Siva (Ed.) 2000. issues and Perspectives. Delhi, BR Publishing House,.
- Dey, A. B (Ed.) 2003 Ageing in India: Situation Analysis and Planning for the Future. New Delhi / WHO and AIIMS.
- Emmatty, Leena. M. 2008 An insight into Dementia Care in India. New Delhi, Sage Publications.
- Hurlock, Elizabeth. 1981 Developmental Psychology. 5th Edition. New Delhi, Tata McGraw Hill Publications.
- Khan M.Z. 1989 Voluntary Welfare Services for the Aged, Dept. of Social Work, New Delhi, Jamia Milia Islamia.

- Rajan, Irudaya.S., India's Elderly, New Delhi, Sage Publications. 1999.

JOURNALS.

- Indian Journal of Gerontology, C-207, Manu Marg, Tilak Nagar, Jaipur.
- R & D Journal of Helpage India . C-14, Qutab Institutional Area, New Delhi.

Course Title: DEVELOPMENT THEORIES AND STRATEGIES: ISSUES CHALLENGES AND RESPONSES

Course Code: SWCP –15

Level: MSW (IV)

Objectives:

- To be acquainted with the development discourse.
- To gain a critical understanding of the theories, models and approaches to development.
- The role of the state and the response of non-state actors to development.

Unit – I: What is Development?

- The concepts of: development, growth, human development, social development and sustainable development.
- Core values of development; Measuring development: per capita income, PQLI, choice and access, HDI, seer's criteria.
- Development and colonialism: continuity and divergence; persistence of global inequalities and dominance.

Unit - II: Theories and Models of Development

- Modernization Theory;
- Dependency Theory;
- Neoliberalism;
- Developmental State;
- Post Development

Unit - III: Theories and Approaches to Development

- Human Development;
- Capabilities Approach;

- Women, Gender and Development: WID, WAD, GAD.
- Participatory Development;
- Good Governance;
- Institutional Turn

Unit - IV: The Role of NGOs and Civil Societies and Social Movements in Development

- The failure of state-market-international aid institutions.
- NGO's and new-liberalism; Relationship of NGOs with INGOs; NGOs and the State; NGOs and the gap between theory and praxis.
- The role of Civil society in development and its relationship with the state in the Indian Context.
- The challenge of social movement to development in India.
- The Social worker as scholar- activist-practitioner.

Reading List:

- Cohen, Michael and Robert Shenton. 1995. "The Invention of Development." Pp. 27-43 in Jonathan Crush(ed), Power of Development. London and New York: Routledge.
- Esteva, Gustavo. 1991. "Development." Pp. 1-23 in Wolfgang Sachs (ed), The Development Dictionary. London: Zed Books
- Rist, Gilbert. 2002. "Definitions of Development." Pp. 8-24 in The History of Development: From Western Origins to Global Faith. London and New York: Zed Books.
- Seers, Dudley. 1972. "What are we trying to Measure?" Journal of Development Studies 8(3):21-36
- Myrdal, Gunnar. 1974. "What is Development?" Journal of Economic Issues 8(4):729-736.
- Wallerstein, I. 1984. "The Development of the Concept of Development." Sociological Theory 2:102-116
- Kothari, Uma. 2005. "From colonial administration to development studies: a post-colonial critique of the history of development studies," Pp. 47-66 in Uma Kothari (ed), A Radical History of Development Studies: Individuals, Institutions and

Ideologies. London: Zed Books

- Cooke, Bill. 2003. "A new continuity with colonial administration: participation in development management." *Third World Quarterly* 24(1):47-61
- Deutsch, Karl. 1961. "Social Mobilization and Political Development." *The American Political Science Review* 55(3):493-514.
- Lerner, Daniel. 1958. *The Passing of Traditional Society: Modernizing the Middle East*. New York: The Free Press.
- Levy, Marion. 1965. "Patterns (Structures) of Modernization and Political Development." *Annals of the American Academy of Political and Social Science* 358:29-40.
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- Raka Ray, Mary Fainsod Katzenstein (ed) 2005. *Social Movements in India: Poverty, Power, and Politics*, Rowman and Littlefield Publishers Inc.
- Shah, Ghanshyam (2004) *Social Movements in India; A review of literature*, Sage, India.
- Srivastava, S.K. (1988) *Social Movements for Development*, South Asia Books
- Rajagopal (2007) *International Law from Below: Development, Social Movements and Third World Resistance*, CUP

Course Title: SOCIAL WORK PRACTICE IN RURAL AREAS

Course Code: SWCP – 16

Level: MSW (IV)

Objectives

- To understand the issues faced by social workers in rural areas.
- To understand the skills necessary to practice in rural settings.
- To be acquainted with government plans and programmes for rural development in Odisha.

Unit – I: Rural Community Characteristics

Resources: natural resource, human resource, economic resources; Demography; Social structure; power structure; Political structure; Structure of rural economy; Governance structure; Presence of industries and external agencies; Indigenous knowledge systems; Needs of Rural communities: poverty landlessness, indebtedness, unemployment, migration, ill health, illiteracy, social exclusion, discrimination,

agriculture, forests.

Challenges to Rural Communities: Urbanization; deteriorating agriculture; changing land use SEZ; corporatization of agriculture and marginalization of small land holders; issues arising out of globalization.

Unit - II: Rural Development

Concept: nature, scope and significance; Approaches to Rural Development: Rural reconstruction approach, community development approach, sectoral development approach, area-specific and target group-oriented approach, economic development with social justice approach: Integrated rural development approach.

Rural local self government: Origin and development of the Panchayati Raj system in India; Salient features of 73rd Constitutional Amendment; Issues of Panchayati Raj: reservation, financial management, participation of political parties; Panchayati Raj institutions in Odisha- structure and functions. Five Year Plans and Rural Development Programmes. Poverty alleviation programmes in rural areas- MGNREGA, NRLM etc. Role of NABARD in Rural Development.

Unit - III: The Tribal Development Issue

Concept of Tribes, Indigenous peoples and Aborigines; Situational Analysis of Scheduled Tribes in Odisha: land, food security, employment/livelihood, displacement, migration, human development indices.

Scheduled Areas: Issues and Governance; Overview from Panchsheel, Tribal Sub- Plan and Special Component Plan; Other Significant Acts regarding Forest Rights, Resettlement and Rehabilitation.

Unit - IV: Response of Social Work

Building sustainable communities: identifying strengths, weaknesses and threats; Generalist Model of Social Work Practice: work with individuals, families, systems, clusters at the communities level; Cultural Competency: understanding the value system, diversity, cultivating sensitivity, gaining trust and building relationships; Advocating Social Justice: working with the oppressed and marginalized, reducing stereotypes/discrimination based on gender, caste, ethnic background; Political advocacy: analysing policies and programmes, working for reform of polices, increasing access and better service delivery of public services.

Reading List:

- Dubey, S.C. 1995. India's Changing Villages;

- Ganguli, B.N. 1973. Gandhi's Social Philosophy. Delhi: Vikas Publishing House;
- Gore, M.S. 1993. The Social Context of Ideology: Ambedkar's Social & Political Thought. New Delhi: Sage
- Kumar, Girish 2006, Local Democracy in India: Interpreting Decentralization, Sage Publications;
- Prasad, B. 2003. Rural Development: Concept, Approach and Strategy
- Sainath, P. One Hundred years of Drought
- Pandey, A.K. 1997. Tribal Society in India, New Delhi. Manak Publishing Ltd
- Agrawal, A.N. 2001. Indian Economy; Nature, Problems and Progress, Vikas Biraj Prakash, New Delhi
- Chamber. Robert, 1983, Rural Development: Putting the last First, Harlow, Longman.
- Datt and Sundaram, 2002, Indian Economy, S.Chand and Co, New Delhi.
- Desai, A.R., 1995 Rural Sociology in India, ISAE, Bombay
- Dube, S.C., 1965 India's changing Villages, RKP, London
- Dubashi, P.R., 2000 Rural development Administration in India, Mumbai.
- Riley John. M, 1995. Stakeholders in Rural Development, Sage: New Delhi
- Sachinanda and Purendu, 2001, 2001, Fifty years of Rural Development in India, Firma KLM Pvt. Ltd, Kolkata.

Course Title: SOCIAL WORK PRACTICE IN URBAN AREAS: MIGRATION, UNORGANISED LABOUR AND LIVELIHOODS

Course Code: SWCP-17

Level: MSW (IV)

Objectives:

- Sensitize the students to the need and problems of urban communities;
- Develop a critical understanding among the students about the programmes of urban development

Unit - I:

Urban Communities - Features and characterization; Concept of Urban, Urbanism
Urbanization – concept, causes and factors responsible for Urbanization; Urbanization
in India – Historical development, Characteristics of clusters town, city, metropolis,
suburbs, Satellite town, etc, Classification of cities. Growth of Urban settlement.

Urbanization and its impact on socio – economic development. Urbanization and
structure of Caste. Concept of Slums Dwellers, Pavement Dwellers and Refugees, their
characteristics and Problems. Changing Face of Urban communities: Infrastructural
development, Growing heterogeneity, merging of fringe villages, the “global city” and
socio-cultural and economic implications. Issues, Implications and Challenges

Unit - II:

Urban Problems – Congestion and overcrowding, Housing and slums, Environment
pollution, lack of inadequate civic amenities, etc. - causes, magnitude, impact, etc.,
Measures for alleviating these problems.

Urban Development – Meaning, need, scope and Historical evolution; planning policy
and programmes viz; slum clearance and slum improvement, Housing and Urban
development corporation; Major urban development authorities in Odisha. Urban
Community Development Programmes.

Unit – III:

Urban Informal sector Organised and Unorganised labour: Unorganised labour issues:
Migrant workers, Debt Bondage and child labour, Wage Structure and Components of
Wages of the unorganised labour, International and national labour scenario - ILO, WTO,
Privatization and role of the State: Social Security Programmes for the unorganised
labour.

Concept of Migration and characteristic of Migrants, Impact of Migration, Pattern of
Migration to cities in India.

Unit - IV:

Concept and scope of livelihood, caste and traditional livelihoods; natural resource crisis
and its impact on the livelihood of people: ecological, socio-cultural and economic
dimensions; Gender, caste and age implications on livelihood. Urban poverty and
livelihood issues; Social Work with urban communities – recent developments and future

perspectives.

Reading List:

- Aziz Abdul: Urban Poor and Urban Informal Sector, Ashish Publishing House, New Delhi, 1984.
- Bharadwai, R.K: Urban Development in India, National Book Trust, New Delhi, 1962.
- Bose Ashish: Studies in India's Urbanization (1901 to 1971), Tata McGraw Hill, New Delhi, 1973.
- Cullingworth, J.B: Problems of Urban Society, Vol 1 The Social Framework of Planning, London – George Allen and Unwin Ltd, 1973.
- Desai A.R and Pillai, S.D.(Eds): Slums and Urbanization, Popular Prakashan, Bombay.
- Diddee, Jaymala and Rangaswamy, Vimla (Eds): Urbanization – Trends Perspectives and Challenges, Rawat Publications, Jaipur 1993.
- Gangrade, K.D.: Community Organization in India, Popular Prakashan, Bombay, 1971.

Course Title: SOCIAL POLICY, PLANNING AND IMPLEMENTATION

Course Code: SWCP -18

Level: MSW (IV)

Objectives:

- Gain knowledge of policy analysis and the policy formulation process.
- Acquire skills in critical analysis of social policies and development plans.
- Develop an understanding of social policy in the perspective of national goals as stated in the Constitution, particularly with reference to fundamental right; and the directive principles of state policy.
- Critically understand the concept, content and process of social development.
- Develop the capacity to identify linkages among social needs, problems development issues and policies.
- Locate strategies and skills necessary for social development and reinforce

values of social justice, gender justice and equality.

Unit - I: Social Policy and Constitution: Concept of social policy, sectoral policies and social services- Relationship between social policy and social development-Values underlying social policy and planning based on the Constitutional provisions(i.e. the Directive Principles of State Policy and Fundamental Rights) and the Human Rights- Different models of social policy and their applicability to the Indian situation.

Unit - II: Sectoral Social Policies in India: Evolution of social policy in India in a historical perspective- Different sectoral policies and their implementation, e.g. Policies concerning education, health, social welfare, women, children, welfare of backward classes, social security, housing, youth, population and family welfare, environment and ecology, urban and rural development, tribal development and poverty alleviation.

Unit - III: Social Planning: Concept of social planning- Scope of social planning- the popular restricted view as planning for social services and the wider view as inclusive of all sectoral planning to achieve the goals fo social development-Indian planning in a historical perspective- The constitutional position of planning in India. The legal status of the planning commission- Coordination between centre and state, need for decentralization- Pancyati Raj, people participation.

Unit - IV: Social Policy Implementation and Social Work:

- Role of social policy in the Indian Development process: land reforms, PDS, employment, education, reservations.
- The social policy implementing structure in India; the lack of an integrated approach or convergence of development schemes and programmes.
- Role of social workers in social policy implementation.
- Do social workers have a major impact on social policy Implementation?

Reading List:

- Bagci, A.K. 1982 Political Economy of Underdevelopment, Cambridge; Cambridge University Press.
- Bandyopadhyay, D.1997 “People’s Participation in Planning: Kerala Experiment”,

Economic and Political Weekly, Sept. 24, 2450-54.

- Bhanti, R. 1993 Social Policy and Development in Rajasthan, Udaipur: Himnashu Publication.
- Bujmer, M,et.al., 1989 The Goals of Social Policy, London: UnwinHyman.
- Chakraborty,S.1987 Development Planning- Indian Experience, Oxford: Claredon Press.
- Dandekar, V.M. 1994 “ Role of Economic Planning in India in the 1990s & Beyond”, Economic and Political Weekly, Vol.29,No.24,1457-1464.
- Desai, V.1988 Rural Development (Vol.I) Mumbai: Himalaya Publishing House.
- Dimitto, D.M. 1991 Social Welfare: Politics and Public Policy, New Jersey: Prentice-Hall.
- Ganapathy, R.S. and Others 1985 Public policy and Policy Analysis In India, Delhi: Sage Publications.
- Ghosh, A. 1992 Planning In India: The Challenge for the Nineties, New Delhi: Sage Publications.
- Government of India Five Year Plan Documents (latest), New Delhi.
- Gupta, S.P. 1993 “ Planning and Liberalization”, Economic and Political Weekly, Vol.28 No.43, Oct.23,2349-2355.
- Jacob, K.K. 1992 Social Development Perspectives Hebsur, R.K. (Ed.) Social Intervention For Justice, Bombay: TISS.
- Huttman, E.D. 1981 Introduction to Social Policy, New York: McGraw-Hill.
- International Labour Office. 1973 Multinational Enterprises and Social Policy, Geneva, ILO.
- Jones, K.Et.al.,1983 Issues in Social Policy, London: ROutledge & Kegan paul.
- Joshi, P.C. 1976 Land Reform in India Kahn, A.E. 1973 Social Policy and Social Services, New York: Random House.
- Kulkarni, P.D, 1979 Social Policy and Social Development in India, Madras: Association of Schools of Social Work in India.
- Kulkarni, P.D.1952 Social Policy in India, New York: McGraW- Hill Book

Company.

- Kulkarni, P.D. 1975 Social Policy in India, Bombay, Tata Institute of Social Sciences.
- Leonard, P. 1997 Postmodern Welfare: Reconstructing an Emancipatory Project, London: Sage.
- Lindblom, C.E. 1980 The Policy-making Process, New Jersey; Prentice-Hall.
- Livingstone, A. 1969 Social Policy in Developing Countries, London: Routledge & Kegan Paul.
- Madison, B. Q. 1980 The Meaning of Social Policy, London: Croom Helm.
- Macpherson, S. 1980 Social Policy in the Third World, London: Wheat-sheaf Brooks.
- Macpherson, S. 1982 Social Policy in the Third World, New York: John Wiley and Sons.
- Mathur, K. Bjorkman Top Policy Makers in India, New Delhi: Concept Publishing Co.
- Meadows, D.H. 1972 The Limits to Growth, New York: University Books.
- Mishra, R. 1977 Society and Social Policy, London: Macmillan Ltd.
- Mukherjee, N. 1993 Participatory Rural Appraisal; Methodology and Applications, New Delhi: Concept Publishers.
- Mundle, S. 1993 participatory Rural Appraisal: Methodology and Applications, New Delhi: Concept Publishers.
- Milliard, M. and Spicker. 1998 Social Policy in a Changing Society, London: Routledge.
- Philips, D.R. and Health and Development, London: Routledge and Verhasselt Yola (Eds) 1994 Kegan Paul.
- Rao, D.B. (Ed.) 1998 World Summit for Social Development Rao, V. "Social Policy: The Means and Ends Question" Indian Journal of Public Administration, Vol.50 No.1 Jan.-March, 1994.
- Rao, V. and Mander, H. An Agenda for Caring: Intervention for the Marginalized, New Delhi: VHA.
- Rastogi, P.N. 1992 Policy Analysis and Problem-Solving for Social Systems, New

Delhi: Sage Publications.

- Roychaudhury, T. 1982 The Cambridge Economic History of India, Vol.I&II, New Delhi: Cambridge University.
- Roy, Sumit 1997 “Globalisation, Structural Change and Poverty”, Economic and Political Weekly, Aug. 16-23, 2117-2132.
- Sachs, W. 3997 Development Dictionary Singh, R.R. (Ed.) 1995 Whither Social Development? New Delhi: ASSWI.
- Singh, Y 1972 Modernization of Indian Tradition, Delhi: Thomas Press. Spicker, Paul 1998 Principles of Social Welfare: An Introduction to Thinking About the Welfare State, London:Routledge. The Probe Team. 1999 Public Report on Basic Education in India New Association with Centre for Delhi: Oxford University Press. Development Economics
- Upadhyay, S.B. 1992 Urban Planning, Jaipur: Printwell. UNDP Human Development Reports, Oxford University Press.
- Vyasulu, V. Vani, B.P. 1997 “Development and Deprivation in Karnataka”, Economic and Political Weekly, Nov. 15 2970-2974.
- Weimer. D.L. and Policy Analysis: Concepts and Practice, New Vining, A.R. 1994 Jersey: Prentice-Hall.
- World Bank World Development Reports (Annual), Oxford University Press.
- Yadav, C.S. (Ed) 1986) Urban Planning and Policies- Part A, New Delhi: Concept Publishing Co. Encyclopedia of Social Sciences Encyclopedia of Social Work.
- De Haan, Anjan (20130 “The Social Policies of Emerging Economics: Growth and Welfare in China and India” IPC-JG working Paper No.110. Brasilia, International Policy Centre for Inclusive Growth.

Recommended Journals/Periodicals

- Alternatives; Development and Change; Economic and Political Weekly.

Course Title: DEVELOPMENT COMMUNICATION

Course Code: SWCP - 19

Level: MSW (IV)

Objectives :

- To study the basic issues in Communication.
- To learn about various channels of Communication
- To understand the channels of mass communication reaching to rural audience.

Unit : I

Development: meaning, concept, process and models of development – theories – origin – approaches to development, problems and issues in development, characteristics of developing societies, development dichotomies, gap between developed and developing societies. Development issues on national and regional and local level.

Unit : II

Development communication : meaning – concept – definition – philosophy – process – theories – role of media in development communication – strategies in development communication – social cultural and economic barriers – case studies and experience – development communication policy – strategies and action plans – democratic decentralization.

Unit : III

Communication with Individual Group, Traditional Communication: Streets play, Puppetry show & Folk media, Rural communication messages Development support communication: population and family welfare – health- education and society – environment and development – problems faced in development support communication.

Unit : IV

Writing development messages for rural audience: specific requirements of media writing with special reference to rural press, radio and television. Problems of Rural

Journalism, Farm Journals, Rural Press, Press Conference, Radio rural Forum, Role of Community Radio in Rural Communication.

Reading List:

Fernandes, Walter : Development with People, Indian Social Institute, New Delhi, 1988.

Jayaweera N. & Amunugama S. : Rethinking Development Communication, AMIC, Singapore, 1988.

Kumar, Kevel J. : Communication and Development : Communication Research Trends, Vol. 9, No.3, 1988.

Hoogvelt Ankie : The Third World in Global Development, Macmillan, London, 1982.

Hornik, Robert C : Development Communication : Information Agriculture and Nutrition in Third World, Longman, London/NY , 1988.

Melkote Srinivas : Communication for Development in the Third World – Theory and Practice, Prentice – Hall, New Delhi, 1991.

Sondhi, Krishan : Communication, Growth and Public Policy Breakthrough, New Delhi, 1983.

Schramm, Wilbur : Mass Media and National Development, Stanford UP, Stanford, 1964.

Course Title: SUSTAINABLE AGRICULTURE

Course Code: SWCP - 20

Level: MSW (IV)

Objectives:

- To Understand the Indian Agricultural Policy and the Crisis in Agriculture.
- To be acquainted with sustainable agricultural practices.
- To effectively respond to the problem of food and nutritional security at the level of the farmer/community.

Unit-I: Principles & Policy for Sustainable Agriculture

Social Work in Rural-Agro ecological Communities;

History & Evolution of Agricultural Practices;

Principles of Sustainable Agriculture;

Policy & Practice of Sustainable Agriculture;

Principles of Industrial Agriculture;

Policy & Practice of Industrial Agriculture.

Unit-II: Soil Health & Water Management Soil Health:

On Farm Biomass;

Cattle Dung;

Earth Worm;

Soil Health Enhancement Techniques;

Organic Carbon Measurement.

Water Management:

In-situ water conservation;

Methods to reduce flow of rain water;

Mulching;

Moisture Management.

Unit-III: Seeds & Cropping Pattern Seeds:

Seed in the context of a micro-ecosystem;

Significance of Diversity in Seed;

Types of Seeds;

Politics of Seed Control;

Techniques of preserving seeds with Farming Communities.

Cropping Pattern:

Multiple cropping patterns & Soil Health;

Soil-climate & cropping patterns;

Cropping Patterns as enhancing photosynthesis process.

Unit-IV: Integration & Ecological Agriculture

Integration of Agriculture:

Interrelated Activities of Agriculture;

Stages of Integration;

Processes of Integration;

Programs available for Integration.

Ecological Agriculture:

Principles of Ecological Agriculture;

Transition from Integrated Agriculture to Ecological Agriculture.

Reading List:

Randhawa M.S, A History of Agriculture in India, Vol. I, II, III & IV, ICAR.

Asian Agri-History Foundation (1999), Krishi Parashara, ISRISAT.

Subramaniam. C (1995) Hand of Destiny: The Green Revolution (Vol.2) Bharatiya Vidya Bhavan.

Shina Vandana, The Violence of the Green Revolution.

Roy. B. C, Chattopadhyay, G.N, And Tirado.R; Subsidising Food Crisis.
www.greenpeaceindia.org.

Howard. Albert, An Agricultural Testament, Other India Press.

Howard. Albert & Wad. Yeshwant D, The Waste Products of Agriculture- Their utilization as humus.

Howard. Albert and Berry. Wendell (1945), Soil and Health,
<http://www.journeytoforever.org/>

Fukuoka. M. (2009) The One Straw Revolution, OIB

Fukuoka. M. (1996). The Road Back to Nature: Regaining the Paradise Lost, OIB.

Dabholkar. S. A. (2001) Plenty for All, OIB.

Save. Bhasker, The Great Agricultural Challenge, OIB.

Green Foundation, Janadharya Seed Savers.

Green Foundation, Seed to Food.

Alvares. Claude (2009), The Organic Farming Sourcebook, Other India Press.

Course Title: DISSERTATION**Course Code: SWCP - 21****Level: MSW (IV)****Dissertation**

The student has to prepare and submit a dissertation under the guidance of a faculty. The student should exhibit ability to review relevant literature formulate a research question, choose appropriate methodology, develop data collection tools, analyze and interpret data and prepare the research report. The length of the dissertation excluding contents and Bibliography should not exceed ten thousand words.

Evaluation Criteria

Sl. No.	Item		Weightage
1	Choice of Topic Review of relevant literature	Scope, Research Potential Comprehension, quality, quantity	10
2	Objective and Hypothesis/Question	Relevance, clarity, relation to topic Research Design/Methodology Appropriateness, selection of variables sample and description	20
3	Tools Used	Appropriateness, use	10
4	Data analysis and interpretation	Scheme, Application of Statistical techniques, use of tables and figures relating findings to objectives and literatures, discussion on findings	20
5	Summary	Synthesis of findings Implications	10
6	Report Presentation	Cauterization, chapter size, structuring of paragraphs vocabulary, clarity, coherence, Bibliography	10
7	Viva-voce	Ability to explain the research process & defend research work	20
Total			100

Course Title: ENTREPRENEURSHIP

Course SWEP - 07

Level: MSW (IV)

Objectives

- To familiarize Social Work students to entrepreneurship
- To give them basic skills and competencies to encourage entrepreneurship through their Social Work practices.

Unit – I : What is Entrepreneurship?

Entrepreneurship- conceptual issues; Entrepreneurship and Development: Entrepreneurship motivating factors, competencies, performance and reward. Status of entrepreneurs in India, problems and concerns of entrepreneurs

Unit – II : How to be an Entrepreneurship?

Opportunity scouting and idea generation: creativity and innovation; the process of setting up a small business: Preliminary screening and detailed study of the feasibility of the business idea: financing/non-financing support agencies; Schemes of assistance from government and non-governmental agencies, policies/programs and procedures and the available schemes

Unit-III : Management Roles of an Entrepreneur

Management roles and functions in a small business; Designing and re-designing business process, location, layout, operations, planning and control. Issues of quality, productivity and environment; Managing business growth; Issues in marketing sales and distribution. Consortium marketing; competitive bidding/tender marketing negotiating with principal customers. Marketing Assistance, Subsidies and other Fiscal and monetary Incentives. National state level and grass-root level financial and non-financial institutions in support of small business development.

Unit – IV : Accounting

Principles of double-entry book-keeping: Journal entries, cash-book, pass book, and Bank Reconciliation Statement ledger account trail balance and preparation of final accounts: Trading and Profit and Loss Account; Balance-sheet. Brief introduction to Single-Entry system of record keeping. Sources of risk/venture capital, fixed capital, working capital and a basic awareness of financial services such as leasing and factoring

Reading list:

Sivakama Sundari, S. Entrepreneurship Development of Rural Women (Vol.I) Asian and Pacific for Transfer of technology, New Delhi.

Heggade, O.D. Developing rural women entrepreneurship, Mohit publications, New Delhi

Santhawali, A.Y. Entrepreneurship Development – Publications, Jaipur.

Bhide, Amar V. The Origin and Evolution of New Business, Oxford University Press, New York, 2000

Dollinger M.J., 'Entrepreneurship strategies and Resources', 3rd edition, Pearson Education, New Delhi 2006

Desai, Vasant Dr. (2004) Management of small scale enterprises New Delhi: Himalaya Publishing Company

Taneja, Gupta, Entrepreneur Development New Venture Creation: 2nd edition Galgotia Publishing Company

Holt, David H., Entrepreneurship: Strategies and Resources, Illinois , Irwin, 1955.

Panda, Shiba Charan, Entrepreneurship Development, New Delhi, Anmol Publications

Patel, V.G., The Seven Business Crises and How to Beat Them, Tata-Mcgraw, New Delhi, 1995

SIDBI Report on Small Scale Industries Sector[latest edition]

Verma, J.C., and Gurpal Singh, Small Business and Industry-A Handbook for Entrepreneurs, Sage, New Delhi, 2002

Course Title: NGO MANAGEMENT**Course Code: SWEP – 08****Level: MSW (IV)****Objectives:**

- To understand the role of NGOs in society
- To gain clarity about the operating environment of NGOs
- To understand the issues involved in the internal management of NGOs

Unit I: Introduction to NGOs

Definitions, History, Roles in Society; Description of the NGO sector; Theoretical Perspectives on Organization and Management of NGOs.

Unit II: The legality of NGOs in India

Societies Registration Act, 1860, Indian Trust Act, 1882, Cooperative Societies Act, 1912, Company Act, 1956 (Some Relevant Part), FCRA: Foreign Contribution Regulatory Act, Income tax Act 1961, Income Tax Exemption: Under Sections 11 and 12, Rebate under Sections 80G and 35AC of Income Tax Act.

Unit – III: The operating environment of NGOs

Understanding the environment in which NGOs function: Economic, Political, Socio-Cultural and Ideological macro level forces that influence NGOs, Globalization and Foreign aid system. Principal Players and their Relationships: Governments, Markets, NGOs, Donors; Importance of partnerships.

Unit – IV: Internal Management of NGOs

Governance structure, Vision and Mission; Internal management needs of a NGO; strategies/plans for action; Managing Resources: Human and Financial; Measuring performance, participation, evaluation; Accountability to multiple stakeholders; Ethical issues faced by NGO managers; Scaling up and sustainability of NGOs; creating a learning environment

Reading List:

Lewis, David. 2007. The Management of Non-Governmental Development Organizations, second edition. New York: Routledge.

Edwards, M. and Fowler, A. (2003) The Earthscan Reader on NGO Management. London: Earthscan Publications, Ltd.

Salamon, L.M. 1994. The Rise of the Nonprofit Sector. Foreign Affairs 74 (3): pp. 109–122

Lewis, D. 2007. Advocacy and Service Delivery: Managing the Main NGO Activities in The Management of Non-governmental Development Organizations, Second Edition

Fowler, A. 1997. Understanding International Development in Striking a Balance: A Guide to Enhancing the Effectiveness of Non-governmental Organizations in International Development London: Earthscan Publications, Ltd.,

Course Title: PROJECT MANAGEMENT

Course Code: SWEP – 09

Level: MSW (IV)

Objectives:

- To understand the fundamentals of Project management and how to initiate, plan, execute and close a project.

Unit - I: Fundamentals of Project Management

What is a Project? Definition, meaning, principles and types; What is project management? meaning, coverage and scope; Who is the project manager?; Project phases and knowledge areas. Planning and its importance; who should be involved in planning?

Unit - II: Initiating Projects and Project Identification

How to get a project started; Setting a mandate, finding a project sponsor and creating a project team: team dynamics and running meetings.

Project Identification: Needs assessment: listening, interviewing, focus group discussions, community mapping; Capacity assessment: human, social, natural, physical, economic, cultural

Unit - III: Planning and Executing Projects

Work Breakdown Schedule (WBS), Project estimating and scheduling techniques-sequencing tasks, identifying the path of the project, considering resources; Risk planning methods; Cost planning; Communications plan; final project plan.

Team management; identifying and involving all stakeholders, user groups, interest groups, beneficiaries, decision makers; Primary and Secondary stakeholders; levels of participation;

Unit - IV: Closing a Project

Closing of a successful project; stakeholder acceptance; writing a final report; Techniques of identifying lessons learned and their analysis; acknowledging successes and failures; and identifying areas for further projects.

Reading List:

Verzuh, Eric. The Fast Forward MBA in Project Management. Published by John Wiley and Sons, Inc.

Project Management Body of Knowledge, 5th Edition. Published by Project Management Institute (PMI)

Blackman, Rachel. 2003. Project Cycle Management. UK: Tearfund.

Preskill, Hallie and Russ-Eft, Darlene. 2005. Building Evaluation Capacity. London: Sage Publications.

Capezio, Peter. 2000. Powerful Planning Skills. Mumbai: Jaico Publishing House.

Smith, Steve. 2002. Plan to Win. New Delhi: Kogan Page India Pvt. Ltd.

Dale, Reidar. 2001. Evaluation Frameworks for Development Programmes and Projects. New Delhi: Sage Publications.

Loehle, Craig. 2000. Thinking Strategically. New Delhi: Foundation Books.

Padaki, Vijay. 1995. Development Intervention and Programme Evaluation. New Delhi: Sage Publications.

Course Title: CLIMATE CHANGE, DISASTER MANAGEMENT AND REHABILITATION

Course Code: SWEP –

10 Level: MSW (IV)

Objectives:

- To understand the challenges of Climate change
- To gain a comprehensive understanding of the Disaster Management Cycle.
- To get acquainted with Disaster Management Policies and Laws in India.

Unit I:

- **Climate Change:** Concept, nature and severity of climate change. Causes of climate change. Impact of climate change: globally in general and Odisha in particular. Greenhouse effect, climate change and disaster.
- **Disaster Management:** Definition, Types of disaster (natural and manmade disaster) mining disaster, tropical cyclone, storms, floods, lightning, forest fire, tsunami and earthquakes.

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Unit II:

- **Concepts associated with Climate Change and Disasters:** air pollution

and acid rain, ozone depletion, bio-diversity extinction, de-forestation and loss of biological diversity, land degradation, deserts and desertification, groundwater over exploitation, dryness and wildfires, population growth and explosion, habitat related problems.

- **Social Systems, Ecological Networks and Disasters:** a socio-political ecology of disasters, nature of human communities, community as an ecological network.

Unit III:

- **Disaster Management Cycle:** Disaster phase, Response phase, Recovery phase, Risk reduction phase, Preparedness phase.
- **The Process of Disaster Management:** mitigation, preparedness, response and recovery.
- **Majors Disasters in Odisha:** Flood, cyclone, drought, tsunami, etc
- **Disaster Management Programs and System in India:** Nation Disaster Management Act (2005), National Policy on Disaster Management (2009), Disaster Management in the Xth Five Year Plan onwards, different bodies National Disaster Management Agency (NDMA), State Disaster management Agency (SDMA), National Disaster Response Force (NDRF), National Institute of Disaster Management (NIDM), India Disaster Resource Network (IDRN). Community based disaster management and community based disaster management practices (case studies), The role of INGOs and NGOs.
- **Disaster Warning and Evacuation:** Factors influencing evacuation and some policy considerations, media and other sources of information, Phases of evacuation: Preparation, Decision

Unit IV:

- **Environmental Legislation and Regulations associated with Disaster Management:** Environment Policy of the Government of India: Five Year Plans, Environment Protection Act (1986), The Environment (Sitting for Industrial Projects) Rules (1999), The Indian Forest Act (1927 and Amendment 1984), The Indian Forest (Conservation) Act (1981), Coastal Regulation Zone Notification (1991).
- **Rehabilitation:** Need for rehabilitation, Government and Non-government programs for rehabilitation, role of NGOs for rehabilitation programmes, Critical review of programmes, Role of Social Work in minimizing the effects of disaster.

Reading List:

Anandha Kumar K.J and Ajinder Walia (2013) India Disaster Report, NIDM: New

Delhi.

Gupta. Anil K et, al (Ed) (2014). Training Module Mainstreaming Climate Change Adaptation and Disaster Risk Reduction into District Level Development Plans, NIDM : New Delhi.

Satendra and Kaushik. D (2013) Forest Fire Disaster Management NIDM: New Delhi.

Vogelbacher (2013) Flood Disaster Risk Management NIDM: New Delhi.

Kaushik. A.D. (2012) Flood Risk Mitigation and Management: A Training of Trainers Module, NIDM: New Delhi.

Course Title: People-Centered Advocacy

Course Code: SWEP – 11

Level: MSW (IV)

Objectives:

1. To acquire conceptual clarity and theoretical knowledge about linkages between state, civil society and market, governance and social policy processes
2. To acquire conceptual clarity about Social Advocacy as a method for bringing about social change to achieve equality and social justice goals enshrined in the Constitution using non-violent methods
3. To become aware of the democratic institutions, actors and the processes of democratic decision making
4. To acquire necessary skills for strategy planning to engage in Social Advocacy
5. To internalize values and attitudes necessary for working at micro, meso and macro levels and with diverse individuals and groups by following the Constitutional and democratic processes

Unit 1: Understanding People Centred Advocacy

- Politics in Social Advocacy and its role in democratic decision making
- Advocacy vis-à-vis Social Revolution and Social Action
- Relevance and importance of people centered advocacy and rights based approaches in India
- Power, politics and public arguments
- Personal and institutional benefits of Social Advocacy

Unit 2: Role of Information, Networking and the Media in Advocacy

- Power of Information in People Centered Advocacy

- Identifying incidents, collecting information and framing issues
- Mobilizing support and importance of coalitions
- Role of organization and campaign strategies
- Building favorable public opinion and putting pressure on decision makers
- Understanding the politics of media and its role in consensus and conflict creation
- Developing material for the media and its diverse audience
- Exploring alternate media for pro-people advocacy

Unit 3: Advocacy with the Legislature and Executive

- Understanding channels between legislators and advocacy groups
- Knowing the actors within and outside legislative bodies
- Role of bureaucracy in policy making, operationalization and implementation.
- Finding policy hooks and political angles. Understanding phases of policy making
- Implications of transparency and accountability vis-à-vis elected representatives and the bureaucracy
- Practical tips and strategies for advocating with legislatures and the bureaucracy

Unit 4: Advocating with the Judiciary and with the reference to the International framework.

- Understanding central and state laws and function of various courts in India
- Role of Information and PILs in Judicial Advocacy
- Post 2015 agenda, post MDG frameworks
- Making post 2015 matter for socially excluded groups in India

Reading List

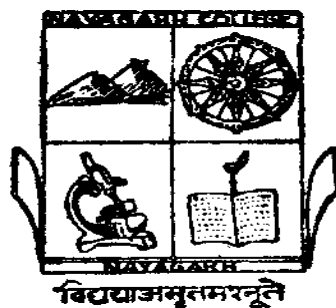
NCAS.resource material and documented case stories on People Centred Advocacy

MASTER OF COMMERCE

M. COM.








((Master Degree Course under CBCS))

For the Admission Batch : 2019-20



NAYAGARH AUTONOMOUS COLLEGE,

NAYAGARH-752 069

	Skill Development
	Employability
	Entrepreneurship
	All the three
	Skill Development and Employability
	Skill Development and Entrepreneurship
	Employability and Entrepreneurship

MASTER OF COMMERCE (Choice Based Credit System)DEPARTMENT OF COMMERCE, NAYAGARH AUTONOMOUS COLLEGE, NAYAGARH,
AFFILIATED TO UTKAL UNIVERSITY**Semester-I**

Code	Course Name	Marks	Credit	Category
MCC-101	Management Concepts and Practices	100	4	A
MCC-102	Statistics for Management	100	4	A
MCC-103	Corporate Financial Accounting	100	4	A
MCC-104	Financial Management	100	4	A
MCC-105	Accounting for Managerial Decision Making	100	4	A
MCC-106	Risk and Insurance Management	100	4	A
Total		600	24	

Semester-II

Code	Course Name	Marks	Credit	Category
MCC-201	Business Environment	100	4	A
MCC-202	Organization Behavior	100	4	A
MCC-203	Marketing Management	100	4	A
MCC-204	Managerial Economics	100	4	A
MCC-205	Small Business Management	100	4	A
MCC-206	Social Survey and Research Methodology	100	4	A/C/D
Total		600	24	

Category: A- Core, C- Open to Allied subjects, D- Open to All

Semester-III

Code	Course Name	Marks	Credit	Category
MCC-301	Project Report (Report -100, Presentation and Vive voce -100)	200	8	A
MCC-302	Strategic Management	100	4	A
MCC-303	Financial Institutions and Markets	100	4	A
MCC-304	Economic Analysis for Decision Making	100	4	A
	Any ONE group from the following			
	(A)Accounting			
MCEA-309	Advanced Accounting	100	4	B/C
MCEA-310	Corporate Tax	100	4	B/C
MCEA-311	planning	100	4	B/C
	Advanced Auditing			
	(B)Finance			
MCEB-312	Merchant Banking & Financial Services	100	4	B/C
MCEB-313	International Finance	100	4	B/C
MCEB-314	Security Analysis	100	4	B/C
	(C)Marketing			
MCEC-315	Services marketing	100	4	B/C
MCEC-316	Retail Management	100	4	B/C
MCEC-317	Customer Relationship Management	100	4	B/C
	(D)International Business			
MCED-318	International Business	100	4	B/C
MCED-319	International Finance	100	4	B/C
MCED-320	Global Risk Management	100	4	B/C
	(E) Entrepreneurship			
MCEE-321	Entrepreneurship in MSMEs	100	4	B/C
MCEE-322	Project Appraisal & Implementation	100	4	B/C
MCEE-323	Accounting & Finance for small Entrepreneurs	100	4	B/C

Category: A- Core, B- Elective, C-Open to Allied Subjects, D-Open to All

Semester-IV

Code	Course Name	Marks	Credit	Category
MCC-401	Corporate Governance & Business Ethics	100	4	A
MCC-402	Management of Financial Institutions	100	4	A
	Any ONE group from the following			
	(A)Accounting			
MCEA-409	International Accounting	100	4	B/
MCEA-410	Accounting Standards & Corporate Reporting	100	4	C
MCEA-411	Accounting for NPOs	100	4	B/
				C
	(B)Finance			
MCEB-412	Portfolio Management	100	4	B/C
MCEB-413	Risk Management & Derivatives	100	4	B/C
MCEB-414	Financial Regulations	100	4	B/C
	(C)Marketing			
MCEC-415	Product Planning & Sales Force Mgt.	100	4	B/C
MCEC-416	International Marketing	100	4	B/C
MCEC-417	Product & Brand Management	100	4	B/C
	(D)International Business			
MCED-418	International Accounting	100	4	B/
MCED-419	International Marketing	100	4	C
MCED-420	International Financial Services	100	4	B/
				C
	(E) Entrepreneurship			
MCEE-421	Entrepreneurship : Innovation & Strategy	100	4	B/
MCEE-422	Statistics for Business Decision Making	100	4	C
MCEE-423	Entrepreneurship & Information Technology	100	4	B/
				C

Category: A- Core, B- Elective, C-Open to Allied Subjects, D-Open to All

Audit Courses

- i) Management of Personal Finances
- ii) Capital Market Instruments
- iii) Financial Inclusion
- iv) Accounting for small Business organizations
- v) Personal Taxation & Planning

(Credit will be assigned if the student opts to go through the examination process. But it will not be considered for CGPA) (Cumulative Grade Points Average)

Evaluation: End Term: 70 Marks

Unit Test and Quiz: 20 Marks, Assignment and Presentation: 10 Marks

Project Report: Thesis: 100 marks, Presentation & Viva-Voce: 100 marks

Minimum Total Marks= 2500

Minimum Credit Points: Core 76 + Elective 24 = 100

FIRST SEMESTER

MCC - 101. MANAGEMENT CONCEPTS AND PRACTICES (Credit – 4)

Objective

To familiarize the students with the developments of management principles and practices.

Course Inputs

UNIT-I Basic Concepts of Management: Management in Antiquity, Historical development of management thought- Classical, Neo-Classical and Modern Schools, Tasks of a professional manager, Managerial roles.

UNIT-II Planning: Nature and significance, developing planning premises, planning exercises and limitations,

Decision Making: Types of decision, decision making process, models, techniques and conditions, creativity exercises.

UNIT-III Organizational Design: Organization structure-mechanistic and organic, Products Functional, and Project and Matrix structure, Centralization versus Decentralization of Authority, Informal Organization, and Organization Effectiveness.

UNIT-IV Management of Human Resources: Manpower planning, Job Analysis, Recruitment & Selection, Training and Development, Performance Appraisal

UNIT-V Management Control: Process, Tools and Techniques, Behavioral Implication of Control, Management in a Global Environment Case Study.

References:

1. Robbins, "Management", Pearsons Education, New Delhi.
2. Koontz & Weihrich, "Essentials of Management "-McGraw Hill
3. Gibson JL etal: Organisations, Behaviour, Structure and Process- McGraw Hill
4. Rao & Narayana ; Principle & Practice of Management – Konark Publishing
5. Stoner & Freeman : Management-PHI
6. Prasad L.M. : Principles & Practice of Management – Sultan Chand.
7. Prasad Manmohan," Management : Concepts and Practices, Himalayan.
8. Terry, George R," Principles of Management", Richard D Irwin.

Objective

The objective of this course is to make the students learn the application of statistical tools and techniques for decision making.

Course Inputs

UNIT-I Partial Correlation, Multiple Correlation, Multiple Regression, Interpolation & Extrapolation.

UNIT-II Probability Theory: Probability- classical, relative and subjective probability; Addition and multiplication probability models; Conditional probability and Baye's theorem.

Probability Distributions: Binomial, Poisson and normal distributions: Heir characteristics and applications.

UNIT-III Statistical Decision Theory: Decision Environment; Expected profit under uncertainty and assigning probabilities; Utility Theory; Decision Tree analysis.

Sampling: Sampling and Sampling (probability and non-probability) methods; Sampling and non-sampling errors; Law of large numbers and central limit Theorem; Sampling distributions and their characteristics.

UNIT-IV Statistical Estimation and Testing: Point and interval estimation of population mean, proportion and variance; Statistical testing- hypotheses and errors; sample size; Large and small sampling tests- Z tests, T tests and F tests.

UNIT-V Non Parametric Tests: Chi-square tests; Sign tests; Wilcoxon Signed – Rank tests;

Statistical Quality Control: Causes of variations in quality characteristics; Quality control chart- purpose and logic; Constructing a control chart- computing the control limits (X and R charts); Process under control and out of control; Control charts for attributes- fraction defectives and number of defects; Acceptance sampling.

References:

1. Levin, Richards I, and David S Rubin: Statistics of Management, Pearson Education, Delhi.
2. Lawrence B. Morse: Statistics for Business & Economics. Harper Collins, NY.
3. Watsnam Terry J. and Keith Parramor: Quantitative Methods in Finance, International Thompson Business Press.
4. Hien, L.W: Quantitative Approach to Managerial Decisions, Pearson Education, Delhi.
5. Gupta, S.P.; Statistical Methods, Sultian Chand, Delhi.
6. Sharma, Anand; Quantitative Techniques for Decision Making, Himalaya Publishing House.
7. Arora P.H., Sumeet etc.; Comprehensive Statistical Methods, S. Chand.
8. Anderson, Sweeney, Williams, Statistics for Business and Economics, Thompson.
9. Agarwal, D.R.; Quantitative Methods, Urinda Publication.

10. Heinz Kohler: Statistics for Business & Economics, Harper Collins, New Delhi.
11. Hooda, R.P: Statistics for Business and Economics, Macmillan, New Delhi.

Objective

The objective of this course is to expose students to advanced accounting issues and practices such as maintenance of company accounts, valuation of goodwill and shares, and handling accounting adjustments.

Course Inputs**UNIT-I Final Accounts and Financial Statements of Companies:**

Corporate problems with special reference to published Accounts.

UNIT-II Valuation of Goodwill and Shares: Funds Flow and cash flow statements.**UNIT-III Accounting Issues: Relating to Amalgamation, absorption, and reconstruction of companies both external and internal.****UNIT-IV Accounts: Relating to liquidation of companies. Investment Accounts. Lease Accounting.****UNIT-V Human Resource Accounting: Meaning, Approaches & Assumptions, Methods of human Resource Accounting.****References:**

1. Beams, F.A.: Advanced Accounting, Pearson Education, New Delhi.
2. Dearden, J. and S. K Bhattacharya: Accounting for Management, Vikas, New Delhi.
3. Engler, C., L.A. Bemstein. And K.R L Lambet: Advanced Accounting, Irwin, Chicago.
4. Fischer, P.M., W.J Taylor and J.A Leer: Advanced Accounting, South-Western, Ohio.
5. Gupta, R.L: Advanced Financial Accounting, S. Chand & Co., New Delhi.
6. Horngreen, " Introduction to Financial Accounting:, Pearson Education, New Delhi.
7. Keiso D.E. and J.J Weygandt: Intermediate Accounting, John Wiley and Sons, NY.
8. Maheshwaari, S.N: Advanced Accountancy- Vol. II, Vikas Publishing House, New Delhi.
9. Monga, J.R: Advanced Financial Accounting, Mayoor Paperbacks, Noida.
10. Tulsian, P.C.: Financial Accounting, Pearson Education, New Delhi.
11. Neigs, R.F: Financial Accounting, Tata McGraw Hill, New Delhi.
12. Shukla, M.C. and T.S. Grewal: Advanced Accountancy, Sultan Chand & Co., New Delhi.
13. Warren, C.S. and P.E Fess: Principles of Financial and Managerial Accounting, South-Western, Ohio.

Objective

The objective of this course is to enable the students to understand the fundamentals of financial management in the context of a corporate entity. It attempts to acquaint them with different dimensions of financial management with a focus on the application of the relevant tools and techniques of financial decision-making aimed at shareholder's wealth maximization.

Course Inputs

UNIT-I Introduction: Nature and Scope of Financial Management; Financial Goals-Conflict of interest between the stakeholders; Functions of Financial Manager, Changing Financial Environment, Emerging Challenges faced by the Finance Manager.

UNIT-II Financing Decisions: Sources of Long term Capital-Equity, Debt, Term Loan, Preference share, Hybrid Securities, Internal Funds-Innovative sources of Domestic and Foreign Capital-Issues relating Financing Decisions.

UNIT-III Leverage and Capital Structure Analysis: Analysis of Operating Leverage and Financial Leverage- Combined Financial and Operating Leverage Concept of Capital Structure- Determinants – Theories of Capital Structure- Relevance and Irrelevance- Capital Structure Decision and Shareholder's Value Maximization.

UNIT-IV Long Term Investment Analysis: Investment Idea Generation-Tools and Techniques of investment analysis-Risk Analysis in Capital Investment Decisions
Dividend Decisions: Issues in Dividend Decisions-Models and Theories of Dividend- Forms of Dividend-Corporate Dividend Behavior.

UNIT-V Short Term Asset Management: Strategic Planning and Estimation of Short Term Funding Needs-Financing Sources-Computation of Cost of Short Term Fund.
Management of Cash, Inventory and Receivables.

References:

1. Bhattacharya, H., "Working Capital Management: Strategies and Techniques". Pearson Education, Delhi.
2. Brealey, Richard A and Steward C. Myers: Corporate Finance, McGraw Hill, Int. ED, New York.
3. Chanda, Prasanna: Financial Management, Tata Mc Graw Hill, Delhi,
4. Pandey, I.M: Financial Management, Vikas Publishing House, Delhi.
5. Van Home, J.C. and J.M. Wachowicz Jr.: Fundamentals of Financial Management, Pearson Education, New Delhi.
6. Van Home, James C, "Financial Management and Policy" Pearson Education, New Delhi.
7. Pinches, George E: Essentials of Financial Management; Harper and Row, New York.
8. Khan MY, Jain PK: Financial Management; Tata Mc Graw Hill, New Delhi.
9. Archer, Stephen H., Choate G Marc, R. George; Financial Management; John Wiley, NY.
10. Block, Stanley B. Geoffrey A Hilt; Foundations of Financial Management; Richard D. Irwin, Homewood, Illinois.

MCC - 105 ACCOUNTING FOR MANAGERIAL DECISION MAKING
(Credit – 4)

Objective

The objective of this course is to acquaint students with the accounting concepts, tools and techniques for managerial decisions.

Course Inputs

UNIT I Accounting Information and Managerial Decision Making: Financial accounting; Accountant's Position, role, and responsibilities.

Analysis Financial Statements: Horizontal and Vertical Analysis, Ratio analysis.

UNIT II Marginal Costing and Break-even Analysis: Concept of marginal cost; Marginal costing and absorption costing; cost- volume-profit analysis; Break-even analysis; Decisions regarding sales-mix, make or buy decisions and discontinuation of a product line etc.

UNIT III Budgeting : Features of a budget; Essentials of budgeting; Types of Budgets- functional, master budgets, etc; Fixed and flexible budget; Budgetary control; Zero-base budgeting; Performance budgeting.

UNIT IV Standard Costing and Variance Analysis: Standard costing as a control technique; setting of standards and their revision; Variance analysis- meaning and importance, kinds of variance and their uses- materials, labour, overhead and sales variance; Disposal of variances.

Accounting Plan and Responsibility Centres: Meaning and significance of responsibility accounting; Responsibility centers – cost centre, profit centre and investment centre; Objective and determinants of responsibility centers.

UNIT V Activity-based costing; Reporting to Management; Balanced Score Card

References:

1. Homgren Charles T. George Foster and Srikanta M. Dattar: Cost Accounting: A Managerial Emphasis, Pearson.
2. Banerjee, B. Cost Accounting. PHI
3. Jawahar Lal, Cost Accounting, Tata McGraw
4. Homgren, C.T. Gary L. Sundem and William O. Stratton: Introduction to Management Accounting, Pearson
5. Khan, M.Y., and Jain, P.K., Cost Accounting, Tata McGraw
6. Maheswari, S.N., Principles of Cost Accounting, Sultan Chand
7. Lall, B.M., and I.C. Jain; Cost Accounting Principles and Practice, PHI
8. Pandey, I.M, Management Accounting, Vani
9. Kaplan, Management Accounting , PHI.
10. Kishore, R.M., Cost and Management Accounting, Taxman
11. Druty, C., Management and Cost Accounting. Thomsom.
12. Shukla, Grewal & Gupta, Cost Accounting, S. Chand.

Objective

The course aims at developing necessary skills for applying the principles of financial analysis to management of funds by commercial banks and the insurance sector.

Course Inputs

UNIT I Basic Concepts of Risk Management and Insurance: Meaning of risk, Basic categories of risk, methods of dealing with risk; Meaning and objective of risk management; Concepts and features of Insurance; Types of insurance contract and fundamental principles of Insurance; Cost benefit of Insurance to the society.

UNIT II Insurance regulatory Act, 1999 and Insurance Market; IRDA Act, 1999, Meaning, Objectives, Duties, Powers and Functions of Authority, Globalization of Indian Insurance, Privatization and Challenges before the Insurance Industry, Need for Reforms and Reforms Strategy.

UNIT III Life Insurance: Definition, Features and Principles of Life Insurance, Procedure for taking a policy, policy conditions, Premium Plans, Calculation of Premium. Settlement of Claims.

UNIT IV Fire and Marine Insurance: Principles, Policy conditions, Types of policies, of fire & Marine Insurance, Clauses and factors of Marine Insurance, Settlement of claims (Both Fire and Marine Insurance).

UNIT V Re-Insurance and Investment: General Features, Common terms, Features and Objects, Rights and Liabilities of Re-Insurance, Principles of Re-Insurance, Methods.
Investment: Investment Principles, Types, Legal and Social aspect of Investment, Policies of Insurance Companies.

References:

1. Arif, "Theory and Practice of Insurance" Educational Book House.
2. Sharma R.S., "Insurance Principles and Practice" Vora, Delhi.
3. Greene and Trieschemann, "Risk Insurance", south Western Publishing Co.
4. Grieder and Beadies, "Principles of Insurance"
5. Mishra M.N. "Insurance principles & Practice", S.Chand.
6. Palande, Shah & etc "Insurance in India" changing policies & Emerging Opportunities, Response Books.
7. Study Material of Insurance Institute of India, Bombay.
8. Ganguly Anand "Insurance Act", New Age International Publication.
9. Insurance Law Manual, Taxman, Delhi.
10. Holyake, "Insurance Management", AITBS Publication.
11. Darfman, Introduction to Risk Management and Insurance.

SECOND SEMESTER

MCC - 201 BUSINESS ENVIRONMENT (Credit – 4)

Objective

The Course develops ability to understand and scan business environment analysis opportunity and take decisions under uncertainty.

Course Inputs

UNIT I Theoretical Framework of Business Environment: Concept, Significance and Nature of business environment; Elements of environment; Techniques of environmental scanning and monitoring. Global environment and its rationale merits and demerits.

UNIT II Economic Environment of Business : Significance and elements of economic environment; Economic systems and business environment; Economic Planning in India; Government Policies- Industrial Policy, Fiscal Policy, Monetary Policy, Public Sector and Economic Development.

UNIT III Political and Legal Environment of Business: Critical elements of political environment; Government and Business; Changing dimensions of legal environment in India.

Socio-Cultural Environment: Critical elements of socio-cultural environment; Social Institution and systems; Social values and attitudes; Indian business system; Social responsibility of business; Consumerism in India.

UNIT IV International and Technological Environment: Multinational Corporations; Foreign Collaborations and India business; International economic Institutions – WTO, World Bank, IMF and their importance to India; Foreign Trade Policies; TRIPS, TRIMS, Anti-dumping. Dispute Settlement.

UNIT V Economic Reforms: - Need for economic reforms, Main features of reforms, structural changes, Deregulation, privatization and globalization impact of reforms, Human faces of reforms, Future trends of reforms, **MNCs**- Definition, advantages, disadvantages, Control over **MNCs**.

OPTIONAL: Trade Block & Business Centres

EEC, NAFTA, ASEAN, SFTA, SAARC

References:

1. Adhikary, M; Economic Environment of Business, Sultan Chand & Sons, New Delhi
2. Ahluwalia, I.J: Industrial Growth in India, Oxford University Press, Delhi.
3. Alagh, Yoginder K: Indian Development Planning and Policy, Vikas Pub. New Delhi
4. Aswathappa, K: Legal Environment of Business, Himalaya Publication, Delhi
5. Chakravarty, S: Development Planning, Oxford University Press, Delhi.
6. Ghosh, Blswanath: Economic Environment of Business, Vikas Pub. New Delhi.
7. Govt. of India: Economis Survey, Various Issues.
8. Raj Agrawal and Parag Diwan, Business Environment; Excel Books, New Delhi.
9. Ramaswamy, V.S. and Nama Kumari; Strategic Planning for Corporate Success, Macmillan New Delhi
10. Sengupta. N.K: Government and Business in India, Vikas Publication, New Delhi.
11. Daniels "International Business, Environment and Operations", Pearson Education, Delhi.

Objective

The objective of this course is to help students understand the conceptual framework of Interpersonal and organizational Behaviour.

Course Inputs

UNIT I Organisational Behaviour: Organisational behavior-concept and significance; Relationship between management and organizational behavior; Attitudes; Perception; Learning; Personality.

UNIT II Group Dynamics and Team Development: Interpersonal and Group Behaviour, Group dynamics-definition and importance, types of groups, group formation, group development, group composition, group performance factors; Group decision making merits and demerits.

Motivation: Process of motivation; Theories of motivation – Need hierarchy theory, theory X and theory Y, two factor theory, Alderfer's ERG theory, McClelland's learned need theory, Victor Vroom's expectancy theory, Stacy Adams equity theory.

UNIT III Leadership: Concept; Leadership styles; Theories- Trait theory, Behavioural theory, Fiedler's contingency theory; Hersey and Blanchard's situational theory; Managerial grid; Likert's four systems of leadership.

UNIT IV Interpersonal and Organisational Communication: Concept of two-way communication; Communication process; Barriers to effective communication; Types of organizational communication; Improving communication; Transactional analysis in communication. Stress Management.

UNIT V Organisational Conflict: Dynamics and management; Sources, patterns, levels, and types of conflict; Traditional and modern approaches to conflict; Functional and dysfunctional organizational conflicts; Resolution of conflict.

References:

1. Robbins, Stephen P. and Mary Coulter; Management, Pearson Education, Delhi.
2. Griffin, Ricky W; Organisational Behaviour, Houghton Mifflin Co. Boston.
3. Robbins, Stephen P: Organisational Behaviour, Pearson Education, Delhi.
4. Hellreigel, Don, John W. Slocum, JR., and Richard W. Woodman: Organisational Behaviour; South Western College Publishing, Ohio. Utilising Human Resources, Prentice Hall, New Delhi.
5. Hersey, Paul, Kenneth H. Blanchard and Dewey E. Johnson; Management of Organisational Behaviour; Utilising Human Resources, Prentice Hall, New Delhi.
6. Ivancevich; John and Michael T. Matheson: Organisational Behaviour and Management, Business Publication Inc. Texas.
7. Koontz, Harold, Cyril O'Donnell and Heinz Wehrich; Essentials of Management. Tata McGraw-Hill, New Delhi.
8. Luthans, Fred; Organizational Behaviour, McGraw-Hill, New York.
9. Newstrom, John W, and Keith Davis; Organizational Behaviour; Human Behaviour at work, Tata McGraw-Hill, New Delhi.

Objective

The objective of this course is to facilitate understanding of the conceptual framework of marketing and its applications in decision making under various environmental constraints.

UNIT I Basics of Marketing: Meaning, Importance, Scope of Marketing; Marketing elements and Strategies, Marketing Environment; Marketing and Economic Development Process; Marketing Organisation.

UNIT II Marketing Management and Studying Consumers Behaviour; Marketing Management Process:- Planning & Market Segmentation, Marketing Research & Marketing Information System; Consumers Behaviour and Marketing Strategies. Buyer's Decision process and consumer Behaviours

UNIT III Production Management & Pricing Strategies: Meaning and importance of product decision, Product Classification, Product Life Cycle (PLC) and marketing Strategies; Branding & Packaging; Pricing objectives, factors of pricing methods, and pricing policies and Strategies

UNIT IV Promotion & Placement Strategies: Meaning and importance of Communication and Promotion, elements of communication, tools of promotion, Objectives and Strategies of Promotion; Meaning and importance of Distribution. Physical Distribution System, Wholesaling and Retailing practices in India.

UNIT V Marketing in Indian Practice: Rural & Agricultural Marketing; International Marketing; Cyber Marketing; Co-operative Marketing; Green Marketing, Services Marketing

Reference:

1. Etzel, M.J, Marketing-Concepts and Cases, Tata McGraw Hill, New Delhi.
2. Keegan: Global Marketing Management, Pearsons, New Delhi.
3. Kotler Philip and Armstrong Gary; Principles of Marketing, Pearsons, New Delhi, 2006
4. Kotler, P.: Marketing Management, Pearsons, New Delhi.
5. Kumar: Marketing & Branding, Pearsons, New Delhi.
6. Majumdar, Ramanuj : Product Management in India, Prentice : fall, New Delhi
7. Mathur; Strategic Marketing Management, McMillan.
8. Motr : Marketing of Higher Technology Products and Innovations, Pearsons, New Delhi
9. Perreault, W.D. and Mc Carthy, E.J: Basic Marketing, Tata McGraw Hill, 2007. New Delhi
10. Ramaswamy, Namkumari : Marketing Management, McMillan, New Delhi.
11. Ramaswamy, Namkumari : Marketing Management, McMillan, Calcutta.
12. Saxena, R: Case Studies in Marketing, The Indian Context. PH, New Delhi.
13. Srinivasan: Case Studies in Marketing, Prentice Hall of India, New Delhi.
14. Stanton, William: Fundamental of Marketing; Tata Mc Graw Hill Publication, New Delhi.
15. Mc Carthy; Marketing Management, Tata-Mc Graw Hill, New Delhi
16. Karunakaran K – Marketing Management, Himalaya Publishing House, New Delhi.

Objective

This course develops managerial perspective to economic fundamentals as aids to decision making under given environment.

Course Inputs

UNIT I Fundamental Concepts & Principles: Introduction to Managerial Economics; Scope and Subject matter. Basic Concepts and Techniques, Nature of Managerial and Economic Problems, Nature of Economic Analysis, Role and responsibility of managerial economic; Implicit and explicit costs.

UNIT II The Theory of Firm: The circular flow of Economic Activity. The nature of the firm. Objectives of the firm, Maximising versus satisfying, the concept of economic profit, theories of profit-Accounting and economic interpretation of profit. Policies on profit maximization, Profits for control.

UNIT III Demand Analysis: The demand schedule and demand curve. The demand function. Price elasticity of demand. Interpretation of elasticity of demand. Income and cross elasticities of demand, business and economic forecasting. Method of forecasting: Expert opinion. Market experiments, Surveys.

UNIT IV Theory of Production. The production function. One variable input production function – Empirical estimation and managerial uses. Two- variable input production function , Isoquants – Characteristics. Features and managerial use. Formulation of a Cobb- Douglas production function.

UNIT V The Theory of Cost: Cost Concepts- meaning and managerial use. Cost function – cost curves – Empirical estimation of a short – run cost function. Cost Reduction and Control.

References:

1. Craig Peterson. H.Cris Lewis, W.:Managerial Economics, Pearson Education, Delhi.
2. Mehta P.L.Managerial Economics Analysis, Problems and cases, Sultan Chand and Sons.
3. Mukherjee Sampat: Business and Managerial Economics. New Central Book Agency, Calcutta.
4. Baumol W. J., : Economic Theory and Operations Analysis, Prentice Hall of India LTD.
5. Johnson J; Economic Methods, New York, McGraw Hill.
6. Reddy, P.N. & Appannaiah, H.R., Essential Managerial Economics. Himalaya Publishing House.
7. Joal Dean: managerial Economics, PHI, New Delhi.
8. Case , “Principles of Economics”, Pearson Education, Delhi.

MCC - 205 SMALL BUSINESS MANGEMENT & PROJECT APPRAISAL

(Credit – 4)

Objective

The objective of the present course is to sensitize the student about the role of SME sector in the economic development of the country. The present course also includes discussion on various functions of a small scale units including tools and techniques of project preparation and appraisal.

Course Inputs

UNIT I SME ; Enterprise Evolution & Function; Definition of SSI Unit and SSI units Entrepreneur, Scope and Objective of SSI Units, Advantages & shortcomings of Small Industries, Small Industry and economic development, Developing Entrepreneurial Skill.

UNIT II Project Management: Project and Project Management, Project Identification, Project Formulation, Project Selection, Project implementation, Techno-Economic feasibility analysis, Social-cost-benefit analysis, Project Report.

UNIT III Small Industry Support system: Needs and important of support system, NSIC, SIDO, SSIB, SISI, DIC, SIDBI, Commercial Banks, Venture Capital, Lease Financing.

UNIT IV Management Process in Small Business and Legal Framework: Planning Process, Organising, Leading and Motivating, Management of Time. The Factories Act, The Employees Provident Fund Act, Industrial Dispute Act, Payment of Wages Act, Workmen's compensating Act.

UNIT V Global Competition: Global Competitiveness, Strategies for SSIs; Sickness in Small Scale Industries- Symptoms, Reasons and Remedies; Future Growth Potential for SSIs.

References:

1. Dollinger, "Entrepreneurship-strategies and Resources", Pearson Education, Delhi.
2. Khamka, S.S "Entrepreneurship Development" S.Chand & Co
3. Cantillon, Richard "Entrepreneurship and Economic development" The Free Press, New York.
4. Gupta , C.B. and Khamka S.S. "Entrepreneurship and Small Business Management", S chand & Sons, Delhi.
5. Gupta C.B, & Srinivasan N.P."Entrepreneurship Development", S. Chand & Sons, Delhi.
6. Desal Vasant; "Dynamic of Entrepreneurial Development and Management, Himalaya Publishing House
7. Deshpande, M.U,; "Entrepreneurship of small Scale Industries", Deep & Deep Publication New Delhi.
8. Shrama, R.A. : "Entrepreneurial Change in Indian History", staling Publisher, New Delhi.

Objective

The Objective of this course is to acquaint students the concepts Social Survey and Research. They will also be provided inputs research methods, research methodology, process of research the process of research the process of report writing.

Course Inputs

UNIT I Research: Meaning and Objectives, Type of Research, Role of research in functional areas; Accounting, Finance, Marketing, HR etc. Research Methods, Research Methodology Research Process.

UNIT II Defining Research Problems: Setting Objectives, Formulating Hypothesis, Research Design, Sample Design.

UNIT III Social Survey: Collection of Primary and secondary data, Design of questionnaire.

UNIT IV Data Processing: Classification, Tabulation, Editing, Analysis and interpretation of data, Uni-variate, Bi-variate and Multi-variate Analysis.

UNIT V Report Writing: Categories of report, parts of a report, presentation of a report.

References:

1. Young. P.V. Sehid, C.F. Scientific Social Survey and Research
2. Seltiz Claire, et: Research Methods in Social Relation, Hold, Tinchart & Willton, New York.
3. Good and Halt, Methods in Social Research, McGraw Hill.
4. Kothari, C.R. Research Methodology Techniques, Wishwa Prakashan, New Delhi.
5. Cooper and Schindler, Business Research Methods, MsGraw Hill.
6. Wilkinsor & Bhandarkar, Methodology of Research in Social Sciences, Himalaya.
7. Paneerselvan R. Research Methodology, PHI.
8. Bajpal SR, research Methodology in Social Science.

THIRD SEMESTER

MCC - 301 PROJECT REPORT (Credit -8)

Objective : The objective of this is to make a survey and prepare a report on current issues.

MCC - 302 STRATEGIC MANAGEMENT (Credit - 4)

Objective

The objective of this course is to enhance decision making abilities of students in situation of uncertainty in a dynamic business environment.

UNIT I Concept of Strategy: Defining strategy, levels at which strategy operates; Approaches to strategic decision making; Mission and purpose, objectives and goals; strategic business unit (SBU); Functional level strategies.

Environmental Analysis and Diagnosis: Concept of environment and its components; Environment scanning and appraisal; organizational appraisal; Strategic advantage analysis and diagnosis: SWOT analysis.

UNIT II Strategy Formulation and Choice of Alternatives: Strategies- stability, growth, modernization, diversification, integration; Merger, take-over and joint strategic, Turnaround, divestment and liquidation strategies; Factors affecting strategic choice; Generic competitive strategies-cost leadership, differentiation focus, value chain analysis, bench marking service blue printing.

UNIT III Functional Strategic : Marketing, Production/Operations and R & D plans policies.
Personnel and Financial plans policies.

UNIT IV Strategy Implementation: Inter-relationship between formulation and implementation; Issues in strategy implementation, Resource allocation.

Strategy and Structure: Structural considerations, structures for strategies Organisational design and change.

UNIT V Strategy Evaluation: Overview of strategic evaluation; Strategic control; Techniques of strategic evaluation and control, Problem in management and evaluation, Global issues in Strategic Management.

References:

1. David, "Strategic Management", Pearson Education, New Delhi.
2. Bhattachary, S.K. and N.Venkataramin; managing Business Enterprises; Strategies structures and systems, Vikas Publishing House, New Delhi.
3. Budhiraja. S.B. and M.B. Athreya: Cases in strategic Management, Tata McGraw Hill, New Delhi.
4. Christensen, C.Roland, Kenneth R. Andrews, Joseph L. Bower, Rochard G. Hamermesh, Michael E. Porter; Business Policy; Text and cases, Richard D. Irwin, Inc, Homewood.
5. Coulter, Mary K: Strategic Management in Action, Prentice Hall New Jersey.
6. David, Fred R: Strategic Management, Prentice Hall, New Jersey.
7. Glueck, William F. and Lawrence R. Jauch: Business Policy and Strategic Management, McGraw Hill, International Edition.
8. H.Igor, Ansoff: Implanting Strategic Management, Prentice Hall, New Jersey.

9. Kazmi, Azhar: Business Policy and Strategic Management, Tata McGraw Hill, Delhi.
10. Srinivasan : Strategic Management – The India Context-PHI.

Objective

This course aims at providing students with an understanding of the structure, organization and working of financial markets and Institutions in India.

Course Inputs

UNIT I Nature of Financial System: Its function Components of Financial System, Evolution of India financial system-Measuring the efficiency of India financial system-Innovations in India Financial System.

Types of Financial Markets: Money Market and Capital Market. Role, Players, Instruments, Constituents and recent development Review of the Securities Market in India; Role of SEBI.

UNIT II Commercial Banking in India: Structure, and Functions., Balance-sheet Analysis,, Risk exposures, Basel Norms, Diversifications in Commercial Banking functions, Role of Commercial Banks in the Money Market, Bank Marketing. A SWOT Analysis of Indian Commercial Banks.

Rural Banking and Micro Finance: Problem and Prospects.

UNIT III Development Financial Institutions: Structure- Role and Objective- Promotional Functions – Emerging Problems & Development Banks- Strategic Options – Concept of Universal Banking.

Insurance Sector: Nature of Insurance Organization, Types of Insurance Products – Basics of Insurance Contracts – Insurance Sector Reforms- Problems of Market Structure – Risk Management and Insurance- Role of IRDA- Emerging Scenario.

UNIT IV Non-Banking Financial Companies: Concept and role in Financial Market- Regulation and Roles of leasing. Hire Purchase and Housing Finance Companies- Venture Capital Companies.

Mutual Funds: Concept, Features and different types of Mutual Funds. Regulation of Mutual Funds- Marketing of Mutual Funds- Problems and Prospects. Latest Scenario of Mutual Funds Industries.

UNIT V Merchant Banking: Concept, function- SEBI guidelines.

Depository System: Objectives, participants and operating mechanism.

Derivative Markets: Basic features of SWAPs, options, Forwards and Future Market.

Foreign investments: Role in economy, Trends, Implications and problems.

Reference:

1. Avdhant: Investment and Securities Markets in India, Himalaya Publication, Delhi.
2. Bhole, L.M. : Financial Markets and institutions, Tata McGraw Hill, Delhi.
3. Ghosh, D.Banking Policy in India, Allied Publication, Delhi.
4. Khan, M.Y: India Financial System, Tata McGraw Hill, Delhi.
5. Varshney, P.n:India Financial System, Sultan Chand & Sons, New Delhi.
6. Srivastava R.M:Management of Indian Financial institution, Himalaya Publishing House, Mumbai.

7. Verma JC: Guide to Mutual Funds and Investment Portfolio, Bharat Publishing House, New Delhi.
8. Gordon and Natarajan, "Financial Markets and Services". Himalayan Publishing House, N.Delhi.
9. Benton, E Gup, 'Financial Intermediations; An introduction', Response books.

MCC - 304 ECONOMIC ANALYSIS FOR DECISION MAKING (Credit - 4)

Objective

This course develops managerial perspective to economic fundamentals as aids to decision making under given environment.

Course Inputs

UNIT I Pricing Theory: Market structure and competitive Behaviour, Perfect Competition – Imperfect completion; monopoly, monopolistic competition and Oligopoly Pricing decisions under various market structure.

UNIT II Pricing Policies and Practices: Cost plus pricing. Skimming price and penetration price. Pricing products of lasting distinctiveness pricing products of perishable distinctiveness pricing standard products when competitor's and few, Pricing and practice.

UNIT III Product Diversification: Meaning and Scope. Product Life Cycle. Opportunity for multiple products. Specification product addition criteria. Policy on dropping old products.

UNIT IV Economic Environment: The Macro-Economic Scenario in India, Problems of Growth, Business Cycles: Cause and consequences – Measures to curb them. Balance of Payment problems. New Trade policy, WTO-critical evaluation and short coming.

UNIT V Economic Reforms: Need for economic reforms, Main features of reforms. Structural changes. Deregulation, Privatization and globalization, Impact of reforms-Human face of reforms. Future of economic reforms.

References:

1. Craig Peterson, H.Cris Lewis, W.:Managerial Economics, Pearson Education, Delhi.
2. Joel Dean: Managerial Economics. PHI.
3. Agarwal A.N.:Indian Economy problems of Development and Planning, New AGE International Pvt. Ltd., New Delhi.
4. Gupta G.S.:Macro Economic Theory and Application, Tata McGraw Hill publishing Company Ltd. New Delhi.
5. McGulgn J.R.and Charies Moyer, Managerial Economics. The Drycon Press, Hinadale
6. Michael Edgament:Macro Economics Theory and Policy, PHI Ltd.
7. Ghosh Alok:Indian Economy, S.Chand & Co.
8. Greene,"Econometric Analysis", Pearson Education, Delhi.
9. Sydsaeter "Mathematics for Economis Analys". Pearson Education, Delhi.

Objectives

The objectives of the paper is to enable students to:

- Appreciate the importance and need of soft skills in personal and personal life
- build a repertoire of functional vocabulary and to move from the lexical level to the syntactic level
- summon words, phrases relevant to the immediate communication tasks in class as well as office
- comprehend the concept of communication
- learn the four basic communication skills – Listening, Speaking, Reading and Writing

Course Inputs:

UNIT – I Recap of language skills – vocabulary, phrase, clause, sentence.

UNIT - II Fluency Building – word match, reading aloud, recognition of attributes, parts of speech in Listening and reading, listening – reading comprehension.

UNIT –III Principles of Communication – Communication as coding and decoding – signs and symbols – verbal and non –verbal symbols – Language AND communication; language VS communication – media/channels for communication

Individual Communication – Self advertising – Over stating and under stating – Overcoming shyness – Writing curriculum vitae, Statement of Purpose – Talking about oneself; interview.

UNIT- IV Types of Communication- functional, situational, verbal and non-verbal, interpersonal, group, interactive, public, mass line, dyadic – with illustrations

Intermediary Communication – Overcoming mental blocks, prejudices and hotspots of the addressee – telephone, teleconferencing, and web chat – greeting, introducing –memos, reports, minutes, business correspondence.

UNIT - V LSRW in Communication – Listening – Active vs Passive (Talk less, listen more); Speaking - Speech vs Enunciation (mind your tone); Reading –Focus on the structure not on the theme alone; Writing – Precise, not only précis writing
Social Communication – Etiquette in LSRW – polite yet assertive, tackling questions, seeking permission, expressing gratitude – gender fair language – discourse and transactional analysis – empathy.

References :

1. Dignen, Flinders and Sweeney. English 365. Cambridge University Press
 2. Goleman, Daniel. 1998. Working with Emotional Intelligence. Bantam Books. New York
 3. Hall and Shephard. The Anti-Grammar Grammar Book: Discovery Activities for Grammar Teaching. Longman
 4. Hewings, Martin. 1999. Advanced English Grammar: A Self-Study Reference and Practice Book for South Asian Students. Reprint 2003. Cambridge University Press. New Delhi
 5. Jayakaran. 2000. Everyone's Guide to Effective Writing. 2 M Publishing International, Chennai.
 6. Jones, Leo and Richard Alexander. 2003. New International Business English. Cambridge University Press
 7. Lewis, Norman. 1991. Word Power Made Easy. Pocket Books
- Nayagarh Autonomous College, Nayagarh (Odisha) affiliated to Utkal University, Vani Vihar,

8. Monippally, Matthukutty. M. 2001. Business Communication Strategies. 11th Reprint. Tata McGraw- Hill. New Delhi
9. Sasikumar.V and P.V. Dhamija. 1993. Spoken English: A Self-Learning Guide to Conversation Practice. 34th Reprint. Tata McGraw-Hill. New Delhi
10. Swets, Paul. W. 1983. The Art of Talking So That People Will Listen: Getting Through to Family, Friends and Business Associates. Prentice Hall Press. New York
11. Windshuttle, Keith and Elizabeth Elliot.1999. Writing, Researching and Communicating: Communication Skills for the Information Age. 3rd Reprint. Tata McGraw-Hill. Australia

MCE - 306 **ENTREPRENEURSHIP DEVELOPMENT**(Credit - 4)

Course Inputs

UNIT –I **Problems in Entrepreneurship Development:** Dot com entrepreneurship, role of Govt. in entrepreneurship Development - R & D, Science technology & Entrepreneurship development.

UNIT –II **Specialized institutions involved in entrepreneurship Development** Business incubation & venture capitalists, Entrepreneurship development efforts in India-Issues & cases

UNIT –III **Change in concept of entrepreneurship:** Entrepreneurship within organization, corporate strategy, Entrepreneurship.

UNIT –IV **Business idea search:** Project identification, project design, Network analysis, Business model PERT, Critical path method, Creativity & Innovation, Meaning & importance & role in developing a new business

UNIT – V **Issues in project management:** Project direction, co-ordination & control, project cost, Evaluations & cost control, Interface with industrial sickness, Project monitoring & MIS.

References:

1. S.S. Nadkarni-Developing new Entrepreneurs, EDII, Ahmadabad.
2. N.P.Singh- Entrepreneurs v/s Entrepreneurship Asian society for ED.
3. Desai Vasant –Dynamics of Entrepreneurial development & management, HPH.
4. Khairka S.S. Entrepreneurial Development , S.Chand & Co, New Delhi.
5. Moharana Drant Desai- Entrepreneurship Development, RBSA Publishers, Jaipur.
6. Paul Jose,Kumar N.Paul T.M. Entrepreneurship Development, HPH, New Delhi.
7. Saini J.S. Rathore B.S. Entrepreneurship Theory & Practice.

MCF - 307 MANAGEMENT OF PERSONAL FINANCES (Credit - 3)

Objectives

The objective of this paper is to make the students familiar with the basics of personal financial management, Personal Savings and Investment Plans, retirement savings plan a computation of risk & return of personal Investments.

Course Inputs:

UNIT-I Basics of Personal Financial Management : Personal Financial Planning Process, Preparation of Personal Budget, Personal Financial Statements, Personal Income Tax Planning, Case Studies on Personal Financial Planning of Individuals.

UNIT -II Personal Savings and Investments in Investment Criteria-Liquidity, Safety Financial Assets and profitability. Saving Instruments of Post Office and Banks, Investment in Shares Debentures, Corporate and Government Bonds, Mutual Funds, Chit Funds.

UNIT-III Personal Investments in Non-Financial Assets : Investment in Physical Assets – Real Estate. Gold and Silver, Risk and Return associated with Investment in Financial and Non-Financial Assets.

UNIT- IV Computation of Return and Risk of Personal Investment : Present Value and Future Value, Computation of Interest, Dividend and Capital gains on Personal Investments.

UNIT - V Retirement Savings Plan : Pension Plans : Defined Contribution plan and defined benefit plan, Provident Fund, Gratuity. Life Insurance Plans, General Insurance Plans, Reverse Mortgage Plans.

References :-

1. Personal Finance by Jack R. Kapoor, Les R. Dlabay and Robert J. Hugus, Tata McGraw –Hill Publishing Company Ltd. New delhi.
2. Financial Education By Reserve Bank of India - rbi.org
3. Personal Finance Columns in the Economic Times, The Business Lones and Financial Express Daily News Papers.
4. Information Bulletin of Post Offices, Banks , Mutual Funds, Insurance Companies.
5. Internal Sources : BSE, NSE, SEBI, RBI, IRDA, MFI etc

MCF - 308 CAPITAL MARKET INSTRUMENTS (Credit - 3)

Objective

To equip the students with an opportunity to understand the role of Capital Market Instruments like Stock, Bond etc.

Course Inputs

UNIT -I Origin, Nature and Role of Capital Markets-Globalization of Capital Markets, Capital Markets in India- Stock Exchange.

UNIT –I I Financial Instruments : Definition & Meaning, Classification of Financial Assets & Liabilities , Share Warrants or Options, Hedging Instruments.

UNIT- III Stocks, Bonds, Debentures – Convertible Debentures, ADR, GDR, ETFs, Units of Mutual Funds.

Unit-IV Derivatives – Basic Features : Role of Derivative Markets, Forward and Futures, Commodity Futures, Stock Futures and Index Futures

Unit-V Options, Stock Options and Index Options, Swaps, Currency Swaps and Interest rate Swaps.\

References :

1. Financial Institutions and Markets – Bhole L. M.- TMH
2. Financial Markets – M. Y. Khan
3. Financial Derivatives – Dr. G. Kotreshwar

Objective

The objective of the course is to expose the students to advanced company account as well as specialized accounts for different types of organization.

Course Inputs

UNIT I Holding Company Accounting: Meaning, Definitions and requirement, Philosophy of consolidation; Minority Interest, Cost Control, Revaluation of Assets and Liabilities, Bonus shares & Dividends, Consolidation of P/L Account and Balance Sheet.

UNIT II Double Account System: Meaning, definition and distinction between single and double account system, Final accounts under double account system, Revenue account, net revenue account, capital account & General Balance Sheet, Electricity Supply Act.

UNIT III Banking Company Accounts: Different systems of Posting, Different statutory books to be maintained. P & L account and p & L appropriation account & balance sheet as per Banking Regulation Act 1949.

UNIT IV Insurance Company Accounts: Life Insurance Companies & the statutory books to be maintained. Statutory provisions in preparing the revenue account, valuation balance sheet and balance sheet. Marine & Fire Insurance Accounts.

UNIT V Government Accounts: Commercial Accounts and Government Accounts, Accounting methods & financial statements, Basic principles of government accounts in India, classification of government accounts in India, Accounting for fire & marine insurance claims & losses construction contracts.

References:

1. Advanced Accounting – Vol. II,III & IV R.L.Gupta & M.Radhsamy (S.Chand)
2. Advanced Accounting – Arunanandan & Raman (Himalaya)
3. Advanced Accounting – Maheswari & Maheswari (Vikash)
4. Practice in Accountancy – Basu and Das (Rabindra Library)
5. Fundamentals of Advanced Accounts-Vol. II- Francis Xavier (TMH)
6. Advanced Accounting – Vol II, Hanif & Mukherjee (Tata McGraw Hill)

Objective

To provide a conceptual idea about the various provisions of the Income Tax Act. Related to the corporate sector and study the implications of these provisions on the tax planning of the companies.

Course Inputs

UNIT I Corporate Tax in India, Assessment of Corporate Assesse- Head wise

UNIT II MAT, TDS, Advance Payment Tax, Self assessment, Tax Planning as Residential Status, Basis of Tax Planning, Tax avoidance, Tax Management and Tax evasion

UNIT III Tax Planning with reference to: Depreciation, Capital gain, House Property, Amalgamation

UNIT IV Tax planning for setting up new undertaking: Basis of Location, Basis of nature of Business

UNIT V Tax Provisions of Merger and Demerger, Transfer Pricing, Double Taxation, Provision for GST in India (if any).

References:

1. R.N.Lakhotia and Subash Lakhotia," Tax planning for non-resident Indians", Vision books (P) ltd.
2. R.N.Lakhotia, "Corporate Tax Planning", "Vision books (P) ltd.
3. Singhanian, V.K.Direct Taxes: Law and Practic, Taxman's Publication, Delhi.
4. Bhagabati Prasad,"Direct Tax Laws & Practices".

MCEB - 311 **Advanced Auditing** (Credit - 4)

Objectives

To gain expert knowledge of current audit practices and procedure and apply them in auditing engagements.

Course Inputs

UNIT-I Audit Strategy, Planning and programming : Planning the flow of audit work, drafting of reports, audit strategy planning, programme and importance of supervision, review of audit reports and working papers, control of quality of audit work.

UNIT-II Documentation and Internal Control, Audit Working Papers , Audit Files, Permanent and Current Audit Files, Ownership and Custody of Working Papers, Elements of Internal Control, Evaluation of Internal Control System, Internal Control Questionnaires, Internal Check List, Test of Control, Concept of Internal Audit.

UNIT- III Audit of Impersonal Hedger: Capital Expenditures, Deferred Revenue Expenditure, Revenue Expenditure, Outstanding Expenses and Incomes, Repairs and Renewals, Distinction Between Reserves and Provisions, Implications of Change on the Basis of Accounting.

UNIT - IV Audit Reports ; Qualification , Notes on Accounts, Distinction Between Notes and Qualifications, Detailed Observations by the Statutory Auditor to the Management vis-avis Obligations of reporting to members, Special Reports on offer Documents.

UNIT-V Government Audit : Constitutional Framework in India, Comptroller and Auditor General of India (Duties, Power and Conditions of Service) Act1971, Audit Procedures adopted by CAG; Audit of public Sector Undertakings- Audit of Commercial Accounts, Auditor of Government Companies, Audit report of CAG on Accounts of Union or State or Central Govt.

References –

- 1) Saxena R. G.- Principles and Practice of Auditing, Himalaya Publishing House
- 2) Gupta Kamal – Contemporary Auditing – Tata McGraw Books
- 3) Emite Woset et al – Advanced Auditing and Investigation-McDonald & Evans, UK
- 4) Emile Woolf – Auditing Today- Prentice Hall

MCEB - 312 **Merchant Banking and Financial Services**(Credit - 4)

Objective

To know conceptual, functional, and regulatory aspects of India Capital Market and Merchant Banking activities.

Course Inputs

UNIT I Indian Financial System & Financial Services: Introduction to Indian Financial system and Securities Market, Market Structure; Market Participants; Financial Instruments; Regulations.

UNIT II Capital Market Operations: New Issues Market and Development, Growth of Stock Market operations in India; Organization and Functioning of Regional Stock Exchange, National Stock Exchange and OTCEI; Trading and Settlement mechanism.

UNIT III Growth of Merchant Banking in India & Issue Management; Meaning, nature, role and functions, regulations; Project Appraisal and Management; Pre-issue and Post-issue management.

UNIT IV Marketing of Financial Services: Depository Services, Credit Rating, Housing Finance, Credit Cards, Mutual Fund.

UNIT V Assets Financial Services: Leasing and Hire Purchase; Factoring, Forfating and Bills Discounting.

References:

1. Fabozzi. F.J., "Capital Market", prentice Hall of India, New Delhi.
2. Femando, A.C., "Indian Financial System", Pearson education, New Delhi.
3. Mishkin, Eakins., "Financial Markets & Institutions", Pearson", Pearson education, New Delhi.
4. Fabozl. F.J., "Foundations of Financial Markets and Institutions".pearson education, New Delhi.
5. Khan, M.Y., "Indian Financial System", TataMc-Graw Hills, New Delhi.
6. Srivastava, R.M., and Nigam, D. "management of Indian Financial institutions", Himalayan Publishing House, New Delhi.
7. Pathak, "Indian Financial System", Pearson education, New Delhi.
8. Desai, "Merchant Banking", Himalayan Publishing House, New Delhi
9. Abdhani, V., "Marketing of Financial Service", Himalayan Publishing House, New Delhi.
10. Machraju, "Merchant Banking and Financial Services," Willey Eastern Publication, New Delhi.
11. Indian Institute of Bankers, "Merchant Banking", Mac millan, New Delhi,
12. Ravichandran K. – Merchant Banking- Financial Services – Himalaya Publishing House, New Delhi.

Objective

To provide a theoretical and practical understanding of the issues involved in international finance from the perspective of a company engaged in international trading.

Course Inputs

UNIT I Forex Market: Structure, Exchange Rates, Player, Types of transactions – Risks in Forex Market – problem of market Imperfection and MNC's – International Monetary System – The concept of Balance of Payment – Challenges in International Finance.

UNIT II Types of Forex Market: Spot and Forward. Currency options and currency futures – Hedging with currency options and futures, International parity relationship.

UNIT III Management of Forex Exposure: Transaction Exposure, Operating/Economic Exposure, Accounting/Transaction exposure.

UNIT IV International Financial Market: Equity Market, Bond Market, International Financing Decisions – Cost of capital, Debt vs. Equity Decisions.

UNIT V Financing International Trade: Letter of Credit, Bill of Lading, Govt. Programmes to Finance International trade – Counter trade – Forms of counter trade.

References:

1. IAN.H.Giddy "Global Financial Markets" (AITBS Publishers and Distributors (1997) New Delhi).
2. P.G. Apte "International Financial Management" (Tata McGraw Hill, New Delhi, 1995).
3. Solink B.H."International Investment" (Addisonwesley publishing Co. Rending Mass).
4. Rajaram S."Forex Guide to Traders and Bankers" (R.Rajaram Madras).
5. Alan, C.Shapiro,"Multinational Financial Management" IAllyn and Bacon Inc,Boston).
6. Jain, Peyrand & Yadav" International Financial Management" (McMillan India Ltd.)

Course Inputs

Unit-I **Meaning and Definition of Investments, Security Portfolios, Returns and Risks** – Risk Elements, Measurement of Risk, Capital Assets Pricing Model, Arbitrage Pricing Theory.

Unit-II **Security Pricing** – Factors Influencing Valuation, Constant Growth Model, Capitalisation of Dividends, Security Pricing Models, Dividend Discounting Methods, P/E Ratio Model and Graham's Approach, Valuation of Securities in India.

Unit-III **Trading in Securities** : -Meaning and Characteristics of Options, Types of Options and Advantage of Derivative Markets – Speculation & hedging.

Futures Trading – Futures and Options, Index Futures, Valuation of Index Futures, Arbitrage Trading & Hedging- derivative trading in Securities.

Unit-IV **Analysis of Securities** : - Fundamentals Analysis, Technical Analysis and Efficient Market Theory.

Unit-V **Portfolio Management:-** What is a Portfolio, Risk and Return in Portfolio Theory, Risk Return analysis- Return on Portfolio, Risk on a Portfolio, Expected Returns, Concept of Alpha, Beta, Correlation Coefficient, Regression Equation- Basics of Portfolio Analysis in India- Markowitz Model, Modern Portfolio Theory- Portfolio Management in Mutual Funds.

References-

1. Avadhani V.A. "Securities Analysis & Portfolio Management", Himalaya Publishing House, Mumbai.
2. Singhi Preeti, "Investment Management", Himalaya Publishing House, Mumbai.
3. Sudhindra Bhat, "Securities Analysis & Portfolio Management", Excel Books, Mumbai.
4. Prasanna Chandra, "Investment Analysis and Portfolio Management", Tata McGraw Hill, India.
5. Fischer Jordan, "Securities Analysis & Portfolio Management", Pearson
6. Avadhani V.A. "Investment Management", Himalaya Publishing House, .

Objective

The objective of this paper is to get the students conceptually clarified and getting them being acquainted with applications of the marketing concepts and strategies to services.

Course Inputs

UNIT I Introduction to Services: Meaning, definition, features and classification of services, Products Vs. Services; Service Sectors and Economic development, Evolution & Growth of Service sector in India; Services Marketing Elements; Services Marketing Triangle;

UNIT II Services Marketing Planning: GAP Model; Services Marketing Management Process, Service Marketing Research; Service Marketing Planning, Market Segmentation (STP) and positioning; Consumer Behavior, Customer Expectations, and Perception; Managing Demand of Services; Service Encounter Management; Strategic Services Marketing and development Service Competitive Advantage (SCA).

UNIT III Services Marketing Strategies: Gap Model and Service Quality Management; Service Expectations and Service Product Planning, Blue Printing and Interactive Marketing; Pricing of Services; Customer Education and Promotion of Services; Service Location and Placement of Services; Internal and External Marketing.

UNIT IV Customer Relationship Management: Managing People, Process and Physical Evidence; Basics of Customer Relationship Management- Understanding Customers expectations, Perceptions and Building Customers Relationship. Services Recovery and Managing Customer Waiting lines and Reservations..

UNIT V Marketing of Services in India: Financial services, Tourism Services, Education and Professional Services, Health services and I.T. & Communication services.

References:

1. Lovelock, C., "Services Marketing, Pearson Education Inc, New Delhi,
2. Zethimal, V.A., and Bitner, M.J., "Services Marketing ". Tata MacGraw Hill, New Delhi.
3. Shajahan, S., "Services Marketing", Himalayan Publishing House, New Delhi.
4. Rao, R., "Services Marketing", Pearson Education Inc, New Delhi.
5. Jha, S.M., "Services Marketing", Himalayan Publishing House, New Delhi.
6. Shanker, Ravi. "Services Marketing ", Excell Book, New Delhi.
7. Apte, G., "Services Marketing", Oxfoed Publication, New Delhi.
8. Dyche, Jill., "The CRM Hand Book", Pearson Education Inc, New Delhi.
9. Mukharjee, Kaushik., "Customer Relationship Management", PHI Publication, New Delhi.
10. Balaji, B., "Services Marketing and Management", S.Chand & Company Ltd, New Delhi.
11. Mohamed, H.P., "CUSTOMER RELATIONSHIP MANAGEMENT", Vikas Publishing House, New Delhi.
12. Jha, S.M., "SOCIAL MARKETING", Himalayan Publishing House, New Delhi.

Objective

The objective of this course is to facilitate understanding of the conceptual framework of retail management and its applications in decision making under various environmental constraints.

Course Inputs:

UNIT I Introduction: Basic on Retailing; Meaning, Importance, Recent Trends Types, Opportunities, Ret. MgF. Decision Process; Retail Organizations; Retail Customers; Retailing in India; Retail Philosophies & Theories, Retailing; Marketing (Gilbert Book); Retail Marketing – Mi (II)

UNIT II Retailing Management Decisions: Retail Market Segmentation and Location Study, Understanding, Retail Customers Buying Behaviors; Retail Marketing; Strategy, Retail Locations and Site Selection; Financial Strategy; Management of Services and Quality in retailing.

UNIT III Product and Pricing Strategies Management IN Retailing: Product and Merchandise Management, Buying Systems, Buying Merchandise Pricing Strategies.

UNIT IV Retail Promotion: Store Management, Relationship Marketing: Atmosphere and Retail Stores Management; Organization- Miq; Store Layout and Management International Retailing; Customer Servicing Retail Customers; Retail Operations; Consumerism and Ethics in Retailing.

UNIT V Supply Chin Management: Introduction, Demand Management, Operation Management, Procure Management, Logistic Management. Information Technology, Performance measurement & Control; Information System and Supply Chain Management; Retail Management Information Systems; Application of IT in Retail Marketing; Challenges, Solutions, Operations, Planning, Designing; Understanding and Improving S.Chains and Supply Chain Processes; Internal Integration Managing Information Flows within the Organizations; Financial Impact of SCM; Customers/Supplier Integration and New Product Day;
Introduction and Basics of Supply Chain: Meaning Supply Chain Performance and Scope, Designing the Supply Chain Network Sourcing, Transporting and Technology in Supply Chain.

References:

1. Chitan Bajaj, Rajnish Tal, Nidhi Srivastava: Retail Management.
2. Michael Levy, Barton A Weitz, Tata Mc Graw Hill.
3. Swapna Pradhan, Tata Mc Graw Hill; Retail Management.
4. Barry Burman, J.E.Evans, Pearson: Retail Management.
5. David Gilbert, Pearson; Retail Management.
6. David A. Taylor, Pearson: Supply Chain.
7. Rahul V.Altekar, PHI: Supply Chain Management Sunil Chopra, Peter Meinal:
8. R.B.Handfield, E.L.Nichols: Supply Chain Redesign
9. Sunil Chopra, Peter Meinal: Supply Chain Management
10. J.R.Ogdon, D.T.Ogden, Biztantra Pub: Integrted Retail Management.

Course Inputs

UNIT -I Introduction to marketing, Customer Services and Customer Relationship Management :- Basics of CRM; Customer Values & Customer Satisfaction; CRM & Sales Cycle : Cost of Acquiring Customer; CRM in Marketing; CRM & Customer Services; The of CRM; Building CRM; Types of CRM

UNIT-II Management of CRM :-CRM Objectives, Planning Strategy & Building Blocks; Tools of CRM; CRM Success; CRM Business Plan; CRM Functionality;; Technological Requirements; CRM Process; CRM Complementation.

UNIT-III CRM Implementation:- Safeguarding CRM Failure, Pre-Implementation & Implementation ; CRM Development Team ; CRM Saboteurs ; CRM Roadblocks ; CRM Challenges.

UNIT-IV E-CRM : Basic , Benefits, Praceolure, CRM in Internet, Factors in e-CRM; Analytical CRM; CRM in e-Business ; Integration of CRM with ERP System, with Data Warehouse, With call Centres; Sales Force Automation.

UNIT-V CRM in Practice – Manufacturing Banking Insurance, Airlines, Hotels, Telecom, SMB Segment, HRM in CRM.

References:-

1. Anton Dr. Jone, Kalia Dr. Shalini Petouh off- Natalie I. "CRM: The Bottamline to Optimizing your ROI", Pearson Publication, New Delhi.
1. Mukherjee Kaushik, CRM- A Strategic Approach, PHI, New Delhi, 2007.
2. Dyche, Jill The CRM Handbook – "A Business Guide to CRM". Pearson Publication, New Delhi.
3. Mohamed, H. P. and Sagadevon, A., "CRM – A step by step Approach". Vikash Publication, New Delhi.
4. Bhat, Govind K. "CRM", Himalayan Publishing House, New Delhi.

Objective

The objective of the course is to help students understand the conceptual framework of international business and thereof make financial decisions.

Course Inputs

UNIT I Nature of International Business: Relevance of International Business, Process of Internationalization, Collaborative Strategies, Strategies For International Business. Barriers to trade- Tariff and Non-Tariff, Triad and International Business.

UNIT II International Environment: Economic Environment: Economic System, Structure, FDI, Free Trade, Competition, Privatization, Deregulation, Cultural Environment, Political & Legal Environment.

UNIT III Export Import Strategies: Export Challenges, Choice of Entry Mode, Factors Favoring Export, Stages of Export, Pitfalls, Selection of market, Export intermediaries, Key Export Documents, Import Strategies, Import documentation, Third Party intermediaries- Direct selling. Direct Exporting, Indirect selling, Export management and Trading companies.

UNIT VI International Trade Theories: comparative Cost Theory, Theories of Specialisation. Theory of Country size, Factor Proportion Theory, Product Life Cycle Theory, Country similarities Theory.

UNIT V Financing of Foreign Trade and Institutional infrastructure: Financing of Operation, Management of Foreign Exchange Risk, Settlement of International Transaction, Uses of Bills of Exchange, Forfaiting, Letter of Credit & Settlement, Factoring, IMF, World Bank, UNCTAD.

References:

1. International Business- Daniels, Radebaugh & Sullivan, Pearson Education
2. International Business- Rugman & Hodgetts, Pearson Education
3. International Business- Bennett, Pearson
4. International Business Environment- Cherunijam, Himalaya
5. International business- Sharan
6. Justin, P., International Business, PHI
7. Cherunillam, International Business, PHI.

Objective

To provide a theoretical and practical understanding of the issues involved in international from the prospective of a company engaged in international trading.

Course Inputs

UNIT I Forex Market: structure, Exchange Rates, Player, Types of Transactions –Risks in Forex Market –Problem Of Market imperfection and MNC's –International Monetary System; The concept of Balance of Payment –Challenges in International Finance.

UNIT II Types of Forex Market: Spot and Forward. Currency options and Currency Futures –Hedging With currency options and futures, International parity relationship.

UNIT III Management Of Forex Exposure: Transaction Exposure, Operating /Economic Exposure ,Accounting/Transaction Exposure.

UNIT IV International Financial Market: Equity Market, Bond Market, International Financing Decisions-Cost of Capital, Debt vs Equity Decisions.

UNIT V Financing International Trade: Letter of Credit, Bill of Lading, Govt. Programmes to Finance International trade-Counter trade-Forms of counter trade.

References:

1. Apte ,p g: International Financial Management, Tata McGraw Hill, New Delhi.
2. Buckley, Adrian: Multinational Finance , Prentice Hall, New Delhi.
3. Eitman D.K and A.I Stonehill, Eitman, Multinational Business Cash Finance, Addition Wesley New York.
4. Sharan V., International Financial Management PHI, New Delhi.
5. Clark, E., International Finance, Thomson.
6. Henning C.N.,W Piggot and W.H. scolt; International financial Management , McGraw Hill, International Edition.
7. Levi, Maurice D; International Finance, McGraw Hill, International Edition.
8. Rodriquefe R.M. and E.E. Carter: International Financial management, Prentice Hall, International Edition.
9. Shaprio Alan C: Multinational Financial Management, Prentice Hall, New Delhi.
10. Yadav S., P.K.Jain and Max P., foreign Exchange Markets, Macmillan, New Delhi.
11. Zeneff D. and J Zwick: International Financial Management, Prentice Hall, International Edition.
12. O, Connor DJ, Bueso At: International Dimensions of Financial Management; Macmillan, New Delhi.
13. Plibeam Keith: International Finance: MacMillan Press, Hong Kong.
14. Melvin "International Money and Finance "Pearson, New Delhi.

Course Inputs

UNIT-I Introduction :- Corporate Growth Strategies and Types of Projects, Major features of the manufacturing and source projects, Importance of project risk management, Project risk management process, Planning project risk management , Importance.

UNIT – II Identifying Project Scope Risk :- Sources of Scope Risk, Risk levels, Assessment tools, Documenting the risk.

Identifying Project Schedule Risk :- Sources of schedule risk, Estimating activity duration, Activity sequencing, Documenting the schedule risk.

UNIT-III Identifying Project Resource Risk :- Source of resource risk, Resource planning outsourcing, Cost estimation and budgeting, Documenting the project resource risk.

Managing the Project Constraints & Documenting Risk :- Analysing constraints, Managing opportunities, Scope medication, Resource modification, Assessing options & updating plans, Seeking missing risks.

UNIT-IV Quantifying and Analysing Activity Risk:- Quantitative and qualitative risk analysis, Risk probability, Risk impact, Qualitative & quantitative risk assessment.

Managing Activity Risk :- Cause analysis, Categories of risk, Risk avoidance, Risk mitigation and risk transfer , Implementing Preventive ideas, Contingency planning and risk acceptance.

UNIT – V Quantifying and Analysing Project Risk :- Project level risk, Aggregating risk response, Questionnaire & surveys, Analysis of scale, Project appraisal.

Managing Project Risk :- Project documentation, Project start up & project implementation, Specification of change management.

Monitoring & Controlling Risky Project-

Reference:

1. Patel M. Bhavesh “ Project Management” Vikash Publishing
2. Kendrick Tom “Identifying & Managing Project Risk”, PHI
3. Koster Kathrin “ Interantional Project Management” Sage Publication.
4. Bary Bentor “Project Management and Leadership Skill”, The Fair mound Press.
5. Daniel Brandon “ Project Performance Measurement” John Wiley & Sons
6. Capels Thomas M. “Financially Focussed Project Management”, J. Ross.
7. Kevin R. Callahan “ Essentials of Strategic Project Management” John Wiley & Sons
8. Chapman Chris et. El. “ managing Project Risk & Uncertainly” John Wiley & Sons.
9. Cleland David “ Project Management: Strategic Design & Implementation”. TMH
10. Cooper Dale F et. el. “ Project risk Management Guidelines : Managing risk in large Projects & Complex Procurements” John Wiley & Sons.

Objective : The purpose of this paper is to prepare a ground where the students view Entrepreneurship as a desirable and feasible career option. In particular the paper seeks to build the necessary competencies and motivation for a career in Entrepreneurship.

Course Inputs :

UNIT- I Entrepreneurship-Enterprise: Conceptual Issues, Entrepreneurship vs. Management, Roles and functions of in relation to the enterprise and in relation to the economy, Entrepreneurship is an interactive process between the individual and the environment, Small business as seedbed of Entrepreneurship. The teachers should emphasize to students the desirability as well as feasibility of a career in Entrepreneurship in the Indian scenario, Entrepreneurs competencies, Entrepreneur motivation, performance and rewards, The teachers may make use of Entrepreneurship Development Institute of India's Inventory of Entrepreneur Competencies and National Institute of Entrepreneurship and Small Business Developments training kit for arousing Entrepreneur motivation and capacity and capability building.

UNIT- II Opportunity scouting and idea generation : Role of creativity and innovation and business research. Sources of business ideas, Entrepreneur opportunities in contemporary business environment, for example opportunities in net-work marketing, franchising, business process outsourcing in the early 21 century, The students be advised to visit various product/service franchises, BPO concerns and meet up/down links in the net-work marketing.

UNIT- III The process of setting up a small business ; Preliminary screening and aspects of the detailed study of the feasibility of the business idea and financing/ non-financing support agencies to familiarize themselves with the policies/programs and procedures and the available schemes, Preparation of project report and Report on Experiential Learning of successful and unsuccessful entrepreneurs, The students may be advised to develop a structured instrument for conducting surveys of the various aspects of entrepreneur/enterprise, They may also be advised to prepare a comprehensive business plan. The desirability and feasibility of liaison with relevant funding and non-funding agencies may also be explored.

UNIT – IV Management roles and functions in a small Business: Designing and re-designing business process, location, layout, operations planning and control. Basic awareness on the issues impinging on quality, productivity and environment, Managing business growth, The pros and cons of alternative growth options: internal expansion, acquisitions and mergers, integration and diversification, Crisis in Business growth.

UNIT – V Issues in small business marketing : The concept and application of product life cycle, advertising and publicity, sales and distribution management, The idea of consortium marketing, competitive

bidding/tender marketing, negotiating with principal customers, The contemporary perspectives on Infrastructure Development, Product and Procurement Reservation, Marketing Assistance, Subsidies and other Fiscal and Monetary Incentives. National state level and grass- root level financial and non-financial institutions in support of small business development.

References

1. Brandt, Steven C., The 10 Commandments for Building a Growth Company, Third Edition, Macmillan Business Books, Delhi, 1977
2. Bhide, Amar V., The Origin and Evolution of New Business, Oxford University Press, New York, 2000.
3. Dollinger M.J., 'Entrepreneurship strategies and Resources', 3rd edition, Pearson Education, New Delhi 2006.
4. Desai, Vasant Dr. (2004) Management of small scale enterprises New Delhi: Himalaya Publishing House,
5. Taneja, Gupta, Entrepreneur Development New Venture Creation,,: 2nd ed.

MCED – 322 **PROJECT APPRAISAL & IMPLEMENTATION** (Credit - 4)

Objective

The objective of the course is to acquaint the students with the concepts, tools and techniques as well as the methods of project planning and use as the strategy in the financial management.

Course Inputs

UNIT I Project: Meaning, Lifecycle, Types of project, Scope of project, Pre- investment studies. Feasibility studies and reports, project report and its contents.

UNIT II Project Appraisal and Evaluation: Material appraisal, technical appraisal, Manpower appraisal, Marketing appraisal, Financial appraisal, Preparation of appraisal reports, techniques of methodology of appraisal.

UNIT III Estimation of Cost of Project: Financing and financial closure, Estimation of profitability and techniques of evaluation.

UNIT IV Administrative Approval: Project organization, Administration, engagement of consultants, preparation of technical specifications and contract finalization.

UNIT V Project Implementation: Scheduling and monitoring and Contract, Post completion Audit and evaluation, Capitalisation of Amount of price.

References:

1. Narendra Singh: Project Management & Contract
2. Vasant Desai: Project Management
3. Bhavesh Patel : Project Management
4. Feasibility Studies, IDBI Manuals for the Preparation of Industrial Project.

MCED – 323 ACCOUNTING & FINANCE FOR SMALL ENTREPRENEURS
(Credit - 4)

- UNIT – I** Principles of double-entry book-keeping: journal entries, cash- book, pass book, and Bank Reconciliation Statement, ledger accounts, trail balance, Preparation of final accounts: Trading and Profit and Loss Account; Balance-sheet. Brief introduction to Single-Entry system of record keeping.
- UNIT- II** Financial statement analysis techniques – Ratio analysis and Inventory Valuation and estimation.
- UNIT - III** Funds flow statement & Cash flow statement analysis, Sources of long term finance.
- UNIT- IV** Meaning, scope, aims and objectives of financial management; finance function; Sources of risk/venture such as leasing and factoring. capital, fixed capital, working capital and a basic awareness of financial services
- UNIT- V** Capital budgeting- concepts, risk analysis of capital investments, cost of capital. Capital Structure: Planning & Theories; Marginal Costing & Profit Planning; Cost volume profit Analysis,

References:

1. Maheshwari, S.N. (2001). Management Accounting and Financial Control. *Sultan Chand and Sons*, New Delhi.
2. Bhattacharya, S.K. and Dearden, J. (1996). Accounting for Management: Texts and Cases. *Vikas Publishing*, New Delhi.
3. **Bhattacharya** (2003). **Financial Accounting for Business Managers**. *Prentice Hall of India*, New Delhi.
4. **Pandey, I.M.** (2003). **Finance: A Management Guide for Managing Company Funds and Profits**. *Prentice Hall of India*, New Delhi.

FOURTH SEMESTER

MCC - 401 CORPORATE GOVERNANCE & BUSINESS ETHICS (Credit- 4)

Objective

The objective of the paper is to provide a theoretical understanding of the issues involved in corporate governance and business ethics from the perspective of a company manager engaged in welfare of the stakeholders.

Course Inputs

UNIT I Corporate Governance (CG): Meaning, Historical Perspective, Issues In CG, Theoretical basis of CG, CG Mechanism, CG Systems, Good CG.

UNIT II Landmarks in the emergence of CG: CG Committees, World Bank on CG, OECD Principles, Sarbanes- Oxley Act, 2002, Indian Committees and Guidelines, CII Initiatives.

UNIT III Agents & Institutions in CG: Rights & Privileges of Shareholders, Investors Problems & Protection, CG & other Stakeholders, Role of Regulators & Government.

UNIT IV Business Ethics: Importance & Need for Business Ethics, Unethical Behavior & Issues, Corporate Governance Ethics, Ethics in Global Business.

UNIT V Ethics and CSR: Importance & Scope of CSR, Social Responsibility & Indian Corporations, Environmental Concerns, Ethics in the Business Decisions.

Reference:

1. A.C.Femado – Corporate Governance, Pearson Education
2. L. P.Hartman – Business Ethics, Tata McGraw-Hill
3. B.H Agalgatti & S. Krishna – Business Ethics, Niraj

MCC - 402 **MANAGEMENT OF FINANCIAL INSTITUTIONS (Credit - 4)**

Objective

The objective of the present course is to provide a comprehensive knowledge to the students about the role of financial institutions in the economy and the way these institutions, specially the commercial banks manage the asset and liabilities side of the balance sheet.

Course Inputs

UNIT- I Introduction: Financial Intermediaries and their Economic functions, Efficiency and stability of the financial institutions – Role of financial regulation Measuring the efficiency of Financial intermediaries Challenges before the financial institutions

UNIT-II Management of Capital and Liabilities: Risk based Capital Standards _ Composition of bank capital – Basel norms. Bank Liabilities – Composition – Funding costs and Banking risk.

UNIT -III Management of Loans and Investments: Loan Management – Principles of sound bank lending – Credit analysis and pricing of Commercial loan, Management of Non-performing Assets.

UNIT I-V Management of Income and Liquidity: Income determination – Structure of Income and Expenditure – Allocation of Income – Determining factors of Income allocation.

UNIT- V Liquidity; Sources of liquidity – Asset vs. liability liquidity – Estimation liquidity needs and liquidity management theories – Management of Primary reserve Secondary reserve – Problems of liquidity management.

References:

1. Srivastava R.M and Nigam Divya “Management of India Financial Institution” Himalaya Publishing House>
2. Altman, Edward “Handbook of Financial Markets and Institutions “ Wiley New York
3. Fabozzi, Frank J & Franco M.G” Financial Markets and Institutions” Prentice Hall
4. Read, Edward W”Commercial Bank Management” Harper and Row New York
5. Robichek A.A Coleman A.B and Hempal G.H “Management of Financial Institutions – Notes and Cases” Dryden Press
6. Grosse H.D “Management policies of Commercial Banks” Prentice Hall Inc
7. Roland, Robinson “Financial Institutions” Richard D Irwin Inc Homewood Illinois
8. Bradley, S.P and Dnignt B.C “Management of Bank Portfolio” John Wiley and Sons Inc
9. Cooper S.K & fraser D.R “The Financial Market Place” Adison – Wisley Publishing Company
10. Levison Marc “Guide to Financial Markets” The Economists
11. Rose and fraser “ financial Institutions “ Business Publication Inc
12. Jadhav Narendra “Challenges to Indian Banking : Competition. Globalisation and Financial Markets “ Mc Millan India

Objective

The objective of this course is to provide an understanding of computers, computer operating system, and application of relevant software in managerial decision making.

Course Inputs

UNIT I Computer Hardware & Software: Computer system as Information processing system, Computer System, different types of computer systems, hardware options – CPU, input devices, output devices, storage devices, communication devices, configuration of hardware devices and their applications. Memory, Software, Different types software, Programming Languages.

UNIT II Modern Information Technology: Basic idea of Local Area Networks (LAN) and Wide Area Networks (WAN), E-mail, Internet technologies, access devices, concept of a World Wide Web and internet browsing. Multimedia.

UNIT III Introduction to Operating System: What is Operating System? Functions of Operating system, Types of Operating System. Windows, Word Processing : Introduction and working with Ms-WORD in Ms- Office, Word basic commands, Formatting-text and documents, Sorting and Tables, Working with graphics, Introduction to mail-merge.

UNIT IV Spread Sheets: Working with EXCEL- formatting, function, chart features, working with graphics in Excel, Using worksheets as database in accounting, marketing, finance and personal areas.

Presentation with Power Point: Power-Point basics, creating presentations the easy way, working with graphics in Power Point, Show time, sound effects and animation effects.

UNIT V Introduction to Accounting Packages: Company Creation, Group and Ledger Creation, Voucher Entry, Maintenance of accounting books and final accounts, financial reports generation, Practical Knowledge on Tally.

References:

1. Diennes, shells S: Microsoft Office, Professional for windows 95, Instance reference, BPB Publication, Delhi
2. Mansfield, Ron: The Compact guide to Microsoft office, BPB Publication , Delhi.

MCE - 404

CORPORATE LEGAL FRAMEWORK

(Credit - 4)

Objective

The objective of this course is to familiarize students with the relevant provisions of various laws influencing business.

Course Inputs

UNIT -I Indian Contract Act, Negotiable Instruments Act, Indian Stamp

Act

UNIT -II Workmen Compensation Act ,Consumer Protection Act, Patent

Act.

UNIT- III Indian Competition Act 2002,, Sick Industries Companies Act.

UNIT -IV FEMA – 2000, Exim-Policies. Information Technology Act,

UNIT -V Indian Companies (Amendment) Act, Trademark Act. , Copy Right Act.

References:

1. Avadhani V. A: SEBI Guidelines and Listing of Companies, Himalaya Publishing House, Delhi
2. Indian Contract Act, 1872.
3. SEBI Act 1992, Nabhi Publication, Delhi.
4. Securities (Contract and Regulation) Act, 1956.
5. Taxman's Company Act, (Latest), V.S.Datey.
6. Taxman's Masters Guide to Companies Act, 1998
7. Taxman's Mercantile Law, (Latest).
8. The Companies Act, 1956.
9. The Negotiable Instruments Act, 1881.
10. Singh, Avtar, Law Relating to Monopolies, Restrictive and Unfair Trade Practices, Eastern Book' Co.
11. Bhandari ML: Guide to Company Law Procedure- Vols I, II and III; Jain Book Agency, New Delhi.
12. Ramalya A; Guide to Companies Act; Wadhwa Publishing, Nagpur.

UNIT - I Concept, Types and motives behind corporate restructuring, Economic Rationale behind Major types of Mergers, Merger Theories. Evaluating the Success of Mergers and Acquisitions. Recent Trends and Challenges In corporate restructuring.

UNIT - II Strategic Approach to Value Creation-Competitive Strategy Vrs Diversification Strategy-Value Creation in Horizontal mergers, vertical Mergers, and Conglomerate Acquisitions-Value creation in Consolidating Fragmented Industries.

UNIT- III Deal Structuring, Valuation Financing M & A-Due Diligence, Selection of Target Company- Methods of Valuation-Paying for Acquisition-Accounting and Taxation Issues in M & A.

Unit: - IV Forms of Restructuring and Divestiture-Spin-offs, Split-ups, Target Stocks, Equity Carve-outs, Going Private and Leverage Buy Outs, Joint Ventures and Alliances, Share Repurchase, Cross Border Acquisitions.

UNIT- V Regulating Takeover Bids, -Bid Strategies and Tactics, Defenses against Takeovers, Post Acquisition Integration, Risks Associated with Mergers and Acquisitions.

REFERENCES-

1. **Jha Nisikanta** "Mergers, Acquisitions and Corporate Restructuring" Himalayan Publishing House.
2. **Weston. J.Fred & Weaver Samuel** "Mergers and Acquisitions" Tata McGraw Hill.
3. **Boeh Kevin & Beamish Paul** "Mergers and Acquisitions- Text and Cases" Sage South Asia Edition.
4. **Sudarsanam Sudi** "Creating Value from Mergers and Acquisitions- The Challengers" Pearson Education.
5. **Weston J Fred, Siu Juan & Johnson Brian** "Takeovers, Restructuring and Corporate Governance" Pearson Education.
6. **Chandrasekhar Krishnamurthy & Viswanath S.R** "Mergers, Acquisitions and Corporate Restructuring "Response Business Books.
7. **Weston J Fred, Chung S Kwang & Hoag. E Susan** "Mergers, Restructuring and Corporate Control" Prentice Hall of India.
8. **Das Bhagaban, & Rakshit** "Corporate Restructuring" Himalayan Publishing House.
9. **Sundarsanam. P. S.** "The essence of Mergers and Acquisitions" Prentice Hall of India.
10. **Shiva Ramu. S** "Corporate Growth Through Mergers and Acquisitions" Response Books.

Objectives

The objective of this paper is to make the students familiar with the basics of personal financial management, Personal Savings and Investment Plans, retirement savings plan a computation of risk & return of personal Investments.

Course Inputs:

UNIT-I Basics of Personal Financial Management : Personal Financial Planning Process, Preparation of Personal Budget, Personal Financial Statements, Personal Income Tax Planning, Case Studies on Personal Financial Planning of Individuals.

UNIT-II Personal Savings and Investments in Investment Criteria-Liquidity, Safety Financial Assets and profitability. Saving Instruments of Post Office and Banks, Investment in Shares Debentures, Corporate and Government Bonds, Mutual Funds, Chit Funds.

UNIT- III Personal Investments in Non-Financial Assets : Investment in Physical Assets – Real Estate. Gold and Silver, Risk and Return associated with Investment in Financial and Non-Financial Assets.

UNIT- IV Computation of Return and Risk of Personal Investment : Present Value and Future Value, Computation of Interest, Dividend and Capital gains on Personal Investments.

UNIT -V Retirement Savings Plan : Pension Plans : Defined Contribution plan and defined benefit plan, Provident Fund, Gratuity. Life Insurance Plans, General Insurance Plans, Reverse Mortgage Plans.

References :-

1. Personal Finance by Jack R. Kapoor, Les R. Dlabay and Robert J. Hugus, Tata McGraw –Hill Publishing Company Ltd. New delhi.
2. Financial Education By Reserve Bank of India - rbi.org
3. Personal Finance Columns in the Economic Times, The Business Lones and Financial Express Daily News Papers.
4. Information Bulletin of Post Offices, Banks , Mutual Funds, Insurance Companies.
5. Internal Sources : BSE, NSE, SEBI, RBI, IRDA, MFI etc

UNIT- I Agricultural Business Practices:- Characteristics of Agriculture

Business- Nature of Indian, Agriculture – Government policies related to agricultural Business- Problems and prospects of Agricultural Business –Agricultural Taxation policy.

UNIT- II Agricultural products and Farms Services:-Nature and

disposal of Agricultural by-products-Farm waste cost of recycling of farm waste.

UNIT- III Allied agricultural business :- Dairy Poultry – Bio –

Manures, etc WTO and its impact on agri-business Practices.

UNIT- IV HRM in Agri Business Management :-

- a) Development of Human Resource through Agricultural Training
- b) Importance of Human Resource in Agricultural
- c) H. R. M. development program for Agribusiness

UNIT-V Emerging Trends In ABM :-

- a) Agro Tourism
- b) Organic Farming
- c) Contract Farming
- d) Herbal Farming

REFERENCES-

1. Principles of Business Organisation Acharya Govekar A.R. Sheth and Co
2. Principles of Practice of Marketing Mamoria, Joshi Kitab Mahal
3. Regulated Markets W. R. Natu
4. Marketing Co-Operative Way G.S. Kamat Maharashtra state Co-op Union
5. Future Trading and Control Ram Desai
6. Bombay Money Market H.T.Y.B.A Parekh
7. Commodity Marketing and P.L. Gadgil Shubhada Sarswat, Distributive Trade Pune

UNIT – I Financial Inclusion and Economic Development,
Savings, Investment and Capital Formation

UNIT – II Dimensions of Financial Inclusions: Micro-credit,
Micro- saving and Micro-insurance

UNIT – III Financial Inclusion and Financial Literacy: Awareness
Campaign by Government

UNIT – IV Financial Regulatory and Financial Inclusion:
Government Directives, RBI Directives

UNIT – V Commercial Banks and Financial Inclusions:
Branch Expansions, Technology and Schemes

References

- 1 Financial Education By Reserve Bank of India - rbi.org
- 2 Personal Finance Columns in the Economic Times, the Business Lines and Financial Express Daily News Papers.
3. Information Bulletin of Post Offices, Banks, Mutual Funds, Insurance Companies.
4. Internal Sources: BSE, NSE, SEBI, RBI, IRDA, MFI etc.

Objective

To acquaint the students regarding the international dimensions of accounting, foreign currency translation, transactional reporting and efforts at harmonization.

Course Inputs

UNIT I International Dimensions of Accounting: Meaning, Importance & Scope of International Accounting, Internationalization of the Accounting in Select Countries.

UNIT II Foreign Currency Translation: The Need for translation, Transaction of Foreign Currency, Financial Statement- Forward Exchange Contracts.

UNIT III International Dimensions of Financial Reporting: Transactional Reporting, Reporting Practices, Consolidation of Financial statements.

UNIT IV Harmonization of Accounting Practices: The Need for Harmonisation, Methods of achieving Harmonisation, Impediments to Harmonisation, The Harmonisation Process at work; Regional and Global Harmonisation, International accounting standards, Indian accounting standards.

UNIT V Analysis of Foreign Financial Statement: Techniques of Financial Statement Analysis, Analysing global financial statements. Evaluation of Performance.

References:

1. Shirin Rathore; "International Accounting " PHI
2. A.K. Basu; "International Accounting Harmonisation" University of Calcutta.
3. B.Banerjee; "Contemporary Issues in Accounting Research " IAA Research Foundation.
4. Meigs & Meigs ; "Accounting : The Basis for Business Decisions" McGraw Hills.
5. Belverd e, Needles Jr. " Financial Accounting". Pub. Houghton & Middlin.

MCEA – 410 ACCOUNTING STANDARDS AND CORPORATE REPORTING
(Credit - 4)

Objective

To provide an understanding of the accounting standards of ASB and IASB, and to study the corporate reporting practices in India.

Course Inputs

UNIT I Accounting Standards: Meaning and Importance, Historical development, Need for harmonization and standardization.
Accounting Standards in India: Objectives, Process of Standard Setting.

IASB & IFRS: International Accounting Standards.

UNIT II Brief idea: About first fifteen accounting standards developed by ASB. (Special emphasis on AS- 1, 2, 3, 6, 10 and 14)

UNIT III Brief idea: About other Accounting Standards, Developed by ASB. (Special emphasis on AS- 17, 18, 20, 25 and 28)

UNIT IV Corporate Disclosure: Statutory and Non-Statutory, Modern Trends in Corporate disclosure.

UNIT V Project Work in Accountancy/ Case Studies

References:

1. N. Das gupta: Accounting Standards: Indian International, Sultan Chand
2. L.S.Porwal: Accounting Theory, Tata McGraw
3. S. Rathore: International Accounting, Tata McGraw
4. E.R.Brown Lee II, K.R.Ferris & M.E.Haskins: Corporate Financial Reporting, Irwin
5. D.S.Rowat: Students' Guide to Accounting Standards, Taxman
6. A.K.Basu (University of Calcutta): International Accounting Harmonisation.
7. Jawahar Lal: Corporate Financial Reporting, Taxman.

MCEA – 411 ACCOUNTING FOR NPOs (Credit - 4)

Course Inputs

UNIT- I Accounting Language & Information System: Generally Accepted Accounting Principles (GAAP), Methods of Accounting; Cash & Accrual.

UNIT- II Books of Accounts: Cash Book & Bank Account, Bank Reconciliation Statement.

UNIT – III Types of Assets: Depreciation, Grants & Donations, Expenditures.

UNIT - IV Final Accounts: Receipt & Payments A/C, Income & Expenditure A/c, Balance Sheet

UNIT - V Financial Statement Analysis & Reporting, Audit Reports

References:

1. Finance & Legal Handbook for NPOs – CA Manoj Fogla, FMSF, 2012.
2. Financial Accounting – Prof. Jawaharlal –Himalaya Publishing House P Ltd
3. 2-Shankarnarayana-Financial Accounting.(Cengage Learning)
4. 3-Bruns-Financial Reporting and Management Accounting(Cengage Learning)
5. 4-Stice-Financial Accounting reporting and analysis.(Cengage Learning)

Objective

The objective of this course is to help students understand various in security analysis & portfolio management.

Course Inputs

UNIT I Investments: Nature and scope of investment analysis, element of investment, avenues of investment.

Security Markets: Primary and secondary market; Primary market- role functions and methods of selling securities in primary market.

Secondary Market: Role, importance, type of brokers, trading mechanism, listing of securities in stock exchange, Depository- role and need.

UNIT II Fundamental Analysis: Trends, indicators, indices and moving averages applied in technical analysis.

Technical Analysis: Trends, indicators, indices and moving averages applied in technical analysis.

UNIT III Efficient Market Hypothesis: Weak, semi-strong and strong market and its testing techniques.

UNIT IV Portfolio Analysis: Estimating rate of return and standard deviation of portfolio. Effect of combining the securities; Markowitz Risk-return optimization; single Index Model or Market Model; Portfolio total risk, portfolio market risk simple Sharpe's optimization solution.

UNIT V Capital Market Theory: Capital market line, Security market line, risk free lending and borrowings; factor Models; Arbitrage pricing theory, two factor and multi factor models.

Portfolio Performance Evaluation: Measure of return, risk adjusted measures of return, market timing, evaluation criteria and procedures.

References:

1. Amling; fundamentals of Investment Analysis, Pearson Education, Delhi
2. Bhalls: Investment Analysis, S.Chand & Co. Delhi.
3. Chandratre K.R.: Capital Issue, SEBI & Listing, Bharat Publishing House, New Delhi.
4. Clark James Fransis, Investment – analysis and management, McGraw Hill, International Edition.
5. Donal e. fisher and Ronal J. Jordan: Security Analysis and Portfolio management. PH. New Delhi.
6. Fabozzi Frank J: investment Management, Pearson Education, Delhi
7. Gupta L.C: Stock Exchange Trading in India; Society for Capital Market Research and Development, Delhi .
8. Machi Raju, H.R: Merchant banking; Wiley eastern Ltd., New Delhi
9. Machi Raju, H.R.; Working of Stock Exchanges in India; Wiley eastern Ltd., New Delhi.
10. Sharpe Willam F., Gordon J Alexander and J.V.Bailly: Investments, Pearson Education, Delhi
11. Sharpe William F: Portfolio Theory and Capital Markets; McGraw Hill, NY.

Objective

This course will familiarize the students in the application of various tools and techniques of financial risk management.

Course Inputs

UNIT I Risk: Definition, types of Risk, Process of Risk Management, The tools of risk Management.

Derivatives: Definition and Evolution of derivatives, Derivatives Markets, Types of Derivatives, Derivatives in India.

UNIT II Futures Market: Functions of futures market, Speculation and hedging, Price spread and hedging, futures and price stabilization, tests of efficiency, Financial futures as a mechanism of risk transference, spot and futures prices.

UNIT III Financial Futures: Interest Rate futures, Currency Futures, (Foreign Exchange) Stock index futures and Financial Futures in India. Risk Management with Futures, Cost of Carry Model, Index Arbitrage, Purchasing Power Parity Theorem.

UNIT IV Options: Terminology and methodology of trading, Types of Options, Option pricing, Swaps, types of Swaps, Swap Valuation, and other derivatives, Speculation with options, Risk management with options & futures.

UNIT V Regulatory Framework of Futures & Derivatives: Regulatory bodies in Major international Markets, Regulatory framework in India, regulatory instruments and needs, Accounting for derivative transactions.

References:

1. John C.Hill : Options, Futures & other derivatives, Pearsons.
2. T.V. Somanathan, Derivatives, Tata McGraw Hill.
3. Redhead, Financial Derivatives, Prentice Hall.
4. Lasys Walter, Lexinton, Speculation, Hedge and Commodity Price Forecasting.
5. Miller, H., Financial Innovation and Markets.
6. Hill J. and T. Schneelesis, Risk reduction and Potential of Financial Futures.

Course Inputs

UNIT –I Banking Regulation Act, 1949:- Provisions relating to: Definition (Sec -5) Functions of banking companies (Sec -6), Restrictions on business of banking companies (Sec -8, 19 and 20) ,Powers of the RBI (Sec -21, 35 and 36 to 36 AD), Winding up of a banking company (Part III and III-A of the Act), Applicability of the act to cooperative banks (Sec- 56).

UNIT-II The Reserve Bank of India Act, 1934 :-Provisions relating Incorporation, Capital management and Business (Sec 3 to 19),Central Banking functions ((Sec -20 to 45):Regulatory and Supervisory, Collection and furnishing of credit information (45 A to 45 G) Penalties, (Sec 58 B to 58 -G), Changing role of the RBI.

UNIT- III Securities & Exchange Board of India (SEBI):- SEBI Act 1992 – Powers & Functions – Collectives, Investment scheme – Registration of intermediaries-Finance, Accounts & Audit of SEBI- Penalties for failure default, Inside trading & Non-disclosure of Acquisition of shares & Takeovers- securities Appellate Tribunals

UNIT – IV Insurance Regulatory and Development Authority (IRDA), IRDA Act, 1999, Establishment and incorporation of authority and duties, powers and functions of authority

**UNIT- V Pension Fund Regulatory and Development Authority Act, 2003(PFRDA)
Forward Market Commission in India (FMC)**

References

1. Tannan's 'Banking', Law and Practice in India Banking
2. P.N. Varshney, Banking: Law and Practice
3. Justin Paul and Padmalatha Suresh: Management of Banking and Financial Services
4. All relevant and recent Bare Acts
5. Indian Institute of Bankers: Laws and Practices relating to banking
6. All journals published by Indian Institute of Banking and Finance
7. Reserve Bank of India functions and working (latest edn.) R.B.I.
8. Monetary Economics for India, Dr. Narendra Jadhav
9. Central Banking for emerging market economies, A. Vasudevan
10. Monetary and financial sector reforms in India : A central banker's perspective, Dr. Y.V. Reddy
11. Indian economy : Essays on money and finance, Dr. C. Rangarajan.
12. Annual Report on Trend and Progress of Banking in India. Reserve Bank of India Bulletin

MCEC - 415 PRODUCT PLANNING AND SALES FORCE MANAGEMNT
(Credit - 4)

Objective

The objective of the course is to acquaint the students with the concepts, tools and techniques as well as the methods of project planning and use as the strategy in the financial management.

Course Inputs

UNIT I Project: Meaning, Lifecycle, Types of project, Scope of project, Pre- investment studies. Feasibility studies and reports, project report and its contents.

UNIT II Project Appraisal and Evaluation: Material appraisal, technical appraisal, Manpower appraisal, Marketing appraisal, Financial appraisal, Preparation of appraisal reports, techniques of methodology of appraisal.

UNIT III Estimation of Cost of Project: Financing and financial closure, Estimation of profitability and techniques of evaluation.

UNIT IV Administrative Approval: Project organization, Administration, engagement of consultants, preparation of technical specifications and contract finalization.

UNIT V Project Implementation: Scheduling and monitoring and Contract, Post emplitia Audit and evaluation, Capitalisation of Amount of price.

References:

1. Narendra Singh: Project Management & Contract
2. Vasant Desai: Project Management
3. Bhavesh Patel : Project Management
4. Feasibility Studies, IDBI Manuals for the Preparation of Industrial Project.

Objective

The objective of this course is to expose students to the conceptual framework of international marketing management.

Course Inputs

UNIT I Introduction to International Marketing: Nature significance; Scope of international marketing; International market orientation framework and EPRG Model. International market entry strategies: Export entry and Non-export entry modes, Bases of International Marketing **International Marketing Environment:** International Marketing Environment; External environment-geographical, demographic, economic, socio-cultural, political and legal environment; Impact of environment on international marketing decisions.

UNIT II Foreign Marketing Selection: Global market segmentation; Selection of Export markets; International positioning **International Marketing Planning, Organising and Control:** Issues in international marketing planning; International marketing information system; Organising and controlling; International marketing operations.

Product Decisions: Product planning for global markets; New product development; Management of international brands; Packing and labeling; Provision of sales related services.

UNIT III Pricing Decisions: Objectives, Factors, Methods and Strategies of Pricing; Financing and Methods of Payment.
Promotion Decisions: Promotional practices in international Marketing, personal selling, sales promotion and public relations, Promotion and Marketing Communication

UNIT IV Distribution Channels and Logistics: Functions and types of channels; Channel selection decisions; Selection of foreign distributors/agents and managing relations with them; International logistics decisions, Organization of International Marketing Activities, Supply Chain Management (SCM)

UNIT V Emerging Issues and Developments in International Marketing: Ethical and social issues; international marketing of services; Information technology and international marketing; Impact of globalization; WTO and Development of International Marketing.

References:

1. Czinkota, M.R: International Marketing, Dryden Press, Boston.
2. Fayerweather, John: John: International Marketing, Prentice Hall, New Delhi.
3. Jain, S.C: International Marketing, CBS Publications, New Delhi.
4. Keegan, Warren J.; Global Marketing Management, Prentice Hall, New Delhi.
5. Onkvisit, Sak and John J. Shaw: International Marketing: Analysis and Strategy, Prentice Hall, New Delhi.
6. Paliwoda, S.J (ed): International Marketing Reader, Routledge, London.
7. Pallwoda, Stanley J.: The Essence of International Marketing, Prentice Hall, New Delhi
8. Sarathy, R and V Terpatra: International Marketing, Dryden Press. Boston.
9. Vasudeva P.K., International Marketing: Excel Books, New Delhi.
10. Gerald Albaum and Edwin Duerr- International Marketing and Export Management, Pearsons

Publication
New delhi

UNIT- I Basics of Product : Meaning, Importance, product Classification, Product –mix, Product Strategy, Product Planning, Product Life Cycle and Marketing, marketing Environment, product and Brand Management, Product Market Strategies for Leaders/Challenges,

UNIT – II New Product Development, Product Positioning Strategies, Packaging Management, Creative Spark, Concept Testing and Test Marketing.

UNIT- III Issues & Concept of Branding :- Meaning, Significance, Function, Creating a Brand, Brand Building, Branding Decision, Anatomy of Brands, Types of Brands, Re-branding, Logo-Changes, Brand Re-launch, Repositioning, Brand Culture, Brand Rituals, Brand and Consumer Psychology,

UNIT- IV Brand Building, Brand Equity, Brand Extension, Global Brands, Brand Placement , Product and Brand Failures, Consumer Protection, Marketing Organisations, Leveraging Plants, Brand Personality, Brand Extensions, Service brands;

UNIT – V Positioning :- Perceptual space and Positioning, Positioning relating to Product Class, Consumer Segmentation, Perceptual Mapping, Brand Benefits and Attributes, Positioning S, Advertising and Positioning Brand, Celebrity Endorsement

References :-

- 1) Chunawalla, S. A., “ Product Management”, Himalaya Publishing House, New Delhi.
- 2) Rao, K. Venugopal, “ Product and Brand Management- Text and Cases”, Himalaya Publishing House, New Delhi
- 3) Sengupta, Subrato : “Brand Positioning”, Tata Mc Graw Hill Publishing House, New Delhi.
- 4) Gupta S. L. , “Brand Management- Text & Cases”, Himalaya Publishing, New Delhi.
- 5) Chunawalla, S. A., “Compendium of Brand Management”, Himalaya Publishing House, New Delhi

Objective

To acquaint the students regarding the international dimensions of accounting, foreign currency translation, transactional reporting and efforts at harmonization.

Course Inputs

UNIT I International Dimensions of Accounting: Meaning, Importance & Scope of International Accounting, Internationalization of the Accounting Profession, Accounting Profession in Select Countries.

UNIT II Foreign Currency Translation: The Need for translation, Transaction of Foreign Currency, Financial Statements- Forward Exchange Contracts.

UNIT III International Dimensions of Financial Reporting: Transactional Reporting, Reporting Practices, Consolidation of Financial statements.

UNIT IV Harmonization of Accounting Practices: The Need for Harmonisation, Methods of achieving Harmonisation, Impediments to Harmonisation, The Harmonisation Process at work: Regional and Global Harmonisation, International accounting standards, Indian accounting standards.

UNIT V Analysis of Foreign Financial Statements: Techniques of Financial Statement Analysis, Analysing global financial statements. Evaluation of Performance.

Reference:

1. Shirin Rathore; "International Accounting" PHI
2. A.K.Basu; "International Accounting Harmonisation" University of Calcutta.
3. B.Banerjee; "Contemporary Issues in Accounting Research" IAA Research Foundation.
4. Meigs & maigs; "Accounting: The Basis for Business Decisions" McGraw Hills.
5. Belverd Needles Jr, "Financial Accounting". Pub. Houghton & Mifflin.

Objective

The objective of this course is to expose students to the conceptual framework of international marketing management.

Course Inputs

UNIT I Introduction to International Marketing: Nature significance; Scope of international marketing; International marketing orientation framework; International market entry strategies.

International Marketing Environment: International Marketing Environment; External environment-geographical, demographic, economic, socio-cultural, political and legal environment; Impact of environment on international marketing decisions.

UNIT II Foreign Market Selection: Global market segmentation; Selection of foreign markets; International positioning.

Product Decisions: Product planning for global markets; New product development; Management of international brands; Packing and labeling; Provision of sales related services.

UNIT III Pricing Decisions: environment Influences on pricing decisions; International pricing policies and strategies.

Promotion Decisions: Promotional practices in international Marketing, personal selling, sales promotion and public relations.

UNIT IV Distribution Channels and Logistics: Functions and types of channels; Channel selection decisions; Selection of foreign distributors/agents and managing relations with them; International logistics decisions.

International Marketing Planning, Organising and Control: Issues in international marketing planning; International marketing information system; Organising and controlling; International marketing operations.

UNIT V Emerging Issues and developments in international marketing: Ethical and social issues; international marketing of services; Information technology and International marketing; Impact of globalization; WTO;

References:

1. Czinkota, M.R; International Marketing, Dryden Press, Boston.
2. Fayerweather, John: International Marketing, Prentice Hall, New Delhi.
3. Jain, S.C: International Marketing, CBS Publications, New Delhi.
4. Keegan, Warren J: Global Management, Prentice Hall, New Delhi.
5. Onkvisit, Sak and John J.Shaw: International Marketing: Analysis and Strategy, Prentice Hall, New Delhi.
6. Paliwoda, S.J (ED) : International Marketing, Reader, Routledge, London.
7. Paliwoda, Stanley J.: The Essence of International Marketing, Prentice Hall, New Delhi.
8. Sarathy, R and V terpstra: International Marketing, Dryden Press, Boston.
9. Vsudeva P.K., International Marketing: Excel Books, New Delhi

MCED - 420 INTERNATIONAL FINANCIAL SERVICES (Credit - 4)

Objectives

- To introduce the field of international financial services to the students and provide an in depth knowledge on various financial services
- To provide an understanding of global financial environment operations of business.

UNIT - 1 Evolution of International Financial Services – its impact on Indian Financial System – Formal Financial System and Informal Financial System – International Financial Institutions – Banking Companies and Non Banking Companies – Classification of Non Banking Companies

– Classification of Activities of Non Banking Finance Companies- Fund Based Activities – Fee Based Activities – concepts, growth, current issues and trends of fee Based and Fund Based activities.

UNIT - II Introduction, Definition, Concept, Players involved in International Securitisation and its Processes, structure, Difference between Pass Through Certificate and Pass Through Securities, International Instruments of Securitisation, Developments and hurdles in Securitisation with recent trends

UNIT - III International Credit Rating and Agencies: Introduction – Concept of Credit Rating – Meaning of Credit rating – Definition, Scope – need and Importance of credit rating in developing countries – Types of credit rating – Kinds of instruments, Credit rating symbols – Credit Rating advantages and disadvantages and the reliability on its rating.

Credit rating agencies in India (CRISIL, CARE, ICRA and Fitch India) vis-a-vis Global rating agencies– Process of Credit Rating and Methodology credit rating agencies – services rendered by credit rating agencies – Solicited rating and unsolicited rating – Equity assessments us Equity grading – rating, Methodology for Financial services, Manufacturing companies, Banks and financial companies, Mutual funds, Insurance companies and IPO grading – Registration and Regulation of Credit rating agencies

UNIT - IV Overview of Global Depository Systems vs. Key features of Depository system in India – depository – legal framework – Eligibility criteria to become a global depository- Agreement between Depository and Issuers – Rights and Obligation of Depositories- Records maintained by Depository – Services of and functions of Global Depositories.

UNIT - V Core International Financial Services- Account opening- Types of Accounts – Types of Application Forms- Dematerialisation Process – Rematerialisation Process. Trading and Settlement –Off-Market Trade,

– Market Settlement-Dematerialisation of Shares

Special Services -Pledge and Hypothecation-Procedure for pledge/Hypothecation-procedure of confirmation of creation of Pledge/Hypothecations by Pledge-Closure of a Pledge/Hypothecation by Pledgor-Invocation of Pledge by Pledge Stock lending and Borrowing – Corporate actions

References:

1. Agarwala&Agarwala, Bulls Bears 7 the Mouse, Macmillan
2. Apte, P.G., International Financial Management, Tata McGraw Hill, 2006.
3. B. L. Mathur, Changing Profile of Financial Services, Bookman Associates
4. Dr. J. C. Verma, Credit Rating, Bharat Publication
5. Eitman, David K., Stonehill, Arthur, Moffet, Michael H., Multinational Business Finance, Pearson Education, 2007
6. I. M. Pandey, Venture Capital – The Indian Experience, Prentice Hall India
7. J. C. Verma, Venture Capital Financing in India, Response Books
8. J. K. Dietrich, Financial Services and Financial Institutions, Prentice Hall India
9. Journal of Financial Services

10. Journal of Investing
11. Journal of Structure Finance
12. Khan M.Y. Financial Services, Tata Mc Graw Hill

MCED - 421 ENTREPRENEURSHIP : INNOVATION AND STRATEGY
(Credit - 4)

UNIT - I Entrepreneurial Growth: Economic & Non-economic Factors, Government Policy and Actions, Entrepreneurial Development Programmes, Youth Entrepreneurship and Women Entrepreneurship.

UNIT- II Innovation: Innovative Project Identification and Selection, Project Formulation, Entrepreneur and Innovation.

UNIT- III Support : Innovative Financing, New sources of finance, Lease Financing and Hire Purchase , Institutional Support and Taxation Benefits , Outsourcing.

UNIT- IV Management : Production and Operations Management, Working Capital Management, Total Quality Management, Creative Destruction for Value Addition.

UNIT- V Strategy : Growth Strategies in Small Business, Marketing Strategies, Sickness in Small Business, Small Enterprises in International Business, E-Commerce.

References :-

1. Nanda, S. K., Lenka T. K., (Ed) Entrepreneurship : Innovations and Strategy, Himalaya Publishers.
2. Khanka, S. S., Entrepreneurial Development, S. Chand

MCED - 422 STATISTICS FOR BUSINESS DECISION MAKING (Credit - 4)

Objective :

This course shall acquaint the students with the concepts and techniques used in Statistics and enable them to apply this knowledge in business decision- making.

UNIT -I Statistics; Characteristics, functions, limitations and scope; statistics in business management; Data collection and presentation, frequency distribution and analysis

UNIT- II Measure of central tendency and dispersion, correlation and regression.

UNIT- III Basic concepts of Probability and probability distribution binomial poisson and normal

UNIT – IV Probability and non-probability sampling, sampling distribution of means and proportions, estimation.

UNIT – V Hypothesis testing of means and proportions for large and small Samples.

References:

1. **Pillai R S N and Bagavathi**, Statistics, S Chand and Co., New Delhi
2. **Sharma J K**, Business Statistics, Pearson Education
3. **Gupta S P**, Statistics, S Chand & Company, New Delhi
4. **Hooda R P**, Statistics for Business and Economic, Macmillan.

MCED - 423 ENTREPRENEURSHIP & INFORMATION TECHNOLOGY

(Credit - 4)

Objective

The objective of this course is to provide an understanding of computers, computer operating system, and application of relevant software in managerial decision making.

Course Inputs

UNIT I Computer Hardware & Software: Computer system as Information processing system, Computer System, different types of computer systems, hardware options – CPU, input devices, output devices, storage devices, communication devices, configuration of hardware devices and their applications. Memory, Software, Different types software, Programming Languages.

UNIT II Modern Information Technology: Basic idea of Local Area Networks (LAN) and Wide Area Networks (WAN), E-mail, Internet technologies, access devices, concept of a World Wide Web and internet browsing. Multimedia.

UNIT III Introduction to Operating System: What is Operating System? Functions of Operating system, Types of Operating System. Windows, Word Processing : Introduction and working with Ms-WORD in Ms- Office, Word basic commands, Formatting-text and documents, Sorting and Tables, Working with graphics, Introduction to mail-merge.

UNIT IV Spread Sheets: Working with EXCEL- formatting, function, chart features, working with graphics in Excel, Using worksheets as database in accounting, marketing, finance and personal areas.
Presentation with Power Point: Power-Point basics, creating presentations the easy way, working with graphics in Power Point, Show time, sound effects and animation effects.

UNIT V Introduction to Accounting Packages: Company Creation, Group and Ledger Creation, Voucher Entry, Maintenance of accounting books and final accounts, financial reports generation, Practical Knowledge on Tally.

References:

1. Diennes, shells S: Microsoft Office, Professional for windows 95, Instance reference, BPB Publication, Delhi
2. Mansfield, Ron: The Compact guide to Microsoft office, BPB Publication ,Delhi.

Audit
Courses

Management of Personal Finances

Objectives

The objective of this paper is to make the students familiar with the basics of personal financial management, Personal Savings and Investment Mans, retirement savings plan a computation of risk & return of personal Investments.

Course Inputs:

UNIT-I Basics of Personal Financial Management : Personal Financial Planning Process, Preparation of Personal Budget, Personal Financial Statements, Personal Income Tax Planning, Case Studies on Personal Financial Planning of Individuals.

UNIT-II Personal Savings and Investments in Investment Criteria-Liquidity, Safety Financial Assets and profitability.
Saving Instruments of Post Office and Banks, Investment in Shares Debentures, Corporate and Government Bonds, Mutual Funds, Chit Funds.

UNITt-III Personal Investments in Non-Financial Assets : Investment in Physical Assets – Real Estate. Gold and Silver, Risk and Return associated with Investment in Financial and Non-Financial Assets.

UNIT-IV Computation of Return and Risk of Personal Investment : Present Value and Future Value, Computation of Interest, Dividend and Capital gains on Personal Investments.

UNIT-V Retirement Savings Plan : Pension Plans : Defined Contribution plan and defined benefit plan, Provident Fund, Gratuity. Life Insurance Plans, General Insurance Plans, Reverse Mortgage Plans.

References :-

5. Personal Finance by Jack R. Kapoor, Les R. Dlabay and Robert J. Hugus, Tata McGraw –Hill Publishing Company Ltd. New delhi.
6. Financial Education By Reserve Bank of India - rbi.org
7. Personal Finance Columns in the Economic Times, The Business Lones and Financial Express Daily News Papers.
8. Information Bulletin of Post Offices, Banks , Mutual Funds, Insurance Companies.
9. Internal Sources : BSE, NSE, SEBI, RBI, IRDA, MFI etc

CAPITAL MARKET INSTRUMENTS

Objective

To equip the students with an opportunity to understand the role of Capital Market Instruments like Stock, Bond etc.

Course Inputs

UNIT-I Origin, Nature and Role of Capital Markets-Globalization of Capital Markets, Capital Markets in India- Stock Exchange.

UNIT-II Financial Instruments : Definition & Meaning, Classification of Financial Assets & Liabilities , Share Warrants or Options, Hedging Instruments.

UNIT-III Stocks, Bonds, Debentures – Convertible Debentures, ADR, GDR, ETFs, Units of Mutual Funds.

UNIT-IV Derivatives – Basic Features : Role of Derivative Markets, Forward and Futures, Commodity Futures, Stock Futures and Index Futures

UNIT-V Options, Stock Options and Index Options, Swaps, Currency Swaps and Interest rate Swaps.

References :

1. Financial Institutions and Markets – Bhole L. M.- TMH
2. Financial Markets – M. Y. Khan
3. Financial Derivatives – Dr. G. Kotreshwar

FINANCIAL INCLUSION

UNIT – I Financial Inclusion and Economic Development, Savings, Investment and Capital Formation

UNIT – II Dimensions of Financial Inclusions: Micro-credit, Micro-saving and Micro-insurance

UNIT – III Financial Inclusion and Financial Literacy: Awareness Campaign by Government

UNIT – IV Financial Regulatory and Financial Inclusion: Government Directives, RBI Directives

UNIT – V Commercial Banks and Financial Inclusions: Branch Expansions, Technology and Schemes

References

1. Financial Education By Reserve Bank of India - rbi.org
2. Personal Finance Columns in the Economic Times, the Business Lines and Financial Express Daily News Papers.
3. Information Bulletin of Post Offices, Banks, Mutual Funds, Insurance Companies.
4. Internal Sources: BSE, NSE, SEBI, RBI, IRDA, MFI etc

Accounting for small Business organizations

Course Inputs

UNIT- I Accounting Language & Information System Generally Accepted Accounting Principles (GAAP), Methods of Accounting; Cash & Accrual.

UNIT- II Books of Accounts : Cash Book & Bank Account, Bank Reconciliation Statement.

UNIT – III Types of Assets, Depreciation, Grants & Donations, Expenditures.

UNIT - IV Final Accounts : Receipt & Payments A/C, Income & Expenditure A/c, Balance Sheet

UNIT - V Financial Statement Analysis & Reporting, Audit Reports

References :

1. Finance & Legal Handbook for NPOs – CA Manoj Fogla, FMSF, 2012.
2. Financial Accounting – Prof. Jawaharlal –Himalaya Publishing House P Ltd
3. 2-Shankarnarayana-Financial Accounting.(Cengage Learning)
4. 3-Bruns-Financial Reporting and Management Accounting(Cengage Learning)
5. 4-Stice-Financial Accounting reporting and analysis.(Cengage Learning)

PERSONAL TAXATION & PLANNING

UNIT – I Basic Concept : Assessee, Person, Income, Connotation of income, Taxable income, tax free income, Gross total income, Assessment year, Previous year, Residential status of assessee, Basis of Charge of Income Tax.

UNIT- II Income from Salary: Income from salary- basis of charge, place of charge, component of salary, partially taxable salary, pension, gratuity, retrenchment, voluntary retirement compensation, PF, profit lieu of salary, fully exempted, salary payment,

UNIT- III Income from house property and Business or Profession: Chargeable income, deemed owner, co-owner, fair rent, annual rent. Standard rent, calculation of annual value, and net annual value for rented and self-coupled houses, deductions. Computation of Business Profits, Concept of Deemed Profits, Deductions, Valuation of Stock, Treatment of Depreciation

UNIT-IV Income from Capital Gain and Other Sources: Transfer of Capital Assets, Cost of Acquisition, STCG, LTCG, Deemed Capital Gain, Exempted Capital Gains,

UNIT – V Computation of Tax Liability and Planning: Aggregation of Income, Deduction to be made in Computing Total Income, Set-off and Carry Forward of Losses, surcharge, Difference between exemption, deduction and rebate, Tax Evasion and Tax Avoidance, Methods of Tax Planning.

Reference Book:

1. Gaur and Narang- *Income Tax Laws and Practice*- Kalyani Publishers.
2. Singhanian- *Direct Laws and Practice*- Taxman's Publication, New Delhi.
3. BhagabatiPrasad, "Direct Tax Laws & Practices".

(Credit will be assigned if the student opts to go through the examination process. But it will not be considered for CGPA (Choice Based Credit System))

Evaluation: End Term: 70 Marks

Unit Test and Quiz: 20 Marks, Assignment and Presentation: 10 Marks

Project Report: Thesis: 100 marks, Presentation & Viva-Voce: 100 marks

Minimum Total Marks= 2500

Minimum Credit Points: Core 68 + Elective 28 = 96

Mutual Fund And Portfolio Management

Objective

The objective of the course is to impart conceptual knowledge and skills relating to mutual fund and portfolio Management.

Course Input

Unit-I Portfolio : Risk & Return, Measurement & Analysis , Non –satiation and risk aversion, diversification, borrowing and lending, utility theory and indifference curves, choice of portfolio and efficient set theorem.

Unit-II Portfolio Analysis : Market Optimization, Sharpe's Optimization, Significance of Beta in the Portfolio, Investment Objectives, Process and Policies.

Unit-III CAPM : Factor Models, APT, Construction of Portfolio, Investment Strategy, Execution, Assets Pricing, Revision and Measures of Return and Performance

Unit-IV Managed Portfolio ; Investment timing, Performance Measurement and Evaluation (different techniques), Foreign Portfolio Investment in India : Issues, Trends, Policies and Techniques.

Unit-V Mutual Funds : Concepts, Origin, Types, Regulation and Operations, Risk Factors, Performance Evaluation.

References :

1. SK., Barua, V. Raghunathan and J. R. Varma : Portfolio Management, TMC
2. Elton, Edwin J. and M. J. Gruber : Modern Portfolio Theory and Investment Analysis, John Wiley & Sons.
3. Graham, Benjamin & David L. Dodd : Security Analysis, M. Graw Hill
4. V. K. Bhalla : Investment Management, S. Chand, New Delhi
5. Fischer, Donald E. Jordan : Security Analysis Portfolio Management.
6. S. Francis, Jack Clarice ; Portfolio Analysis
7. Sharpe, Alexander, Betty : Investment , Prentice Hall of India.
8. Russell J. Fuller, Farrel, Jr. Modern Investment and Security Analysis. Tata McGraw Hill
9. Lee Chang. F. Joseph : Security Analysis & Portfolio Management
10. M. Y. Khan : Indian Financial System, McGraw Hill.
11. Resort A. Strang : Portfolio Construction and Protection.

Financial Derivatives and risk Management

Objective

The Course will familiarize the students in the application of various tools and techniques of Financial Risk Management.

Course Input

Unit-I Risk : Definition, Types of risk, Process of risk Management, The Tools of Risk Management.

Derivatives : Definition and Evolution of Derivatives, Derivatives Markets, Types of Derivatives, Derivatives Market in India

Unit-II Futures Market : functions of Futures Market ,Speculation and hedging, Price, Spread and hedging, futures and price stabilization, Tests of Efficiency, Financial futures as a mechanism of risk transference, Spot and future Prices.

Unit- III Financial Futures : Interest Rate Futures , Currency Futures(Foreign Exchange) Stock Index Futures and Financial Futures in India, Risk Management with Futures, Cost of Carry Model, Index Arbitrage, Purchasing Power Parity Theorem.

Unit-IV Options : Terminology and Methodology of Trading, Types of Options, Option Pricing, Swaps, Types of Swaps, Swap Valuation, and other Derivatives, Speculation with Options, Risk Management with options & Futures.

Unit- V Regulatory Framework of Futures & Derivatives ; Regulatory bodies in Major International Markets, Regulatory framework in India, Regulatory Instruments and needs, Accounting for Derivative Transactions.

References :

1. John C. Hull : Options, Futures & Other Derivatives, Pearsons
2. T. V. Somanathan : Derivatives, Tata mc Graw Hill
3. Redhead : Financial Derivatives, Prentice Hall
4. Lasys Walter, Lexinton : Speculation, Hedg & Commodity Price Forecasting.
5. Hill J. and t. Schneelesis ; Risk Reduction, Potential of Fina ncial Futures.
6. Jarrow and Rudd. Lrwin ; Optional Pricing, Homewood, Irwin.
7. Dubofsky and Miller, derivatives : Valuation and Risk Management, Oxford University Press, New York.
8. Watsham. T., Futures and Options in Risk Management, Thompson, Asia
9. Wilmott. P., The Theory and Practice of Financial Engineering, John Wily and Sons, England.
10. Gupta. S. L., Financial Derivatives, PHI
11. Kumar, Financial Derivatives, PHI
12. Cox, J. and Rubinstein M. " Options Market" PHI
13. Tucker, A. L.: "Financial Futures, Options and Swaps", West Publishing Co, St paul Minn.

Advanced Auditing

1. Auditing concepts Basic Principles governing an audit- Relationship of auditing with other disciplines -Audit Programme-Vouching, - Verification and Valuation.

2 Auditing and Assurance Standards

Overview-Standard setting process-Role of International Auditing and Assurance Standard Board and Auditing and Assurance Standard Board in India.

3 Risk Assessments and Internal Control

Evaluation of internal control procedures; techniques including Questionnaire; flowchart; internal audit and external audit, coordination between two.

4 Audits of Limited Companies

Preliminaries to the audit of limited company-Audit of share capital Transactions, Debentures and other transactions-Audit report with special Reference to CARO 2003 *Profit and divisible profit-Dividends- Investigation under Companies Act, 1956.

5 Audit Committee and Corporate Governance

Corporate Governance: Introduction-Verification of Compliance of Corporate Governance.

Audit Committee: Constitution-Powers of Audit Committee-CEO/CFO Certification to Board-Report on Corporate Governance.

Recommended Books:

- 1) Spicer and Peglar : Practical Auditing
- 2) Kamal Gupta: Contemporary Auditing
- 3) R.C. Saxena : Auditing (Himalaya)
- 4) Basu : Auditing
- 5) Jagadish Prasad: Auditing: Principles
- 6) M.D.Paula : The Principles of Auditing
- 7) B.N. Tondon: A Handbook of Practical Auditing
- 8) The Institute of Accountants of India : Auditing assurance Standards

Sales & Sales Force Management

Unit-I Introduction to Sales Management: Meaning, Nature, Importance and Scope of Sales Management, Role of Sales in, Sales Process and Personal Selling; Selling & Sales Management; Sales Strategic Ethics in Sales Management.

Unit-II Sales Techniques and Selling Skills : Direct Marketing and Relationship Selling; Sales Channels and Industrial, Commercial, Public Authority Selling; Selling for resale and selling Services ; Sales Promotion, Public Relations, Sales Strategic ; Personal Selling Theories.

Unit-III Sales Force Management: Job analysis, Recruitment Selection; Training; Compensation and Motivation; Monitoring and Performance Evaluation; Salesmanship and sales Promotions.

Unit-IV Sales Planning: Job of Sales Manager; Sales Planning, Sales Organizations and Compensation, Sales Quota and Sales Forecasting; Territory Management.

Unit-V Sales Control – Monitoring & Performance Evaluation; Sales Control & Cost Analysis; Controlling the Sales Efforts through Sales Budgeting, Sales Quota, Sales Territories; Institutional Sales Management.

References:-

1. Spiro, R. L. Stunton, W.J. , Rich, G. A., " Management of Sales Force" , Tat McGraw Hill, new Delhi.
2. David Jobbes, and Geoff Lancaster, "Selling and Sales Management, Pearson Publications, New Delhi.
3. Chunawalla, S. A. "Sales Management", Himalaya Publishing House, Mumbai.
4. Keskar, Anil and Abhayankar, Suresh, "Sales Management and Personal Selling". Himalaya Publishing House.
5. A. Keskar, and S. Abhankar, "Sales Management and personal Selling", Himalaya Publishing House, New Delhi.
6. Khan Martin, "Sales & Distribution Management", Excel Books.
7. Gupta S. L. "Sales & Distribution Management", Excel Books.
8. Tanner Jeff, Honeycutt, Earl De, Erffmeyer, Robert C., "Sales Management", Pearson Publications, New Delhi.
9. Still, Richard R., Edward Cunoliff W., Norman Govani A. P., "Sales Management: Decision Strategy and Cases", Pearson Publication: New Delhi.

BUSINESS LANGUAGE AND COMMUNICATION SKILLS

Websites

www.tatamcgrawhill.com/digital_solutions/monippally

www.dictionary.cambridge.org

Nayagarh Autonomous College, Nayagarh (Odisha) affiliated to Utkal University, Vani Vihar,

www.wordsmith.org

ସ୍ନାତକୋତ୍ତର ଓଡ଼ିଆ ବିଭାଗ

Nayagarh Autonomous College

Nayagarh



ସ୍ନାତକୋତ୍ତର ଓଡ଼ିଆ ବିଭାଗ








ଏମ୍.ଏ. ପାଠ୍ୟକ୍ରମ

Nayagarh Autonomous College, Nayagarh

ଏମ୍.ଏ. ଓଡ଼ିଆ ପାଠ୍ୟକ୍ରମ (2019-2020)

(ନିୟମିତ ବିଦ୍ୟାର୍ଥୀଙ୍କ ପାଇଁ)

For Regular Students

 Skill Development	Two years of Four Semester Course Design Syllabus for choice based credit system
 Employability	
 Entrepreneurship	
 All the three	
 Skill Development and Employability	
 Skill Development and Entrepreneurship	
 Employability and Entrepreneurship	

COURSE STRUCTURE

01. Group- A Papers	:	CORE PAPERS (Compulsory Papers)	8 to 10
02. Group- B	:	Core Elective Papers (Special Papers)	4 to 6 Papers

03. Group – C : Allied Elective Courses. 4 to 6 Papers

(Open to students of all the Department as well as of allied disciplines)

04. Group- D : Free Elective in 3rd Semester 2to 6 Papers

(The student may pursue such a course in his own Department or in other Department)

05. Group- E : Audit Papers: (No Credit Points)

Total Papers : 18

Total Marks : 1800

Total Credit Points : 72

(Each paper: 4 Credits $4 \times 18 = 72$)

INSTRUCTION :

Each Paper : 100 Marks

• Internal Assessment : 100 Marks

• Semester Examination : 70 Marks

Total : 100 marks

FIRST SEMESTER

Group-"A"

Paper Code	CORE PAPERS-Compulsory Papers Course Name (Core Papers)	Marks	Cr
1.1	ପୁରାଣ ଓ ପ୍ରାଚୀନ କାବ୍ୟ କବିତା	100	4
1.2	ଆଧୁନିକ କାବ୍ୟ କବିତା	100	4
1.3	କଥା ସାହିତ୍ୟ 4	100	
1.4	ଗଦ୍ୟ ସାହିତ୍ୟ 4	100	

Total credit 4 x 4=16 Total Marks 100 x 400=400

SECOND SEMESTER

Group-"A"

Paper Code	Core Paper-Compulsory Papers Course Course Name (Core Paper)	Marks	Cr
2.1	ଭାଷା ବିଜ୍ଞାନ	100	4
2.2	ଓଡ଼ିଆ ସାହିତ୍ୟର ଇତିହାସ 4	100	
2.3	ଓଡ଼ିଆ ନାଟ୍ୟ ସାହିତ୍ୟ 4	100	
2.4	ତୁଳନାତ୍ମକ ସାହିତ୍ୟ ସମୀକ୍ଷାତତ୍ତ୍ୱ, ଅନୁବାଦ ସାହିତ୍ୟ	100	4

Total credit: 4 x 4 = 16 Total Marks 100 x 4 = 400

THIRD SEMESTAR

Group- "B & C"

Paper Code	Core Elective- Special Paper Course Name(Core Elective)	Mark	Cr
3.1	ଭାଷାତତ୍ତ୍ୱ- ୧	100	4
3.2	ଭାଷାତତ୍ତ୍ୱ- ୨	100	4
3.3	ରଙ୍ଗମଞ୍ଚ ଓ ନାଟ୍ୟତତ୍ତ୍ୱ *(D)	100	4
3.4	ନାଟକ ଓ ନାଟ୍ୟକାର *(D)		100
4			
3.5	ଆଧୁନିକ କାବ୍ୟ କବିତା *(D)	100	4
3.6	ଆଧୁନିକ ଗଦ୍ୟ ସାହିତ୍ୟ *(D)	100	4
3.7	ଓଡ଼ିଶାର ଧର୍ମଧାରା *(D)	100	4
3.8	ଓଡ଼ିଶାରେ ବୈଷ୍ଣବଧର୍ମ *(D)	100	4

Any Six to be opted by the students.

Total credit : 4 x 6 = 24

Total Mark

100 x 6 = 400

*D : Free Elective Papers

FOURTH SEMESTER

Group-"A & B"

Paper Code	Course Name (Core Papers)	Marks	Cr
4.1	ଲୋକ ସାହିତ୍ୟ (*D) Core Course	100	4
4.2	ଗବେଷଣା ପଦ୍ଧତି	100	4
4.3	ଗବେଷଣା ନିବନ୍ଧ ପ୍ରସ୍ତୁତି ଓ ମୌଖିକ ପରୀକ୍ଷା	200	8
4.4	ଗ୍ରନ୍ଥ ସଂପାଦନା ଓ ଆଲୋଚନା Elective Core (Any one)		

Credit= 4x2=08

Total Credit-16

Credit 8x1=08

Total Marks 400

*D: FREE ELECTIVE PAPERS

GROUP - E

Audit Course (No Credit)

1. Creative Writing (Poetry, Short Story)
2. Performing Arts (Drama)
3. Computer Application

DETAILED SYLLABUS

ସର୍ବଶେଷ ପାଠ୍ୟକ୍ରମ

1ST SEMESTER Group - A (Cort Course)

COURSE CODE - 1.1

ପୁରାଣ ଓ ପ୍ରାଚୀନ କାବ୍ୟ କବିତା

ପୂର୍ଣ୍ଣସଂଖ୍ୟା - ୨୦

ମୁନିଚ୍ - ୧ ସାରଳା ମହାଭାରତ - ସ୍ୱର୍ଗାରୋହଣ ପର୍ବ ।

ମୁନିଚ୍ - ୨ ଭାଗବତ - ଜଗନ୍ନାଥ ଦାସ - ରାସପଞ୍ଚାଧାର

ମୁନିଚ୍ - ୩ ଲାବଣ୍ୟବତୀ - ଉପେନ୍ଦ୍ର ଭଞ୍ଜ - ୧, ୫, ୨୨ ଛାନ୍ଦ

ମୁନିଚ୍ - ୪ ପ୍ରାଚୀନ କବିତା (ପ୍ରାଚୀନ-ମଧ୍ୟକାଳୀନ କବିତା . ସଂ. ଡ଼ ସନ୍ତୋଷ କୁମାର

ତ୍ରିପାଠୀ - ପ୍ରାଚୀ ସାହିତ୍ୟ ପ୍ରତିଷ୍ଠାନ)

(କେଶବ କୋଇଲି, ଗ୍ରୀଷ୍ମବର୍ଣ୍ଣନା, ଘେନାଇ ଆମ୍ଭେ ଯେତେ

କହିଲୁରେ, ରସମାନସ ରଧୁକେଶ, ସ୍ୱମୁତି ଚିନ୍ତାମଣି (୧୫ଶ ବୋଲି)

ମୁନିଚ୍ - ୫ ପ୍ରାଚୀନ ଓଡ଼ିଆ କବିତାର ସ୍ୱରୂପ

(ଚଉତିଶା, କୋଇଲି, ଭଜନ, ଜଣାଣ, ଚମ୍ପୂ)

ପ୍ରଶ୍ନ ସମ୍ପର୍କୀୟ ସୁଚନା

'କ' ବିଭାଗ (୭୦୦ ରୁ ୧୦୦୦ ଶବ୍ଦ ମଧ୍ୟରେ) ଉପରୋକ୍ତ ମୁନିଚ୍ ଗୁଡ଼ିକରୁ

୫ଟି ପ୍ରଶ୍ନ ଆସିବ । ତତ୍ତ୍ୱଧରୁ ଗାଟିର ଉତ୍ତର ଆବଶ୍ୟକ । $୧୨ \times ୩ = ୩୬$

'ଖ' ବିଭାଗ (୪୦୦ ରୁ ୫୦୦ ଶବ୍ଦ ମଧ୍ୟରେ) ଉପରୋକ୍ତ ମୁନିଚ୍ ଗୁଡ଼ିକରୁ

୫ଟି ପ୍ରଶ୍ନ ଆସିବ । ତତ୍ତ୍ୱଧରୁ ଗାଟିର ଉତ୍ତର ଆବଶ୍ୟକ । $୮ \times ୩ = ୨୪$

'ଗ' ବିଭାଗ (୧୫୦ ରୁ ୨୦୦ ଶବ୍ଦ ମଧ୍ୟରେ) ଉପରୋକ୍ତ ମୁନିଚ୍ ଗୁଡ଼ିକରୁ

୪ଟି ପ୍ରଶ୍ନ ଆସିବ । ତତ୍ତ୍ୱଧରୁ ୨ଟିର ଉତ୍ତର ଆବଶ୍ୟକ । $୫ \times ୨ = ୧୦$

COURSE CODE - 1.2

ଆଧୁନିକ କାବ୍ୟ କବିତା

ପୂର୍ବସଂଖ୍ୟା -

୭୦

ମୁନିର୍ - ୧ ମହାଯାତ୍ରା - ରାଧାନାଥ ରାୟ ।

ମୁନିର୍ --୨ ଉତ୍କଳିକା (ପ୍ରଥମ ୪ଟି କବିତା) - ରାଧାନାଥ ରାୟ ଗଡ଼ନାୟକ

ମୁନିର୍ - ୩ ଆଧୁନିକ ଓଡ଼ିଆ କବିତା - ସଂ. ପ୍ରଫେସର ସଂଘମିତ୍ରା ମିଶ୍ର

(ଆଶା, ପିତୃପକ୍ଷତର୍ପଣ, ଧରାବତରଣ, ଜହ୍ନରାତି, ଭକ୍ତୋଶ୍ରବଣ)

ମୁନିର୍ - ୪ ଆଧୁନିକ କାବ୍ୟ କବିତାର ସଂଜ୍ଞା ଓ ସ୍ୱରୂପ

(କାବ୍ୟ, ମହାକାବ୍ୟ, ଗାଥାକବିତା, ଗୀତିକବିତା)

ମୁନିର୍ - ୫ ବିଦ୍ରୋହୀ, ଶୋକଗୀତିକା, ଚତୁର୍ଦ୍ଦଶପାଦୀ କବିତା, ସମ୍ବୋଧନ ଗୀତିକା

ପ୍ରଶ୍ନ ସମ୍ପର୍କୀୟ ସୂଚନା

'କ' ବିଭାଗ (୭୦୦ ରୁ ୧୦୦୦ ଶବ୍ଦ ମଧ୍ୟରେ) ଉପରୋକ୍ତ ମୁନିର୍ ଗୁଡ଼ିକକୁ ୫ଟି ପ୍ରଶ୍ନ ଆସିବ । ତତ୍ତ୍ୱଧରୁ ଗାନ୍ଧିର ଉତ୍ତର ଆବଶ୍ୟକ । ୧୨

x ୩ = ୩୬

'ଖ' ବିଭାଗ (୪୦୦ ରୁ ୫୦୦ ଶବ୍ଦ ମଧ୍ୟରେ) ଉପରୋକ୍ତ ମୁନିର୍ ଗୁଡ଼ିକରୁ ୫ଟି ପ୍ରଶ୍ନ ଆସିବ । ତତ୍ତ୍ୱଧରୁ ଗାନ୍ଧିର ଉତ୍ତର ଆବଶ୍ୟକ ।

Γx୩=୨୪

'ଗ' ବିଭାଗ (୧୫୦ ରୁ ୨୦୦ ଶବ୍ଦ ମଧ୍ୟରେ) ଉପରୋକ୍ତ ମୁନିର୍ ସଂକଳ୍ପ । ୪ଟି ପ୍ରଶ୍ନ ଆସିବ । ତତ୍ତ୍ୱଧରୁ ୨ଟିର ଉତ୍ତର ଆବଶ୍ୟକ । ୫

x ୨= ୧୦

COURSE CODE - 1.3

କଥା ସାହିତ୍ୟ

ପୂର୍ବସଂଖ୍ୟା – ୧୦

ମୁନିଟ୍ - ୧ ରୁଦ୍ର ସୁଧାନିଧି - ନାରାୟଣାନନ୍ଦ ଅବଧୂତ ସ୍ଵାମୀ - ରୁଦ୍ର ସୁଧାନିଧିର ଜନ୍ମ ପର୍ଯ୍ୟନ୍ତ

ମୁନିଟ୍ - - ୨ ଭୀମାଭୂୟା - ଗୋପାଳବଲ୍ଲଭ ଦାସ

ମୁନିଟ୍ - ୩ ଦକ୍ଷିଣାବର୍ତ୍ତ - ଶାନ୍ତନୁ କୁମାର ଆଚାର୍ଯ୍ୟ

ମୁନିଟ୍ - ୪ ଦାନାପାଣି - ଗୋପୀନାଥ ମହାନ୍ତି

ମୁନିଟ୍ - ୫ ହାତ, ଡାକମୁନସୀ, ନିଜସଞ୍ଜି, ମୋକ୍ଷ, ଲକ୍ଷ୍ମୀର ଅଭିଶାର

ପ୍ରଶ୍ନ ସମ୍ପର୍କୀୟ ସୂଚନା

'କ' ବିଭାଗ (୭୦୦ ରୁ ୧୦୦୦ ଶବ୍ଦ ମଧ୍ୟରେ) ଉପରୋକ୍ତ ମୁନିଟ୍ ଗୁଡ଼ିକରୁ

୫ଟି ପ୍ରଶ୍ନ ଆସିବ । ତତ୍ତ୍ଵରୁ ଗାଟିର ଉତ୍ତର ଆବଶ୍ୟକ । ୧୨× ୩
= ୩୬

'ଖ' ବିଭାଗ (୪୦୦ ରୁ ୫୦୦ ଶବ୍ଦ ମଧ୍ୟରେ) ଉପରୋକ୍ତ ମୁନିଟ୍ ଗୁଡ଼ିକରୁ ୫ଟି ପ୍ରଶ୍ନ
ଆସିବ । ତତ୍ତ୍ଵରୁ ଗାଟିର ଉତ୍ତର ଆବଶ୍ୟକ ।

୮× ୩ = ୨୪

'ଗ' ବିଭାଗ (୧୫୦ ରୁ ୨୦୦ ଶବ୍ଦ ମଧ୍ୟରେ) ଉପରୋକ୍ତ ମୁନିଟ୍ ଗୁଡ଼ିକରୁ ୪ଟି ପ୍ରଶ୍ନ
ଆସିବ । ତତ୍ତ୍ଵରୁ ୨ଟିର ଉତ୍ତର ଆବଶ୍ୟକ । ୫

× ୨ = ୧୦

COURSE CODE - 1.4

ଗଦ୍ୟ ସାହିତ୍ୟ

ପୂର୍ଣ୍ଣସଂଖ୍ୟା- ୧୦

ମୁନିଟ୍ – ୧ ଜୀବନପଥେ - ରମାଦେବୀ (ପ୍ରଥମ ୨୦ଟି ଅଧ୍ୟାୟ)

ମୁନିଟ୍ – ୨ ଆମେରିକା ଅନୁଭୂତି - ଗୋଲୋକ ବିହାରୀ ଧଳ

ମୁନିଟ୍ – ୩ ଆମ ଓଡ଼ିଶାର ଗର୍ବ ଓ ଗୌରବ- ସଂ. ପଠାଣି ପଟ୍ଟନାୟକ (ପ୍ରଥମ ୫ଟି ଅଧ୍ୟାୟ)

ମୁନିଟ୍ – ୪ ପ୍ରବନ୍ଧ କଟିପୟ - ସ. ଡ. ବିଷ୍ଣୁପ୍ରିୟା ଓତା- କିତାବ ମହଲ

(ଓଡ଼ିଆ ଜାତୀୟତା, ସୌନ୍ଦର୍ଯ୍ୟ ଓ ପ୍ରେମ, ଆର୍ଯ୍ୟଜୀବନ, କ୍ଷମା, ଭାରତୀୟ ନାରୀର ଆଦର୍ଶ)

ମୁନିଟ୍ – ୫ ପ୍ରବନ୍ଧ, ଜୀବନୀ, ଆତ୍ମଜୀବନୀ ଓ ଭ୍ରମଣ କାହାଣୀର ଚତୁ ।

ପ୍ରଶ୍ନ ସମ୍ପର୍କୀୟ ସୂଚନା

'କ' ବିଭାଗ (୭୦୦ରୁ ୧୦୦୦ ଶବ୍ଦ ମଧ୍ୟରେ) ଉପରୋକ୍ତ ମୁନିଟ୍ ଗୁଡ଼ିକରୁ ୫ଟି ପ୍ରଶ୍ନ ଆସିବ । ତତ୍ତ୍ଵରୁ ଗାଟିର ଉତ୍ତର ଆବଶ୍ୟକ ।

୧୨x୩=୩୬

'ଖ' ବିଭାଗ (୪୦୦ ରୁ ୫୦୦ ଶବ୍ଦ ମଧ୍ୟରେ) ଉପରୋକ୍ତ ମୁନିଟ୍ ଗୁଡ଼ିକରୁ ୫ଟି ପ୍ରଶ୍ନ

ଆସିବ । ତତ୍ତ୍ଵରୁ ଗାଟିର ଉତ୍ତର ଆବଶ୍ୟକ ।

୮x ୩ =

୨୪

‘ଗ’ ବିଭାଗ (୧୫୦ ରୁ ୨୦୦ ଶିକ୍ଷା ମଧ୍ୟରେ) ଉପରୋକ୍ତ ୟୁନିଟ୍ ଗୁଡ଼ିକରୁ ୪ଟି ପ୍ରଶ୍ନ
ଆସିବ । ଡକ୍ଟରରୁ ୨ଟିର ଉତ୍ତର ଆବଶ୍ୟକ ।

୫x

୨ = ୧୦

2ND SEMESTER

Group - A (Core Course)

COURSE CODE - 2.1

ଭାଷା ବିଜ୍ଞାନ

ପୂର୍ଣ୍ଣସଂଖ୍ୟା –

୧୦

ୟୁନିଟ୍ – ୧ ଭାଷାର ସଂଜ୍ଞା, ପ୍ରକାରଭେଦ, ଉତ୍ପତ୍ତି ସଂପର୍କୀୟ ମତବାଦ

ୟୁନିଟ୍ – ୨ ବାଗ୍‌ଯତ୍ତ ଓ ତା’ର ବିଭିନ୍ନ ଅଂଶର ପରିଚୟ, ବାଦ୍ୟଯତ୍ତର ଭୂମିକା

ୟୁନିଟ୍ – ୩ ଅର୍ଥ ପରିବର୍ତ୍ତନ ଓ ଧ୍ୱନି ପରିବର୍ତ୍ତନର ବିଭିନ୍ନ କାରଣ ଓ ଦିଗ

ୟୁନିଟ୍ – ୪ ଇଣ୍ଡୋ-ୟୁରୋପୀୟ ଭାଷା ପରିବାର, ଭାରତୀୟ ଆର୍ଯ୍ୟ

ଭାଷାଗୋଷ୍ଠୀ, ଓଡ଼ିଆ ଭାଷାର କ୍ରମବିକାଶ

ୟୁନିଟ୍ – ୫ ଓଡ଼ିଆ ଭାଷା ଉପରେ ବିଭିନ୍ନ ଭାଷାର ପ୍ରଭାବ (ଇଂରାଜୀ, ଯାବନିକ,
ଦ୍ରାବିଡ଼)

ପ୍ରଶ୍ନ ସମ୍ପର୍କୀୟ ସୂଚନା

‘କ’ ବିଭାଗ (୨୦୦ ରୁ ୧୦୦୦ ଶିକ୍ଷା ମଧ୍ୟରେ) ଉପରୋକ୍ତ ୟୁନିଟ୍ ଗୁଡ଼ିକରୁ ୫ଟି ପ୍ରଶ୍ନ
ଆସିବ । ଡକ୍ଟରରୁ ୩ଟିର ଉତ୍ତର ଆବଶ୍ୟକ ।

୧୨ x ୩ = ୩୬

'ଖ' ବିଭାଗ (୪୦୦ ରୁ ୫୦୦ ଶବ୍ଦ ମଧ୍ୟରେ) ଉପରୋକ୍ତ ମୁନିଟ୍ ଗୁଡ଼ିକରୁ ୫ଟି ପ୍ରଶ୍ନ
ଆସିବ । ତତ୍ତ୍ୱଧରୁ ଗାଟିର ଉତ୍ତର ଆବଶ୍ୟକ । ୮

× ଗା = ୨୪

'ଗ' ବିଭାଗ (୧୫୦ ରୁ ୨୦୦ ଶବ୍ଦ ମଧ୍ୟରେ) ଉପରୋକ୍ତ ମୁନିଟ୍ ଗୁଡ଼ିକରୁ ୪ଟି ପ୍ରଶ୍ନ
ଆସିବ । ତତ୍ତ୍ୱଧରୁ ୨ଟିର ଉତ୍ତର ଆବଶ୍ୟକ ।

୫×୨ = ୧୦

COURSE CODE - 2.2

ଓଡ଼ିଆ ସାହିତ୍ୟର ଇତିହାସ

ପୂର୍ଣ୍ଣସଂଖ୍ୟା - ୭୦

ମୁନିଟ୍ - ୧ ପ୍ରାକ୍ ସାରଳା ସାହିତ୍ୟ

ମୁନିଟ୍ - ୨ ସାରଳା ଓ ପଞ୍ଚସଖା ସାହିତ୍ୟ

ମୁନିଟ୍ - ୩ ରୀତି ସାହିତ୍ୟ

ମୁନିଟ୍ - ୪ ସ୍ୱାଧୀନତା ପୂର୍ବବର୍ତ୍ତୀ ଓଡ଼ିଆ ସାହିତ୍ୟ

ମୁନିଟ୍ - ୫ ସ୍ୱାଧୀନତା ପରବର୍ତ୍ତୀ ଓଡ଼ିଆ ସାହିତ୍ୟ (ଗଳ୍ପ, ଉପନ୍ୟାସ,
ନାଟକ, କବିତା)

ପ୍ରଶ୍ନ ସମ୍ପର୍କୀୟ ସୂଚନା

କ' ବିଭାଗ (୭୦୦ ରୁ ୧୦୦୦ ଶବ୍ଦ ମଧ୍ୟରେ) ଉପରୋକ୍ତ ମୁନିଟ୍ ଗୁଡ଼ିକରୁ ୫ଟି ପ୍ରଶ୍ନ
ଆସିବ । ତତ୍ତ୍ୱଧରୁ ଗାଟିର ଉତ୍ତର ଆବଶ୍ୟକ । ୧୨

× ଗା = ୩୬

'ଖ' ବିଭାଗ (୪୦୦ ରୁ ୫୦୦ ଶବ୍ଦ ମଧ୍ୟରେ) ଉପରୋକ୍ତ ମୁନିଟ୍ ଗୁଡ଼ିକରୁ

୫ଟି ପ୍ରଶ୍ନ ଆସିବ । ତତ୍ତ୍ୱଧରୁ ଗାଟିର ଉତ୍ତର ଆବଶ୍ୟକ । ୮× ୩ = ୨୪

'ଗ' ବିଭାଗ (୧୫୦ ରୁ ୨୦୦ ଶବ୍ଦ ମଧ୍ୟରେ) ଉପରୋକ୍ତ ଯୁନିଟ୍ ଗୁଡ଼ିକରୁ

୪ଟି ପ୍ରଶ୍ନ ଆସିବ । ଡକ୍ଟରରୁ ୨ଟିର ଉତ୍ତର ଆବଶ୍ୟକ ।

୫ × ୨ =

୧୦

COURSE CODE - 2.3

ଓଡ଼ିଆ ନାଟ୍ୟ ସାହିତ୍ୟ

ପୂର୍ଣ୍ଣସଂଖ୍ୟା- ୭୦

ଯୁନିଟ୍ - ୧ କାହିଁକାବେରୀ - ରାମଶଙ୍କର ରାୟ

ଯୁନିଟ୍ - ୨ ଭାତ - କାଳୀଚରଣ ପଟ୍ଟନାୟକ

ଯୁନିଟ୍ - ୩ ଅରଣ୍ୟ ଫସଲ - ମନୋରଞ୍ଜନ ଦାସ

ଯୁନିଟ୍ - ୪ ଶୋଣିତ ସ୍ଵାକ୍ଷର - ବିଜୟ କୁମାର ଶତପଥୀ

ଯୁନିଟ୍ - ୫ ଏକାଙ୍କିକା - ସଂ, ନାରାୟଣ ସାହୁ

(ଲେଭେଲ କ୍ରମିକ, ପ୍ରବେଶ ପ୍ରସ୍ଥାନ, ସଂଧ୍ୟା ଆସରର ଭୂତ, ଦୁଃସମୟ)

ପ୍ରଶ୍ନ ସମ୍ପର୍କୀୟ ସୂଚନା

'କ' ବିଭାଗ (୭୦୦ ରୁ ୧୦୦୦ ଶବ୍ଦ ମଧ୍ୟରେ) ଉପରୋକ୍ତ ଯୁନିଟ୍ ଗୁଡ଼ିକରୁ

୫ଟି ପ୍ରଶ୍ନ ଆସିବ । ଡକ୍ଟରରୁ ୩ଟିର ଉତ୍ତର ଆବଶ୍ୟକ ।

୧୨ × ୩

= ୩୬

'ଖ' ବିଭାଗ (୪୦୦ ରୁ ୫୦୦ ଶବ୍ଦ ମଧ୍ୟରେ) ଉପରୋକ୍ତ ଯୁନିଟ୍ ଗୁଡ଼ିକରୁ

୫ଟି ପ୍ରଶ୍ନ ଆସିବ । ଡକ୍ଟର ଶାନ୍ତିର ଉତ୍ତର ଆବଶ୍ୟକ ।
୨୪

୮×୩ =

‘ଗ’ ବିଭାଗ (୧୫୦ ରୁ ୨୦୦ ଶବ୍ଦ ମଧ୍ୟରେ) ଉପରୋକ୍ତ ଯୁକ୍ତି ଗୁଡ଼ିକରୁ ୪ଟି ପ୍ରଶ୍ନ
ଆସିବ । ଡକ୍ଟର ଶାନ୍ତିର ଉତ୍ତର ଆବଶ୍ୟକ ।

୫

×୨ = ୧୦

COURSE CODE - 2.4

ତୁଳନାତ୍ମକ ସାହିତ୍ୟ, ସମୀକ୍ଷାତତ୍ତ୍ୱ ଅନୁବାଦ ସାହିତ୍ୟ

ସଂଖ୍ୟାସଂଖ୍ୟା - ୭୦

ଯୁକ୍ତି - ୧ ତୁଳନାତ୍ମକ ସାହିତ୍ୟର ସଂଜ୍ଞା, ସ୍ୱରୂପ ଓ ପରିସର

ଯୁକ୍ତି - ୨ ତୁଳନାତ୍ମକ ସାହିତ୍ୟର ଉପଯୋଗିତା ଓ ବିଚାରଧାରା

ଯୁକ୍ତି - ୩ ସମୀକ୍ଷାତତ୍ତ୍ୱ (ରସବାଦୀ, ଜାତିବାଦୀ, ନିନ୍ଦନତାତ୍ତ୍ୱିକ, ଶୈଳୀତାତ୍ତ୍ୱିକ)

ଯୁକ୍ତି - ୪ ଅନୁବାଦ ତତ୍ତ୍ୱ (ସଂଜ୍ଞା, ସ୍ୱରୂପ ଓ ପ୍ରକାରଭେଦ)

ଯୁକ୍ତି - ୫ ଅନୁବାଦର ପ୍ରୟୋଗ

(ଅନୁବାଦର ବର୍ଣ୍ଣନା - ସଂ. ପ୍ରଶରତଚନ୍ଦ୍ର ରଥ)

ତୁହିପରା, ତପସ୍ୱିନୀ, To the Cuckoo Geetanjali)

ପ୍ରଶ୍ନ ସମ୍ପର୍କୀୟ ସୂଚନା

‘କ’ ବିଭାଗ (୭୦୦ ରୁ ୧୦୦୦ ଶବ୍ଦ ମଧ୍ୟରେ) ଉପରୋକ୍ତ ଯୁକ୍ତି ଗୁଡ଼ିକରୁ ୫ଟି ପ୍ରଶ୍ନ
ଆସିବ । ଡକ୍ଟର ଶାନ୍ତିର ଉତ୍ତର ଆବଶ୍ୟକ ।

୧୨ × ୩ = ୩୬

'ଖ' ବିଭାଗ (୪୦୦ ରୁ ୫୦୦ ଶବ୍ଦ ମଧ୍ୟରେ) ଉପରୋକ୍ତ ୟୁନିଟ୍ ଗୁଡ଼ିକରୁ ୫ଟି ପ୍ରଶ୍ନ ଆସିବ ।

ତତ୍ତ୍ୱଧରୁ ଗଠିତ ଉତ୍ତର ଆବଶ୍ୟକ ।

୮ x

୩ = ୨୪

'ଗ' ବିଭାଗ (୧୫୦ ରୁ ୨୦୦ ଶବ୍ଦ ମଧ୍ୟରେ) ଉପରୋକ୍ତ ୟୁନିଟ୍ ଗୁଡ଼ିକରୁ ୪ଟି ପ୍ରଶ୍ନ ଆସିବ । ତତ୍ତ୍ୱଧରୁ ୨ଟିର ଉତ୍ତର ଆବଶ୍ୟକ ।

୫ x ୨ = ୧୦

3RD SEMESTER

(Group - B & C)

CORE ELECTIVE (SPECIAL PAPERS) (ANY SIX)

COURSE CODE - 3.1 (Any Six)

ଭାଷାତତ୍ତ୍ୱ - ୧ (linguistics – 1)

ପୂର୍ଣ୍ଣସଂଖ୍ୟା – ୭୦

ୟୁନିଟ୍ – ୧ ଭାଷା ଓ ଭାଷାତତ୍ତ୍ୱ ସଂପର୍କୀୟ ଆଲୋଚନା, ଭାଷାତତ୍ତ୍ୱ

ଅଧ୍ୟୟନର ବିଭିନ୍ନ ଦିଗ (ଐତିହାସିକ, କାଳାନୁକ୍ରମିକ, ବର୍ଣ୍ଣନାତ୍ମକ ଓ ତୁଳନାତ୍ମକ)

ୟୁନିଟ୍ – ୨ ଭାଷିକ ଧ୍ୱନି ମାନଙ୍କର, ପ୍ରେରଣ ଓ ଗ୍ରହଣ ପ୍ରକ୍ରିୟା,

ବାକ୍ୟଯନ୍ତ୍ରର ବିଭିନ୍ନ ଅଂଶର ପରିଚୟ ଓ କାର୍ଯ୍ୟକାରিতା

ୟୁନିଟ୍ – ୩ ଓଡ଼ିଆ ଭାଷିକ ଧ୍ୱନିମାନଙ୍କର ବର୍ଗୀକରଣ, ଇଂରାଜୀ ଧ୍ୱନିମାନଙ୍କର

ପରିଚୟ ଓ ବିଭାଗୀକରଣ

ୟୁନିଟ୍ – ୪ ଫୋନିମ୍ ର ସଂଜ୍ଞା ଓ ପ୍ରକାରଭେଦ, ଓଡ଼ିଆ ଧ୍ୱନି ଗ୍ରାମଗୁଡ଼ିକର ପରିଚୟ

ମୁନିଟ୍ – ୫ ଆର୍ତ୍ତଜାତୀୟ ଧ୍ବନ୍ୟାତ୍ମକ ଲିପିର ପରିଚୟ ଓ ଧ୍ବନ୍ୟାତ୍ମକ ପ୍ରତିଲିଖନ

ପ୍ରଶ୍ନ ସମ୍ପର୍କୀୟ ସୂଚନା

'କ' ବିଭାଗ (୭୦୦ରୁ ୧୦୦୦ ଶବ୍ଦ ମଧ୍ୟରେ) ଉପରୋକ୍ତ ମୁନିଟ୍ ଗୁଡ଼ିକରୁ ୫ଟି ପ୍ରଶ୍ନ ଆସିବ । ଡକ୍ଟରରୁ ଗାଟିର ଉତ୍ତର ଆବଶ୍ୟକ । | ୧୨
× ୩ = ୩୬

'ଖ' ବିଭାଗ (୪୦୦ ରୁ ୫୦୦ ଶବ୍ଦ ମଧ୍ୟରେ) ଉପରୋକ୍ତ ମୁନିଟ୍ ଗୁଡ଼ିକରୁ ୫ଟି ପ୍ରଶ୍ନ ଆସିବ । ଡକ୍ଟରରୁ ଗାଟିର ଉତ୍ତର ଆବଶ୍ୟକ । ୮
× ୩ = ୨୪

'ଗ' ବିଭାଗ (୧୫୦ ରୁ ୨୦୦ ଶବ୍ଦ ମଧ୍ୟରେ) ଉପରୋକ୍ତ ମୁନିଟ୍ ଗୁଡ଼ିକରୁ ୪ଟି ପ୍ରଶ୍ନ ଆସିବ । ଡକ୍ଟରରୁ ୨ଟିର ଉତ୍ତର ଆବଶ୍ୟକ । ୫
× ୨ = ୧୦

COURSE CODE - 3.2

ଭାଷାତତ୍ତ୍ୱ - 2

linguistics – 2

ପୂର୍ଣ୍ଣସଂଖ୍ୟା- ୭୦

ମୁନିଟ୍ – ୧ ଧ୍ବନିନିୟମ (ଗ୍ରାମସ୍, ବର୍ଷାର, ରାୟ) ଶବ୍ଦ ବିଜ୍ଞାନ ଓ ରୂପବିଜ୍ଞାନ

ମୁନିଟ୍ – ୨ ଭାଷାର ଅର୍ଥତାତ୍ତ୍ୱିକ ବିଚାର, ଭାଷାର ବାକ୍ୟତାତ୍ତ୍ୱିକ ବିଚାର

ମୁନିଟ୍ – ୩ ଭାଷିକ ଧ୍ବନିର ଦୈର୍ଘ୍ୟ, ବନାଘାତ, ସ୍ଵରଲହର

ମୁନିଟ୍ – ୪ ଶୈଳୀ ବିଜ୍ଞାନ ଓ ତାହାର ବିଭିନ୍ନ ଦିଗ

ମୁନିଟ୍ – ୫ ଓଡ଼ିଆ ଭାଷା ବିଜ୍ଞାନ ଚର୍ଚ୍ଚାର ପରଂପରା

ଭାଷା ବିଜ୍ଞାନୀ (ପାଣିନୀ, ଗୋପୀନାଥ ନନ୍ଦଶର୍ମା, ଗୋଲୋକ

ପ୍ରଶ୍ନ ସମ୍ପର୍କୀୟ ସୁଚନା

'କ' ବିଭାଗ (୭୦୦ ରୁ ୧୦୦୦ ଶବ୍ଦ ମଧ୍ୟରେ) ଉପରୋକ୍ତ ମୁନିଟ୍ ଗୁଡ଼ିକରୁ ୫ଟି ପ୍ରଶ୍ନ ଆସିବ । ତତ୍ତ୍ଵରୁ ଗାଟିର ଉତ୍ତର ଆବଶ୍ୟକ ।

$$୧୨ \times ୩ = ୩୬$$

"ଖ" ବିଭାଗ (୪୦୦ ରୁ ୫୦୦ ଶବ୍ଦ ମଧ୍ୟରେ) ଉପରୋକ୍ତ ମୁନିଟ୍ ଗୁଡ଼ିକରୁ ୫ଟି ପ୍ରଶ୍ନ ଆସିବ ତତ୍ତ୍ଵରୁ ଗାଟିର ଉତ୍ତର ଆବଶ୍ୟକ ।

୮x

$$୩ = ୨୪$$

'ଗ' ବିଭାଗ (୧୫୦ ରୁ ୨୦୦ ଶବ୍ଦ ମଧ୍ୟରେ) ଉପରୋକ୍ତ ମୁନିଟ୍ ଗୁଡ଼ିକରୁ ୪ଟି ପ୍ରଶ୍ନ ଆସିବ । ତତ୍ତ୍ଵରୁ ୨ଟିର ଉତ୍ତର ଆବଶ୍ୟକ ।

୫

$$\times ୨ = ୧୦$$

COURSE CODE - 3.3

ରଙ୍ଗମଞ୍ଚ ଓ ନାଟ୍ୟତତ୍ତ୍ଵ

Stage and Dramaturgy

ପୂର୍ବସଂଖ୍ୟା – ୭୦

ମୁନିଟ୍ – ୧ ନାଟକର ଉତ୍ପତ୍ତି, ପ୍ରକାର ଭେଦ ଓ ଗଠନକୌଶଳ, ପ୍ରାଚ୍ୟପାଶ୍ଚାତ୍ୟ ନାଟ୍ୟତତ୍ତ୍ଵ

ମୁନିଟ୍ – ୨ ରଙ୍ଗମଞ୍ଚର ପ୍ରକାରଭେଦ, ମଞ୍ଚକଳାର ବୈଶିଷ୍ଟ୍ୟ

(ବେଶ ରଚନା, ସାଜସଜ୍ଜା, ଆଲୋକ ସଂପାତ, ବିଭିନ୍ନ ପ୍ରକାର ଅଭିନୟ)

ମୁନିଟ୍ – ୩ ଲୋକନାଟ୍ୟ ପରଂପରା (ଲୀଳା, ଦଣ୍ଡନାଟ, କଣ୍ଠେଇନାଟ, ଧନ୍ତୁଯାତ୍ରା)

ମୁନିଟ୍ - ୪ ବିଭିନ୍ନ ନାଟ୍ୟଧାରା (ପ୍ରତୀକବାଦୀ, ଅସ୍ଥିତବାଦୀ, ବାସ୍ତବବାଦୀ, ଅଭିବ୍ୟକ୍ତିବାଦୀ)

ମୁନିଟ୍ - ୫ ଏକାଙ୍କିକା ଚତୁ (ସଂଜ୍ଞା, ସ୍ୱରୂପ, ପ୍ରକାରଭେଦ, ଗଠନରୀତି)

ପ୍ରଶ୍ନ ସମ୍ପର୍କୀୟ ସୂଚନା

'କ' ବିଭାଗ (୭୦୦ ରୁ ୧୦୦୦ ଶବ୍ଦ ମଧ୍ୟରେ) ଉପରୋକ୍ତ ମୁନିଟ୍ ଗୁଡ଼ିକରୁ ୫ଟି ପ୍ରଶ୍ନ ଆସିବ । ଡକ୍ଟରରୁ ଗାଟିର ଉତ୍ତର ଆବଶ୍ୟକ ।

$$୧୨ \times ୩ = ୩୬$$

'ଖ' ବିଭାଗ (୪୦୦ ରୁ ୫୦୦ ଶବ୍ଦ ମଧ୍ୟରେ) ଉପରୋକ୍ତ ମୁନିଟ୍ ଗୁଡ଼ିକରୁ ୫ଟି ପ୍ରଶ୍ନ ଆସିବ । ଡକ୍ଟରରୁ ଗାଟିର ଉତ୍ତର ଆବଶ୍ୟକ ।

$$୮ \times ୩ = ୨୪$$

'ଗ' ବିଭାଗ (୧୫୦ ରୁ ୨୦୦ ଶବ୍ଦ ମଧ୍ୟରେ) ଉପରୋକ୍ତ ମୁନିଟ୍ ଗୁଡ଼ିକରୁ ୪ଟି ପ୍ରଶ୍ନ ଆସିବ । ଡକ୍ଟରରୁ ୨ଟିର ଉତ୍ତର ଆବଶ୍ୟକ ।

$$୪ \times ୨ = ୮$$

୫

COURSE CODE - 3.4

ନାଟକ ଓ ନାଟ୍ୟକାର

Drama & Dramatist

ପୂର୍ଣ୍ଣସଂଖ୍ୟା - ୭୦

ମୁନିଟ୍ - ୧ ସ୍ୱାଧୀନତା ପୂର୍ବବର୍ତ୍ତୀ ଓଡ଼ିଆ ନାଟକର ବିକାଶଧାରା

ମୁନିଟ୍ - ୨ ବିଶେଷ ଅଧ୍ୟୟନ (ଜଗନ୍ନାଥ ଲାଲା, ରାମକୃଷ୍ଣ ରାୟ, ଅଶ୍ୱିନୀ କୁମାର ଘୋଷ, କାଳୀଚରଣ ପଟ୍ଟନାୟକ)

ମୁନିଟ୍ – ୩ ସ୍ଵାଧୀନତା ପରବର୍ତ୍ତୀ ଓଡ଼ିଆ ନାଟକର ବିକାଶଧାରା

ମୁନିଟ୍ – ୪ ବିଶେଷ ଅଧ୍ୟୟନ (ମନୋରଂଜନ ଦାସ, ବିଜୟ ମିଶ୍ର, ଗୋପାଳ
ଛୋଟରାୟ, ରାମଚନ୍ଦ୍ର ମିଶ୍ର)

ମୁନିଟ୍ – ୫ ସାଂପ୍ରତିକ ନାଟକର ଗତି ଓ ପ୍ରକୃତି

(ମୁକ୍ତ ଧାରାର ନାଟକ, ମିଥ୍ ଧର୍ମୀନାଟକ, ନାଟକରେ ଲୋକ ଉପାଦାନ, ଛୋଟ
ନାଟକ)

ପ୍ରଶ୍ନ ସମ୍ପର୍କୀୟ ସୂଚନା

କ' ବିଭାଗ (୭୦୦ ରୁ ୧୦୦୦ ଶବ୍ଦ ମଧ୍ୟରେ) ଉପରୋକ୍ତ ମୁନିଟ୍ ଗୁଡ଼ିକରୁ ୫ଟି ପ୍ରଶ୍ନ
ଆସିବ । ତତ୍ତ୍ଵରୁ ଗାଟିର ଉତ୍ତର ଆବଶ୍ୟକ । ୧୨

× ୩ = ୩୬

ଖ' ବିଭାଗ (୪୦୦ ରୁ ୫୦୦ ଶବ୍ଦ ମଧ୍ୟରେ) ଉପରୋକ୍ତ ମୁନିଟ୍ ଗୁଡ଼ିକରୁ ୫ଟି ପ୍ରଶ୍ନ
ଆସିବ । ତତ୍ତ୍ଵରୁ ଗାଟିର ଉତ୍ତର ଆବଶ୍ୟକ ।

୮× ୩ = ୨୪

ଗ' ବିଭାଗ (୧୫୦ ରୁ ୨୦୦ ଶବ୍ଦ ମଧ୍ୟରେ) ଉପରୋକ୍ତ ମୁନିଟ୍ ଗୁଡ଼ିକରୁ ୪ଟି ପ୍ରଶ୍ନ
ଆସିବ । ତତ୍ତ୍ଵରୁ ୨ଟିର ଉତ୍ତର ଆବଶ୍ୟକ ।

୫×୨ = ୧୦

COURSE CODE - 3.5

ଆଧୁନିକ କାବ୍ୟ କବିତା

Modern Odia Poetry

ପୂର୍ଣ୍ଣସଂଖ୍ୟା - ୭୦

ମୁନିଟ୍ – ୧ ଆଧୁନିକ ଓଡ଼ିଆ କାବ୍ୟଧାରା (ରାଧାନାଥଙ୍କଠାରୁ ସ୍ଵାଧୀନତା ପର୍ଯ୍ୟନ୍ତ)
(ରୋମାଣ୍ଟିକ୍ କାବ୍ୟଧାରା, ଜାତୀୟତାବାଦୀ ଚିନ୍ତାଧାରା,
ମାନବବାଦୀ ଓ ପ୍ରଗତିବାଦୀ କାବ୍ୟଚେତନା)

ମୁନିଟ୍ - ୨ ବିଶେଷ ଅଧ୍ୟୟନ (ଗୋପବଂଧୁ, ନୀଳକଣ୍ଠ, କାଳିନ୍ଦୀ ଚରଣ,
ବୈକୁଣ୍ଠନାଥ)

ମୁନିଟ୍ - ୩ ସ୍ଵାଧୀନତା ପରବର୍ତ୍ତୀ ଓଡ଼ିଆ କବିତାରେ ପ୍ରୟୋଗ ଓ ପରୀକ୍ଷାର ସ୍ଵର

ମୁନିଟ୍ - ୪ ବିଶେଷ ଅଧ୍ୟୟନ (ସଚ୍ଚିଦାନନ୍ଦ, ବେଣୁଧର, ଗୁରୁପ୍ରସାଦ, ଭାନୁଜୀ)

ମୁନିଟ୍ - ୫ ବିଶେଷ ଅଧ୍ୟୟନ (ରମାକାନ୍ତ, ସୀତାକାନ୍ତ, ସୌଭାଗ୍ୟ, ଦୀପକ)

ପ୍ରଶ୍ନ ସମ୍ପର୍କୀୟ ସୂଚନା

'କ' ବିଭାଗ (୭୦୦ ରୁ ୧୦୦୦ ଶବ୍ଦ ମଧ୍ୟରେ) ଉପରୋକ୍ତ ମୁନିଟ୍ ଗୁଡ଼ିକରୁ ୫ଟି ପ୍ରଶ୍ନ
ଆସିବ । ତଳ୍ଲକ୍ଷରୁ ଗାଟିର ଉତ୍ତର ଆବଶ୍ୟକ ।

$$୧୨ \times ୩ = ୩୬$$

"ଖ" ବିଭାଗ (୪୦୦ ରୁ ୫୦୦ ଶବ୍ଦ ମଧ୍ୟରେ) ଉପରୋକ୍ତ ମୁନିଟ୍ ଗୁଡ଼ିକରୁ, ୫ଟି ପ୍ରଶ୍ନ
ଆସିବ । ତଳ୍ଲକ୍ଷରୁ ଗାଟିର ଉତ୍ତର ଆବଶ୍ୟକ ।

$$୮ \times ୩ = ୨୪$$

'ଗ' ବିଭାଗ (୧୫୦ ରୁ ୨୦୦ ଶବ୍ଦ ମଧ୍ୟରେ) ଉପରୋକ୍ତ ମୁନିଟ୍ ଗୁଡ଼ିକରୁ ୪ଟି ପ୍ରଶ୍ନ
ଆସିବ । ତଳ୍ଲକ୍ଷରୁ ୨ଟିର ଉତ୍ତର ଆବଶ୍ୟକ ।

$$୫ \times ୨ = ୧୦$$

COURSE CODE - 3.6

ଆଧୁନିକ ଗଦ୍ୟ ସାହିତ୍ୟ

Modern Odia Prose

ପୂର୍ଣ୍ଣସଂଖ୍ୟା - ୭୦

ମୁନିଟ୍ - ୧ ରମ୍ୟରଚନା, ଜୀବନୀ, ଆତ୍ମଜୀବନୀ, ଭ୍ରମଣକାହାଣୀ, ଗଳ୍ପ ଓ
ଉପନ୍ୟାସର ତତ୍ତ୍ଵ

ମୁନିଟ୍ - ୨ ବିଶେଷ ଅଧ୍ୟୟନ (ବିଶ୍ୱନାଥ କର, ନୀଳକଣ୍ଠ ଦାସ, ଗୋପାଳ ପ୍ରହରାଜ,
ଗୋବିନ୍ଦ ଭୂପାଠୀ)

ମୁନିଟ୍ - ୩ ବିଶେଷ ଅଧ୍ୟୟନ (ଗାନ୍ଧିକ ଫକୀରମୋହନ, କାଳିନ୍ଦୀ ଚରଣ,
ଔପନ୍ୟାସିକ ଗୋପୀନାଥ ମହାନ୍ତି, ଶାନ୍ତନୁ କୁମାର ଆଶ୍ୱର୍ଯ୍ୟ)

ମୁନିଟ୍ - ୪ ବିଶେଷ ଅଧ୍ୟୟନ (ବିବେକୀ, ଭାଗବତ ଚୁଙ୍ଗାରେ ସଂଧ୍ୟା
(୧ମ), କଳାଶକ୍ତି, ପୃଷ୍ଠପୁରରେ ବର୍ଷାବରଣ)

ମୁନିଟ୍ - ୫ ବିଶେଷ ଅଧ୍ୟୟନ (ଛ' ମାଣ ଆଠ ଗୁଣ, ଅନ୍ଧଦିଗନ୍ତ)

ପ୍ରଶ୍ନ ସମ୍ପର୍କୀୟ ସୂଚନା

'କ' ବିଭାଗ (୭୦୦ରୁ ୧୦୦୦ ଶବ୍ଦ ମଧ୍ୟରେ) ଉପରୋକ୍ତ ମୁନିଟ୍ ଗୁଡ଼ିକରୁ ୫ଟି ପ୍ରଶ୍ନ
ଆସିବ । ଡକ୍ଟରରୁ ଗାନ୍ଧିର ଉତ୍ତର ଆବଶ୍ୟକ ୧୨
× ୩ = ୩୬

'ଖ' ବିଭାଗ (୪୦୦ ରୁ ୫୦୦ ମଧ୍ୟରେ) ଉପରୋକ୍ତ ମୁନିଟ୍ ଗୁଡ଼ିକରୁ ୫ଟି ପ୍ରଶ୍ନ ଆସିବ
। ଡକ୍ଟରରୁ ଗାନ୍ଧିର ଉତ୍ତର ଆବଶ୍ୟକ । $\Gamma \times ୩ =$
୨୪

'ଗ' ବିଭାଗ (୧୫୦ ରୁ ୨୦୦ ଶବ୍ଦ ମଧ୍ୟରେ) ଉପରୋକ୍ତ ମୁନିଟ୍ ଗୁଡ଼ିକରୁ ୪ଟି ପ୍ରଶ୍ନ
ଆସିବ । ଡକ୍ଟରରୁ ୨ଟିର ଉତ୍ତର ଆବଶ୍ୟକ । ୫
× ୨ = ୧୦

COURSE CODE - 3.7

CORE ELECTIVE

ଓଡ଼ିଶାର ଧର୍ମଧାରା

Religious Trends in Odisha

ମୁନିଟ୍ – ୧ ଓଡ଼ିଶାରେ ବିଭିନ୍ନ ଧର୍ମଧାରାର ଉଦ୍ଦେଶ୍ୟ ଓ ବିକାଶ

ମୁନିଟ୍ – ୨ ବୌଦ୍ଧ ଓ ଶାକ୍ତ ଦର୍ଶନ, ଓଡ଼ିଆ ସାହିତ୍ୟରେ ତାର ପ୍ରତିଫଳନ

ମୁନିଟ୍ – ୩ ନାଥଧର୍ମ ଦର୍ଶନ ଓ ଓଡ଼ିଆ ନାଥ ସାହିତ୍ୟ

ମୁନିଟ୍ – ୪ ଶୈବ ଧର୍ମ ଦର୍ଶନ ଓ ଓଡ଼ିଆ ସାହିତ୍ୟରେ ତାର ପ୍ରତିଫଳନ

ମୁନିଟ୍ – ୫ ମହିମା ଓ ବ୍ରାହ୍ମଦର୍ଶନ ଓଡ଼ିଆ ସାହିତ୍ୟରେ ତାର ପ୍ରତିଫଳନ

ପଞ୍ଚ ସମ୍ପର୍କୀୟ ସୂଚନା

'କ' ବିଭାଗ (୭୦୦ ରୁ ୧୦୦୦ ଶିକ୍ଷା ମଧ୍ୟରେ) ଉପରୋକ୍ତ ମୁନିଟ୍ ଗୁଡ଼ିକରୁ ୫ଟି ପଞ୍ଚ ଆସିବ । ତତ୍ତ୍ଵରୁ ଗାଟିର ଉତ୍ତର ଆବଶ୍ୟକ ।

$$୧୨ \times ୩ = ୩୬$$

"ଖ" ବିଭାଗ (୪୦୦ ରୁ ୫୦୦ ଶିକ୍ଷା ମଧ୍ୟରେ) ଉପରୋକ୍ତ ମୁନିଟ୍ ଗୁଡ଼ିକରୁ ୫ଟି ପଞ୍ଚ ଆସିବ । ତତ୍ତ୍ଵରୁ ଗାଟିର ଉତ୍ତର ଆବଶ୍ୟକ ।

$$୮ \times ୩ = ୨୪$$

'ଗ' ବିଭାଗ (୧୫୦ ରୁ ୨୦୦ ଶିକ୍ଷା ମଧ୍ୟରେ) ଉପରୋକ୍ତ ମୁନିଟ୍ ଗୁଡ଼ିକରୁ ୪ଟି ପଞ୍ଚ ଆସିବ । ତତ୍ତ୍ଵରୁ ୨ଟିର ଉତ୍ତର ଆବଶ୍ୟକ ।

$$୫ \times ୨ = ୧୦$$

COURSE CODE - 3.8

CORE ELECTIVE

ଓଡ଼ିଶାର ବୈଷ୍ଣବଧର୍ମ

Vaishnavism in Odisha

ପୂର୍ଣ୍ଣସଂଖ୍ୟା - ୭୦

ମୁନିଚ୍ - ୧ ଦୁର୍ଗାଧ୍ୟାୟ ବୈଷ୍ଣବ ସଂପ୍ରଦାୟ (ରାମାନୁଜ, ନିନ୍ଦାର୍କ, ବଲ୍ଲଭାରାୟ, ମାଧ୍ୱାଚାର୍ଯ୍ୟ)

ମୁନିଚ୍ - ୨ ବିବିଧ ଧର୍ମର ତତ୍ତ୍ୱ (ଜ୍ଞାନମିଶ୍ରା ଭକ୍ତି, ଶୂନ୍ୟତତ୍ତ୍ୱ, ପିଣ୍ଡ ବ୍ରହ୍ମାଣ୍ଡ ତତ୍ତ୍ୱ, ରାଧାକୃଷ୍ଣ ତତ୍ତ୍ୱ)

ମୁନିଚ୍ - ୩ ଶୁଦ୍ଧଭକ୍ତି ଧର୍ମର ପୃଷ୍ଠଭୂମି ଉତ୍ତର ଓ ବିକାଶ

ମୁନିଚ୍ - ୪ ବିଶେଷ ଆୟନ (ରାଧାତତ୍ତ୍ୱ, ଗୋପୀତତ୍ତ୍ୱ, ସତତ୍ତ୍ୱ, ରାସତତ୍ତ୍ୱ)

ମୁନିଚ୍ - ୫ ଓଡ଼ିଆ ସାହିତ୍ୟରେ ଜ୍ଞାନମିଶ୍ରା ଓ ଶୁଦ୍ଧଭକ୍ତିର ପ୍ରତିଫଳନ

ପ୍ରଶ୍ନ ସମ୍ପର୍କୀୟ ସୂଚନା

'କ' ବିଭାଗ (୭୦୦ ରୁ ୧୦୦୦ ଶିକ୍ଷା ମଧ୍ୟରେ) ଉପରୋକ୍ତ ମୁନିଚ୍ ଗୁଡ଼ିକରୁ ୫ଟି ପ୍ରଶ୍ନ ଆସିବ । ତତ୍ତ୍ୱଧରୁ ଗାଟିର ଉତ୍ତର ଆବଶ୍ୟକ ।

$$୧୨ \times ୩ = ୩୬$$

'ଖ' ବିଭାଗ (୪୦୦ ରୁ ୫୦୦ ଶିକ୍ଷା ମଧ୍ୟରେ) ଉପରୋକ୍ତ ମୁନିଚ୍ ଗୁଡ଼ିକରୁ ୫ଟି ପ୍ରଶ୍ନ ଆସିବ । ତତ୍ତ୍ୱଧରୁ ଗାଟିର ଉତ୍ତର ଆବଶ୍ୟକ ।

$$୮ \times ୩ = ୨୪$$

'ଗ' ବିଭାଗ (୧୫୦ ରୁ ୨୦୦ ଶିକ୍ଷା ମଧ୍ୟରେ) ଉପରୋକ୍ତ ମୁନିଚ୍ ଗୁଡ଼ିକରୁ ୪ଟି ପ୍ରଶ୍ନ ଆସିବ । ତତ୍ତ୍ୱଧରୁ ୨ଟିର ଉତ୍ତର ଆବଶ୍ୟକ ।

$$x ୨ = ୧୦$$

୫

COURSE CODE - 3.9

Shree Jagannath Cult

ଶ୍ରୀଜଗନ୍ନାଥ ସଂସ୍କୃତି

ପୂର୍ଣ୍ଣସଂଖ୍ୟା - ୭୦

ମୁନିଟ୍ - ୧ ଶ୍ରୀଜଗନ୍ନାଥ ସଂସ୍କୃତିର ପୃଷ୍ଠଭୂମି ଓ ବିକାଶଧାରା

ମୁନିଟ୍ - ୨ ବିଭିନ୍ନ ସଂସ୍କୃତି ସହିତ ଜଗନ୍ନାଥ ସଂସ୍କୃତିର ସଂପର୍କ (ବୌଦ୍ଧ, ଜୈନ)

ମୁନିଟ୍ - ୩ ଓଡ଼ିଶାର ବୈଷ୍ଣବ ସଂସ୍କୃତି ଓ ଶ୍ରୀଜଗନ୍ନାଥ ସଂସ୍କୃତି

ମୁନିଟ୍ - ୪ ଓଡ଼ିଶାର ଆଦିବାସୀ ସଂସ୍କୃତି ଓ ଶ୍ରୀଜଗନ୍ନାଥ ସଂସ୍କୃତି

ମୁନିଟ୍ - ୫ ଓଡ଼ିଶାର ଲୋକସଂସ୍କୃତି ଓ ଶ୍ରୀଜଗନ୍ନାଥ

ପ୍ରଶ୍ନ ସମ୍ପର୍କୀୟ ସୁଚନା

'କ' ବିଭାଗ (୭୦୦ ରୁ ୧୦୦୦ ଶବ୍ଦ ମଧ୍ୟରେ) ଉପରୋକ୍ତ ମୁନିଟ୍ ଗୁଡ଼ିକ ୫ଟି ପ୍ରଶ୍ନ ଆସିବ । ତତ୍ତ୍ଵଧରୁ ଗାଟିର ଉତ୍ତର ଆବଶ୍ୟକ ।

$$୧୨ \times ୩ = ୩୬$$

'ଖ' ବିଭାଗ (୪୦୦ ରୁ ୫୦୦ ଶବ୍ଦ ମଧ୍ୟରେ) ଉପରୋକ୍ତ ମୁନିଟ୍ ଗୁଡ଼ିକରୁ ୫ଟି ପ୍ରଶ୍ନ ଆସିବ । ତତ୍ତ୍ଵଧରୁ ଗାଟିର ଉତ୍ତର ଆବଶ୍ୟକ ।

$$୮ \times ୩ = ୨୪$$

'ଗ' ବିଭାଗ (୧୫୦ ରୁ ୨୦୦ ଶବ୍ଦ ମଧ୍ୟରେ) ଉପରୋକ୍ତ ମୁନିଟ୍ ଗୁଡ଼ିକରୁ ୪ଟି ପ୍ରଶ୍ନ ଆସିବ । ତତ୍ତ୍ଵଧରୁ ୨ଟିର ଉତ୍ତର ଆବଶ୍ୟକ ।

$$୫ \times ୨ = ୧୦$$

COURSE CODE - 3.10

CORE ELECTIVE

ଶ୍ରୀଜଗନ୍ନାଥ ସାହିତ୍ୟ

Shree Jagannath Literature

ପୂର୍ଣ୍ଣସଂଖ୍ୟା- ୭୦

ମୁନିଟ୍ - ୧ ଓଡ଼ିଶାର ଲୋକସାହିତ୍ୟ ଓ କିମ୍ବଦନ୍ତୀରେ ଶ୍ରୀଜଗନ୍ନାଥ

ମୁନିଟ୍ - ୨ ଓଡ଼ିଆ ପୁରାଣ ଓ ପ୍ରାଚୀନ କାବ୍ୟକବିତାରେ ଶ୍ରୀଜଗନ୍ନାଥ

ମୁନିଟ୍ - ୩ ମଧ୍ୟକାଳୀନ ଓ ଆଧୁନିକ କାବ୍ୟକବିତାରେ ଶ୍ରୀଜଗନ୍ନାଥ

ମୁନିଟ୍ - ୪ ଓଡ଼ିଆ ଗଳ୍ପ ଉପନ୍ୟାସରେ ଶ୍ରୀଜଗନ୍ନାଥ

ମୁନିଟ୍ - ୫ ଓଡ଼ିଆ ନାଟକ ଓ ପ୍ରବନ୍ଧରେ ଶ୍ରୀଜଗନ୍ନାଥ

ପ୍ରଶ୍ନ ସମ୍ପର୍କୀୟ ସୂଚନା

'କ' ବିଭାଗ (୭୦୦ ରୁ ୧୦୦୦ ଶବ୍ଦ ମଧ୍ୟରେ) ଉପରୋକ୍ତ ମୁନିଟ୍ ଗୁଡ଼ିକରୁ ୫ଟି ପ୍ରଶ୍ନ
ଆସିବ ତତ୍ତ୍ଵରୁ ଗାଟିର ଉତ୍ତର ଆବଶ୍ୟକ ୧୨

× ୩ = ୩୬

"ଖ" ବିଭାଗ (୪୦୦ ରୁ ୫୦୦ ଶବ୍ଦ ମଧ୍ୟରେ) ଉପରୋକ୍ତ ମୁନିଟ୍ ଗୁଡ଼ିକରୁ ୫ଟି ପ୍ରଶ୍ନ
ଆସିବ । ତତ୍ତ୍ଵରୁ ଗାଟିର ଉତ୍ତର ଆବଶ୍ୟକ । ୮×

୩ = ୨୪

'ଗ' ବିଭାଗ (୧୫୦ ରୁ ୨୦୦ ଶବ୍ଦ ମଧ୍ୟରେ) ଉପରୋକ୍ତ ମୁନିଟ୍ ଗୁଡ଼ିକରୁ ୪ଟି ପ୍ରଶ୍ନ
ଆସିବ । ତତ୍ତ୍ଵରୁ ୨ଟିର ଉତ୍ତର ଆବଶ୍ୟକ । ୫×

୨ = ୧୦

(Any Six to be opted by the students)

Total credit 4 x 6 = 24,
600

Total Marks 100 x 6 =

4TH SEMESTER

CORE COURSE

COURSE CODE - 4.1

ଲୋକସାହିତ୍ୟ (Folk Literature)

ପୂର୍ଣ୍ଣସଂଖ୍ୟା - ୭୦

ୟୁନିଟ୍ - ୧ ଲୋକସାହିତ୍ୟର ସଂଜ୍ଞା, ସ୍ୱରୂପ, ଅଧ୍ୟୟନ ବିଭିନ୍ନ ଦିଗ

ୟୁନିଟ୍ - ୨ ଲୋକଗୀତ ଓ ଲୋକଗଳ୍ପର ସଂଜ୍ଞା ଓ ସ୍ୱରୂପ

ୟୁନିଟ୍ - ୩ ଲୋକନାଟକର ସଂଜ୍ଞା ଓ ସ୍ୱରୂପ

ୟୁନିଟ୍ - ୪ ଲୋକତତ୍ତ୍ୱର ବିଭିନ୍ନ ଉପାଦାନ (ମୋତିଫ, ଟାଇପସ୍, ମରପେଠାଲଜି)

ୟୁନିଟ୍ - ୫ ଲୋକସାହିତ୍ୟର ବ୍ୟାବହାରିକ ଦିଗ (ରୁଢ଼ି, ପ୍ରବାଦ ପ୍ରବଚନ)

ପ୍ରଶ୍ନ ସମ୍ପର୍କୀୟ ସୂଚନା

'କ' ବିଭାଗ (୭୦୦ ରୁ ୧୦୦୦ ଶବ୍ଦ ମଧ୍ୟରେ) ଉପରୋକ୍ତ ୟୁନିଟ୍ ଗୁଡ଼ିକରୁ

୫ଟି ପ୍ରଶ୍ନ ଆସିବ । ତତ୍ତ୍ୱଧରୁ ଗାଟିର ଉତ୍ତର ଆବଶ୍ୟକ ।

୧୨ x ୩

= ୩୬

'ଖ' ବିଭାଗ (୪୦୦ ରୁ ୫୦୦ ଶବ୍ଦ ମଧ୍ୟରେ) ଉପରୋକ୍ତ ୟୁନିଟ୍ ଗୁଡ଼ିକରୁ ୫ଟି ପ୍ରଶ୍ନ

ଆସିବ । ତତ୍ତ୍ୱଧରୁ ଗାଟିର ଉତ୍ତର ଆବଶ୍ୟକ ।

୮ x ୩ = ୨୪

'ଗ' ବିଭାଗ (୧୫୦ ରୁ ୨୦୦ ଶବ୍ଦ ମଧ୍ୟରେ) ଉପରୋକ୍ତ ୟୁନିଟ୍ ଗୁଡ଼ିକରୁ ୪ଟି ପ୍ରଶ୍ନ

ଆସିବ । ତତ୍ତ୍ୱଧରୁ ୨ଟିର ଉତ୍ତର ଆବଶ୍ୟକ

୫

x ୨ = ୧୦

4th SEMESTAR

CORE COURSE

COURSE CODE - 4.2

ଗବେଷଣା ପଦ୍ଧତି

Research Methodology

ପୂର୍ଣ୍ଣସଂଖ୍ୟା - ୧୦

ୟୁନିଟ୍ - ୧ ଗବେଷଣାର ସଂଜ୍ଞା, ସ୍ୱରୂପ ଓ ପ୍ରକାରଭେଦ

ୟୁନିଟ୍ - ୨ ସାହିତ୍ୟ ଗବେଷଣାର ଐତିହ୍ୟ ଓ ସାଂପ୍ରତିକଧାରା

ୟୁନିଟ୍ - ୩ ଗବେଷଣାର ବିଭିନ୍ନ ଦିଗ ଓ ପର୍ଯ୍ୟାୟ

ୟୁନିଟ୍ - ୪ ତଥ୍ୟ ସଂଗ୍ରହର ବିଭିନ୍ନ ଭଣ୍ଡାର

ୟୁନିଟ୍ - ୫ ଗବେଷଣାର ବିଭିନ୍ନ ଅଙ୍ଗ (କ୍ଷେତ୍ର ପରିକଳ୍ପନା, ତଥ୍ୟ ସଂଗ୍ରହ ପଦ୍ଧତି, ନିର୍ଣ୍ଣୟ ପର୍ଯ୍ୟବେକ୍ଷଣ)

ପ୍ରଶ୍ନ ସମ୍ପର୍କୀୟ ସୂଚନା

'କ' ବିଭାଗ (୧୦୦ ରୁ ୧୦୦୦ ଶବ୍ଦ ମଧ୍ୟରେ) ଉପରୋକ୍ତ ୟୁନିଟ୍ ଗୁଡ଼ିକରୁ ୫ଟି ପ୍ରଶ୍ନ ଆସିବ । ତତ୍ତ୍ୱଧରୁ ୩ଟିର ଉତ୍ତର ଆବଶ୍ୟକ ।

$$୧୨ \times ୩ = ୩୬$$

'ଖ' ବିଭାଗ (୪୦୦ ରୁ ୫୦୦ ଶବ୍ଦ ମଧ୍ୟରେ) ଉପରୋକ୍ତ ୟୁନିଟ୍ ଗୁଡ଼ିକରୁ ୫ଟି ପ୍ରଶ୍ନ ଆସିବ । ତତ୍ତ୍ୱଧରୁ ୩ଟିର ଉତ୍ତର ଆବଶ୍ୟକ ।

$$୮ \times ୩ = ୨୪$$

'ଗ ବିଭାଗ (୧୫୦ ରୁ ୨୦୦ ଶବ୍ଦ ମଧ୍ୟରେ) ଉପରୋକ୍ତ ଛୁନିଟ୍ ଗୁଡ଼ିକରୁ ୪ଟି ପ୍ରଶ୍ନ ଆସିବ । ଡକ୍ଟରରୁ ୨ଟିର ଉତ୍ତର ଆବଶ୍ୟକ ।

୫

x ୨ = ୧୦

COURSE CODE - 4.3

DISSERTATION

CORE ELECTIVE

ଗବେଷଣା ନିବନ୍ଧ

ପୂର୍ଣ୍ଣସଂଖ୍ୟା : ୧୦୦

ପ୍ରକଳ୍ପ ପ୍ରସ୍ତୁତି (ପ୍ରାୟୋଗିକ, ସମାଲୋଚନାଧର୍ମୀ ସନ୍ଦର୍ଭ ରଚନା) ପ୍ରତ୍ୟେକ ପରୀକ୍ଷାର୍ଥୀ ଅନୁ୍ୟନ ୮୦ ପୃଷ୍ଠାର ଏକ ସମାଲୋଚନାଧର୍ମୀ ସନ୍ଦର୍ଭ ପ୍ରସ୍ତୁତ କରି ପରୀକ୍ଷା ଆରମ୍ଭ ପୂର୍ବରୁ ବିଭାଗମୁଖ୍ୟଙ୍କ ନିକଟରେ ଦାଖଲ କରିବାକୁ ହେବ । ଏହି ସାହିତ୍ୟ କୃତିଗୁଡ଼ିକର ବିଷୟ ତଥା ଶୀର୍ଷକ ବିଭାଗ ଦ୍ଵାରା ଅନୁମୋଦିତ ହେବା ଆବଶ୍ୟକ ।

COURSE CODE - 4.4

(Seminar Presentation with Viva)

ପାଠକ୍ର ଉପସ୍ଥାପନ ଓ ମୌଖ ପରୀକ୍ଷା

ପୂର୍ଣ୍ଣସଂଖ୍ୟା : ୧୦୦

- e. ପରୀକ୍ଷା ଆରମ୍ଭର ଯଥେଷ୍ଟ ପୂର୍ବରୁ ପରୀକ୍ଷାର୍ଥୀ ବିଭାଗଦ୍ଵାରା ଅନୁମୋଦିତ ପ୍ରବନ୍ଧ ପ୍ରକଳ୍ପ ସମ୍ପନ୍ନୀୟ ପ୍ରସ୍ତୁତି କରିବେ ।
(୫୦)
୨. ପ୍ରସ୍ତୁତ ପ୍ରକଳ୍ପ ସମ୍ପର୍କରେ ଏକ ମୌଖିକ ପରୀକ୍ଷା କରାଯିବ ।
(୫୦)

କ୍ରିୟା

ଗ୍ରନ୍ଥ ସଂପାଦନା ଓ ସମାଲୋଚନା

(Editing & Textual Criticism)	(100 + 100)
Course Code 4.3 : Editing	(100)
Course Code 4.4 : Textual Criticism	(100)

Group - E

Audit Course (No Credit)

1. Creative Writing (Poetry, Short story)

କବିତା ଓ ଗଳ୍ପର ସଂଜ୍ଞା, ସ୍ୱରୂପ, ପ୍ରକାରଭେଦ, ଶୈଳୀ, ଭାଷା, ପ୍ରାୟୋଗିତ ଆଲୋଚନା

2. Performing Arts (Drama)

ନାଟକର ସଂଜ୍ଞା, ସ୍ୱରୂପ, ପ୍ରକାରଭେଦ, ବିଭିନ୍ନ ପ୍ରକାର ଅଭିନୟ

ମେକଅପ୍, ସାଜସଜ୍ଜା, ରିହରସଲ, ପ୍ରାୟୋଗିକ ଆଲୋଚନା

3. Computer Application

Computer Software, Hardware, System Software, Application Software, CPU, Memory RAM, ROM, Input & Output Device, Floppy Disk, Hard Disk, CD, Mouse, Keyboard etc.

